Music Therapy process with young people who have severe and multiple disabilities

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MUSIC THERAPY PROCESS WITH YOUNG PEOPLE WHO
HAVE SEVERE AND MULTIPLE DISABILITIES

Ph.D. Thesis

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Abstract

This research was inspired by the responses of children with cerebral palsy and severe and multiple disabilities during music therapy at the Cheyne Hospital for Spastic Children, London, 1985-1986. These responses were surprisingly full of life, optimism and awareness. They prompted the writer to investigate her work in the hope of finding some explanation.

A detailed description was made of the processes of interactive music therapy with two groups each of four children who were described as having cerebral palsy and severe and multiple disabilities. The writer’s interest was that of a developmental music therapist. The sessions took place over one academic year and were video-taped. Two early and two late sessions were transcribed, first as a written musical score with coded observables, then distilled into a computer file as a list of timed events.

The study was qualitative and quantitative. Descriptions and interpretations were made of selected portions, and corroborative evidence of the findings sought by performing analyses of the event list. In relation to the enormity and complexity of the data gathered, this study has only explored a fraction of the possibilities.

There were two major aims: (1) to investigate the hypothesis that the role of the music therapist is like that of the ‘good-enough mother’ as described by D. W. Winnicott (2) to generate some broad guidelines of music therapy.

Three main questions were addressed:

(1) Did the children take more part in music therapy sessions over a period of time?
(2) When did the major child-therapist interactions occur?
(3) When the music therapist focused on an individual child how could it be known that the child was aware of this attention?

The study showed that the children responded to music therapy and had some expectation of how the music ‘worked’. For example, some beat on the downbeat, pitched in the therapist’s tonality and followed V7-I shifts. One child sang four notes of a scale.

There was every indication that children with severe and multiple disabilities possessed and used a musical understanding which enabled them to connect and relate to the therapist.
I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

Sue Van Colle
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Sue Van Colle

January 2003
Chapter 1
Music Therapy:
Introduction and Broad Historical Overview

1.1 A Background to Music Therapy

Music therapy is a relatively new profession. Bunt points out that although music is cited as having been used as early as 1500 BC and was systematically used by the Greeks in the 6th - 4th centuries BC to alleviate disorder and suffering in human beings, it was not until 1944 AD that music therapy emerged as a profession allied to medicine and the first music therapy curriculum was designed at Michigan State University. Since then a world-wide movement has established university-ratified training programmes and music therapy associations and societies with their journals and publications.

1.2 The Legacy of the Greeks

It is important to consider the attitude of the ancient Greeks towards music. Their system of using it for healing not only foreshadowed the music therapy profession of today but resonates with current neurological research. Music permeated Greek culture and was used in a wide variety of settings to enhance public and private ceremonials and festivals, and as an adjunct to diverse work activities such as marching to war or rowing a boat. The Greeks were well aware of how music stimulates the spirits and … assists in maintaining the rate of achievement and, where necessary, in synchronizing everyone’s efforts.

They strongly believed that music had the power to alter a person’s mood or disposition, and that it could be applied in a rational way to restore harmony where there was dis-ease or disharmony. Pythagoras was credited with having developed a science of musical psychotherapy and a daily programme of songs and lyre pieces to be

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played in the morning and at night. These were to promote a feeling of energy on arising and such tranquility on going to bed that ‘prophetic dreams’ would follow. Plato and Aristotle both

considered that the right type of music was a powerful instrument of education which could alter the characters of those who studied it, inclining them toward inner order and harmony.

Music was so potent that Plato, in his ideal State, was in favour of prohibiting those forms of music that could disrupt inner harmony and cause social unrest.

Various elements of music were perceived as having particular effects. Certain modes and scales, for example, were thought to have specific properties. For Aristotle the Dorian mode was steady and manly and produced a ‘particularly equable feeling’, while the Phrygian mode could induce a state of emotional excitation and indeed, according to the great classical scholar E. R. Dodds (cited by Storr), was used for its cathartic effects in the Dionysiac rituals. Rhythms and tempi had different moods and effects as well. West suggests the

trochaic rhythm was felt to have a running or tripping effect, the paenonic was associated with lively dancing … the dochmiac was used only when the tone was urgent or impassioned.

Music which comprised predominantly long value notes was thought to be conducive to a ‘calm and serious state of mind’. Similarly rhythms in duple time were considered ‘more even, orderly and grateful’ but those in quintuple or septuple time could be disturbing and carry one away.

The Pythagoreans believed that harmony in music, art, architecture and cosmology arose from the underlying numerical relationships in each. In music, intervals could be

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3 Ibid., p. 31.
5 Ibid., p. 42.
6 Ibid., p. 43.
7 West, op. cit., p. 153.
8 Ibid., p. 159.
9 Ibid., p. 159.
expressed as a ratio between two whole numbers, the concordance of an interval being related to the elegance and simplicity of the numbers involved. Thus the octave, fifth, fourth and major third are the most concordant intervals, characterised by the ratios of low numbers 2:1, 3:2, 4:3 and 5:4; the semitone and augmented fourth or tritone are discordant intervals, characterised by ratios of higher numbers 16:15 and 45:32.

Harmony implied the reconciliation of apparent differences and harmonic music contributed to the complete integration of the person.\(^\text{10}\)

During the past few years, the neuropsychiatrist Peter Fenwick and professor of music and psychiatry Paul Robertson, have reviewed research into neurobiological effects of music. They encountered the neurobiologist and neurologist Mark Jude Tramo at Harvard Medical School, together with his colleagues, who found a neurological basis for the experience of simple intervals as concordant, thereby putting the intuitive theory of the Greeks on to a scientific footing.

Basic physiological and anatomical properties of auditory and cognitive systems determine why some combinations of simultaneous tones sound more harmonious than others. Distinctive acoustic features of consonant and dissonant intervals are translated into distinctive patterns of neural activity.\(^\text{11}\)

The neurone firing patterns in the auditory nerves were found to be regular in response to the perfect fourth and perfect fifth and erratic for the semitone and the tritone.

The psychologists Marcel R. Zentner and Jerome Kagan, at Harvard University, have investigated the responses of four month old infants to consonant and dissonant versions of two melodies.

Infants looked significantly longer at the source of sound and were less motorically active to consonant compared with dissonant versions of each melody. Further, fretting and turning away from the music source occurred more frequently during the dissonant than the consonant versions. The results suggest that infants are biologically

\(^{10}\) Manley P. Hall, *The Therapeutic Value of Music Including the Philosophy of Music*, (Los Angeles: Philosophical Research Society, 1982).

prepared to treat consonance as perceptually more pleasing than dissonance.\textsuperscript{12}

It has been found that such regular neurone firing patterns are experienced as favourable by mammals, including infant humans.\textsuperscript{13} Clearly this has ramifications for music therapy.

Wieser and Mazzola have also studied brain responses to harmony by recording electrical activity at certain interior points in the brain (depth EEG).\textsuperscript{14} Their results reveal mechanisms that distinguish between consonance and dissonance, and the classification of intervals as consonant or dissonant agrees exactly with the definition of Palestrina.\textsuperscript{15} This finding shows the interval of a fourth, 4:3, to be discordant, but otherwise agrees with the above Greek definition of concordance.

The Greeks perceived music in medicine as a ‘curative or preventive means that could and should be controlled, since its effects on man’s physical and mental state were predictable’.\textsuperscript{16} When Madsen and Madsen wrote of the rise of music therapy in mid-twentieth century America, they were describing a reconnection with this rational approach. A ‘discipline arose that has gained progressive scientific respectability’.\textsuperscript{17} Part of this respectability lay in the reawakened but more sophisticated attempt to reconcile artistic and scientific sides of music. Training programmes were established that had broadly-based curricula and stimulated the need to define the profession. Music therapists became aware that if their work produced positive effects on their


\textsuperscript{15} See Alfred Mann, \textit{The Study of Counterpoint}, (New York: W. W. Norton, 1971), English translation of part of Johann Joseph Fux, \textit{Gradus ad Parnassum}, 1725. This famous treatise on counterpoint describes the art of Palestrina, listing the unison, third, fifth, sixth and octave as consonances and the second, fourth, diminished fifth, tritone and seventh as dissonances. The fourth can be classified as an imperfect consonance when the upper note is duplicated at a lower octave.


clients, then negative effects could also be produced.\textsuperscript{18} Recently they have become aware of the non-unitary nature of their profession, of the need to include a psychotherapy training in the courses\textsuperscript{19} and of the borrowing from psychodynamic and developmental theory. The implications for the profession’s need for self-examination were, and are, enormous.

\subsection*{1.3 The Transitional Period}

The Greek concept of music as a healing agency was not immediately developed, although several scholars including the Roman Marcus Terentius Varro (116-27 BC) drew on Greek sources when writing about music’s healing power.\textsuperscript{20} In the early sixth Century the Latin philosopher and statesman Ancius Manlius Severinus Boethius (480-574) wrote a treatise on the arts which alluded to musical healing, ‘De Institutione Musica’, and he described many of the ways in which music was used by the Greeks as remedies for sickness of varying kinds. He is quoted by the late psychotherapist and psychiatrist Anthony Storr as saying

\begin{quote}
Music is so naturally united with us that we cannot be free from it even if we so desired.\textsuperscript{21}
\end{quote}

Boethius’ words resonate with contemporary research in music and music therapy.\textsuperscript{22} His treatise was the chief source of information about music therapy in antiquity, and formed, in later years, part of the medieval ‘quadrivium’ in education, the highest subjects that could be studied.\textsuperscript{23}

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\textsuperscript{18} Ibid. p. 9.
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\textsuperscript{22} See Paul Robertson, \textit{Music and the Mind}, (London: Channel 4 Television Publication, 1996) and section 1.11 The Research of Fenwick and Robertson, on page 23 of this thesis.
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1.4 Music Therapy in the Middle Ages: Religion and Magic

Medieval Europe in the thirteenth to fifteenth centuries departed, to a large extent, from the Platonic-Pythagorean view of music therapy. It was through the eyes of the Church rather than the State that music as a healing power was predominantly used ‘to avoid profane and pernicious influences on men’s souls’. The empirical rationale approach to music and healing was lost. Accounts vary about the extent to which Greek music therapy continued to be practised during this period, and there was a diversity of opinion as to its value. Aristotle’s doubts regarding the scope of music therapy contributed to a general scepticism towards it, so too his doubts concerning the audibility of the ‘music of the spheres’. According to R. Boxberger, however, belief in the power of the musical modes to influence behaviour continued.

The doctrine of the Harmony of the Spheres holds that the planetary and stellar spheres combine to make a ‘vast musical instrument’, tuned to the notes of the diatonic octave. Plato ‘speaks in terms of the soul having circuits or revolutions analogous to those of the heavenly bodies…Music, the soul and the whole universe were governed by the same principles of mathematical order and proportion’. ‘A skilled musician can produce changes in a person’s disposition because like responds to like: music has a mathematical basis and we react to it because the human soul shares the numerical motion of the soul of the universe’.

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28 Martin West, op. cit., p. 64.

1.5 The Renaissance and Musical Harmony

The Renaissance from the fourteenth to sixteenth century, represented the climax of a long movement towards cultural and spiritual freedom in Europe. With it came a revival of Greek and Roman humanism in which man’s life on earth was celebrated and considered of equal importance to that in the next world. In the wake of Platonism, music therapeutics attained a philosophical centrality, a cultural resonance, among educated Europeans greater than it has enjoyed at any time before or since…

Platonism was not exclusive, however, in that the theory of the four humours, based on the four elements of earth, water, air and fire became a point of direct contact between music and medicine. Humoral pathology began with Hippocrates (c.460-c.377 BC) and was based on the cosmogony of Empedocles (5th century BC) who theorised that all material existence related to the four elements.

In medical theory, these four elements corresponded to the four humors of the body - blood, phlegm, yellow bile and black bile.

These gave rise to the ‘four temperaments – sanguine, phlegmatic, choleric and melancholic’. The theory of music

…set forth four component musical elements and related them to the four cosmic elements.

The musical elements represented four voices: bass, tenor, alto and soprano. Each of these was comparable to one of the four humours (in the order they are listed) and when presented together formed harmony, which, in this way, brought together totally

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32 Florence Tyson, op. cit., p. 4.
34 Florence Tyson, op. cit., p. 4.
different elements. Paul Robertson describes the link between antiquity and contemporary thought in this area:

The ancient belief that a harmonious condition generates health and happiness, whilst a discordant state of mind and body encourages sickness and unease, has become part of the language of healers.35

Post Renaissance physicians and scientists made the body the locus of their healing and research, while music was engrossed with its expressive potential for communication. The humanistic trend of the Renaissance continued, however, so that a more caring approach was afforded so-called mental patients, one which contrasted with that of the punitive Middle Ages.

1.6 Views of Other Cultures

According to the arts therapist and ethnomusicologist Joseph J. Moreno, ‘music therapy is not a recently developed modality’.36 Long before the Greeks of Antiquity, primitive societies had used music as therapy in shamanic healing for 30,000 years, and their rituals are still being practised throughout the world.37 It is music therapy as a profession which is recent, not music as healing. Moreno sees the shaman as a holistic healer who draws on many sources simultaneously to effect healing. Altered consciousness and trance-like states arise out of entrainment and drumming of rhythmically hypnotic, repetitive supportive music.

The reports of shamanism and music in primitive societies which ethnomusicologists and musical anthropologists have given provide similar accounts. In the 1970s Anthony Seeger, for example, found that Suyá Indians in Mato Grosso, Brazil performed invocations or ‘curing chants’ when a member of their society was ill.38 Their ‘objective was to have an effect on another person’s body’.39 The Huni Kui, or

37 Ibid., p. 167.
39 Ibid., pp. 32-33.
Amahuacas, another South American tribe, used chants at the end of the 19th century, believing that

the most powerful force coming from any live being was its breath and that words emanating from the breath were a creative force.\(^{40}\)

They therefore used ‘evocative chants and fragrant smoke’ to induce a ‘trance-like atmosphere’ around the sick one.\(^{41}\) They are ‘still active’.\(^{42}\) Today in Malaysia, the Temiars, who belong to the Senoi ethnic division of the Aboriginal people, also use music as part of their healing. ‘Tamiar mediums sing when they cure’ and use trance-dancing too.\(^{43}\) Of particular interest to music therapy is the fact that the Temiars listen to their rain forest, and echo its sounds in their music. Just as they try to be sensitive to their environment, which has an energy and power of its own, so music therapist’s aim to listen sensitively to their clients.

In considering ancient and primitive music for healing, we are connecting with the roots of music therapy, tracing our lineage and learning about the evolution of the relationship between problems of living, or sickness, and healing approaches. By doing this we have the opportunity to see what musical principles ‘repeat themselves’\(^{44}\) and thereby come to a greater understanding of what music as an agency in healing really is, and the best way we can use it. One major repeated aspect of music therapy is that there has been a resurgence of interest in an empiricist approach to it.

1.7 Music Therapy in Victorian Britain

Music therapy as it is known today in modern Britain began with the activities of the members of The Guild of St. Cecilia, founded in 1891 by Canon Frederick Kill


\(^{41}\) Ibid., p. 189.

\(^{42}\) Ibid., p. 199.


Harford. This provided ‘music therapy to hospitalised patients’ who had ‘mental and physical disorders’ and represented the first efforts to establish an organisation in Great Britain dedicated to providing music therapy to a large number of people.

The Guild, of which Harford was the sole administrator, also wanted to research the effects of music. William B. Davis, drawing on letters by Harford to the British Medical Journal identifies four of his goals. One was to determine the effectiveness of sedative music in reducing anxiety and pain, as well as its ability to induce sleep.

and another to identify the types of illness in which music was most effective.

Additionally it was hoped to establish a body of on-call music therapists who would respond quickly to physician’s requests and even provide live music over the telephone. This idea has not been taken up by music therapists as yet, but has been adapted by busy companies, shops and theatre booking offices, for example, who use recorded music in the attempt to ease their customer’s frequent long wait while the line is engaged. Many of the precepts of Canon Harford’s work, however, find a voice in the definitions and descriptions of twentieth century music therapy. These include acknowledgement of the need for music therapy training, cooperation with the medical world and the power of music to affect patients in physical or emotional distress.

However, despite Davis’ enthusiasm, reports from patients that music had helped them, the support of Florence Nightingale and of influential Londoners, his failing health,

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47 Ibid., p. 12.
48 Ibid., p. 12.
lack of financial resources and criticism from certain musical and medical quarters of the media, led to the decline of The Guild.50

1.8 The Development of the Music Therapy Profession

1.8.1 Beginnings

During the Second World War the hospital authorities began to employ musicians to assist them in overcrowded hospitals. The medical and scientific communities were sceptical, however, of the potential of music to reach people and influence behaviour. They criticised the anecdotal evidence on which the healing properties of music were based, and challenged the emergent profession to verify its work.51 The association that music had with magic may have been another reason why professionals did not take music therapy seriously.52 When something is ‘magic’ we lack full rational control over it, cannot direct its unknown elements or repeat it at will.

The psychoanalytic model of Sigmund Freud made it possible to consider the workings of the mind in a new way. He described the principle governing magic as ‘the principle of the omnipotence of thoughts’ and thereby opened up a way of reaching magic and de-mystifying it.53 His work brought with it a systematic approach to understanding the mind and was one of the major influences that led to the emergence of Psychotherapy and the Arts Therapies (for which it provided an increasingly ‘respectable’ back-cloth).

1.8.2 Status and Context

The National Association for Music Therapy (NAMT) was established in 1950 in the United States of America and was the first professional organisation in the field of music therapy. Its neighbours lay in the respected fields of medicine, education and

50 Davis points out that similar organisations were established in the United States in the early twentieth century which, like Harford’s Guild, were driven by one individual, and also failed. Davies, op. cit., p. 15


psychology. Its closest professional peers were psychotherapists who, from 1952 onwards, were under attack from Hans J. Eysenck.\textsuperscript{54} The music therapy profession was an outsider needing to define itself. It was related to ‘various orientations within psychology and philosophy’.\textsuperscript{55} It had points of contact with various models which included the medical, the behavioural, the humanistic (or ‘third’ force as Abraham Maslow called it), existential and the psychoanalytic. Its uniqueness lay in its use of music as a treatment modality and in its concern ‘both with man and the relationship-man-music’.\textsuperscript{56}

One thing the profession seemed initially to lack was the right image. While its contribution to hospital programmes was helpful, this was usually organised by a Hospital’s Recreational Department. The notion of music therapy as a recreation tended to overshadow its therapeutic input. Positive change brought about by ‘recreation’ was not considered in the same league as medically or scientifically controlled intervention. Therapists themselves do not regard recreation and therapy as synonymous either. The profession needed to objectify and explain its findings.

\textbf{1.8.3 Theory and Treatment}

Music therapy theories had their origin in the treatment strategies used to meet the needs of war veterans and these were based on empirical observations made in hospitals during World Wars I and II.

Tyson identifies four lines of development along which the application of music gradually evolved.\textsuperscript{57} Firstly music was used in ‘Functional Occupational Therapy’. Playing instruments could improve damaged nerve tissue, joints and muscles, while blowing an instrument and singing exercised the lungs. Secondly, music was an ‘adjunct to psychiatric treatment’. It was found to have helpful properties for those

\textsuperscript{54} Hans Jurgen Eysenck, 1916 - 1997, was a German-born professor of psychology, renowned for his psychometric tests of human personality and intelligence and his pioneering work in the development of ‘behaviour therapy’. He stressed the importance of empirical findings in research and started controversy in the 1950s over the value of psychoanalysis, arguing that there was no statistical evidence to prove its effectiveness. See Hans J. Eysenck, ‘The Effects of Psychotherapy: An Evaluation’, \textit{Journal of Consulting Psychology} 16, 1952, pp. 319-324.

\textsuperscript{55} Bunt, op. cit., p. 38. See also Even Ruud, \textit{Music Therapy and its Relationship to Current Treatment Theories}. (St. Louis, MO: Magnamusic-Baton, 1980).

\textsuperscript{56} Ruud, op. cit., p. 70.

who were mentally ill, most of all perhaps the power of arousal, and the ability to mobilise a person’s inner resources. Thirdly, music was a ‘direct aid to anaesthesia’. It helped pre-operative patients to relax, thus reducing the need for drugs. Lastly, music was used as a ‘psychological stimulus in the total hospital environment’ where apparently it was introduced in much the same way as tea: to cure and help everything. It was only as the profession examined itself through the models of other disciplines that it came to realise the precise significances and potential of its own treatment modality.

As the music therapy profession first emerged in the United States it tended to ally itself with behavioural science and made continued use of receptive techniques. Behavioural therapists usually address one specific aspect of the person, the symptom, with the aim of effecting change in this area. They are concerned with modifying behaviour rather than developing insights and resolving unconscious conflicts, and use music as a re-enforcer. This approach is seen by its critics as addressing one small part of a person and neglecting to see the symptom in context, as part of the whole person. It led in turn to a somewhat ‘atomistic’ kind of research.

The use of receptive techniques has persisted to the present day. In their account of music therapy research in the United States, Bunt and Hoskyns make references to music therapy used as a re-enforcing agency in the attainment of a variety of specific skills (e.g. reading, numeracy and imitation skills) and to help reduce ‘dysfunctional’ or inappropriate behaviours such as aggression and hyperactivity. Music therapy

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61 Bunt and Hoskyns, op. cit., p. 4.
continues to be used for the improvement of physiologically based disorders through the application of auditory stimuli for temporal learning and rehabilitation.  

1.8.4 Scientific Research and Respectability

As the music therapy profession emerged, so did its need to validate itself and become ‘respectable’. One way it lessened its outsider status was through identification with the behavioural tradition, in particular the behavioural school of therapy. This latter identification yielded data for empirically based scientific research with its control experiments and statistical measures, which could be easily appreciated. A profusion of outcome research aimed to evaluate the efficacy of music therapy in different clinical fields and went towards answering the question ‘Does music really help make people well?’ In as much as the findings of certain studies informed educational and community programmes, an affirmative answer was produced. In so far as music therapy was able to analyse and account for itself in objective and specific terms much was gained in terms of respectability.

The issue of respectability was central to other contiguous professions and disciplines in America after the Second World War. Berger and Berger state that a proper sociology establishment truly emerged during post-war years as ‘a very respected and settled academic field’ which ‘devoted great attention to the development of empirical research methods and statistical techniques’. Garfield and Bergin connect the post-war era with a general increase in clinical and counselling psychology training and with psychologists and psychiatrists working together in clinical settings ‘in professional

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64 Bunt and Hoskyns, op. cit., pp. 3-6.

65 Madsen and Madsen, op. cit., p. 9.


organisations devoted to psychotherapy, and in scholarly organisations’. In the early
days of music therapy, however, it was only the ontological dilemmas of these
professions that linked them together. Music therapy can be seen as a multivalent
atom, intuiting its connections with other disciplines but not yet in a position to make
them, demonstrate them or use them systematically.

1.8.5 Music Therapy in the Great Britain: Music as Expression

A cross-fertilisation and diversity of ideas gradually came about as the profession
emerged, developed and grew in size. Juliette Alvin played an important part in this.
In 1958 she established music therapy in Great Britain, forming the British Society for
Music Therapy (BSMT), and establishing and directing the music therapy course at
the Guildhall School of Music and Drama in 1968. Alvin saw music therapy as more
of an art than a science in that the important ‘feeling’ side of music was not accessible
to scrutiny in the same way as purely physiological phenomena. She also saw music
therapy as teamwork and stressed the importance of music therapists working alongside
other professionals.

Alvin’s views contrasted with those prevalent in the United States of America and
became the base-line in British training programmes. They also encapsulated the idea
that the notion of ‘physical’ and ‘psychological’ are separate. She compounds the
division between psyche and soma when she writes ‘Britain has kept alive the
Hellenic tradition that man’s harmonious development cannot be achieved without the
right balance between body and mind…’

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68 Sol L. Garfield and Allen E. Bergin, ‘Introduction and Historical Overview’, in Sol L. Garfield and
Allen E. Bergin (eds.), Handbook of Psychotherapy and Behavior Change, (New York: John Wiley,


70 The BSMT currently (November 2002) has about 800 members.

71 Juliette Alvin, Music Therapy, (London: John Clare Books, 1983), p. 76: ‘Since the physical and the
psychological responses act on one another, the number of non-measurable factors involved in the
process makes music therapy an art more than a science’.

72 The writer uses the word ‘psyche’ here after Bettleheim 1982 who translates the overarching concept
of Sigmund Freud’s ‘das Ich’, ‘das Es’ and ‘das Uber-Ich’ as ‘soul’. There is no generally accepted
p. 71.

73 Alvin, op. cit., p. 161.
1.8.6 Music Therapy Training in Great Britain

During the 1960s and 1970s the profession began to spread world-wide, and music therapy associations were established in Denmark, France, Germany, Poland, Canada and Japan. Initially, however, the locus of training was in Great Britain and the United States, at the Guildhall School of Music and Drama and Michigan State University. The Guildhall music therapy course in Great Britain boasted two ex-students at the end of its first year, two ‘pioneers’, but fortunately numbers have increased.

In many countries the music therapy profession grew out of an awareness of music therapy in Great Britain and the United States of America. Students from all over the world completed the training programmes in these countries and then helped establish music therapy in their country of origin. There were, however, pioneers in other countries. For example, the psychiatrist and music therapist Rolando O. Benenzon was responsible for establishing music therapy in South America, founding the Argentine School of Music Therapy in 1966. He is renowned for his innovative approach to child psychosis. Another pioneer is the music therapist Ruth Bright who helped to establish music therapy in Australia and created the Australian Music Therapy Association whose first conference was held in Sydney in 1975. She is one of the most prolific authors in the field of music therapy, and has contributed a great deal to an understanding of terminal illness and grief.

There was in addition a certain amount of proselytising abroad, notably in the early 1960s by Nordoff and Robbins and Alvin to such countries as Scandinavia, Latin America and Japan. In recent times Alan Wittenberg, an American consultant, forged links with Russia, a country unwilling officially to invite a ‘specialist in a non-existent

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It is ironic to consider that at this time the USSR is itself ‘non-existent’.

By 1981 there were three music therapy courses available in Great Britain. These were the Guildhall course, the Nordoff-Robbins Music Therapy Centre course, established 1974, and the Roehampton Institute Music Therapy course, established 1981. Their shared goal was to ‘train musicians in clinical, professional and musical skills to practice music therapy’.  

The Guildhall course particularly expected students to have a high level of practical musicianship (although this was and is a prerequisite for entrance on the other two courses). Under the direction of Margaret Pickett during the period 1982-1991, it offered a broad training which left students free ‘to develop a style of their own based on their musical response to their patients, clients and pupils’. Today the Guildhall course, directed by Sarah Hoskyns, continues to stress the importance of a humanistic partnership between the compassionate nature of the music therapist and his or her skills as a musician.

The Nordoff-Robbins course saw music itself as the essential and most powerful agent of change in music therapy, and based itself on a method of evaluating and giving clinical direction to music therapy, in which both co-operative and “resistive” modes of the child’s/client’s communicating and relating are significant.

It trained students to work in pairs, as co-therapists, using a creative approach in an interactive framework. The development of the client/therapist relationship was

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80 This is quoted by the Guildhall and Roehampton courses as ‘Objectives of Training’, *Basic Module of Training*, APMT document regarding Postgraduate Diplomas in Music Therapy, 10th December 1986. The Nordoff-Robbins course gives a lengthier description of its training objectives, and stresses work with children. The general thrust, however, is in line with the other two courses.

81 Ibid.

viewed in terms of the changing qualities of their music making. Piano improvisation is an important part of training and is used clinically to facilitate the emergence of the ‘Music Child’, the ‘individualised musicality inborn in each child’. Pauline Etkin is the current director of the course.

Elaine Streeter established and directed the Roehampton course from 1981 to 1986. She took the improvisational techniques of the Nordoff-Robbins School but stressed observational techniques of learning rather than experiential ones. Central to her course was a developmental model of therapist and patient which was thought to find similarities of expression in the mother-child dyad. Prior to the start of the course, students were expected to spend several weeks observing a neonate with his or her mother. Unlike the other two courses, the Roehampton course based itself firmly on the idea that we do not know what music therapy is, a statement explicitly made and one which has generated much positive work and thought. In recent times a psychoanalytically-informed approach has been introduced by John Woodcock and Kay Sobey.

In 1991 a two-year part-time course was set up by Leslie Bunt in the Department for Continuing Education at Bristol University. Features of this are the accommodation of musicians from non-western cultures and the invitation to working musicians to train as therapists. ‘No specific model is taught’ although there is an underlying humanistic emphasis to the course. Students are encouraged to develop their own personal style of work.

Two more courses have been set up in recent years. The first is a Diploma and M.A. music therapy course established by Helen Odell-Miller and Amelia Oldfield which began in September 1994 at the Anglia Polytechnic University in Cambridge. Students are encouraged to ‘investigate, research and explore’ music therapy. A wide range

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84 Nordoff and Robbins, op. cit., p. 1.


86 *Basic Module of Music Therapy Diploma Courses*, Association of Professional Music Therapists.
of theories and approaches are taught and a dynamic approach to learning stressed. The second music therapy course, established in 1997, is at the Welsh College of Music and Drama, and is directed by Alison Levinge. Psychodynamic and humanistic approaches are emphasised and mother-infant observation is required.

Although there are variations in the courses the general trend is for students to forge their own routes while being informed of various models. The scope for the profession is enormous.

1.8.7 The AAMT, the APMT and Cross-Fertilisation

A second American music therapy association was established in 1971, The American Association for Music Therapy (AAMT). The inception of this association was important. The AAMT was concerned with humanistic and psychoanalytic approaches in clinical work and contrasted with those generally expressed by the NAMT. This was indicative of the degree to which the profession had developed. It was assuming a dialectic quality, one which fostered an increase in discussion of issues concerning the role and identity of the profession. By the 1980s there were many different clinical approaches and an intermittent cry for professional unity, one repeated as the profession developed in size and scope.

In 1976 a second music therapy organisation was also formed in Great Britain, the Association of Professional Music Therapists (APMT). This had a different emphasis to its American counterpart. Membership was only open to qualified music therapists (with a modified membership for those in training), and its brief was to govern and represent the profession. It did this well since in 1982 music therapy was recognised by the Department of Health and Social Security as a profession on a level with other paramedical professions, and awarded a similar career and pay structure. The APMT complemented the work of the BSMT, whose membership included non-music therapists and whose brief was to publicise the profession. Currently 438 qualified music therapists belong to the APMT and 64 music therapy students.

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The profession attracted a variety of people to its centres of training who brought with them different traditions and perspectives\(^88\) and brought about, therefore, an increasing cross-fertilisation of ideas. Three modes of cross-fertilisation are identifiable. One comes from the work music therapists undertook as part of a team-approach in hospitals and schools.\(^89\) A second came from the ideas and characteristics of the influx of people new to the profession.\(^90\) The third continued to be the range of affinities the profession naturally had with other disciplines and professions and the influence of these through professional collaboration and use of their research methodologies, particularly models of psychology.\(^91\) This complex of ideas and practices was, by the 1990s largely responsible for enormous clinical diversity in music therapy practice.

In 1998, the NAMT and AAMT joined forces to become the American Music Therapy Association (AMTA) which, in the year 2002, was quoted as having 2636 qualified music therapist members and 964 student music therapist members. Its mission was the ‘progressive development of the therapeutic use of music in rehabilitation, special education, and community settings’. The brief of the AMTA was also to set ‘the education and clinical training standards for music therapists’.\(^92\) The fusing of the NAMT and AAMT appears to be one step towards the longed for professional unity.

### 1.9 Difficulty in Defining Music Therapy

No internationally accepted definition of music therapy exists, a fact which emphasises the scope of music therapy. Social, political and economic factors can affect the way in which music therapy develops.\(^93\) So too can the personality of the music therapist. In her book Music Therapy, Alvin informally defines music therapy many times as do all writers on the subject. This reflects the fact that music is understood, experienced

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\(^{88}\) See the *Music Therapy International Reports*, (Philadelphia: American Association for Music Therapy [AAMT]).

\(^{89}\) Alvin, op. cit., pp. 156-162.


\(^{93}\) See for example reports on Argentina, France, Japan and Poland, Oldfield and Summer (eds.), op. cit.
and made in different ways, and music therapists make different decisions about which clinical approach is most effective with a given client. It is thus a major task for the profession to describe itself in one breath.

Nonetheless there are common features between the various definitions of music therapy, as is the case in psychotherapy.\textsuperscript{94} Compare the AMTA definition and the APMT definition, looking at that of the AMTA first:

Music Therapy is an established health profession in which music is used within a therapeutic relationship to address physical, emotional, cognitive and social needs of individuals of all ages. Music therapists use both instrumental and vocal music strategies to facilitate changes that are non-musical in nature. After assessment of the strengths and needs of each client, qualified music therapists provide indicated treatment and participate as members of an interdisciplinary team to support a vast continuum of outcomes.

The APMT definition:

A form of treatment whereby a mutual relationship is set up between the patient and therapist, enabling changes to occur in the condition of the patient and therapy to take place… By using music creatively in a clinical setting, the therapist seeks to establish an interaction, a shared music experience and activity leading to the pursuit of therapeutic goals determined by the patient’s pathology.\textsuperscript{95}

Common to both is a delineated therapeutic area and the goal of alleviating distress and disorder through the agency of music. This may be adequate for a professional identity to be expressed. Hopefully through research the essential components of music therapy may be more clearly explicated.

\textsuperscript{94} See Sydney Bloch, \textit{What is Psychotherapy?}, (Oxford: Oxford University Press, 1982).

\textsuperscript{95} \textit{A Career in Music Therapy}, (London: Association of Professional Music Therapists [APMT], 1982).
1.10 Current Trends in Music Therapy Practice

Bruscia describes a variety of improvisational models of music therapy. These include Creative Music Therapy (after Nordoff and Robbins), Free Improvisation Therapy (after Alvin) and Analytical Music Therapy (after Priestley, Wright and Wardle). While not new in themselves, these therapeutic approaches are currently used and very often constitute the raw data in current research even if in modified forms. Bruscia also describes models that combine different art forms and educational philosophies thereby extending the definition of music therapy. These include musical psychodrama which was developed by Joseph Moreno in the late 1970s.

Tyson itemises music therapy techniques, and, further to Bruscia’s survey includes Developmental Music Therapy (a psychoeducational approach), and Guided Imagery in Music, a technique receiving much attention now in Great Britain as well as the United States.

One can see from the above that music therapy is moving away from its initial preoccupation with behavioural science. It is now considering the ‘inner world’ to which Freud alluded. One might also deduce that the profession is testing its boundaries in so far as it is incorporating mixed-media paradigms in its area of application. There is a sense that the profession is redressing the balance of focus in an attempt, perhaps, to find a long term equilibrium.

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97 See Mary Priestley, Music Therapy in Action, (St. Louis, MO: Magnamusic-Baton, 1975).


101 In the 1960s Alvin and Priestley referred to Freudian and Jungian models respectively in the early days of music therapy in Great Britain, thus sowing the seeds of this trend. The writer’s assertion was confirmed with respect to the UK in 1997 by the results of a survey by David Stewart. In respect of music therapists’ working models, mother-infant and psychoanalytically-informed models predominate, while behavioural and physiological ones are little used. See David Stewart, ‘The State of the UK Music Therapy Profession’, British Journal of Music Therapy, 2000, 14(1), pp. 13-27.
In considering the contribution of many individual music therapists, it is tempting to seek a paradigm that embraces a collection of individuals. Alternatively there may be, as Maranto suggests, a proliferation of different Schools, which is the current position within psychotherapy.\textsuperscript{102} Storr takes the view that research in psychotherapy may eventually disclose the ‘common factors which lead to a successful outcome’ and hence reduce compartmentalisation or psychotherapy ‘labels’.\textsuperscript{103}

\subsection*{1.11 The Research of Fenwick and Robertson}

Peter Fenwick, a consultant neuropsychiatrist at the Maudsley Hospital, and Paul Robertson, leader of the Medici String Quartet and Visiting Professor of Music and Psychiatry at Kingston University, have combined their expertise in recent years to explore the relationship between music and the mind. While their research is not actually dedicated to music therapy much of what they have discovered is highly relevant to this field.

Fenwick and Robertson address the question of whether there is a ‘scientific basis for music, mind, healing and consciousness’,\textsuperscript{104} by no means an easy question to answer. They are helped in their quest by positron emission tomography (PET), an imaging technique in which oxygen or glucose in the body is labelled with a radioactive atom so that it can be tracked. The PET scan can show different active areas in the brain according to subtly different tasks, e.g. playing music or experiencing music, so it is able to provide an insight into the mechanisms of the brain in relation to music. As discussed above (page 3), one notable discovery was that harmonious chords, known as concordant pitch combinations, create regular neurone firing patterns in the brain which are preferred because the right hemisphere has to do less to interpret the sounds. This supports the practice of many music therapists, especially those working with children (the writer included) of using tonal music in their clinical work. Tonal music with a simple structure is liable to be more accessible to the children and therefore more likely to facilitate the child-therapist relationship than other types of music.


\textsuperscript{103} Anthony Storr, \textit{The Art of Psychotherapy}, (op. cit.), introduction p. viii.

Child psychologist Sandra E. Trehub of the University of Toronto has found that babies as young as six months ‘display highly developed abilities to recognise musical structures’ and connect sound with emotion.\(^{105}\)

It is clear that infants do not begin life with a blank musical slate. Instead they are predisposed to attend to the melodic contour and rhythmic patterning of sound sequences, whether music or speech. They are tuned to consonant patterns, melodic as well as harmonic, and to metric rhythms\(^{106}\)

These abilities facilitate mother-child bonding in the pre-verbal stage, and also, potentially, allow the music therapist to forge a sensitive relationship with children who have no expressive language, and who developmentally are like babies. If the children can follow the music, the more likely they are to find meaning in what the therapist does, to interact with her and to experience themselves in a meaningful relationship.

The work of Mireille Besson at the Cognitive Neuroscience Laboratory in Marseilles was also researched.\(^{107}\) Besson is looking at electrical activity in the brains of musicians and non-musicians in connection with anticipating events. She has discovered that both groups were sensitive to rhythmic, melodic and harmonic incongruities in music, musicians performing better in some but not all cases.\(^{108}\) This has implications for this research. It adds weight to the idea that the children will react to violation of expectancy in the therapist’s music, which will in turn indicate they are following events. It also suggests that the potential for children with disabilities to experience successful events will increase when a therapist uses tonal music since more can be anticipated. This is important as it could help the children to feel satisfied and confidant.


Another area researched by Fenwick and Robertson concerns receptive music, the effect that listening to music has on the brain. PET can show that listening to Mozart for fifteen minutes can raise spatial IQ by 9%. A quasi-classical style of music was used by the therapist in the music therapy sessions for this study and possibly in some small degree this could have had a similar effect on the children.

The ‘Mozart effect’, a term coined by the Los Angeles Times in October 1993, arose from the research findings of psychologist Francis Rauscher, physicist Gordon L. Shaw and colleagues at the Center for the Neurobiology of Learning, University of California, Irvine. In 1993, Rauscher, Shaw and Katherine N. Ky reported that college students, after listening to a Mozart piano sonata, K. 448, experienced significant although temporary gain in spatial reasoning skills, the effect lasting for 10 to 15 minutes. These findings prompted further research into this phenomenon, later studies confirming the ‘Mozart Effect’.

Rauscher and her colleagues used Mozart’s music in their research because he composed at an early age and this meant that he was

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\text{exploiting the inherent repertoire of spatial-temporal firing patterns in the cortex}\]^{113}

Rauscher emphasises that there are no scientific studies supporting the notion that the ‘Mozart Effect’ will increase children’s or adult’s overall intelligence, an idea that has had popular appeal\(^{114}\).

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The ‘Mozart Effect’ is being researched in Great Britain by the teacher Anne Savan. She found that playing Mozart to a class of unmanageable teenagers with learning problems significantly relaxed her students and induced a feeling of calmness in them combined with the motivation to focus on classroom work. She also found the music of Mozart when played backwards had the same effect, while playing Haydn had little or no impact. The quasi-classical style of music used in the writer’s music therapy research may have improved the ‘compliance’ of the children and enabled the therapist to reach them more easily. It is not clear at this stage what the exact parameters of the ‘Mozart effect’ are.

Rauscher, at the University of Wisconsin, is currently focusing on the relationship between music cognition to spatial intelligence in humans and animals. Her recent findings support the notion that music training may improve children’s ability to reason abstractly, perhaps strengthening the neural firing patterns of the brain that are relevant to both musical and spatial cognition. ...music instruction may facilitate the learning of abstract mathematical problems, including ratios and fractions.

Fenwick and Robertson reported further research findings, not all of which can be described here. One of these concerns the brain’s power of imagination. It is possible for the brain to imagine music, and doing this can bring about similar physiological changes as receiving external auditory stimulation. Again this is visible on a PET scan. Possibly the children in this research project were able to imagine music. If so they could administer beneficial parts of the session to themselves by thought alone, giving them a measure of control, a possibly creative outlet and a way of introjecting the therapist.

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1.12 Conclusions

It can be seen that music therapy has developed significantly as a profession, but its diversity proves problematic for those trying to define it. Ruud makes the claim that a single model of music therapy will be impossible to introduce, just as one of man would be. In the writer’s view there can be no one method of working in music therapy but it may be possible to discover an underlying explanatory framework. This will provide a unified theory of music therapy and will reflect different approaches.

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117 Ruud, op. cit., pp. 70-71.
Chapter 2
Music Therapy Research in Great Britain

2.1 Foundations of British Research

About twenty years passed between the introduction of music therapy into Great Britain and the beginnings of rigorous research into the profession. Hoskyns points out that British music therapists had first to ‘create a need for music therapy and to establish the services in hospitals, schools and centres in the community’. Once this need had been established there was a freedom to undertake research which would ‘show the efficacy of music therapy intervention’ and ‘question how it operates’.

Affirmation of this ‘new’ freedom to undertake research came in 1980 when a music therapy research fellowship was established at the City University Department of Music. The fellowship was initially held by Leslie Bunt and subsequently by Julienne Cartwright, Sarah Hoskyns, Colin Lee, Penny Rogers, Gary Ansdell and currently (December 2002) Jackie Robarts. The formal beginnings of music therapy research in Great Britain are linked with the inception of this fellowship and particularly with Leslie Bunt, who helped establish it and was the first British music therapist to gain a doctoral qualification in music therapy.

It is arguably the case that the foundations for a British research tradition can be understood in terms of Bunt’s research itself as well as in terms of the activities and ideas generated by the City Fellowship. It is essential, however, to remember the context in which Bunt, his contemporary Streeter and those who followed, undertook their research, in particular the philosophies, theories and approaches of the training programmes. Unlike its American forerunner, the British music therapy profession did not ally itself to the behaviourist school and those music therapists who undertook research came from a tradition in which an active model was at the centre of its clinical approach. Bunt’s work was a product of this tradition which, over the past decade, has permeated the spirit of British research and has been the springboard for the majority of music therapy researchers who largely base their studies on their own, active clinical material.
This chapter concentrates on research projects undertaken at Universities for postgraduate degrees. It also mentions a few other relevant studies.

### 2.1.1 The Contribution of Bunt

Bunt started his research in 1978 at a time when there was a dearth of ‘objective, structured inquiry’ into British music therapy as his 1982 review of the British Journal for Music Therapy showed.\(^{119}\) He pointed out that only 9% of articles in British music therapy journals could be categorised as ‘objective inquiry’ and only a few concerned experimental research. His doctoral thesis aimed therefore to be as objective a study as possible, laying great emphasis on statistical measures.

As part of his objective strategy, Bunt drew on the work of ethologists who specialise in objective study of non-verbal communication.\(^ {120}\) He compiled a video-tape data collection based on his own clinical work and then analysed it using time-sampling techniques and reliability checks. He argued that ethological methods are particularly helpful in music therapy research since they bring ‘more rigour in investigation’, provide a needed body of descriptive work for the profession and generate questions.\(^ {121}\) They also, importantly, provide one way of reaching the human mind. Inferences can be made about certain types of repeated behaviour and correlations made between types of behaviour and the contexts in which they occur. This is hugely relevant to music therapy inquiry.

He considered, however, that ethologists were passive observers of that which they were describing while he, as a researcher-therapist, was affecting the observed environment, subjectively involved and undertaking ‘action’ research. To that extent Bunt and his followers adapted ethological methods making copious use of independent raters for reliability checks.

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121 Bunt, op. cit., p. 128.
The significance of Bunt’s study lay not only in its ‘discovery’ of the ethologists or in its findings that music therapy can be effective with children who have disabilities. Its significance lay also in providing a comprehensive review of professional literature and an exposition and discussion of the many issues which confront music therapists and face those undertaking research. In so doing, Bunt pointed the way for further research. While his own work was a piece of outcome research, Bunt recommended that music therapists undertake process research, and investigate the way changes in music therapy are reached. He has also pointed out that a fusion of process and outcome research would be ideal. In this respect his ideas correspond to modern thinking in psychotherapy research.

It is too early to estimate Bunt’s influence in the field of music therapy research, but it is a fact that his work established a research tradition in this country and raised the profile of music therapy in Great Britain. It is probably not a coincidence that two of Bunt’s immediate successors, Odell and Oldfield, employed experimental design, and Müller and the writer ethological methods. It may be inevitable, however, that certain researchers are undertaking process research, and attempts are being made to link process and outcome research.

### 2.1.2 Influence of the City Fellowship

The City Fellowship also played a part in establishing music therapy research in Great Britain. It offered a firm research base for music therapy and created a forum for presenting projects and debating issues relevant to music therapy research.

It was advantageous that the fellowship was based at City’s Department of Music. The Department had an academic tradition and interest in scientific approaches to music.

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122 This was said during an informal seminar led by Leslie Bunt and Catherine Butler at *The Case Study as Research*, Fourth Music Therapy Day Conference at the City University, London, February 1988.


was also interested in understanding music as a ‘human science’ and wished for inter-discipline communication. This was already clear from the two-day conference on Science and Music in 1986. Here the need for music therapy to provide theories, and later, models – if not a global model – was made evident, and the difficulty of objectifying the workings of the mind repeatedly discussed.

Further conferences were organised at City, the impetus for which mainly came from the resident music therapy fellows. These covered many aspects of music therapy research, in particular research design. An effort was made to encourage hesitant music therapists who wished to undertake research but felt insufficiently equipped. An effort was also made to forge links with art therapies and a conference was held in 1989 in conjunction with the newly formed Arts Therapies Research Committee. This sought to explore ‘possibilities for shared ideological avenues’ and ‘map quite clearly the position at which each profession lies along the continuum of research developments’. Another conference, ‘Inquiry in the Arts Therapies’, took place in 1993. Problems of methodology were common to all arts researchers, and a need was expressed to maintain a sensitive link with the ‘art’ side of each profession when researching it.

Common to all the conferences was a questioning attitude towards research design, an inter-disciplinary conference population and an emphasis on opportunity for discussion and debate. Music therapists were invited to speak about their projects, no matter at what stage they were, and had the opportunity to consider them with a variety of experienced professionals.

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125 Conference on Science and Music at the City University Music Department, London, 17th-18th April 1986. No proceedings were published.


127 Inquiry in the Arts Therapies, Arts Therapies Conference held at the City University, London, 21st-22nd May 1993. It was organised by Penny Rogers, then current Research Fellow in Music Therapy.

The conferences promoted an enthusiasm for research and encouraged new research. They also fostered an awareness of different research strategies as yet unaddressed, particularly process research. It was found important to devise ways of analysing the variable active input of therapist and client in the clinical situation.

The crude physical science or medical model, where the client is passive recipient of some ‘treatment’ is clearly inappropriate, and goes against the explicit assumptions of many therapists.\(^{129}\)

New paradigm research was explored as one route towards incorporating subjective responses.

The City Fellowship continues to attract music therapy researchers, and the tradition of organising research conferences has been maintained. There is also growing interest in music therapy research from other Universities, particularly at Edinburgh and Bristol Universities.

### 2.1.3 The Work of Streeter

Streeter is considered to be part of the foundation of the British music therapy research tradition. She completed her M.A. in 1979 at York University: ‘A Theoretical Background to the Interpretation of Rhythmic Skills with Particular Reference to the Use of Music Therapy as an Aid to the Clinical Assessment of Pre-School Handicapped Children’.\(^{130}\)

Her work encapsulates many of the themes which form part of current research, notably the mother-infant relationship, and these arise purely from a theoretical consideration of rhythm. Whereas Bunt gathered information on a large scale from external sources, Streeter gained and generated it from a theoretical exploration of one component of


\(^{130}\) Since Streeter’s research, music therapists have become more aware of the value of and need for assessment within music therapy clinical practice. Methods of assessment are evolving and becoming more rigorous. See, for example, *Journal of Music Therapy*, 37(2), 2000, and *Music Therapy Perspectives*, 18, 2000, both of which focus on assessment.
music therapy, alone, considering and defining the role of rhythm in the ‘organisation of perceptions’ and its function in the ‘infant’s earliest development’.  

Streeter was the pioneer of formal music therapy research in Great Britain, the start of her project pre-dating that of Bunt. Many of Streeter’s theoretical ideas were later expressed through her direction of the Roehampton training course. The writer trained on this course and was influenced by Streeter’s theories.

2.2 The Shape of British Research

The shape of British research has been primarily determined by individual and personal visions rather than by a professionally pre-determined and corporate rationale. The genesis of research themes has stemmed from the enthusiasm of individual researchers in respect of their own highly varied work. The contrast between the work of Bunt and Streeter represents to some extent a microcosm of what followed: a diversity of types of research in many different clinical fields.

Evidence of the individual qualities which music therapists brought to their research became apparent during meetings of the APMT Research Sub-group, newly-formed in 1989 and co-ordinated by the writer. There was, however, some unexpected common ground. Unbeknown to each other, Heal, Levinge and the writer had all used the mother-child relationship as a model in their work which, in each case, was rooted in the psychoanalytic tradition and informed by the work of psychoanalysts like Bowlby and Winnicott.  

It is significant that one quarter of the then current researchers focused their research in this way.

The group initiated a register of music therapy research in Great Britain. It became obvious that researchers were not sufficiently aware of each other’s work, and other interested parties had restricted access to it. The writer compiled this register in 1991

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131 Elaine Streeter, A Theoretical Background to the Interpretation of Rhythmic Skills with Particular Reference to the Use of Music Therapy as an Aid to the Clinical Assessment of Pre-School Handicapped Children, M.A. thesis, University of York, 1979, p4.

and it was adopted as a document of the APMT.\footnote{Sue Van Colle (ed.), \textit{Music Therapy Research Register of the Association of Professional Music Therapists of Great Britain}, (London: APMT, 1991).} A European music therapy research register with a similar format grew out of this. It was maintained by Penny Rogers and Dr. Henk Smeijsters and published in 1993 when Rogers took over the coordination of the research group.\footnote{Henk Smeijsters and Penny Rogers (eds.), \textit{European Music Therapy Research Register}, (Utrecht: W. O. M. [Music Therapy Research Group of the Dutch Association for Creative Therapy], 1993).}

The writer’s work is firmly based in the British research framework. She now reviews British music therapy research in order to place her research in perspective. A chronological account of research is given so a sense of historical development can be seen. The research described is listed in the directory included in Arts Therapies Research,\footnote{See Helen Payne, ‘Arts Therapies Research Bibliography’ in Andrew Gilroy et al. (eds.), \textit{Arts Therapies Research: Proceedings of the First Arts Therapies Research Conference held at the City University on 11th March 1989}, (London: City University, 1989), pp. 51-55.} 1989; the European Music Therapy Research Register,\footnote{Henk Smeijsters et al. (eds.), \textit{European Music Therapy Research Register}, 2, (Castricum, The Netherlands: Stichting Muziektherapie [Music Therapy Foundation], 1995).} Volume Two, 1995; and the unpublished European Music Therapy Research Register, 1999 edition.\footnote{A copy of the 1999 draft register was obtained from the maintainer, Penny Rogers. The information was in the form of a computer file without page numbers. There is currently no comprehensive, up-to-date register, and consequently the writer has not been able to present a definitive account of new research projects in the years 1999-2002.} Completed research is considered first and then research in progress, each account being followed by a discussion of presented material. She goes on to comment on the direction of British research, finally considering her own research and its direction.

\subsection*{2.2.1 Completed Research}

Nineteen music therapy research projects were completed at Universities or Polytechnics in Great Britain during the period 1979-2000. Five researchers were registered at the City University while each of the other researchers were registered at different universities spread throughout the country. A number of short independent projects were also undertaken, in different parts of the country. This geographical distribution of researchers is encouraging, since it suggests a wide network of potential
interdisciplinary co-operation, and more opportunity to make known that music therapists are serious about understanding their profession.

After the work of Streeter in 1979, there was a gap of three years before new research started. Then Odell-Miller began an investigation into music therapy with the elderly mentally ill, comparing its efficacy with reminiscence therapy and using statistical measures and time-sampling observation method. Oldfield also investigated the effects of music therapy but with a group of adults with severe learning difficulties. She compared the efficacy of music therapy to that of play activities. Both researchers employed the experimental method while the clinical areas of their research differed, as did the type of their controls. Their results were favourable to music therapy, Oldfield finding that music therapy was more useful when offered on a regular basis rather than intermittently.

A pair of socially orientated studies followed in 1984. Fenwick examined the provision for music in special schools in Birmingham and Troup, in Glasgow, ‘completed a research project exploring community-based approaches for practising music therapists’. The psychologist Müller began her Ph.D. in 1986, an investigation into the effects of music therapy on bonding between autistic children and their mothers. Her data collection was based on the clinical work of the music therapist Warwick. Müller used transition analysis from video tape and employed ethological, direct observation and rating scale methodologies. Her primary aim was to investigate the effects of music therapy on autistic children while the second aim was to ‘gain detailed information


about patterns of interaction between mothers and their autistic child’. To this end, behaviours were coded, recorded then analysed using a specially designed computer programme. Müller had 55 coded behaviours for the children and 35 for the mother. This was a new approach in music therapy research and one used in this study.

In 1987, Pavlicevic embarked on research in music therapy with chronic schizophrenics. While interested in the effect of music therapy intervention, she sought to understand the ‘inter-musical processes’ in the therapist-client improvisation, and aimed to support her theories with her experimental results. She thus undertook the first process and outcome study. Pavlicevic drew on two theoretical models to evaluate her clinical work, non-verbal mother-infant interaction and the idea of music and emotion indicating one another in dynamic form. She used a Musical Interactive Rating of patient-therapist contact levels which she developed herself for the analysis of data. Her results suggested an amelioration in the clinical condition of her clients, and show musical improvisation to be an excellent vehicle for music and emotion in human communication. This piece of work set a high standard for music therapy research and provided a model of music therapy. It also added ‘valuable weight to the body of evidence that music therapy has a measurable influence and effect’.

Several independent research projects were undertaken around this time. Two studies explored mixed-media arts therapy and others focused on individual music therapists’ own work. Sutton made a case study of music therapy with an individual

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147 Refer to the *Arts Therapies Research*, op. cit., particularly the work of J. Selman, R. Simon and J. Sutton, 1987; also to V. Cosgriff, J. Sutton, R. Hamill and E. Crozier, 1986.
who had Parkinson’s disease\textsuperscript{148} and Hoskyns undertook an outcome study of the value of short term music therapy in the care of Huntington’s Chorea.\textsuperscript{149}

During the years 1988-89 more research projects were begun than in any other two-year period to date (see Figure 1 on page 37). In 1988, Heal, at the Tavistock Clinic, London, made a psycho-analytically informed observational study for an M.A., comparing client behaviour during individual music therapy with observations of mother-infant interaction. The clinical psychologist Lawes and the music therapist Woodcock collaborated to research the effects of music therapy in reducing self-injurious behaviour with people with severe learning difficulties.\textsuperscript{150} They found that music therapy did not reduce injurious behaviour but ‘variations in self injurious behaviour was significant’.

![Figure 1 Number of research projects started per year, 1977-1998](image)

The research of Lee also began in 1988 but involved a different clinical field.\textsuperscript{151} Lee undertook music therapy with people diagnosed as HIV positive or living with AIDS.


\textsuperscript{149} Sarah L. Hoskyns, \textit{An Investigation into the Value of Music Therapy in the Care of Patients Suffering from Huntington’s Chorea}, The Association to Combat Huntington’s Chorea, Hinckley, Leicestershire, 1981.


He made a detailed analysis of the musical content of the improvisations that occurred in his music therapy sessions, and took into account his clients’ views on therapy. Use of a MIDI output from the piano facilitated musical analysis, although it was necessary to amend the computer score through audio-tape listening. His main findings seemed to support the hypotheses that in therapeutic improvisation ‘there is a direct link between musical representation and therapeutic outcome’, 152 that there is a generative process of musical improvisation, and that cultural preferences affect the course of the music. His research raised many issues, one being the questionable value of connecting music therapy and music analysis.

In 1988 Rogers researched music therapy with a group of schizophrenics. 153 She made an experimental study to test memory in these subjects and used two physiologically-orientated models, the theories of Cerebral Dominance in Schizophrenia and Baddeley’s Model of Working Memory. By comparing the performance of schizophrenic subjects with different types of groups to auditory short term tasks, information about the memory of schizophrenic subjects was obtained. Of particular interest to music therapy was the finding that ‘short verbal memory in schizophrenia is impaired to a greater extent than short term musical memory’. 154

Wigram also began his research in 1988. This was a physiologically-based outcome study in psychology, looking at the effects of vibro-acoustic therapy on clinical and non-clinical populations. 155 He considered how low frequency sound and music can alter psychological and physiological states. This research, completed in 1996, was the first of its kind in Great Britain and contrasted with research based on an interactive model. By using a purely quantitative approach, it made statements about the boundaries of music therapy, drawing attention to the importance of physical responses to sound itself, and about music therapy research.

152 Ibid., p. 257.
154 An outline of Rogers’ research is in the APMT Music Therapy Research Register.
Levinge began her doctorate in 1989 after researching the processes of playing music with children presenting with non-physically based language and communication disorders. She looked at these from a Winnicottian perspective considering the concepts of holding, play and the transitional object. Her work, like that of Heal and the writer, was psycho-dynamically orientated. Continuing in the same field she then embarked on a qualitative study of young children in music therapy, and compared and contrasted ‘developmental concepts of D. W. Winnicott with certain identified processes’ occurring in the sessions.\(^{156}\) Her field of enquiry, method and approach contrasted with that of Wigram\(^{157}\) but she too explored a subject that was of interest to many music therapists.\(^{158}\)

Dunachie, who undertook an M.Sc. at Keele University, also started his research in 1989. He made a process study which investigated the undirected responses of adults with learning difficulties, comparing these with the improvisations of pre-school children. His findings indicated ‘common features’.\(^{159}\)

Between 1990 and 2000 ten music therapy research projects were undertaken and brought to completion. Sutton and Toolan began research studies in 1991. Sutton began a study comparing rhythmic perception in mainstream and language impaired children between the ages of four and seven years.\(^{160}\) An innovative and prolific researcher, she also undertook two two-year studies, one in a related area, ‘Parallel Development of Music and Language with Speech and Language Disordered Children’,\(^{161}\) the other concerning traumatised children in Northern Ireland.\(^{162}\) Her

\(^{156}\) *European Music Therapy Research Register*, 1999.


\(^{159}\) This was converted to M.Phil. Steve Dunachie, *An Investigation of the Improvisations of Mentally Handicapped Adults: An Observational Study*, M.Phil., Department of Psychology, University of Keele, 1995.


\(^{161}\) Julie Sutton, *Parallel Development of Music and Language in speech and Language Disordered Children*, 1991. This research was funded by the Department of Health and Social Security, Stormont, Northern Ireland.

\(^{162}\) Julie Sutton, *The Music Project*, 1996-8, a two-year part-time research study of group therapeutic music-making and individual music therapy for children affected by the Northern Ireland Conflict. The
work addressed some key aspects of music therapy, in particular the similarities between language and music. In 1996 she began her doctoral research in which she sought to understand the impact of silence in her clinical work.\(^{163}\)

Toolan, in collaboration with Worsley, undertook a process study, in 1991, of music therapy with adults and children with learning difficulties.\(^{164}\) In this he argued that music therapy ‘provides a structure to support and encourage learning in a patient’, which includes gains in self-awareness.\(^{165}\) A model for the assessment of the subjects’ involvement was suggested and time-sampling technique used. In 1992 MacDonald started an evaluative study looking at structured music workshops for individuals with learning difficulties. Again this touched on issues about the boundaries of music therapy, and its definition.\(^{166}\) Also in 1992, Magee embarked on an investigation of the use of familiar pre-composed music and unfamiliar improvised music in clinical music therapy with individuals with chronic neurological illness. This took the form of a qualitative case study using grounded theory, with some quantitative measures in the pilot study.\(^{167}\)

From 1993-2000 two main research projects were begun, those of Purdie and Ansdell. Purdie, at the University of Aberdeen, looked at the effects of music therapy on people with stroke, evaluating its impact on communication, behaviour and mood.\(^{168}\) Ansdell’s orientation, at the City University, was around what he called the ‘music therapist’s dilemma’.\(^{169}\) This concerned the ‘problems and possibilities of talking


\(^{164}\) Peter Toolan and Catherine Worsley, *Music Therapy – A Descriptive Study of Therapeutic Process* (working title). This was an independent project based at Prudhoe Hospital, Northumberland.


about music therapy’ when it is often difficult to verbalise about musical processes. He sought a meta-theory of music therapy which would uncover the relationships between ‘praxis, discourse and epistemology’. The writer’s study contrasts with that of Wigram although it too considers people with cerebral palsy. Wigram looked at the outcome of a passive treatment while this study was concerned with process in an interactive model, and drew on psychodynamic theory. Such contrasts appear exciting as they indicate the scope of music therapy research. Similarities are also exciting since they indicate the possible importance of certain themes. Clearly this research has an affinity with that of Levinge who finds the concepts of Winnicott resonate with processes in interactive music therapy. The use of both qualitative and quantitative research approaches, however, makes this study different. It also has a similarity to the work of Müller, both studies analysing patterns of interaction of young children and using coded observables. Both researchers make a detailed observation of interactive processes using a technique of coding behaviours. This researcher has 101 observables for each child and 113 for the therapist and helper, a greater number than in the work of Müller, but essentially both researchers are doing the same thing.

### 2.2.1.1 Discussion

Two features of the research described above emerge. Firstly there is a diversity of clinical fields under investigation, and these are dictated by the respective clinical areas of the researchers. Secondly, there is a predominant strategic theme to early research projects. They are mostly outcome studies, examining the effects of music therapy intervention and employing quantitative research design. Those of Pavlicevic and Lee are exceptions. Both are concerned with what happens during music therapy sessions, and Pavlicevic further considers the effects of her treatments. In many ways both researchers represent a pivotal stage between immediate post-Bunt research and that currently being undertaken.

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170 Draft European Music Therapy Research Register [EMTRR], 1999.

There are shifts away from traditional research. Lee, Sutton and Troup move towards a new-paradigm approach. This provides an alternative to the orthodox research methods and incorporates subjective data in the research design. Researcher and subject interact making a cooperative inquiry. Troup involved clients in determining therapy aims while Sutton wanted the client’s view on how helpful music therapy had been. She used an evaluation questionnaire which was filled out at the end of therapy by the clients themselves. Lee noted the thoughts and feelings of his clients, and involved them in evaluation of taped musical improvisations.

It appears, however, that at first the profession wanted to prove its efficacy before defining itself. Outcome research yields experimental results which can indicate the effectiveness of music therapy to the outside world. Bunt and Hoskyns describe research of this kind as having ‘external validity’. Psychotherapy research proceeded in a similar fashion, initially adopting a ‘defensive position to prove psychotherapy works’ rather than investigating what leads to change. After the first period of research, therefore, music therapy had still to be ‘discovered’ so to speak. New measures and methodologies had to be found to explain it. Lee and Pavlicevic were the first music therapist-researchers to tackle this. Having gained in confidence, the profession is now broadening its focus.

### 2.2.2 Current British Research

Current British music therapy research is being undertaken throughout the country in slightly increasing numbers. There are 11 people (including the writer) registered at Universities, 9 of whom are music therapists, several undertaking independent projects and many either about to start new projects or considering the possibility of doing so. Bunt has suggested that as more clinical work is undertaken, so more research is being done.\(^\text{174}\)

\(^{172}\) Bunt and Hoskyns, op. cit., p. 3.


\(^{174}\) Bunt expressed this idea informally at the Fourth Music Therapy Day Conference held at the City University, London, February 1988.
A number of research projects are near completion. That of Hoskyns comes into this category. Hoskyns is investigating music therapy with persistent adult offenders, looking at both process and outcome. She is using new paradigm methodology and employing three research methods: survey, a music therapy grid (based on Kelly's construct theory) and video analysis. Kelly evolved a psychological theory which assumes that man is able to construe his environment and is not obliged just to react to it. The grid is a psychological tool that arose out of this theory. By rating one’s feelings, it is possible to see how one is now and determine how one would like to be. Hoskyns has adapted the grid to investigate her client’s view of music therapy, and see if their perceptions change over time. Its use helps the researcher maintain a sensitivity towards his or her subject population, and lessens the division between researcher and subject. Hoskyns’ study is the first in music therapy to draw on Kelly’s psychology of personal constructs. The problems posed by being a therapist/researcher emerge here.

The music therapist Rogers is evaluating the use of interactive music therapy with sexually abused clients, in particular focusing on the process of music therapy. She has a variety of approaches. These include making detailed transcriptions of improvisations and analysing them, asking clients to fill in a questionnaires after each session and using new-paradigm methodology in co-operative inquiry with colleagues and discharged clients. She is influenced by the work of Erikson, Bowlby and Winnicott, seeking out comparisons between the work of these psycho-analytical theorists and clinicians and that of music therapy. This study is important because it synthesises many of the research approaches and theoretical models of its predecessors.

The doctorate of Sutton has recently reached completion. This considers free musical improvisation as a form of conversation. Sutton’s data is drawn from existing recordings of free improvised music which she analyses by using a conversational analysis methodology. Her approach is highly relevant to music therapy clinical practice where openings, endings, turn-taking and silence – all part of conversation – figure in the improvised music.

176 EMTRR, 1999.
177 Julie Sutton, An Investigation of Free Musical Improvisation as a Form of Conversation, op. cit.
Robarts’ study is entitled ‘Investigating Assertiveness in Music Therapy with Adolescents with Anorexia Nervosa’. It examines changes in musical aesthetic form in the therapeutic process. Her research takes the form of a qualitative multiple case study design and draws on the theories of Daniel Stern and Colwyn Trevarthen among others. The background to the study is poiesis, ‘the creative act, the process of coming into being, giving rise to the creative impulse, the original thought’.  

Further research is being undertaken by Pavlicevic looking at the role of music therapy in schools in South Africa. Odell-Miller, in collaboration with other arts therapists, has begun a long-term outcome study looking at mentally-ill people who need long term intervention. In 1997 MacDonald began a second study, investigating whether there was a reduction of pain in post operative patients while listening to music.

The research of Dawn Wimpory, Paul Chadwick and Susan Nash should be mentioned here although it is not about music therapy as such. Their work, in the field of autism, is similar to that of the writer in that she is endeavouring to facilitate communication with children who find it difficult to communicate and interact socially. They use music in what they call Musical Interaction Therapy (MIT) which ‘uniquely synchronises live music to adult-child interactions’. Their methods are also similar to the writer’s in that they use video-tape, transcribe observables and make use of computer programmes to analyse the data. Selection of observables draws on the Coding of Active Sociability in Preschoolers with Autism (CASPA) which is an assessment tool developed to identify naturally-occurring social engagement in young children with autism and also those adult strategies which appear to facilitate such communication. It is intended to systematically capture social interaction within one-to-


179 *EMTRR*, 1999.

180 Ibid.


one situations, being particularly useful in clinical play-based assessments.

The method of assigning codes differs from that used in this study. The rater needs to make sense of an interaction before assigning codes whereas the writer assigned codes to observables without interpreting them, trying to make sense of them by looking at simple patterns of observables.

2.2.2.1 Discussion

The most striking feature of current research is its diversity, its reaching into every aspect of music therapy and exploring the many key issues. Four more clinical fields are being researched: anorexia nervosa, cerebral palsy, sexual abuse and recidivism. Robarts and Sutton are investigating the components of music while Odell-Miller, in contrast, treads a pragmatic path assessing the effectiveness of music therapy with the mentally ill in the context of the NHS (also assessing the effectiveness of the assessment procedures used). There is a slight increase in the number of combined process and outcome studies. Much use is made of the video recorder. Qualitative research and process research both emerge as important and relevant methods of inquiry into music therapy. The profession no longer feels compelled solely to prove its efficacy.

2.3 The Writer’s Research Position

The writer was impressed by the amount of outcome research that had been undertaken and sought to redress the balance by undertaking a process study. As has been discussed, Bunt, Odell-Miller and Oldfield, who completed their research just before the writer began hers, all looked at the outcome of music therapy and used experimental methods. The work of Rogers was also experimental. The focus of the qualitative research of Levinge, however, who began her research one year after the writer, was ‘to bring together a verbal mode of thinking and practice with a musical

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183 Dawn Wimpory, R. Peter Hobson and Susan Nash, Evaluation and Employment of the Coding of Active Sociability in Preschoolers with Autism Schedule (CASPA) to Identify Facilitators of Social Behaviour in Patients with Autism, (2000). This is a draft report intended for the Wales Office of Research and Development for Health and Social Care. The writer wishes to thank Susan Nash for permission to quote from it.
form, and to develop a different model of thinking’. She did this by looking at case studies over a period of time and describing them in words. The research of Sarah Hoskyns in the field of recidivism is both process and outcome.

The writer’s research position lies somewhere between the work of Levinge and that of Julie Sutton who departs from outcome research and looks at the process of communication. Her hypothesis is that we can look at what happens in free improvisations as if they were conversations. This research is nearer to that of the writer in that it considers the very building blocks of the music therapy process.

2.4 Conclusion

Despite the flourishing research picture, certain problems remain. Outcome research has positive benefits but does not tell us ‘how’ and ‘why’ music therapy works. It does not help us answer the question ‘What is music therapy’? Process research goes a long way towards doing this but there are difficulties attached to it. It is not always possible to make sense of the data it yields, and it is not possible to tell what aspects of the process influence outcome.

The writer agrees with Bunt that the best strategies for investigating music therapy are those in which there is some relation between process and outcome. By combining these strategies one takes a ‘critical step in generating or evaluating theory about the basis of particular treatment techniques’. The writer finds the work of Greenberg in some ways relevant here, and she has followed part of his research approach. Greenberg proposes a process analytic approach which involves the study of ‘sequentially patterned change episodes’. He suggests that process research should make explicit the implicit map of the experienced clinician, select and describe the task environment, make rational and empirical analyses of performance of tasks and compare actual and possible performance. This latter step enables the researcher to

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185 Personal communication.


187 Greenberg, op. cit., pp. 3-16.
construct a model of the therapeutic process occurring in these episodes. The model
should generate hypotheses about the task performance of the participants. These
hypotheses can be tested both in incorporating successful strategies in controlled trials
of treatment programmes, and in the therapeutic process itself by comparing successful
and unsuccessful episodes. This study limits itself to describing change events in
detail and making interpretations of a few selected cases, attempting to find a
connection between the behaviour of the therapist (the given observable) and action of
the child (the measured observable), an approach also advocated by Elliot for
psychotherapy research.\footnote{Robert Elliott, ‘Fitting Process Research to the Practising Psychotherapist’, \textit{Psychotherapy: Theory, Research and Practice}, 20(1), Spring 1983, pp. 47-55.} The start of each session is described as well, when some
response is expected.

The writer’s work is discussed more fully in Chapter 5. Here it is important to indicate
her particular interest is in examining interaction and moments of reciprocity between
therapist and client. The writer is undertaking an analysis of behaviour, looking in
detail at the audible and visible observables of both children and therapist, including the
music. Transcription of all this material will provide a particularly broad and rich
body of data. It is also the aim of this study to derive general guidelines of music
therapy. These will be broad and will hopefully indicate that certain types of musical
activity help children.

The writer has relied heavily on the piano in her clinical work and now appraises its use
in music therapy.
Chapter 3
Intervals and the Piano

3.1 Introduction

The writer is one of many British music therapists who in their training were encouraged and directed towards using the piano as part of their clinical technique. Students were ‘given’ the piano, expected to utilise its qualities and build upon them rather than question them. On all courses and whatever improvisational skills were taught, piano was and is emphasised. It was an instrument that everyone had to play and one that had to be learned by those who were non-pianists.

If the above says something about the British training courses, it leaves untouched the issues of why the piano is considered useful in music therapy and why it has been adopted so keenly by the writer for her clinical work; some music therapists, despite their training, use the piano relatively seldom. In this chapter these questions are considered, firstly assessing the practical properties of the piano, and secondly discussing the psychological aspect of the therapist’s relationship to the piano. The study is prefaced by placing use of the piano in its overall context.

3.2 The Piano as One of Many Instruments in Music Therapy

The piano is but one of many instruments used in music therapy. Perhaps the wholeness of the client requires a variety of sounds, and this need is understood by music therapists. In the writer’s clinical work with children who had cerebral palsy and severe and multiple disabilities, however, she did not employ a variety of instruments but relied heavily on the piano, giving the children a restricted number of percussion instruments and only introducing a few herself. This approach therefore contrasts with others. In music therapy the piano co-exists with a great variety of cross-cultural instruments and music therapists often use and offer their clients a wide choice of these. It is therefore important to consider in detail properties of the piano which may make a piano-oriented technique clinically worthwhile.
3.3 Fundamental Properties of the Piano and their Value to the Music Therapist

3.3.1 Polyphonic Capability

Being a keyboard instrument which can be played polyphonically, the piano has the advantage of being able to present both harmony and melody as well as counterpoint.

The usefulness of harmony was demonstrated by Paul Nordoff. Nordoff drew on the potential of re-harmonisations for the purpose of stimulating and placing routine actions in a new specific tonal context so feelings and gestures could be experienced in a new and meaningful way.\(^{189}\) He also made much use of the emphasis on particular intervals in music. These can be easily played in various ways on the piano, doubled to give the interval extra depth, for example, an effect less easily achieved on other polyphonic instruments. On a violin or 'cello the players would have to spread the chords, presenting the intervals in a less stable way. The polyphonic capability of the piano and the layout of its notes generally facilitates the exploration of diatonic tonality and supports the use of Western scales and harmonic structures. These qualities have been important in the writer’s clinical work.

Harmonisation of melody also has a place in client-therapist interaction at the piano, a useful sharing instrument. An accompaniment can be used by the therapist when his or her client is playing a single melodic line, and vice versa. In this way there can be a visible and physical closeness while an audible separateness of identity is maintained. The piano accommodates too those clients who play with their fists, or all their fingers. Its polyphonic capability gives the music therapist the opportunity of meeting this output in various ways, perhaps melodically or by selecting notes that occur in the chord clusters of his or her client and presenting these in musical empathy. The richness of sonority at such times can be very exciting. Many of the writer’s clients have been stimulated and absorbed by pianistic interchange of this kind.

A third simple but positive point in favour of the piano’s polyphonic capability is that it is possible for the therapist to continue playing with one hand while using the other for something else. A child may be held, a client’s playing guided, another instrument played.
In the clinical work that forms the basis of this research, the writer played the piano almost entirely by herself using musical material somewhat in the style of Nordoff. For example each child was given a theme, one that reflected the way in which the child presented, and this was varied through use of harmony and rhythm according to how the child presented at different times. This technique would have been impossible without a keyboard instrument with polyphonic capability. If one compares the piano with a guitar, for example, it can be seen why. The melody of a song can be doubled easily on voice and piano, thus presenting it in a clear way, an important consideration when working with children who have severe and multiple disabilities. This melodic clarity is enhanced by the loudness of the piano when required, and at the same time supported by a full accompaniment. It is difficult to achieve these effects on a guitar. Further, the piano has the ability to be a sustaining instrument while the guitar has a limited sustaining powers. These points, coupled with the piano’s range of pitches facilitates lucid thematic improvisation. Overall the issue is of clarity, potential for intensity and independence of musical ‘voices’.

Lastly, the research of Krumhansl on ‘psychological representations of pitch relations in tonal music’ renders the polyphonic capability of the piano highly significant.\textsuperscript{190} This will be discussed in section 3.3.3.

3.3.2 The Fixed Twelve-Note Scale

The modern piano uses the Western equal tempered system of tuning whereby the octave is divided into twelve equal steps. The fundamental property of this chromatic scale, and indeed the reason why it was invented, is that it contains within itself the diatonic scales in all twelve keys. In every such scale the intervals apart from the octave are slightly distorted from the corresponding natural intervals (those based on the intervals within the harmonic series) but the tuning is equally acceptable in every key.

The fact that the intervals are distorted theoretically seems a disadvantage. However, recent research indicates that perception of pitch tends to be categorical in that a range

A further arguable disadvantage to the piano scale is that it is a fixed system; the pitch of a piano note cannot be changed as it can for example on a stringed instrument. While certain nuances are therefore not available, the piano does have the advantage of being an instrument which an unskilled client can play in tune.

The system of diatonic scales embedded in the chromatic scale is fundamental to Western music and its value is supported by the findings of mathematicians and cognitive psychologists as well as those who have contributed to a rich intuition-based tradition with its anecdotal literature. This is now discussed.

\textbf{3.3.2.1 Mathematical Investigation of the 12-Tone Scale}

Sloboda draws on the mathematically-based work of Balzano to argue that the 12-fold division of the diatonic scale is ‘psychologically optimal’ and that the ‘12-note chromatic scale can be seen as a single system which satisfies both algebraic and acoustic constraints’.\footnote{Sloboda, op. cit., p. 257. See also pp. 253-257.}

Balzano selected what he considered to be the essential properties of the normal diatonic scale. He then attempted to construct other diatonic scales from chromatic scales where the number of steps is not necessarily twelve. He found this was only possible when the octave was divided into 12, 20, 30, 42… steps. In this series the twelve note division was found to give rise to a diatonic scale having unique properties. Particularly the distinction between tones and semi-tone was found to be greater than that between the analogous intervals in the other scales. In practice this distinction gives the greatest sense of location to the listener, viz. knowing where you are in the scale.
3.3.3 Diatonic Scale and Tonality

The writer has used the piano in her clinical work to present and articulate the diatonic scale and to stress tonality. She has been interested in the piano’s ability to help the listener perceive, remember and process what s/he hears and has proceeded with the view that the particular intervals in the diatonic scale contribute to the listener finding his or her bearings in a piece of music. This has been discussed by Sloboda, while additional research in the field of cognitive psychology has provided wider evidence of the important properties of the diatonic scale and tonal systems in respect of aiding the listener to follow musical events.

The experimental and analytical work of Krumhansl on pitch and key perception by people from the Western world provides very strong evidence that listeners have a mind-set for tonality. Subjects exposed initially to a specific key then prioritised the notes of the scale. In the scale of C, for example, C, E, and G were the first expected notes, D, F, A and B the second most expected, and lastly, the chromatic notes. This means the reference points of the tonal system enable efficient processing of pitch events and, Krumhansl and Kessler show, influence listeners’ perception of key relationships. Because the listeners will prioritise the notes of a scale, their use is one way of generating expectation. Since the piano has a polyphonic capability, it can generate expectation and structure experience extremely well by using chords and harmonies, a chord giving much information about a key.

3.3.3.1 Tonality, Expectation and the Good-Enough Mother

In her work with children who had cerebral palsy and severe and multiple disabilities, the writer assumed that she could use the piano to provide a musical world which would generate expectation in the ways described above. Since her group of clients had problems with memory she aimed to reduce the reliance of memory on previous notes by working with those notes, chords and key changes which would, theoretically be most readily anticipated and negotiated. In the Winnicottian concept of the good-enough mother (one of the writer’s models) predictability is important. The writer

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194 Donald W. Winnicott, *Playing and Reality*, (London: Penguin Books, 1982), p. 11: ‘The good-enough mother’ (not necessarily the infant’s own mother) is one who makes active adaptation to the infant’s needs.’ Winnicott also uses the term ‘facilitating environment’ to denote the ‘good-enough
theorised that by using musical material that would often entail confirming her clients’ musical expectations she would produce in them a sense of pleasure, security and well-being as would the ordinary devoted mother. Also by using tonal music she would make herself most accessible to them. It was further anticipated that violation of expectancy could elicit significant emotional responses in the children.\textsuperscript{195}

### 3.3.4 Wide Range of Notes

It is assumed that just as musical intervals have a projective quality, so too do the different registers of the piano, though to the writer’s knowledge this has not been researched. Since the piano keyboard is wide, the variety of responses to tones might be great. This is seen as an asset in music therapy. A wide range of notes would seem to offer a broad interface between therapist and client, and the piano’s compass in this respect exceeds most orchestral or percussive instruments.

This interface can have several functions. First, it can provide an area which therapist and client can physically share as has already been indicated. Second, the different ranges can be used metaphorically. Bruscia describes how in paraverbal therapy a client is asked to ‘associate different ranges of the piano to family members’.\textsuperscript{196} This helps produce ‘verbal clarification and insight into the client’s emotional life’.\textsuperscript{197} Thirdly, the piano’s compass helps clients follow events in tonal music. The large range of notes has a potential to reinforce the perception of sameness in tonality and, consequently, to highlight any violation of expectancy. This quality is significant in the light of the research findings of Krumhansl.

### 3.3.5 Subtle Alteration of Volume

The piano responds to the touch of a pianist. According to how the keys are depressed so the velocity of the hammer against the string, and hence the volume of the note, can


\textsuperscript{197} Ibid., p. 292.
be greatly varied. This quality is one that distinguishes the piano keyboard from that of the harpsichord and organ where finger skill cannot change volume. Certain electronic keyboards are touch sensitive, but without the same sense of directness as that of the piano.

The piano therefore is arguably the most intimate keyboard instrument. As the therapist thinks and feels in respect of his or her client, so s/he plays spontaneously. No mechanical devices are needed to set up the instrument in advance of playing a given passage. The keyboard is ready to be used immediately, and the soft pedal is easily played by the foot. Use of dampers is the other vital way the pianist can control volume (and tone), and in combination with finger touch yields a formidable dynamic resource.

Because the piano is able to effect subtle changes in volume, the therapist is able to communicate his or her awareness of the smallest fluctuations in the client’s presentation of themselves, and is able to do so continuously. This facility promotes an empathetic relationship which can accommodate the juxtaposition of contrasting dynamics.

3.3.6 Notes Sounding with Attack

The piano is essentially a percussive instrument despite its ability to be played with a singing or smooth quality. The note is produced as a consequence of a felt hammer striking the strings.

The writer suggests that the sudden emergence of tone which results has the quality of assertiveness. There is no hesitation or ambivalence when the note is sounded, no imperceptible coming into being, rather a categorical statement that is difficult for the listener to deny.

Is this assertiveness an advantage or disadvantage? The writer suggests the answer is context dependent. The aim in her own work with children with restricted ability for active music-making, was largely to work with pitch relations within an harmonic infra-structure. Further it was to extend these in such a way as the children would know, in the clearest way possible, that they were in a relationship, and this relationship was without doubt, without ambiguity and consistent. For the writer any aspect of the
piano which promotes these goals is unequivocally favourable, and the attack of the piano notes comes in this category.

The piano’s assertiveness is unhelpful when the therapist wants to mirror the quality of sound a client is producing. This is partly because the notes have an edge which poses a distance between pianist and listener. Thus wind instruments might best reflect a client’s vocalisations, voice and instrument sharing a physical property, and if the client is playing a ‘metal instrument’ such as the glockenspiel, the therapist might best play another ‘metal instrument’ such as the metallaphone.

The piano is particularly well-suited to reflecting the shape and mood of a client’s output, and the attack on the notes is not disruptive here. It must also be stressed that it is possible to reduce the categorical quality of the piano notes by sensitive timing and pedalling.

3.3.7 Note Decay

The notes on the piano fade fairly quickly unless the sustaining pedal is used. Even then there is only a limited, though useful amount of time before they die. According to Seashore, however,

the listening ear tends to ignore this and, instead of hearing tones as having a sudden change in intensity and timbre, tends to hear the initial characteristics of the tone until the next key is struck, in spite of the fact that the physical change in tone is very radical.\(^{198}\)

This indicates that the fading of notes is not a problematical aspect of the piano.

In her clinical work at a special school for children with cerebral palsy, the writer found that fading piano notes prompted her piano-playing clients to depress the keys again. There is a learning process here which involves mastery over the environment. Although the potential for gaining control applies to other instruments, greater delight seems to be elicited by piano playing possibly because the feedback is relatively precise, and the same physical procedure can be applied to different notes. It is suggested that part of this delight has its origins in throwing and retrieval, one of the developmental learning processes in infancy.
The majority of music therapists use pianos rather than synthesisers. There is a preference for acoustic instruments and synthesisers are not often available where the therapists work. There are, however, many effects on electronic keyboards that cannot be achieved on the piano. One, relevant here, is the production of an even tone that remains for as long as the key is depressed. Perhaps this would not be helpful in music therapy, there being no correspondence between the mind-body system, with its movement, rhythms and cycles, and an infinitely long note which lacks the property of decay. The emphasis in music therapy is on growth and change, and the writer thinks notes of potentially infinite duration do not lend themselves to the give and take of an interactive relationship.

### 3.3.8 The Piano as an Imposing Object

The piano is an instrument with an imposing presence. It is large, stands out in a room and has an aesthetic and architectural quality. It dwarfs most other instruments. How do these properties serve music therapy or are they problematic in clinical work?

It is suggested that answers to these questions are context dependent. In the work of Nordoff and Robbins with children who had disabilities, the grand piano offered an inviting physical interface. It could be crawled over, used for lying on and generally explored. In the work of Steele and in the writer’s recent work, the body of an upright piano provided the means for children’s peek-a-boo games as well. A client of Lee’s, living with AIDS, physically climbed into a grand piano in order to pluck the strings. Such activities reflect the client-therapist relationship, and are related to clinical goals within the music therapy. They show how the body of the piano can figure in the therapeutic process and possibly offer an alternative to direct physical contact with the therapist him or herself. From this perspective the piano has an advantage over smaller, more intimate instruments. It offers a bigger area for contact which can then be relatively close or distant. It can also accommodate a person’s entire body. This could be useful for people with hearing impairments, the

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200 The writer refers to the work of Pamela Steele which she observed during her music therapy training.

201 This was discussed at a seminar given by Lee at the City University in June 1989.
wooden top of a grand piano providing an ideal sound carrier. If a client were to choose to lie on top of the piano s/he could hear and feel the vibration of the strings when the therapist played on the keyboard. In the forefront of the music therapist’s objectives with such clients, however, is communication, and whatever helps the client’s ‘vocal intonation, vocal quality, speech fluency and speech intelligibility’ must take priority.202

It is possible that a therapist at a piano could be regarded as particularly large or powerful, and this might make the client feel diminished in some way. The writer suggests that being at a large piano can, on the positive side, engender confidence in the client. Any potency attached to the size of the instrument can be introjected by the client as his or her therapy proceeds. Clients are generally free moreover to use the piano as well. Another criticism of use of the piano in music therapy is that the piano might act as a barrier. In the writer’s view, if a client is going to perceive an instrument as a barrier, s/he would bring this feeling with him or her to music therapy and attach it to the first instrument that s/he encountered, whatever it was. Music therapist’s who avoid using the piano for fear of it being a barrier, may well be projecting their own sense of separateness from a certain client, or their own inflated sense of self importance. The size of a musical instrument is an internal issue.

3.3.9 The Relative Difficulty of Moving a Piano

The piano is a heavy instrument, not easily moved. This can be a drawback but is not necessarily so. In schools, hospitals and other institutions where music therapists work, a room is generally set aside for therapy sessions and a piano provided which can remain in that room. The need to transfer a piano from one room to another does not, therefore, generally arise. In those cases where music therapists go to their clients and work on a ward, for example, a piano is usually available in the lounge area of that ward.

Sometimes music therapists work at a client’s bedside or in a one to one situation in a small room off a ward. Here using a piano is a practical problem, although some therapists would suggest that its use is inappropriate in such instances. The writer

agrees that the piano is unsuitable for use at a client’s bed-side on a ward but her feeling would be one of frustration not to be able to use a piano in a self-contained room however small.

The piano is obviously not an instrument which can be manually extended or given to a client, or played en route across a room like most orchestral instruments, or indeed like mini electronic keyboards. Theoretically this is a disadvantage. Practically, however, there is very little about a piano, in particular its keyboard, which elicits the feeling of wanting to move it around. Its positive attributes lie elsewhere, for example in attracting people to it as well as providing a place rather than an object. In her clinical work generally, the writer has found that mini-synthesisers are not usually passed to and fro from client to therapist, but lingered over.

3.3.10 The Piano and the Voice

Music therapists often sing while they play the piano. The combination offers a contrast since the piano’s sound does not blend with the voice. Maybe this has the quality of giving perspective to the voice, and clarifies pianistic textual shifts. It also means that the therapist simultaneously presents in two distinctive modes, and is split. It appears therefore that a gestalt is formed which is satisfying since it represents a resolution of disparate elements. This resolution may have positive psychological significance to the client.

3.4 The Psychological Relationship Between Therapist and Piano

This section considers theoretical, intuitive and cultural traditions surrounding the piano.

3.4.1 Nordoff, Robbins, Steiner and the Fixed Well-Tempered Scale

There is an intuitive body of thought regarding the 12-note scale and the diatonic scale which has informed the music therapy profession. The predominant figures in this are
Rudolf Steiner, and the two music therapists he influenced, Paul Nordoff and Clive Robbins.

An account of their ideas must start with a significant point of departure. Steiner regarded the piano as a ‘Philistine instrument’, one not derived from the spiritual world. The instruments of the orchestra reflected the different elements of man (his head, his chest, his limb system) while the piano was born out of abstract materialism. Nordoff and Robbins, who were impressed by Steiner, nevertheless evolved a piano-and-voice orientated music therapy approach. Both Steiner and Nordoff, however, use the well-tempered scale as a reference point for their theories, and Nordoff, as if to reach for Steiner’s spiritual dimension, stressed that the piano had to make the quality of the intervals be felt.

Steiner had a special view of man’s inner spiritual world which he vividly described and experienced in terms of the musical intervals of the 12-note scale. He regarded intervals as having a living quality. The interval of the fifth for example gives form and a sense of completion. ‘One is held back, just as the human form is held together and enclosed by the skin’. The third, both in its major and minor forms, enables man to feel a sense of inwardness, a feeling of the ‘structure of his own organization’.

The Nordoff-Robbins school is informed by the Steinerian concept of intervals but does not rigorously adhere to it. It ascribes few precise significances to intervals, and their use essentially remains context dependent. Nevertheless Nordoff saw the triad in root position as strong and affirming, and drew attention to Steiner’s view of the third as the ‘interval of inner experience and balance’. Nordoff also saw the fifth as a forceful

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203 Rudolf Steiner, 1861-1925, was an Austrian scholar, lecturer, seer and clairvoyant who founded Anthroposophy. It was his humanistic approach to Spiritual Science that was meaningful to Clive Robbins and Paul Nordoff, and his ideas on the nature of music.


206 Clive Robbins and Carol Robbins (eds.), Healing Heritage, op. cit.


208 Rudolf Steiner, The Inner Nature of Music and the Experience of Tone, op. cit., p. 61.

209 Clive Robbins and Carol Robbins (ed.), op. cit.
interval but he used its force to achieve both calming or stimulating effects. This resonates with Steiner’s view of the fifth which he said was ‘man himself’. Importantly Nordoff made use of the form of intervals to match a child’s feelings. Intervallic distance or closeness could help create for a child ‘a musical setting with form and mood: a musical-emotional environment with which he may feel some affinity’. He believed the potential of intervals can stir and draw out the potential of the child. Their shapes represent the inner shape of his or her life.

It is against this background that the piano’s fixed scale must be considered. The piano’s design, compass and accessibility invites the exposition of intervals in many different ways, rendering it of vital importance to the music therapist who empathises with the ideas expressed above.

3.4.2 Carla Savio

Significance has been given to the well-tempered scale in post-Steiner years by the Italian music teacher and music therapist Carla Savio who played a significant part in introducing music therapy into Italy. In 1972 she conceived a Personality Projective Intervals Test (PPIT) based on the psychological association of each degree of the C major scale considered as an interval in relation to the tonic. In this the intervals were viewed as having the potential of reflecting human development as well as the evolution of the tonic. The relationship with a mother, for example, was symbolised by a third (c'-e'), this interval defining a key and being analogous to the way in which the mother ‘defines’ her neonate in a primary symbiotic relationship. The interval of a fifth (c'-g') symbolised a father.

In vertical [Western] tonal musical harmony, the fifth is ‘the dominant’ interval. That is to say, in any given composition, it is the dominant, fundamental, harmonic interval.

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211 Rudolf Steiner, Eurythmy as Visible Music, op. cit., p. 32.

212 Nordoff and Robbins, Creative Music Therapy, op. cit., p. 93.

It provides the basic harmonic force of the composition and can be repeated as the base to the harmonic line. As a result, the fifth is associated with the father.\textsuperscript{214}

The sister was symbolised by a second (c'-d'), being near yet different from the mother, while the brother was symbolised by a fourth (c'-f'), again near, yet different, from the father. Savio invested the sixth (c'-a') with the symbol of sex, and viewed the interval as representing ‘pathos, languor and eros’ in music. The seventh (c'-b') was a symbol of social integration, the dissonance of the interval by analogy representing the difficulties involved in relating to society. The octave unison was thought of as the self, the adult self only able to achieve autonomy after working through the parental relationships.

3.4.2.1 Development of the PPIT

When developing her test, Savio and one colleague checked the responses to the intervals of 6040 school children aged between 3 and 14 years. Music featuring thirds was played to nursery children aged 3-5, and it was found that those who did not like it had a problem with their mothers. Children of 6-10 years were given a list of family members, in which they were included, and played the interval of a third, fifth, fourth, second and octave. They were then asked to pair the family member with the interval played according to their feelings and thoughts. A similar procedure was applied to young people of 11-13 years of age but with this group the sixth was included, the questioner asking ‘Is this your boy/girlfriend?’ Finally, all the intervals were played to the young people aged 14. The results of this procedure supported Savio’s correspondence of intervals and psychosocial concepts.

3.4.2.2 Test Procedure

The test uses two separate series of 42 pairs of intervals, covering every possible pair except a pair of equal intervals. Both series were originally chosen at random (by drawing items out of a hat), and were designated ‘Pattern A’ and ‘Pattern B’. The therapist plays the intervals on the piano and the subject is asked to reject the least liked

interval from each pair. These negative choices are taken to indicate problem areas.

The test is administered on two consecutive days, on the first day using Pattern A followed by Pattern B, and on the second day using Pattern B followed by Pattern A. On each day, results of the first Pattern are taken to indicate conscious reactions of the self to the external world, while the second is taken to represent the relationship of the self to its subconscious inner world. The person administering the test counts up the number of times intervals have been rejected in Pattern A and Pattern B, putting the findings into graph form. The graphs of Day 1 and Day 2 are compared and used to indicate where relationships are problematic.

3.4.2.3 Interpretation of Results

Savio also considered that a Jungian perspective was useful. The intervals of mother and sister were jointly regarded as the anima, the personification of the woman within the man. Those of father and brother were similarly regarded as the animus, the personification of man in a woman’s psyche. The intervals of society and self were regarded as persona, the mask or face a person puts on to confront the world, and the interval of a sixth was regarded as the shadow, ‘the thing a person has no wish to be’ 215

These procedures yielded numerical data that Savio was able to interpret and use as a diagnostic tool. Her findings were also of potential therapeutic value. When the subject understands the psychological significance of the intervals and is invited to discuss the findings with the therapist, s/he has the opportunity to confront his or her inner feelings. The data are further transformed into mandalas and into musical notation, offering further possibilities for interpretation. The mandalas, in particular, are used in Jungian practice, and are derived from the Sanskrit word meaning ‘magic circle’. They were said by Jung ‘to express the totality of the psyche as this is apperceived and experienced in individuation’. 216


3.4.2.4 Applications of the PPIT

The Italian Ministry of Public Education acknowledged the test’s value and it was used for assessing children’s suitability for changing class at school. The test was also applied to 1,000 men applying to enter the army, the anonymous results being made available for study.

3.4.2.5 Validation of the PPIT

The psychologist and psychotherapist Josette Kupperschmitt described the PPIT in 1995 and in the same year, together with colleagues, attempted to validate the major underlying assumption of the test, viz. the association of Savio’s psychosocial concepts with the seven intervals. In this study a rating form was constructed using 20 bipolar attributes (e.g. happy/sad, hot/cold), and 80 subjects rated each of the seven musical intervals in terms of the 20 attributes. They then similarly evaluated the psychosocial concepts, after which a comparison was made between the different descriptions of intervals and concepts. A type of principal component analysis called classical binary analysis was then used to derive a measure of ‘closeness’ between each interval and each psychosocial concept. This showed Savio’s concepts to be largely valid. Those which were not validated are undergoing further investigation by Kupperschmitt et al.

3.4.2.6 Conclusion

Overall Savio’s work suggests that intervals are representative in some way of relationship. Given that the therapeutic approach presented here is anchored in the idea that relationships, particularly close ones, need to be developed for the children to progress, it was important to choose a medium which represented the intervals as clearly as possible. The piano facilitates this approach.

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217 Carla Savio personal communication.
218 Carla Savio personal communication.
3.4.3 Tradition and Economics

Choice of an instrument in music therapy can be influenced by cultural considerations. In China, for example, traditional instruments such as the lute are often preferred to Western ones since music therapists are still drawn by the teachings of the ancient dynasties. By way of contrast Argentinian music therapists often use makeshift instruments. Economic constraints prohibit the use of sophisticated instruments and thus the piano is not mandatory in training.

Since music therapists tend to be pragmatic and show considerable loyalty to historical practices, it is hardly surprising that British music therapists invest importance in the piano. It is part of the heritage of Western music and it is omnipresent. It must be acknowledged that the electronic keyboard has in recent years also begun to make its way into schools, but at the time of the clinical work for this study it was not as available in schools as the piano, and the writer, therefore, does not make an appraisal of it here. The piano, however, fulfils the prerequisites for therapeutic intervention: it is there to be played and one can connect with it from a Western cultural point of view.

3.4.4 Historical Views of the Piano

The history of the keyboard and piano are considered important with respect to music therapy for two main reasons.

Firstly the piano provides a reflection of the musical and cultural context of which it was a part and from which it emerged. Connection with it means connecting with part of the Western musical process. One aspect of this was the link between instrumental and vocal music. According to Meeûs, vocal developments influenced the morphology of the keyboard. While the latter was only used to accompany plainsong, it did not need a wide compass nor any chromatic note other than B flat.

By the beginning of the 14th century, however, the development of polyphony had caused a widening of

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keyboard compass and the progressive addition of chromatic keys.\textsuperscript{223}

Thereby musical events made their impact on a musical instrument, and the listener, hearing harmony and polyphony was also hearing the voices of society. Grout, when referring to the Renaissance consort of recorders and viols uses the word ‘family’ to describe the range of instruments covering the voices from bass to soprano.\textsuperscript{224} The piano readily makes available what may be seen as a ‘family’ of pitches, and allows pitch and interclass relationships to be explored with ease on this instrument.

Secondly, aspects of the evolution of the keyboard, and subsequently the piano, resemble developmental shifts in the human maturational process just as keyboard playing was modified to accommodate changing musical concepts. Up to the 13th century the hand rather than the finger was used to depress the modest number of notes on the earliest keyboards.\textsuperscript{225} According to Praetorius, the fist, wrists and even knees were used.\textsuperscript{226} Such gross motoric skills are part of infant development. From the 14th century onwards, however, as the keyboard changed and the music written for it changed, organists and harpsichordists began to use their fingers with finer skill. The later invention and development of the piano at the turn of the eighteenth century accommodated even subtler articulation of the 12-note keyboard system. Because of the action of the hammers, different degrees of pressure on the keys produced different dynamics and this made available a greater expressive range.

What is important is that today’s piano allows for all types of playing whether by the therapist, client or both. This is significant for music therapy. One can explore the full circle.

3.4.5 The Writer and the Piano

The writer, like many of her colleagues, grew up in a home that had a piano in it. Finding that she had a musical talent her parents organised piano lessons for her at an


\textsuperscript{226} See Meeùs, op. cit.
early age and she soon composed as well as performed piano music, and also used the piano for climbing on and hiding underneath. She did not work hard at a second instrument since she had a special involvement with the piano. It has been of central importance throughout her life in different ways at different times and not surprisingly was offered as her first instrument when applying to the Roehampton Institute’s Music Therapy Course where she subsequently trained. She was a composer-pianist learning about music therapy.

In many ways this résumé of the writer’s life provides an ordinary example of middle-class conditioning. Her talent, plus the relatively affluent environment in which she lived resulted in her being a pianist. The implications of this equation for music therapy need illuminating, as do its implications for undertaking research in this field.

One important feature of the writer’s background is that she became fluent on the piano, using it as an extension of herself, for self expression and communication through improvisation, composition and performance of repertoire. Instrumental fluency is a pre-requisite for being a music therapist, especially in Great Britain where an interactive model is central to music therapy approaches. Pavlicevic argues that music and emotions indicate one another. The writer agrees with this view and sees fluency as the means to articulate this ‘index’. Improvisation training, offered by all British music therapy courses, helps harness improvisatory skills and, hopefully, make students aware of how best to use them in the clinical situation. It helps the student be aware of what s/he is doing and hopefully helps him or her to know why s/he is doing it. But is this latter really the case?

There is a certain drawback attached to empathy with an instrument and having a talent for it: one is less likely to be able to appraise it objectively. While part of this chapter endeavours to rationalise the use of the piano in music therapy the writer must also admit that she has experienced difficulty in prizing herself apart from her own musical material and disentangling herself from her own inner world in order to question it.

This difficulty is extremely significant since it pertains to all of that part of music therapy which involves ‘complex artistic material’. Music therapists play what feels right, and draw on material they accept as feeling right. But this does not imply objectivity.

It was difficult to be objective in this study, both from clinical and research perspectives. Firstly the majority of children were not assertive, making it easy to project onto them fantasies about their inner world of feelings. Secondly, it was tempting to over interpret or exaggerate the significance of small changes in their behaviour since they were so welcome. Thirdly, because of the ego deficit in the majority of the children, the therapist had to avoid fusing with them. Even observing the video tapes it was possible to interpret the contours, shapes and pauses within a musical passage as if the children were following the music and experiencing it in the same way as the therapist. As a result of all this, it was important for the writer as researcher to find ways of being objective.

An intuitive approach, however, does not necessarily affect the value of a music therapist’s clinical work. This resides squarely in the degree to which s/he can help his or her clients. It does, however, pose a problem for the music therapy researcher and, indeed, for the profession itself when it tries to understand its clinical processes. The tension between intuitive knowing and scientific objectivity has been experienced firsthand by the writer. In many cases the writer’s constant surprise at the answers to analytic questions underlines the main issues: firstly it is difficult to stand back from oneself and, secondly, it is difficult to be objectively introspective even when one tries.

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Chapter 4
Donald W. Winnicott

4.1 Introduction

This chapter gives a brief outline of some of the most important concepts and theories of the paediatrician and psychoanalyst Donald Woods Winnicott (1896-1971). It focuses on the mother-child relationship, and early development of the infant, areas of particular interest for Winnicott and ones which are closely connected with this study.

Winnicott drew on the work of Anna Freud and Melanie Klein. They worked with children who had psychological disorders and they regarded these as stemming from unconscious conflicts. Improvements occur through ‘self-observation, self-awareness, and insight’.\textsuperscript{229} facilitated by the therapist’s verbal interpretations. Such insight could help the analysand master inner conflict, and mature. There are discrepancies between the viewpoints of Klein and Freud, although both believed that the therapist became a transference object viz. someone who the client makes the focus of his or her emotional response.

Anna Freud believed that child analyses need to be accompanied by education, or re-education, in the sense that the parents or their substitutes might need to add to or alter their educative measures with the child’.\textsuperscript{230}

Eventually she proposed that the psychoanalyst, in addition to their traditional role, should act as a teacher in fostering developmental change

since it takes the detailed understanding of the development of the internal world and of mental functioning to perceive precisely what is lacking in the child’.\textsuperscript{231}

Winnicott felt that much therapeutic change could be accomplished by enabling the child to develop mastery through a relationship with a significant other, usually the


mother. The mother did not have to be seen as a paragon of virtues, but merely a ‘good-enough mother’. The term ‘good-enough’ relates to the mother’s adaptation to her newborn infant’s need and is used by Winnicott to distinguish his own and Kleinian terminology.

The mother-infant relationship was of immense interest to Winnicott and his ideas about it were central to his theoretical contribution to psychoanalysis, his understanding of children and his practice as a clinician when he used the good-enough mother/infant relationship as an ‘indispensable paradigm for the psychoanalytic setting’.

He made the famous observation that there

is no such thing as an infant, meaning of course that whenever one finds an infant one finds maternal care, and without maternal care there would be no infant.

Implicit in this view of the mother-infant dyad is the notion of dependency and the need for an interactive relationship which enables psychological and physical growth. With this in mind, the concept of the good-enough mother permeates Winnicott’s thinking, although it is often subsumed under the umbrella terms ‘facilitating environment’ or ‘environmental provision’ since the mother-infant relationship formed what Winnicott named as the ‘baby’s first environment’. However, it is with the mother in mind that the writer now describes some of the key Winnicottian concepts, including those that she considers relevant to her research. Their order of presentation follows that of

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233 Winnicott refers to Klein’s terms of the “good mother” and the “bad mother” as ‘internal objects that are nothing to do with real women’ He states: ‘The best a real woman can do with an infant is to be sensitively good-enough at the beginning so that illusion is made possible to the infant at the start that this good-enough mother is the “good breast”’. Cited in Jan Abram, *The Language of Winnicott: A Dictionary of Winnicott’s Use of Words*, (London: Karnac Books, 1996), p. 194.

234 Ibid., p. 3.


Davis and Wallbridge who, like the writer, had difficulties compartmentalising Winnicott’s work, but who, in her view, made a satisfactory attempt to do so.\textsuperscript{237}

> It is particularly difficult to separate idea from idea…he [Winnicott] will not be fitted into pigeon-holes: he was all of a piece’.\textsuperscript{238}

### 4.2 Towards Sharing the External World

#### 4.2.1 Transitional Objects and Transitional Phenomena

Winnicott’s concepts of Transitional Objects and Transitional Phenomena, conceived in the latter part of his life, are important to consider. They are distinctive features of his thinking, have been considered among his ‘most important theoretical contributions to psychoanalysis’ and stem from his great interest in the mother-infant relationship, the cornerstone of human development for Winnicott.\textsuperscript{239}

Transitional objects relate to the earliest phase of a child’s life when they are fused with their own mother and the boundary between me and ‘not-me’ is unrecognised. A transitional object may be a piece of blanket from a cot, for example, or a teddy-bear, but it is not the object in itself which is significant. Rather, it is the use made of it which matters.

> It is a first symbol, and it stands for confidence in the union of baby and mother based on the experience of mother’s reliability and capacity to know what the baby needs through identification with the baby.\textsuperscript{240}

For the infant ‘it is a possession’ but one that at the same time ‘is…not an external object either’.\textsuperscript{241} Winnicott believed that it is essential to acknowledge an intermediate space or transitional experience between total subjectivity and the external world. By doing this the child will develop more confidently and naturally, using the


\textsuperscript{238} Ibid., p. 16.


transitional object to ‘bridge the gap between the fused state with mother and…a realisation of separateness’.  

Transitional phenomena can be found by infants in music when they are babbling or when ‘an older child goes over a repertoire of songs and tunes while preparing for sleep’.  

Marjorie McDonald, drawing on Winnicott, and writing about music as a transitional phenomenon, hypothesises similarly when she says

If given the opportunity, the infant and toddler will “absorb” music…in the same way that he absorbs, shares, and responds to language, as an auditory expression of the emotional tie with his parents.

The writer suggests that during her clinical work the children may have experienced transitional music phenomena, although she cannot judge whether the children were able to hold on to these outside music therapy, and soothe themselves with remembered musical themes.

Alison Levinge’s research has shown that

a music therapist can allow a child to have the experience that the music being created, has arisen out of his or her intention to make music.

She calls this ‘musical illusion’. It is by creating this illusion that a transitional space can be created in which a ‘potential mutual musical space can begin to develop’. For Levinge, the ‘transitional music object’ can be represented by one of

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246 Ibid., p. 232.

247 Ibid., p. 232.
many aspects of the session, ‘the therapist, the music or the musical instruments’, but must in some way be conceived by the child as being their own creation. While agreeing with the last part of Levinge’s view, the writer thinks that the criteria for transitional objects in music therapy is their having an enduring quality, one that lasts from session to session. She regards the musical themes given to the children as falling into this category, something given by the therapist in much the same way as a teddy bear or a piece of blanket might be given by a mother to her infant, although these ‘must be found [by the infant] in order to be created’, a paradox that Winnicott urges us to accept. It is also true that the solo instrument given to each child in every session could be a transitional object.

4.2.2 Play and Potential Space

Following on from the concept of the transitional object comes the concept of play which Winnicott saw as a ‘universal’, central to all aspects of health.

Playing is a creative experience which has a place, and takes time. It is seen by Winnicott as a third area, the other two being ‘inner or personal psychic reality and…the actual world in which the individual lives’. He locates play in what he calls ‘the potential space’ which first exists between the mother and infant, and also exists between therapist and client, and between the individual and the environment in later years.

Where there is a ‘potential space’, the infant will have experienced a sense of trust and reliability in their mother at the time of having been merged with her, and when beginning to separate from her. Winnicott makes the distinction between separation and separating.

In the experience of the more fortunate baby (and small child and adolescent and adult) the question of separation

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248 Ibid., p. 232.
251 Ibid., p. 121.
252 Ibid., p. 121.
in separating does not arise because in the potential space
between baby and mother there appears the creative
playing that arises naturally out of the relaxed state.253

Clearly the mother has to be a good-enough mother with the ability to adapt to the
infant’s needs. In this way she engenders confidence in her child, the confidence that
is necessary for the process of separation.

4.2.3 Object Usage

The concepts of object-relating254 and subsequent object-usage were important to
Winnicott who saw the transition from one state to the other as being ‘the most difficult
ing thing, perhaps, in human development’.255 This is when the subject perceives the
object ‘as an external phenomenon, not as a projective entity’ and recognises the object
as an entity in its own right.256

Winnicott understands the transition in infancy as involving aggression or
‘destructiveness’. This is not seen by Winnicott as innate, rather as a part of the
environment, and is a psychological process rather than one entailing physical action.
First the infant attacks the object (mother) who must be able to survive this, and do so
without retaliating. If this happens the infant discovers that s/he is not omnipotent, and
the object is meaningful and real. The infant then invests his or her mental energy to
make use of the object, and finally mother and infant have a shared reality. This can
‘feed back other-than-me substance into the subject’.257

Freud saw destructiveness in terms of a death instinct while Klein saw it in terms of the
subject envying the good object. Winnicott disagreed with both these views. For him
it was traced to the prenatal motility of the infant and was fused with erotic impulses
which were aimed at the object, but not initially in anger. With each successive
‘attack’ the object’s survival leads to increased object permanence.

253 Ibid., p. 128.
254 The word ‘object’ has a particular significance in psychoanalytic language. It refers to a person, or
part of a person, or symbols of one or the other, and usually not to an inanimate and manipulable ‘thing’.
255 Donald W Winnicott, ‘The Use of an Object and Relating through Identifications’, in Clare
Winnicott, Ray Shepherd and Madeleine Davis (eds.), Psycho-Analytic Explorations, (London: Karnac
256 Ibid., p. 222.
‘The survival of the person who has been destroyed means that this same person can safely be hated, repudiated and rebelled against, which all leads to a strengthening of their being loved, accepted and relied upon.\textsuperscript{258}

This is what a child needs in order to grow up and become independent.

4.3 Environmental Provision

4.3.1 Holding

Winnicott considers ‘holding’ as one of the most significant elements of good-enough mothering. Holding broadly refers to the way in which a mother, and a father too, create a safe environment in which the infant can develop, one in which the infant may experience unbroken physical and psychological provision which ‘is the basis for what gradually becomes a self-experiencing being’.\textsuperscript{259}

The good-enough mother intuitively identifies or empathises with her baby and adapts to their needs. Initially the mother

by an almost 100-per-cent adaptation affords the infant the opportunity for the \textit{illusion} that her breast is part of the infant. It is, as it were, under the baby’s magical control.\textsuperscript{260}

This enables the infant to experience a sense of omnipotence. It is as though the breast is created by the baby and therefore becomes a ‘subjective phenomenon’.\textsuperscript{261} Later on, the infant, with the help of their own mother, begins to differentiate between ‘what is objectively perceived and what is subjectively conceived of’, a process of disillusionment and reality-testing.\textsuperscript{262} The initial


\textsuperscript{259} Donald W. Winnicott, ‘The Ordinary Devoted Mother’; talk given to the Nursery School Association of Great Britain and Northern Ireland, London Branch; cited in Davis and Wallbridge, \textit{Boundary and Space}, op. cit., p.106.


\textsuperscript{261} Ibid., p. 13.

\textsuperscript{262} Ibid., p. 13.
feeling in control can enable the infant to trust the environment and as a result, begin to develop a sense of external reality.  

The mother’s identification with her infant comes about as a result of what Winnicott describes as ‘the temporary state of ‘Primary Maternal Preoccupation’, an intense feeling for the baby just before and two weeks after giving birth. This state of feeling allows the mother to be extremely empathetic towards her baby, as well as the fact that she remembers her own experience of babyhood and her own needs at that time.

For the music therapist Alison Levinge ‘both processes of identification and adaptation are essential components of improvisation’ in music therapy, a view with which the writer concurs.  

In musical improvisation it is possible to identify and adapt to a child’s sounds, by relating to and connecting with the different elements of their music in the moment. Improvisation provides the opportunity for this to happen, as the music is being created out of the musical interactions which take place at the time. In musical terms, Winnicott’s two concepts could be named musically as matching and meeting.

Another aspect of holding is visual mirroring.

What does the baby see when he or she looks at the mother’s face? I am suggesting that, ordinarily, what the baby sees is himself or herself. In other words the mother is looking at the baby and what she looks like is related to what she sees there.

This provides a means for infants to discover their own separate identity, learning about this from studying the gaze of their own mother.

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266 Ibid., p. 193.

The psychoanalyst Andrea Sabbadini proposes a parallel aspect of Winnicott’s visual mirroring which he calls ‘echoing’. This occurs when ‘the child’s voice, sounds and noises’ are reflected. This constitutes a form of auditory holding which, in the writer’s view, is of central importance in music therapy.

4.3.2 Handling

The way the infant is handled by its mother is important too. Handling, if active and adaptive, can facilitate the development of a psychosomatic union within the child, the sense of an infant being inside their own body and separate from the external world. Winnicott describes this as ‘personalization’. The mother holds the baby in ‘a natural way’ and the baby feels a ‘oneness so necessary for ego integration’ and the discovery of the self. Adequate handling can also make the infant feel secure, avoiding possible ‘feelings of being dropped, feelings of anxiety or falling’.

The therapist in this study felt that music therapy might facilitate oneness in children with severe and multiple disabilities enabling them to make musical assertions. All of the children lacked control in varying degrees over their bodies, yet nearly all could organise responses to the music.

Winnicott stipulates that the mother should take the trouble to avoid co-incidences when object-presenting since these can cause a muddle. An example would be ‘handing a baby over to someone else’s care at the same time as weaning’. In addition the mother must be careful to distinguish between the external world and the imaginary one since the infant relies on her to help them integrate the two.

Good-enough holding, handling and object presenting are part of the ‘environmental provision’ an infant requires in order to develop a sense of being, and a feeling of trust.

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270 Ibid., p. 59.


273 Ibid., p. 13.
in the ‘not me’ object. The failure of environmental provision at the time of the infant’s absolute dependence can, according to Winnicott, lead to psychotic illness. This, which has various forms, is organised as a defence ‘against the trauma of unthinkable anxiety’ and usually entails retreat to an invulnerable position. The psychoses include distortion of ego-organisation and the development of a ‘false self’, (see 4.4.1 The True Self and False Self, p 78).

4.3.3 Object Presenting

Object presenting entails the mother being able to present the world to the infant in ways that are manageable for them, and in ways that avoid confusion. The mother needs

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\text{to present each new fragment of the world as and when the child is ready for it. She needs to do this while being ‘consistently herself’ and giving the ‘care and attention of someone who is going on being herself’.}\]

Initially the mother presents the world to her infant as extensions of herself since the ‘infant cannot at first distinguish itself from the mother’ or indeed the ‘outside world’ from the ‘inside world’.\(^{276}\) For example, when meeting new people, the ‘strangers’ meet the mother and infant as a unit, the infant having the security of the parent to offset the presentation of new material. In this way the infant learns about the world, the objects presented to them a little ‘larger’ each time to correspond with its growing capacity to digest and manage them.

4.4 Early Psychic Functioning

Two of Winnicott’s early psychic concepts, those of the true and false selves, have been given prominence in the work of certain music therapists. They are therefore described here and followed by a description of clinical work in which the concepts seem relevant.

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\(^{274}\) Davis and Wallbridge, *Boundary and Space*, op. cit., pp. 59-60.

\(^{275}\) Ibid., p. 115.

4.4.1 The True Self and False Self

In Winnicott’s view, failure of adaptation on the part of the mother could result in the infant’s ego splitting into two parts. One part would be the ‘true’ or authentic self, kept in secrecy, while the other could be regarded as the ‘false self’, which develops on a compliance basis. The aetiology of this division is linked to the repeated failure of the not good-enough mother ‘to meet the infant gesture’, one that is spontaneous and comes from the infant’s True Self.277 ‘Instead she substitutes her own gesture which is to be given sense by the compliance of the infant’.278 As a result the True Self does not become a ‘living reality’.279

The function of the false self, in varying degrees, and as the infant develops, is to ‘hide and protect the True Self’.280 In so doing, however, it leaves the individual feeling unreal, and unfulfilled, ‘as though they had not started to exist’.281 While the concept of splitting can be seen ‘in health as an achievement of personal growth’, when an individual has both a private and social self,282 in ‘illness the split is a matter of a schism in the mind that can go to any depth; at its deepest it is labelled schizophrenia.283

Several music therapists have drawn on these concepts in order to understand the clients with whom they work. Helen Tyler describes her feelings in the counter-transference when working with a 7-year-old girl.284 These feelings were initially of ‘unreality’, ‘meaninglessness’ and ‘boredom’ while the child’s music was essentially

278 Ibid., p. 145.
279 Ibid., p. 145.
280 Ibid., p. 142.
281 Ibid., p. 142.
283 Ibid. p. 66.
284 The counter-transference is a psychoanalytic term denoting the ‘whole of the analyst’s unconscious reactions to the individual analysand — especially to the analysand’s own transference’. Jean Laplanche and Jean-Bertrand Pontalis, The Language of Psychoanalysis, (London: Karnac Books and The Insitute of Psycho-Analysis, 1988), p. 92.
defensive rather than spontaneous and ‘rigid and stereotyped’ rather than expressive.\textsuperscript{285} Tyler’s feelings, while indicating to her that the child was stuck and needed to move on, resonated to some extent with the implied emptiness of a child who is not being her True Self. Tyler first met the needs of what she perceived to be the girl’s musical False Self and then, by gradual musical intervention, facilitated the emergence of her authentic True Self. ‘Her playing of the instruments had a new exuberance and feeling of joyful abandon as she allowed the tight controls and defences to loosen’.\textsuperscript{286}

Another reference to Winnicott’s concept of the True and False Self has been made by Janice Dvorkin in her work with a 42-year-old woman with a Narcissistic Personality Disorder.\textsuperscript{287} The client had difficulty in adjusting to the therapeutic relationship, (a ‘transference resistance’), and was seen as having a False Self which protected her from possible loss of control if contact were made.\textsuperscript{288} At first she presented as ‘perfectionist, comical and adaptive’, then, after three and a half years of music therapy, shifted to being someone ‘who can approach her truer dysphoric and uncomfortable feelings and fears, and tolerate and explore them musically’.\textsuperscript{289} A similar theme, but in a different clinical context, is described by Anne Sloboda who describes her work with a young woman with anorexia nervosa.\textsuperscript{290} The client presented as ‘jolly, active and friendly’, but, in fact, this was a defence against bad inner feelings; she was frightened of people finding out she was ‘rotten inside’.\textsuperscript{291} Hence she was ‘split’, only becoming in touch with her True Self as she gained weight.

For the writer, the Winnicottian concept of the True and False Self does not have clinical relevance to the children who are the subjects of this study, but does have an indirect relevance to the role of the music therapist in this study. She found it was important to play the piano and sing in an authentic way, so that she was at one with

\textsuperscript{286} Ibid., p.63.
\textsuperscript{288} Ibid., p. 5.
\textsuperscript{289} Ibid., p. 6.
\textsuperscript{291} Ibid., p. 10.
her music; it appeared that the children were more responsive when she did this. When she played automatically without ‘inhabiting’ her music, she was not in touch with the children. This may pose a problem for the music therapist since, when working creatively, it is more difficult to have an off-day and simply ‘do the job’ in a mechanical way. In music therapy there is a constant interchange, as in counselling for example, so it is important for music therapists to be self aware and ‘genuine’ in their music making and their relating to the children with whom they work.

4.5 Conclusion

This chapter has shown that the role of the mother is central to Winnicott’s view of emotional development. As a result the good-enough mother-infant relationship was transposed by him into the psychoanalytic setting where he felt there was the possibility that ‘early environmental failure could be mended’. The writer’s position with regard to music therapy is that the music therapist can also be like the good-enough mother, but in a different way. This concept is explored in the following chapter.

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Chapter 5
Mother-Infant Relationship:
A Model for the Therapist-Client Relationship?

5.1 Introduction

This chapter discusses the central themes of the writer’s research and philosophical position. It begins by describing the ethological tradition which has influenced the writer’s work. Then it describes the early development of the mother-infant dyad up to 12 months, discussing aspects of it which connect with music therapy, and referring to related research. Finally the parallels between Winnicott’s concept of the good-enough mother and the writer’s clinical approach, which she has called the ‘Basic Structure’, are discussed. The children with whom the therapist has previously worked are referred to, as well as those with whom she has worked in this research. A full description of the children who were the subject of this study is given in 6.6.9 The Children on page 134.

5.2 Ethology

Ethology, (from the Greek ethos meaning custom or character) is a science which originated from zoology. It seeks to understand behaviour by looking at the context in which it occurs and viewing it as having adaptive or survival value. Ethologists, therefore, study the behaviour and communication of animals and humans in their natural environment by making detailed descriptions of each. The writer has drawn on this methodology to describe her data.

The ethological approach grew out of the pioneering work of the zoologist Konrad Z. Lorenz in the 1950s. He stimulated work on ‘ethograms’, which were monographs on the behaviour of a variety of animal species, at first mainly descriptive, but gradually

incorporating a growing body of interpretations and hypotheses.²⁹⁴

When this descriptive and interpretive approach came into being, animal ethology was born, and, subsequently, human ethology, both of which were recognised by child developmentalists and behavioural scientists as a tool for understanding behaviour.²⁹⁵ The psychopathologist John Bowlby was notably first among them to really apply ‘modern ethological approach to human studies’²⁹⁶ and is renowned for his ethological attachment theory, influenced by evolutionary theory and observational studies of animals.²⁹⁷ He asserts that what is essential for mental health is that the [human] infant and young child…experience a warm, intimate and continuous relationship with his mother (or permanent mother-substitute) in which both find satisfaction and enjoyment.²⁹⁸

Bowlby emphasised the reciprocal nature of this attachment process and saw it having its roots in a set of instinctual infant responses which derived from the need for protection and survival.

The developmental psychobiologist Hanuš Papoušek and his wife, social paediatrician Mechthild Papoušek, are two other ethologist researchers who investigate human mother-infant interaction. Early in their work, they used ethological methods to study the beginning of post-natal learning in the newborn, who were, as for Bowlby, part of a reciprocal relationship with their mother. One of the first motor responses they observed were infants’ head movements.

Together with eye movements, head turns represent a fundamental orienting behavior which the infant adaptively uses to facilitate information input in novel situations or to limit and avoid such input in distressing situations.\textsuperscript{299}

The writer also used this observable which was especially important when children had severely restricted movement of the rest of their body. In the 1980s the Papoušeks went on to examine musical elements in the infants’ vocal behaviour, as described below (see page 106). Their research, described as ‘exquisite’ by Harriet Rheingold, proves inspirational for many music therapists of which the writer is one.

The sensitive portrayal of the subtle interactions between infant and caretaker presented by the Papoušeks provides a conceptual synthesis, on the one hand, of cognition and learning, and on the other, of the motor, social, affective and cognitive abilities of the infant. Both these syntheses qualify as substantive contributions to knowledge.\textsuperscript{300}

Ethological methods are generally used today for studying mother-infant interaction, and the recent work of Lynne Murray and Liz Andrews is an example of this.\textsuperscript{301} They are, however, also used in other fields. Studies have been undertaken, for example, observing the behaviour of people with mental health problems, people who are autistic and people with learning disabilities.\textsuperscript{302}


\textsuperscript{302} See, for example: S. A. Corson, E. Corson and J. A. Alexander, Ethology and Non-Verbal Communication in Mental Health, (Oxford: Pergamon, 1979).


The writer thought that the nature and content of vocal, gestural and instrumental interactions during a session might be a means of examining the child’s internal state just as ethologists use other observable behaviours. Brazelton, in the context of neonatal assessment, describes the thesis behind his life’s research:

In a baby with even a mildly damaged nervous system, or a depressed sensorium due to maternal drugs, one saw a real interference in behavioural responsiveness. This seemed to point to the interaction between physiological and psychological responses and, in my mind, behavioural responses afforded a new window into physiological and neurological integrity. 303

It is precisely this interaction, in the above sense, that has impressed the writer and has influenced her work. By the same token, as internal biochemistry can affect behaviour, the writer considered that the external stimuli in music therapy could also affect the children’s internal state, at which point they would present behavioural changes. If children who had severe disabilities could respond to the therapist as she played the piano and sang, if they could present changes of behaviour, this could highlight the significance and profound effect of music therapy. Ethological method would make this apparent, giving a ‘window’ on the mind.

One of the most important contributions of ethology is that it has facilitated dialogue between different disciplines, in particular psychoanalysis and developmental psychology, enriching both. Speaking of the division between the ‘conative’ and the ‘cognitive’, Murray writes:

In recent years the influence of ethology with its emphasis on the role of emotion in regulating interactions, coupled with detailed descriptive work, has to some extent bridged the gap 304.


5.3 Development of the Mother-Infant Relationship

5.3.1 The Foetus

In recent years, with the advent of new technology, there has been much research on foetal responses to stimulation. This has shown that infants experience the world before birth, so when they are born they are familiar with many aspects of the mother and her environment, and are ready to engage with both. Research in the foetal stage has hardly really investigated the mother-foetus interaction although there is increasing evidence of the foetus responding to its mother.305

5.3.1.1 Auditory System

‘Embryologists agree that the ear is the first organ to develop in embryo’, suggesting that it becomes a significant component of the interactions with the external environment.306 It has been shown that the ‘fetus is capable of responding to sound as early as 25-26 weeks gestation’.307 The foetus is aware of ‘maternal heart sounds, maternal bowel sounds and maternal voice’, 308 an awareness that is ‘functionally important for the newborn’309 as is discussed below.

Additionally, the foetus responds to external sounds, as research from the 1920’s onwards has shown.310 Early experiments concentrated on observing the response of the foetus to stimuli such as ‘warning horns and wood claps’311 while recent experiments have shown that the foetus also responds to music, preferring Mozart and Vivaldi to other composers.

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309 Ibid., p. 5.

Fetal heart rates invariably steadied and kicking declined, [in response to Mozart and Vivaldi] while other music, especially rock ‘drove most fetuses to distraction’ and they ‘kicked violently’ when it was played to their pregnant mothers.312

Lecanuet suggests that various other factors than the type of music, namely, its loudness, its pitch, and, to a large extent, the behavioral state of the baby, may control the reaction of the fetus.313

He also points out that the way a mother reacts to the music may also have an impact on the foetus but this is yet to be researched.314

5.3.1.2 Smell, Taste and Touch – The Proximal Senses

The foetus has an olfactory sense and can detect and store chemosensory information in the prenatal environment.315 Because of this the newborn is familiar with its mother’s odour,316 and is already familiar with the odour of a variety of foods she has eaten, showing a preference for the odour of these.317 The writer is unaware of any research on taste. Although not specifically described most mothers describe the reaction of the foetus to pressure on the abdomen.

5.3.1.3 Visual System

The foetus is also sensitive to light. It will startle if a bright light is shone on the mother’s abdomen but will turn towards a soft light. When in a quiescent state its reactions are less intense.

311 Ibid., p. 11.
314 Ibid., p. 17.
These differentiated responses to external stimuli can be perceived as signals by the mother. If these signals coincide with her own responses, they may initiate the beginnings of synchrony between mother and child.  

5.3.1.4 Movement

Particular attention has been given to foetal movements since they can be studied by non-invasive methods and because they have diagnostic value. The foetus performs the full range of movements of the neonate and these are affected by the state of the mother and any substances she may have taken, such as alcohol or tobacco. Notably the foetus can suck its fingers from about 15 weeks, showing an innate ability to pacify itself and a readiness or state of preparation for suckling the breast. Certainly at birth, the newborn is by no means a stranger to the world and has already interacted with its mother. The writer suggests that these prenatal skills are learnt so early that even babies who sustain damage at or around birth retain responses towards the social world, and the potential to interact with it.

5.3.2 The Social World of the Newborn

Immediately after birth, infants are highly sensitive to their interpersonal environment and, most importantly, participate in it using visual, auditory and other senses.

5.3.2.1 Visual System

Infancy research to date has particularly focused on the visual environment, stressing the image of the human face. Newborns prefer looking at a painted face on a flat board to painted boards with abstract images or scrambled faces. They enjoy looking at faces and seem ‘to be programmed for learning about human faces from birth’. The newborn become increasingly excited when following a

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319 Ibid., p. 25.

responsive adult’s face ‘back and forth and even up and down in the delivery room’

They also show a ‘general preference for people rather than objects’, though the newborn can take an active interest in attractive objects as well as human faces. It is clear that sight is not just a passive ability and that the newborn wants to see their mother and the environment, and is a social being.

Newborn also possess a remarkable ability to imitate facial expressions, and it is their ‘innate representational capacity’ that allows for this, a theory that supplants those of the classic founders of developmental psychology such as Piaget and Bowlby.

It is as if the baby can already sense that she and the other person are in some way the same.

This imitative ability shows a high degree of integration. When a neonate imitates an adult’s tongue protrusion, for example,

the infant at some level must recognise an identity between a seen form…and the unseen, felt experience of his own tongue protrusion.

Giannis Kugiumutzakis and Colwyn Trevarthen, both of whom have undertaken microanalytic studies of mother-infant mother interaction, suggest that the neonate’s ‘deep seated need to communicate is the strongest motive’ for his or her imitative response.

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321 Brazelton and Cramer, op. cit., p. 54.
322 Ibid., p. 54.
Some of the specific imitative phenomena of newborns, such as mouth or tongue movements, emotional expressions and hand movements may certainly be understood as the expressive components of vocal and gestural communications. The writer suggests that the early, visually mediated imitative ability has a vocal parallel when the children in this study sing the same notes as the therapist. They too can sing, sound like the therapist and use the sonic repertoire of the ‘music mother’. They could be regarded therefore as ‘music-babies’, having an ability to connect and identify with the caregiver, and sharing a ‘communicative musicality’.

It is clear that sight, as well as hearing, plays a part in the bonding process. Visual recognition becomes a rewarding signal for both parents. The fact that a newborn learns about each of them so rapidly tells them that all the baby’s faculties are intact and that they are important to the baby already.

5.3.2.2 Auditory System

The capacity of the newborn to hear is also evident at birth. L. W. Olsho and her colleagues have obtained reliable auditory thresholds and discrimination of auditory stimuli in infants as young as two weeks of age. Newborns show a preference for their own mothers’ voices, a familiar sound, giving the sense that they are engaging with her. This helps the mother and newborn child to bond and interact, a phenomenon which is thought by the writer to transpose into the music therapist-child

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328 Ibid., p. 79.
relationship where the therapist acts as a music-caregiver or ‘music-mother’. It may be the underlying reason why the children in the writer’s study vocally echo many of the music therapist’s sung notes. The capacity for this stems from a very early period in their lives. A ‘musical relationship can recreate aspects of this early stage’ especially given that newborns respond to, and vocally imitate, their mothers.

…under very specific, flexible experimental conditions and internal states, a minority of [newborns], even during the first 45 minutes, after delivery, made effortful imitations of a vocal model or the rhythm of the vocal models.

The newborn will also turn its head towards the sound of someone’s voice, as well as to an unusual sound such as a rattle, combining visual and auditory skills as they do when interacting with their mother.

The research of William Condon and Louis Sander showed that the newborn synchronised their movements to the mother’s speech rhythms. Brazelton and Cramer comment on the phenomenon by writing:

This is an example of the great mutual power of adaptation in early infancy. The baby’s movements match the mother’s, who, in turn, adapts her speech to the baby’s movements. Parents learn the pitch, the rhythm that captures their baby, who begins to dance, as it were, to the accompaniment of their voices.

The children in the writer’s study often ‘danced’ to the therapist’s music by moving part or parts of their body, often the head or the foot. They usually did so on the downbeat, or at cadences, and thus bore a similarity to the children described by Condon and Sander. Darren actually beat in time with the therapist, while Rosanna,
despite being less able to move, frequently beat on the downbeat of the therapist’s music.

It was difficult to tell whether a child who was barely able to move was internally following the beat of the therapist’s music. However, it was at times likely that a child was doing this. They might look up if the therapist altered the tempo or pulse, suggesting they had been aware of it and had noticed the change. These responses resonate with those of earliest infancy suggesting there is a parallel between the music therapist-child relationship and that of the mother-baby.

5.3.2.3 Smell, Taste and Touch

The newborn indicate a strong attachment to the mother in a variety of ways, are sensitive to her attributes and strive to get to know her. At six or seven days after birth the newborn show a preference for their own mother’s odour, and will turn towards a breast pad worn by their mother rather than a breast pad worn by another woman. Murray and Andrews report the newborn showing this preference as early as two hours after birth. Recent studies have shown that the newborn who have been breast-fed ‘come to learn and prefer the overall scent of their own mothers’ and the newborn ‘can be seen to guide himself to the mother’s breast by the smell of the breast milk’. Infants also show a preference for their mother’s face rather than that of another woman, and prefer being held by her than by another woman thus reinforcing the strong mother-newborn link.


When suckling at the breast there is a burst-pause pattern which can be understood in terms of the newborn eliciting some social response from the mother when pausing. Analogous moments to this may occur when certain children in this study look towards the therapist after playing their instruments.

The newborn are sensitive to different tastes, and register their like or dislike of a liquid by facial expression and differing patterns of sucking. The interaction of the newborn with their mother seems to change the infants’ affect in even the most basic functions. Lewis Lipsitt argues that the newborn particularly like sweet liquids since there is a decrease in sucking to enable them to savour the liquid. The writer was struck by the stillness of some of the children at certain times when, head or eyes toward the piano, they seemed to be literally ‘drinking in’ and savouring the music.

Touch is an important communicative modality, the skin of the foetus sensing the amniotic fluid and the warmth of the mother’s body from the beginning of its life. Thus the newborn is sensitive to being held and patted, stimulated or soothed by different kinds of physical contact with their mother. In this study the children were not usually touched or held, other than by the helper during assisted beating. This is because sound was emphasised and, additionally, it was inherently impractical to make physical contact. However aspects of musical communication were thought to be similar to certain touch communication. The varied tempi and rhythms of patting, for example, could be expressed pianistically or on percussion by the therapist. The paediatrician and child psychiatrist Berry Brazelton found that a slow patting motion is soothing whereas more rapid patting becomes an alerting stimulus, and the threshold is very specific.

If the patting is too fast, the baby becomes upset.


347 The work of Lipsitt is cited by Fox, ibid., p. 55.


5.3.3 The Development of the Infant up to Six Months

According to Arnold Gesell the ‘neonatal period is drawing to a close’ at four weeks of age,\textsuperscript{350} and infants are becoming more sophisticated in their responses, rapidly developing from day to day.

5.3.3.1 Visual System

Infants have increasing muscular control of their eye-balls from about four weeks, when they stare vacantly at large masses such as windows or ceilings.\textsuperscript{351} Around three months there is a ‘shift in the development of their visual system’.\textsuperscript{352} Whereas previously the infant could only focus at a close range, they ‘begin to be able to focus on things that are at a distance’,\textsuperscript{353} and can distinguish unified patterns out of generalised movement.\textsuperscript{354} Importantly, this widens the scope for interaction with the mother, and objects from the environment which attract the infant can be brought into play, following the infant’s cues.

It is thought that infants of about three months can see colours and distinguish between them but there are doubts as to whether infants younger than seven weeks have this ability. This is partly because the neural pathways responsible for colour discrimination are immature, and partly ‘because methodological problems in testing young infants confound hue and brightness’.\textsuperscript{355}

5.3.3.2 Auditory System

The month-old infant is sensitive to sounds, startling or freezing if there is a sudden noise and usually turning towards the sound of a soothing human voice. S/he ‘coos


\textsuperscript{351} Ibid., p. 19.


\textsuperscript{353} Ibid., p. 63

\textsuperscript{354} Bennett I. Bertenthal, ‘Origins and Early Development of Perception, Action and Representation’, \textit{Annual Review of Psychology}, 47, 1996, p. 448. This describes research on ‘…infants’ perception of biological motions. These motions are depicted by points of light moving as if attached to the major joints and head of a person walking. …Three- and five-month-old infants discriminate these same moving point-light displays from ones in which the temporal patterning of the lights are perturbed’.

responsively to mother’s talk from about five to six weeks’. One child in this study, Mahmoud, made such vocalisations when being helped to play an E-flat chime bar during a narrative-type song played and sung by the therapist (see Example 4, page 287 in Appendix A). He also made gurgling sounds during this, sounds which reflect contentment in young infants and may have been linked to the narrative quality of the song. Indeed, the corners of his mouth were turned up in a smile. There was, therefore, a striking resemblance between Mahmoud, whose chronological age was 6 years and developmental age was 2.6 months, and a month-old baby listening to its mother telling him or her a story.

At about three months of age, the infant begins to be aware of a greater variety of sounds, and is aware of their significance. For example, ‘approaching voices, footsteps or running bathwater’ are sounds that may indicate an impending event and which can elicit excitement. In many music therapy sessions the therapist, seating herself at the piano, was watched with apparent interest, and sometimes excitement by the children, while different kinds of musical events appeared to generate similar feelings. Certain children in this study were like three-month old infants in other respects, viz. vocalising delightedly when pleased, or when spoken to, something which Barnaby, Christopher, and Rosanna did on occasions.

5.3.3.3 Smell, Taste and Touch

Literature with regard to smell, taste and touch focuses on the newborn. The senses clearly remain important, however, as the infant develops and grows. A distressed baby, for example, will nestle into its own mother’s shoulder and become calm, feeling her body with its familiar odour and familiar touch. Touching is also important when mother, or father, lift the infant in the air in a playful way, or support the infant sitting on the lap of one of the parents. The baby will feel secure in the hands and arms of the caregiver who is, once again, familiar.

357 Ibid., p. 25.
358 Ibid., p. 28.
359 A description of all the children is given in section 6.6.9 The Children on page 134.
Infants continue to taste their own mother’s milk when breast-feeding. This is thought by many to promote mother-infant bonding, a possibility considered hard to prove by Illingworth since there are ‘so many variables’.  

The sparsity of literature on smell, taste and touch, after the foetal and newborn stages, may be explained by those senses being partially superseded by the infant’s developing visual, cognitive and motor skills. Furthermore, it is difficult to set up experiments to investigate complex variables with such young infants.

### 5.3.3.4 Social Interaction Integrating Sensory and Motor Skills

Infants are particularly predisposed towards social interaction from about six weeks to three months, the period which Colwyn Trevarthen calls ‘primary intersubjectivity’. Their senses and motor skills all come into play as they engage in ‘protoconversation’ with their own mothers, in a face-to-face situation, sharing their own feeling world and responding to her ‘intuitive motherese’, (a ‘special kind of affectionate speech of a person who is trying to get a response from the baby’). This consists of the mother repeating short, evenly-spaced words with simple, sing-song intonations in a resonant yet relaxed and breathy, moderately high-pitched voice.

It is a universal phenomenon which transcends different languages and cultures.

This phenomenon has been increasingly analysed by different researchers, particularly since the ground-breaking research of Berry Brazelton, Koslowski and Main, and

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360 Ronald S. Illingworth, op. cit., p. 213.
364 Trevarthen, Aitken et al., op. cit., p. 94.
Condon and Sander. Condon and Sander. The former analysed filmed observables of the mother-child unit on a second-by-second basis and found reciprocity to be an important part of the interaction. The latter observed microsynchrony between infant movement in relation to the phoneme boundaries of the mother’s speech. Throughout these, and later studies, some of which refined the early mother-infant research, it is possible to see that despite the inequality of the partners in the face-to-face dialogue, they both control the interaction, and both demonstrate a ‘sensitivity and susceptibility’ to each other. They also confirm

the empathy and identification that Winnicott described as stemming from the mother’s ‘Primary Preoccupation’ with her baby with demonstrations of fine, unconscious adjustment to infant sensitivities.

5.3.3.5 Microanalysis of Protoconversations

Research employing a microanalytic method to understand the intricacies of early mother-infant relationship reveals not only the sensitivities of both subjects to one another, but also the many musical elements in their relationship, notably timing, phrasing and prosody. These are some of the fundamental aspects of music therapy, in which the essence of infant perception and expression find their counterpart in the client-therapist relationship in a dynamic and spontaneous way.

Colwyn Trevarthen, one of the most notable and active contributors to the field of infancy research, makes prolific use of video microanalysis, looking at the interpersonal motives of early communication. He gives an example of the ‘protoconversational cycle and its microanalysis’ in which he describes a healthy

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mother and her 6-10 week-old infant, who has been positioned in a comfortable way.\textsuperscript{370} The microanalysis reveals cycles of communication which

are mediated by eye-to-eye orientation, vocalizations, hand gestures and movements of the arms and head, all acting in coordination to express interpersonal awareness and emotions.\textsuperscript{371}

First the infants focus on their own mothers, wanting to get to know them. They then make a ‘statement of feeling’ in one or more of a variety of forms, to which mothers respond in an empathetic way.\textsuperscript{372} Mother and infant commune in synchrony and then follows what Trevarthen calls a ‘more serious utterance’\textsuperscript{373} performed by the infant. This

infant utterance is the behavior, in that context of interpersonal coordination and sharing of feelings, which justifies the term ‘protoconversation’. It looks and sounds as though the infant, in replying to the mother, is offering a message or statement about something it knows and wants to tell.\textsuperscript{374}

The mother responds to this, with intuitive motherese, as if the infant had said something intelligible.\textsuperscript{375}

Trevarthen’s microanalysis shows that mother and infant exchange ‘similar or matching contributions’ and are intensely involved with one another, responding to the smallest details of gesture, vocalisation and gaze.\textsuperscript{376} Mother and infant also respond to and perceive each other in different modalities at times, the infant moving his or her body, the mother smiling, for example. The protoconversation reveals the ‘dynamic expressive motor impulse and the cycles of alerting and focalising in receptivity that


\textsuperscript{371} Ibid., p. 131.

\textsuperscript{372} Ibid., p. 131.

\textsuperscript{373} Ibid., p. 131.

\textsuperscript{374} Ibid., p. 131.

\textsuperscript{375} Ibid., p. 132.

\textsuperscript{376} Ibid., p. 130.
are innate in human communication.'\textsuperscript{377} and which go towards establishing a
foundation for adult relationships.

Stephen Malloch researches a similar field. In one of his studies he makes a computer-
based acoustic analysis of the components in a mother-infant interaction where, once
again, the mother is healthy and the six-week-old infant healthy and comfortable.\textsuperscript{378} He observed they are ‘partners in a musical dialogue’.\textsuperscript{379} Using spectrographic
analysis, computerised pitch plots and various measures of timbre, Malloch draws
attention to pitch, quality and narrative in mother/infant vocalisations, these three
elements being necessary for ‘communicative musicality’ in which there is ‘co-
operative and co-dependent communication’.\textsuperscript{380}

His microanalysis shows that the mother does not imitate the infant’s vocalisation
exactly, but feeds it back to the infant in a magnified and clarified way. For example,
if the infant makes a rising vocalisation, the mother might continue and exaggerate this
upward pitch movement, intuitively sharing a sense of shape with her baby and
confirming she has received its being-in-the-world. This is something music therapists
often do in their clinical work in response to their clients.

Malloch additionally points to a rhythmic element (in the same mother-infant
conversation), linking it to music. He places ‘bar-lines’ at ‘important temporal
landmarks’,\textsuperscript{381} for example at the onset of a vocalisation or an emphasised syllable.
Where there is a large gap between vocalisations, it is usually possible to insert
artificial bars having approximately the same length as the surrounding bars. Thus
there is the suggestion of an underlying pulse.

In a different microanalysis of an infant of four months who is sharing a nursery rhyme
with her mother, Malloch describes how the baby girl takes part in a musical narrative,
(the onset of which causes her to smile because of its familiarity).\textsuperscript{382} She is aware of

\textsuperscript{377} Ibid., p. 133.
\textsuperscript{378} Stephen N. Malloch, ‘Mothers and Infants and Communicative Musicality’, \textit{Musicae Scientiae},
\textsuperscript{379} Ibid., p. 32.
\textsuperscript{380} Ibid., p. 31.
\textsuperscript{381} Ibid., p. 34.
\textsuperscript{382} Ibid., p. 45.
the structure of the rhyme, vocalises in time with her mother and, during the third verse, consistently vocalises on the last beat of the bar. She even introduces triplets, a musical elaboration. Her varied vocalisations show ‘a true musical feeling – they support the musical structure of the rhyme – they never work against it’. In another microanalysis of a premature infant interacting with her father, periodicity emerges as a marked feature, its regularity similar to that of bar-lines in music.

Timing is a feature of the research of Beatrice Beebe, Joseph Jaffe et al. who made a video microanalysis of the interaction between infants aged three-and-a-half to four months and their mothers, ‘evaluating the ways in which mother and infant match the timing of their vocal and kinesic behaviours’. They found that the mother and infant influence one another and match the timing of their vocal and kinesic interactions, although the features which match between mother and infant are not necessarily the same as those between adults.

A particularly interesting hypothesis emerged from their study:

> these temporal sensitivities are not necessarily a function of the emotional attachment between mother and infant, but rather are available as social-perceptual abilities which can under certain conditions be utilized with an attuned strange caretaker at this age.

This lends weight to the ability of the music therapist to interact effectively with the children.

The mother is naturally disposed to imitate the infant’s gestures, an activity which Winnicott calls ‘mirroring’. Timing here is important too. If the response is too slow for example, the infant may not understand that the response is in relation to them.

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383 Ibid., p. 47.
384 Ibid., p. 37.
386 Ibid., pp. 240-241.
If it is too fast, the infant may turn their attention elsewhere. When the mother extends or develops the infant’s gesture conversation becomes like ‘a musical duet.’

From these examples of research into early mother-infant interaction it can be seen that there is a marvellous ability and motivation on the part of infants to reach out towards their mothers or care-givers and engage with them, drawing on all their resources, the mothers being similarly motivated. This is of vital importance since the ability of an infant to experience him or herself in a relationship is a pre-requisite for ‘developing a sense of him or herself as a social being and as part of a human community’. This drive for communication and sharing goes hand in hand with a sensitivity to social contingency from as early as two months, and an infant of this age ‘will also expect adults to produce socially contingent responses during face to face interactions’. It is a period when timing, pitch, gesture and facial expression are all reference points in the infant’s world, ones that from an early age s/he seeks to make sense of in order to connect with his or her mother and, subsequently, society.

5.3.4 The Infant between Six and Twelve Months

By the age of six months an infant has developed greatly, having greater motor control and a sense of exploration.

5.3.4.1 Visual System

The infant is ‘visually insatiable’ at six months of age’, and ‘moves head and eyes eagerly in every direction when attention is attracted’. Their visual-motor skill has improved so they are able to grasp objects within 6 to 12 inches, and ‘often concentrate self-centeredly on exploration of objects, and on developing their own manipulative activity’. If these objects are dropped, and roll or fall outside the infant’s visual field, these are forgotten or only searched for ‘vaguely’. When the infant is aged between

392 Ibid., p. 30.
6 months and 1 year, visual acuity ‘seems to be within the normal adult range’. By nine months of age, the infant is ‘visually very attentive to people, objects and happenings’.

Gesell points out that at each stage of development, the infant’s ocular adjustments are more advanced than their manual adjustments. This means, for example, that when about six months old, the infant can ‘perceive a piece of string, but is inept at plucking it.’ Visual contact appears, therefore, along with sound, of dominant importance developmentally.

5.3.4.2 Auditory System

At the age of six months, the infant ‘turns immediately to mother’s voice across the room’ and ‘vocalizes tunefully to self and others using sing-song vowel sounds or single or double syllables’. Around nine months of age, the infant ‘is eagerly attentive to everyday sound, particularly [to the] voice’, sometimes shouting to attract attention, listening, then shouting again. These last two behaviours are similar to those of interactive music therapy, when the child, or indeed adult, announces themselves vocally and then awaits ‘the other’, the therapist.

Lois Bloom states that the start of ‘articulatory capabilities for actual words comes with the onset of babbling sometime between 6 and 9 months’. At first the babbling is reduplicated, when each syllable in a string of babbling is the same. Nonreduplicated babbling, composed of different vowels and consonants, and an increased variety of stress patterns and intonation contours, is often thought to start later, though some studies report that both types of patterns ‘occur from the beginning of babbling at 6 to 7 months’.

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394 Sheridan, op. cit., p. 33.
396 Ibid., p. 22.
397 Sheridan, op. cit., p. 31.
months of age’. While reduplicated babbling begins to resemble the ‘rhythm and sound of adult speech’, when the infant produces nonreduplicated babbling, it begins to sound ‘more like efforts to say words’.

Barnaby in this study was particularly vocal presenting sing-song vowel sounds, and both reduplicated and nonreduplicated tuneful babbling in ‘long repetitive strings of syllables’, like a nine month old child, and clearly pitched singing sounds. Sheridan points out that while children largely babble for ‘self amusement’ they also do this as a sign of ‘favoured communication’. Since Barnaby often had his head and eyes towards the therapist, leant his body towards her and had a smile on his face when he was vocalising, this may be seen as favoured communication. Additionally Barnaby imitated the vocalisations of the therapist. Different levels of maturation can thus be presented by the same child.

The writer has pointed out that the foetus responds to music (see section 5.3.1.1 Auditory System, page 85). The research of Sandra Trehub and Laurel Trainor shows that from the age of six months to eleven months the infant is sufficiently discriminating to notice changes in melodies. Of specific relevance to the writer’s study is the finding that infants are more able to notice incongruities within the context of tonal music. This appears to be an innate ability and suggests that given tonal music, the children in the writer’s study may be processing the therapist’s music and thus following it.

By 12 months the child recognises its own name, ‘jargons loudly’ and uses ‘conversational cadences’. They imitate ‘adults’ playful vocalizations and sometimes word forms with gleeful enthusiasm’.

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400 Ibid., (Bloom), p. 318.
401 Sheridan, op. cit., p. 34.
403 Sheridan, op. cit., p. 37.
404 Ibid., p. 37.
The writer is not sure if the children in her study knew their own names, it seemed as though they did, but it was certainly the case that several of them, (Darren, Mahmoud, Barnaby) took delight at times in imitating the therapist’s vocalisations. Notably Barnaby, who had no expressive language, once imitated the word ‘play’, while Mahmoud and Darren imitated vowel sounds. Darren also once said ‘Hello’, again despite having no expressive language.

5.3.4.3 Smell, Taste and Touch

It has been suggested that in the early stages of infant development, ‘auditory, tactual, kinesthetic and olfactory discriminations may more be important’ since sight takes time to develop.\(^{405}\) Obviously this is not to say that once the ocular system has matured these other systems are no longer important. Rather the infant of 6 to 12 months is involved with their new abilities: the performance of fine movements and seeing things with increasing visual clarity. Because of this the infant can grasp small toys. S/he ‘manipulates objects attentively and takes everything to [his or her] mouth’.\(^{406}\) By 9 months infants are biting and chewing\(^ {407} \) so that they are in fact experiencing new tastes and smells. Since they ‘cling to a known adult’ when amongst strangers and can be reassured by him or her, the sense of touch remains important.

Only 3 out of the 8 children in the writer’s study, Barnaby, Darren and Joe were able to perform these manual tasks, or, indeed, move their heads freely to see objects and persons around them. The writer conjectures that sight may have even brought about painful inner feelings at times, when, for example, Christopher tried to move his hand towards a tambourine but was unable to reach it.

5.3.4.4 Social Interaction Integrating Sensory and Motor Skills

Between the ages of 6 months and 1 year, the infant develops increasing skills for social interaction. At six months they respond to an adult with ‘smiles, gestures


\(^{406}\) Sheridan, op. cit., p. 31.

\(^{407}\) Sheridan, op. cit., p. 35.
movements and sounds’. When infants are 7 or 8 months the ‘adult begins to point in order to draw their attention to an object or event. Within a few months, infants begin actively to use pointing gestures themselves…’

These can be ‘protodeclarative’ when drawing attention to the object, or ‘protoimperative’ when the infant indicates the adult should do something. Such behaviour is part of a ‘bi-stratal proto-language consisting of meaning and sound’, the most developed type of non-verbal communication before speech, in which the infant vocalises and gesticulates with clearly defined communicative purposes. ‘Its essential feature is the elevation of the shared topic to meaningfulness in joint awareness’, the mother adjusting her method of communication accordingly.

The sense, then, of what Daniel Stern calls a ‘subjective self’ is emerging, and a state in which the infant discovers that inner experiences can be shared. Trevarthen and Penelope Hubley call this new type of relatedness in children of six to nine months ‘secondary intersubjectivity’, when a ‘deliberately sought sharing of experience about events and things is achieved for the first time’. This new reaction is ‘voluntary, not reflexive’. The nature of intersubjective relatedness is viewed differently by psychobiologists, psychoanalysts and psychologists, but all recognise an important shift has occurred in infants who have a ‘new organizing subjective perspective about their social lives’.

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409 Ibid., p. 286.


411 Ibid., p. 286.


416 Daniel N. Stern, op. cit., p. 125.
At about the same time as the emergence of intersubjectivity, the mother ‘adds a new dimension to her imitation-like behaviour’ which Daniel Stern calls ‘affect attunement’. This can be described as

the performance of behaviors that express the quality of feeling of a shared affect state without imitating the exact behavioural expression of the inner state.

Stern gives the example of an infant who reaches excitedly for a toy and joyfully exclaims ‘Aaaaah!’ when managing to grab it. The mother matches the infant’s inner feelings but in a different modality, jiggling her shoulders ‘like a go-go dancer’ for as long as her infant’s vocalisation took, and expressing, in her movements, the same intensity of excitement and joy experienced by her child. Focus is given thereby to the ‘quality of feeling that is being shared’ and not just to its external manifestation, ‘Vitality affects’, which have amodal properties viz. intensity, time and shape, are also attuned to, and are experienced as ‘dynamic shifts or patterned changes within ourselves and others’. They facilitate constant attunement, since categorical affects such as those of joy and excitement, as described above, do not occur all the time.

Trevarthen and Marwick point out another change in the mother’s behaviour which has been elicited by that of the infant.

Towards 9 months after the baby’s birth, mothers respond to some sense that their infants are becoming more cooperative with experiences and with the manipulation of things. Most mothers unconsciously take on a new role of helpful instructor in the performance of a task.

417 Ibid., p. 140.
418 Ibid., p. 140.
419 Ibid., p. 140.
420 Ibid., p. 142.
421 Ibid., p. 156.
Each successive shift in the infant is understood by Trevarthen and Marwick as a sign of developing motives in the infant for cooperation with the mother, and explained as part of a motivation for language.

The principle adaptive function or benefit of the emotional attachment of the infant to the mother is not just physical ‘protection’, but psychosocial and cultural education of the mind.\textsuperscript{423}

From around 8 months to 1 year of age, the infant engages in social referencing.

The 8-month-old infant’s new competencies in the motor, affective, cognitive and social domains bring on a new world of uncertainty and mother, or familiar caretakers can help by providing emotional information about unfamiliar objects or people.\textsuperscript{424} Their emotions will affect how the infant’s experience is digested.

The research of Mechthild Papoušek and Hanuš Papoušek has clearly shown that there are many musical elements in the vocalisations of infants, and these ‘develop in the context of social interaction’.\textsuperscript{425} In one study, which includes a detailed single-case observation of musical elements in their daughter from birth to 16 months, they show the sensitivity of the infant to the prosody and rhythm of mother’s ‘babytalk’, (intuitive motherese), suggesting this helps the infant to use its own voice communicatively, prosody and rhythm appearing early in the vocal repertoire. Early infant vocalisations were

most effectively elicited and most joyously produced if the parental ‘babytalk’ was contingent on the infant’s behaviour and carried out with attentive turn-taking.\textsuperscript{426}

Thus musical elements permeate our total being-in-the-world and are part of our relationships with other human beings. We express ourselves in a musical way. Given this fact it is perhaps inevitable that the communicative expression of the

\textsuperscript{423} Ibid., p. 283.
\textsuperscript{426} Ibid., p. 204.
children in the writer’s study was often musical, though at the same time it appears extraordinary, in the light of their severe disabilities. The Papoušeks point out that there is little research on infant vocalisations, and the writer has found this to be so in her literature searches. The writer’s study, therefore, may be a contribution to this field.

5.3.5 The Effect of Maternal Depression

The writer has focused thus far on descriptions of mother-infant interaction in which both parties are healthy. If however one of the parties is not healthy, this can powerfully affect the interpersonal exchange. When the mother is depressed, as, for example, in postpartum depression, she presents in a way that disrupts the mutual regulation between mother and infant, especially when infants from 4 to 6 months are involved. E. Z. Tronick and M. Katherine Weinberg found that mothers who were withdrawn caused their infants to fuss and cry, or, if the mothers’ condition was chronic, to become passive and withdrawn themselves. This is because they were unable to ‘repair the interaction’. Over time, this could lead to the infant’s affective core becoming angry and sad, and their feeling ineffectual. In the case of intrusive mothers, the infants were sometimes able to re-open a ‘social connectedness’ through displaying anger, but over time, were likely to be affected adversely, becoming essentially angry and defensive, wary that their mother would be intrusive again.

The initial reaction of infants to a blank-face in perturbation studies reveals that they quickly become disturbed. A ‘response is shown that has the characteristics of protest, the infant looking at the mother, frowning, thrashing the arms and making effortful negative vocalisations’. Infants expect their caregiver to behave contingently with the infants’ behaviour.

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429 Ibid., p. 68.


431 Ibid., p. 256.
5.3.6 The Effect of the Infant on the Mother

The effect of the infant on the mother is also important to consider, since the infant has personal powers which can affect their own caregiver. Evelyn Thoman writes that

the nature of parental behaviour is in large measure a function of the child’s characteristics, including his precipitating behaviour as well as his response to the parents’ activity.432

Thoman stresses how a mother’s behaviour and that of her infant are interdependent, and that the mother needs cues from her infant that indicate their own needs. If an infant is rejecting, showing an avoidance response when picked up and held, it is upsetting and frustrating for the parents. This feeling would, in turn, affect parental behaviour towards their infant.433

It often felt difficult for the therapist to engage with the children in this study. Those who were least mobile and least vocal presented as least accessible, and the therapist she had to make an enormous emotional effort, expressed through her music, in order to reach them. An intuitive part of this effort caused a self-perceived increase in the quality of warmth in her singing, an audible behaviour not quantified by the writer. This seemed, to the therapist, to be similar to the vocal pitch modulations found in ‘motherese’, the infant directed language of the ordinary devoted mother.

The mothers of autistic children also have difficulty in adjusting to the ‘unavailability’ of their infants and become

directive in their speech, attempting to initiate cooperation even when the child is unresponsive, a strategy which is often counterproductive.434


433 Ibid., pp. 177-200.

Richard Bell reports on a mother whose positive feelings towards her infant ebbed in the first month of her infant’s life until she wanted nothing to do with the infant. ‘Her infant fusses a great deal, was not responsive to holding and was late in exhibiting smiling and eye-to-eye contact’. It was diagnosed eventually as having brain damage. Such responses testify to the power of the child to affect its environment, although, of course, a child is not limited to inducing negative reactions. Anneliese Korner writes of the many examples which demonstrate that the baby’s stage of development has a powerful pull on the actions and feelings of the caregiver. One of the best examples is the effect of the emergence of the smile and of eye-to-eye contact in promoting maternal attachment.

Not only is the infant or child influenced by its social, political, economic and biological world, but in fact the child itself influences its world in turn.

5.3.7 Music Therapy and the Mother-Infant Model

There has been much investigation into the application of the psychoanalytic model to music therapy, but it is only since the end of the 1980s that music therapists formally began comparing the mother-infant relationship with that of the client-therapist relationship in interactive music therapy.

The work of some of these music therapists is now discussed.

Anthi Agoutou draws on the mother-infant model to help her understand some of the processes in her music therapy work with a 10-year-old girl, Lara, who has autistic tendencies and severe learning difficulties. She likens Lara’s periods of activity

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and co-activity with the therapist, and ensuing non-engagement periods, to the pauses that occur in mother-infant interaction following engagement. At these times the infant needs to withdraw a little after giving their mother attention and the mother has to be sensitive to the infant’s need to do so. Stern calls the infant’s withdrawal a ‘time-out episode’ which consists of a ‘relative behavioural silence’. Allowing for it helps the overall continuity of the mother-infant play period by using the time-out as an opportunity for ‘resetting the interaction on a different course’.

Margaret Heal Hughes, describing her work with adults who have severe learning disabilities, suggests using the mother-infant model for thinking about the unconscious meanings that clients are communicating through their movements and sounds during music therapy sessions.

The early work of Heal Hughes, which is based on a psychoanalytical approach to mother-infant interaction, is described in section 2.2.1 Completed Research on page 34 under the name of Heal.

In the field of mental health, David John finds it helpful to consider the mother-infant relationship from a psychoanalytic point of view. He draws on Wilfred Bion’s concept of the ‘mother’s reverie’ in which the mother acts as a container for the infant’s confusion and anxieties, filtering them of their distress. John proposes that the music therapist can take on a similar role vis-à-vis a client who has severe mental health problems. He also suggests that the concept of the transformational object as described by Christopher Bollas is useful for music therapists to consider. It refers to the infant experiencing their own mother as a ‘process of transformation’ and links

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440 Ibid., p. 93.
with the idea that the ‘transforming quality seems to be at the core of music, in that we expect music to do something to our self experience’. \textsuperscript{444} John’s description of the client finding their ‘pre-verbal voice’ in music therapy additionally emphasises the period of communication in early infancy. \textsuperscript{445}

The mother-infant relationship is also seen by Mercédès Pavlicevic to be analogous to the therapist-client relationship in music therapy, and she supports her view with the findings of micro-analytic infancy researchers, some of who have already been mentioned by the writer. \textsuperscript{446}

Her perspective focuses on the innate musicality of infants, the musical way they engage with the world and their search for optimal ‘inter-personal relating’. \textsuperscript{447} While exposed to nursery rhymes and lullabies, their ‘living experience of the world…is in the presence of the musical elements of rhythm, tempo, intensity, contours pattering and so on’ which the infant is able to experience, as both active agent and recipient, in a ‘co-coordinated, highly flexible manner’. \textsuperscript{448} Pavlicevic draws the important conclusion, with which the writer concurs, that our earliest experiences of music elements are powerful, and are ‘re-kindled’ in music therapy. Here music is used for communication, and resonates with our previous ‘non-verbal and pre-verbal ways of being’. \textsuperscript{449} Infants have a strong urge to communicate, do so coherently from an early age, and, with their mothers, create a ‘music’ which is the totality of their vocalisations and gestures. This totality is at the heart of interactive music therapy.

Jacqueline Robarts draws on the findings of microanalytical mother-infant research, from psychoanalytical, psychological and developmental viewpoints. Aware of the extent to which the dynamic forms of mother-infant communication are essentially musical, having ‘temporal organization…fluctuations of tonal rhythmic intensity…of


\textsuperscript{445} Ibid., p. 160.

\textsuperscript{446} Beatrice Beebe et al., Lynne Murray, Hanuš Papoušek, Mechthild Papoušek, Daniel Stern and Colwyn Trehart.


\textsuperscript{448} Ibid., p. 100.

\textsuperscript{449} Ibid., p. 101.
tempo…and so on’, she regards early object relations ‘in terms of musical introjects’. The ‘reciprocity envelope’, similar to the ‘behavioural envelope described by Brazelton and Cramer’ is also seen in musical terms, namely ‘musical dynamic form’, which, in the music therapy relationship, ‘symbolize[s] some of the fundamental aspects of self-other representation in early object relations’. Reflecting from a psychoanalytical perspective on her work with a 13-year-old girl, Melanie, who presented with early onset anorexia, and was compliant and over-dependent, Robarts realised how much the music therapy processes acted as a ‘container/transformer’ for those children who have disturbed or insufficient ego development. It can be seen how the mother-infant relationship invites a variety of perspectives and provides a great many influences.

5.3.8 Conclusion

It has been shown that infants respond to external stimuli before birth and, from the moment of birth, have a strong motivation to communicate, especially with their mothers. Many of the face-to-face communications with her are initiated by infants who ‘invite’ their mothers to engage with them. While the mother-infant dyad mutually regulates these interactions, obviously the mother has greater control of the two, and this enables her to support and extend her infant’s vocal and gestural communications, as well as providing a physically safe and predictable environment.

An important feature of the mother-infant engagement is its inherently musical quality. This resonates with the musical medium used by music therapists, but also brings with

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it the ‘dynamic forms’ which are the shape of emotional experience or feeling.\textsuperscript{454} Music therapy offers, therefore, a place or ‘space’ in which a client’s deepest feelings may be expressed and responded to in a safe environment. The role of the therapist is like that of a mother because she is able to ‘contain’ these feelings, respond to them, acknowledge them and at some point intervene in such a way that the client is able to develop or move on from the point at which they are stuck.

All the abilities of newborns show they are well prepared to take part in the human social world, and, indeed, seek it out. This suggests that children who have severe and multiple disabilities might do the same if provided with an environment of music in which they can take an active part.

\textbf{5.4 The Basic Structure}

\textbf{5.4.1 The Birth of the Basic Structure}

The Basic Structure (BS) was a pragmatic response, on the part of the therapist, to the needs of a therapeutic group of eight children at the Cheyne Centre, all of whom had cerebral palsy and severe and multiple disabilities. Because many of the children could not see each other properly, and because the physical arrangement of the children was spread out a great deal, it seemed logical to the therapist to delineate a therapeutic space, possibly a potential space, through musical means. Further, because many of the children’s responses were slow and it was difficult to attend to every child within the hour allotted, it seemed reasonable to use a musical language to which the children might have access: Western tonality.

With these considerations in mind, the therapist conceived a music therapy approach designed specifically for this group, calling it the Basic Structure (BS). Although ‘basic’ it was envisaged as a multi-layered structure with many potential significances. It was designed to help and encourage the children to operate independently and to help them sense being in an interactive relationship. As part of this strategy each child was given a ‘solo instrument’ chosen on the basis of his or her arm mobility. This was either a tambourine held by a snare drum stand (referred to hereafter as a drum because it was set up for use as such) or a pair of Chinese cymbals suspended from a stand and

positioned close to the child’s hand, thus making it possible at all times for the child to make a sound, even with the slightest movement. This arrangement also meant that the children did not need an assistant to attend to them all the time, and this fact would hopefully bring into focus their potential for independence at some level. The children were given the same ‘solo instrument’ in each music therapy session, and the therapist hoped they would identify with it, and regard it as an extension of themselves.

5.4.2 Description of the Basic Structure

The ground plan or schema of the Basic Structure (BS) and, therefore, the music therapy session, was based on a commonly used harmonic plan, ‘tonic, dominant, tonic’, which unfolded over a period of about 40 minutes (see Figure 2).

<table>
<thead>
<tr>
<th>I (Tonic) Context</th>
<th>V (Dom.) Hello Song</th>
<th>V / Other Development</th>
<th>I Context Reprise</th>
<th>I Bye-Bye Music</th>
</tr>
</thead>
</table>

| CTEXT | HSONG | DEVL | CTEXT | BYE |

**Figure 2 Sections of the Basic Structure**

Each child was assigned an individual theme or song, composed over the first few sessions as the therapist began to get to know the children, and their personalities became apparent. In other words the therapist was adjusting to them and their reactivity, whether positive or negative. These themes were in different keys but set in the overall tonality of the ‘Context Music’, also composed gradually, which aimed to reflect the group as a whole and was always presented in the home key of the BS. In the first part of the session, the children’s themes would alternate with the Context Music (see Figure 3). If the children vocalised or used their instruments, the therapist would respond in a thematic or free improvisatory way. When this interaction ended she would return to the BS Context Music, moving on after this to the next child’s song and so on, until all the children had been addressed.

455 If it had appeared that a child did not like his or her theme, this would have been changed. Apparent lack of response to a theme, however, was not necessarily interpreted as dislike.
There followed a lengthy series of ‘hellos’ (see Figure 4) in which each child, in turn, was assisted by the helper to beat a tambourine on the downbeat during a specially composed Hello Song. The tambourine, referred to as the Hello Tambourine, was the usual instrument used in the Hello Song turns, and was held by the helper. During the assisted beating on the Hello Tambourine the child’s own solo instrument was put aside and returned afterwards. The Hello Song was played every time in the dominant key of the Basic Structure, and had been written in a way that stressed the tonic, which in turn frequently coincided with the downbeat (see Example 1 on page 284 in the Appendices). It conformed to Leonard Meyer’s ‘Law of Good Continuation’ in which a shape or a pattern will, all other things being equal, tend to be continued in its initial mode of operation.\(^\text{456}\)

The Hellos were often lengthy because they prompted many of the children to beat by themselves after the song had ended, the helper simply extending the tambourine in front of the child while the therapist supported each child’s percussive output pianistically, and sometimes vocally. A tambourine was used for assisted beating.

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because, in the therapist’s opinion, the small drum sound together with that of the thin brass discs or jingles orchestrate and emphasise the rhythmic event of the downbeat and give rich feedback to the child.

The Development Section was unplanned. It was hoped the children would be aroused by the Basic Structure thus far, and would initiate more, the therapist interacting with their more overt behaviour and taking the lead from them. As well as improvised music, precomposed material was sometimes introduced. The Chime-Bar Song is an example of this and is referred to as repertoire (REP), one of a series of composed pieces used with each group. In certain cases, improvisations became repertoire. ‘Let’s Play Listening’ is an example of this.

The last part of the session consisted of a reprise of the Context Music and Children’s Themes and ended with a Bye-Bye Song. As with all parts of the Basic Structure, free or thematic improvisation was introduced by the therapist in response to spontaneous gestures, facial expressions, vocalisations or instrumental output. In the Context Reprise, this was combined with orienting the children to the situation in which they had been, and currently were, the therapist singing about what had happened in the session, and alerting the children to the fact that it was nearly time to finish.

After using the Basic Structure for a short while, and perceiving many of the children becoming lively and responsive musically, it seemed to the therapist that her role had similarities with that of Winnicott’s ‘good-enough mother’ and the ‘facilitating environment’.

5.5 The Basic Structure and the Good-Enough Mother

There are two main reasons why the writer views the Basic Structure (BS) approach as being similar to that of a good-enough mother. These can be seen in terms of (1) what the BS itself provides, and (2) the way the therapist articulates the BS. Interestingly the music therapist is at one with her environment just as the good-enough mother is part of the facilitating environment.

457 See pages 285-287 of Appendix A.
5.5.1 The Structure Itself

Firstly, the tonality and structure of the Basic Structure (BS) provide a musical means whereby the therapist can ‘hold’ the children just as the good-enough mother holds the infant. The predictability of much of the BS, and its boundaries, resonate with the concept of holding, which provides a safe base from which a child can explore, having felt contained. The overall harmonic scheme of the structure is thought to contribute to the capacity of the BS to hold the children, and is one of the many constituents of it that provide a ‘routine of care’ such as the infant has from its parents. This concept is slightly adapted from that of Winnicott. He talks about the individual mother-infant relationship rather than a mother with a group of children, and says the routine is ‘never the same with any two infants’, for each child is a different individual. Nevertheless in broad terms it is similar, and bears a similarity to the technique of the psychoanalyst who provides the same broad boundaries at each session. Furthermore, the individuality of each child is acknowledged by the music therapist when she engages with the children on an individual basis.

Secondly, the concept of good-enough ‘handling’ by the mother is also a concept which applies to the Basic Structure (BS). Just as the good-enough mother handles the child, facilitating a union between psyche and soma, so the parameters and tonal language of the BS are thought to ‘handle’ the child. They provide a milieu from which the child can absorb or introject musical elements, and from these fashion their own self, which can then be projected into the external world. In the BS there is a union between Western tonality and the self of the child which, from its earliest stages, has been described as being born out of an innate musicality. The ‘self’ here may be regarded as the ‘music child’ as described by Paul Nordoff, but the writer sees it also from the perspective of an awakening or stimulation of the ego, which is provided with a Western musical language to use, as well as the musical protolanguage of early infancy.


459 Ibid., p. 107.

Thirdly, the Basic Structure (BS) acts as a sort of guide for the children. Its architecture aims to unfold in such a way as to foster each child’s self-awareness. It aims to bring into focus that the child

(1) is in a music therapy space (Context Music)
(2) is an individual presence and force in that space (child’s individual musical theme)
(3) has the capacity for intersubjectivity (Hello Song)
(4) can be assertive and affect his or her environment
(5) is able to operate independently (Solo instrument/voice/gestures/facial expressions)

The concepts (1) to (4) correspond with the original order of the sections of the BS and their corresponding aims, but they are also on-going aims. Item (5) is not section-specific, but again an on-going aim. The qualities of the children, listed above, are reflected in the shape of the BS which, in many ways, is a microcosm of the various stages in a child’s development.

All these factors reflect the various aims of the Basic Structure (BS) music and overlap to some extent with the therapist’s articulation of it (see next section below). One overall aim of the BS is to facilitate the experience of successful and self-reinforcing events, something the good-enough mother naturally does. The Hello Song, for example, is composed in a way that is easy to follow (see Example 1 on page 284 in the Appendices). The writer thinks that many of the children were able to recognise what the next bit of melody or rhythm did, and, as a result, moved, vocalised or played their instruments on the ‘right ‘note or beat, thereby experiencing a sense of achievement.

5.5.2 Music Therapist’s Articulation of the Basic Structure

There is a relationship between the children and the therapist on a personal level, when the individual and spontaneous interactions are fashioned by the child’s needs, and sonic or visible expressions. This leads to interactions which are similar to protoconversation, and the mother-infant exchanges which occur during secondary intersubjectivity. In these the many behaviours that are exhibited by the good-enough
mother can be seen in the music therapist. These include mirroring, turn-taking, sharing the child’s mood or joke, smiling and laughing in an empathetic and encouraging way, object presenting, identifying with the child being, sensitive to the child’s vocal timing, supporting the child’s instrumental or vocal sounds, and having a readiness to give meaning to or enhance the meaning of a child’s output. All these behaviours help to establish the experience of subjectivity in the infant, a state the music therapist strives to foster, as does the good-enough mother.

The therapist gave each child their own theme or tune, which was sounded, in various forms, during the Context Section, but also frequently during the entire session, as and when the therapist was addressing or referring to a particular child. This tune could be thought of as a transitional object (see section 4.2.1 Transitional Objects and Transitional Phenomena on page 70).

The Basic Structure was also articulated by the use of anticipation. Murray and Andrews point out that infants of three months or more ‘quickly pick up the sequence of events in body games … and in set games with toys’. The enjoyment can be enhanced by the mother improvising, delaying the climax of the game, for example. The therapist in this study, as well as presenting set structures and thematic improvisation, often delayed the resolution of a chord, the ‘climax’, and thus behaved like the mother. An important aspect of these games is the shared enjoyment. With the children in this study a long pause between the chord and its resolution very often enabled the children to gather and present their responses.

It has been shown that the infant is a social being. The Basic Structure encourages the child to discover and define themselves socially in musical terms.

5.5.3 Problems Associated with the Basic Structure

A teacher from the ‘Special Unit’ assisted the music therapist. Occasionally she would say to the therapist: “It didn’t work today”, when the children were silent and apparently unmoved. The crucial issue was: what did not work? There was no “it” in fact. There was a relationship between the therapist and the children. If the therapist felt tired or unwell in any degree, her ability to articulate the Basic Structure suffered,

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so too her ability to speak to the children and listen to them. She fell back on the Basic Structure as a means of offering the children something rather than nothing. This, however, was unsatisfactory, and was proof that they did not respond when the therapist was inauthentic or emotionally absent. In short, notes by themselves are not sufficient when the therapist is unavailable and is working in a Winnicottian way.

5.6 The Writer’s Philosophical Position

The writer used her experience of being a music therapist in conjunction with her knowledge of psycho-analytical theory. Her approach is not experimental but more observational, and closest to the mother-infant model. She is a reflective practitioner of music therapy, appraising and re-appraising her own work and this study came about as the result of that process when she undertook some clinical work, perceived another way of working (the Basic Structure approach), then reflected on this as she proceeded. It seemed to her that her role as a music therapist was like that of Winnicott’s good-enough mother, and the Basic Structure had some part in this. She wanted to understand more of what was going on, and decided to look at her approach with a different group of children, hence this research project. Her philosophical position is, therefore, essentially a naturalist one, in which she is both biased and open-minded.

5.7 Conclusion

There are two main points to emerge from the description of mother-infant development, the concepts of Winnicott and the writer’s Basic Structure.

(1) In the clinical work for this study the therapist provided a structured framework in which a child can develop a sense of agency.

(2) The therapist-client relationship was found to be similar to that of the mother-infant.

(a) The types of communication are similar in each, both having a musical basis.
(b) The aims of each are coterminous, to promote psychological development.
(c) Both facilitate psychological development through sensitive adaptation, empathy and support.
(d) Both entail developing relationships. Children interact with their mothers from
birth, an interaction that is affected by age and experience. In music therapy, the therapeutic relationship develops over time.

The above points indicate that the mother-infant relationship can provide a model for the therapist-client relationship.
Chapter 6
Research Methods

6.1 Introduction

This chapter discusses the writer’s research methods. It begins by outlining her theoretical orientation, describing the clinical field in which she has worked and adding some further comments about her clinical approach. It then describes the research route she chose, giving reasons for her choice. The chapter concludes with a summary of her research design, an account and discussion of her work thus far and a brief appraisal of the work ahead.

6.2 Orientation

The writer has an interest in psychotherapy and some knowledge of psychoanalytic theory. These factors in conjunction with her playing the piano, working with children who have cerebral palsy and her Roehampton training, which emphasised mother-infant observation, led to this study.

Winnicott provides a clear framework for considering the mother-child interaction. One of his central ideas was that the mother should provide a good-enough environment for her child and thereby facilitate his or her psychological and physical growth. The phrase ‘good-enough mother’ reflects the role of one who is ‘able to adapt in an active, unconstraining and unresentful way’\(^\text{462}\) to the needs of her infant, and supposes the infant is able to make a contribution to the relationship too.

In the therapeutic relationship it is possible for the therapist to become a new ‘significant other’, the good-enough mother, in the eyes of the client. Winnicott understood this and worked with psychologically damaged or disturbed children endeavouring to give them the opportunity of either having what they missed in their primary relationship, or promoting development from a point of fixation.

The writer believed that the music therapist could become a new ‘significant other’ to children in music therapy groups. In particular the children with severe and multiple

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disabilities and cerebral palsy had not been able to enter into a fully active relationship with their own mothers, (no matter how loving), on account of their pathology. Many of the developmental milestones reached by infants who have no disabilities are beyond the reach of the child with severe and multiple disabilities, and this affects their experience of being in the world and their being within an interactive relationship. Children with spastic quadriplegia and severe and multiple disabilities, for example, cannot move their arms and are not free to explore the breast, then later the face of the mother in order to get to know her better. They have poverty of choice regarding ways of asserting themselves, initiating interactions and exploring the world. The writer’s view is that because of these constraints, the ego of these children does not form properly or develop, and consequently they lack a sense of agency. The aim of music therapy was to offer a musical environment which might facilitate their psychological growth, and increase their motor skill, and offer an opportunity for experiences that they would normally not have available to them.

6.3 Description of Cerebral Palsy

Cerebral Palsy is a term used to describe a broad spectrum of motor disability which is non-progressive and is caused by damage to the brain at or around birth. Although the damage is non-progressive, the clinical picture changes as the nervous system develops and the child grows. 463

There are three main types of cerebral palsy: spastic, athetoid and ataxic. In the first case muscle tone is increased and a person’s limbs are stiff. In the second case there is fluctuating muscle tone which causes involuntary movement. In the third case there is tremor and oscillation of muscle tone. All three types of cerebral palsy have associated disorders which may exacerbate the condition. Visual impairment, epilepsy and learning difficulties often accompany spasticity and sometimes there is retardation. Deafness will sometimes accompany athetosis, and persons with ataxia are likely to suffer from epilepsy, deafness and sometimes lack the power of expressive language.

It should be stressed that people who have cerebral palsy are affected in a variety of ways, and associated disorders do not necessarily occur. Thus some people who have

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spastic quadriplegia due to cerebral palsy, for example, are often highly intelligent, people with athetosis can hear perfectly well, and still other individuals who are above average intelligence have mild symptoms of cerebral palsy and are ambulant, and able to speak. Nevertheless, children with cerebral palsy, generally speaking, have to work hard at attaining independence, forming relationships, and communicating since the disorder interferes with direct interaction with the environment. For example it often takes time for a child with speech problems to make him or herself understood. This can be frustrating for the child and requires patience on the part of the person to whom s/he is speaking.

The writer, in her role as therapist, chose to work with children who had cerebral palsy and severe and multiple disabilities because she felt children of this kind were almost totally dependent, with little ability to communicate and, therefore, had few relationships. Music therapy could offer the children a range of choice, the experience of successful events and a sense of agency. As a researcher she felt any reactions to or engagement with the music from such children would be extremely important.

6.4 Augmentative and Alternative Communication

In 1998-9, when the writer ran music therapy sessions with the children just described, work in the field of Augmentative and Alternative Communication, (AAC) had progressed. In addition to Blissymbolics,\(^{464}\) Makaton\(^{465}\) and other aided communication systems there were technological ones. Switches attached to a wheelchair could activate voice syntheseses transmitting chosen words, (‘hello’, ‘yes’ and ‘no’, for example), or they could control mechanical actuators which, for instance, beat percussion instruments. The picture on a ‘touch screen’ could change if touched by a child’s finger or hand, offering an alternative to negotiating the pages of a book, a

\(^{464}\) Blissymbolics is a ‘communication system designed for children who are unable to use normal spoken or written language. The system uses a set of simple symbols denoting important everyday concepts and these are presented on a board together with their written equivalents.’ The system, devised by the Canadian chemical engineer Charles Bliss (1897-1985) in the 1970s, is sometimes presented in a plastic-covered book. (David Crystal (ed.), The Cambridge Encyclopedia, Second Edition, Cambridge: Cambridge University Press, 1994), p. 156.

\(^{465}\) Makaton is a ‘unique language programme offering a structured multi-modal approach for the teaching of communication, language and literacy skills. It is devised for children and adults with a variety of communication and learning disabilities’. (Makaton Vocabulary Development Project, Surrey, England). Scope, the disability organisation whose focus is people with cerebral palsy, lists five key aspects of Makaton: use of speech and sign concurrently, signing key words but saying the whole sentence, finger spelling, visual strategies (body language, facial expression), and natural gesture.
keyboard or a mouse. In 1989 the Soundbeam was launched, a sonic MIDI controller system which translates physical movements into MIDI controller messages, allowing performers to play musical phrases without physical contact with the equipment. This provided an exciting way of making music for adults or children who had impaired motoric ability since the slightest movement could affect the Soundbeam. The technology behind the Soundbeam has been used to produce a wide variety of sounds drum kits, clarinets, jazz sounds and so on. Foot switches can be used additionally to produce musical effects.  

Only one of the children, Darren, who took part in the music therapy which formed the basis for the writer’s research used basic AAC because the teachers found it was beyond the abilities of the other children.  

Barnaby was given a Bliss board but at the time the writer was working with him, he had yet to understand it. Because of this the children’s channels of communication were limited. The writer thinks, however, that even if the Soundbeam had been available to the children (neither school had one), it would not have been helpful since they would not have understood the principle on which it worked. The therapist thought it vital to provide an instrument which the children could handle so that tactile, visual and auditory senses were combined, and the children could connect with it. If the children had been able to use the Soundbeam, the writer thinks that the powerful self-directed feedback would have tended to exclude the building of a relationship between the therapist and the children.

The Soundbeam has undoubted value for people with other types of problems however, and has been endorsed, for example, by the British music therapist Wendy Magee for use in the field of neurodisability.

6.5 The Writer’s Clinical Technique

The writer has largely described her clinical technique, her ‘Basic Structure’ way of working, in 5.4 The Basic Structure, page 113. Since this approach is not directly

\[\text{466}\] The Soundbeam was designed by Robin Wood for the Soundbeam project. Inventors today continue to design a variety of equipment for people with disabilities. Mark O’Reilly from University College Dublin, Department of Psychology, is one of the leading designers in this field.

\[\text{467}\] The children are described in section 6.6.9 The Children on page 134.
comparable to extant ones, it may be useful to identify those of its features which bear
similarity to other, frequently-used improvisational models.\(^{468}\)

Firstly, the model is essentially interactive in that the responses of the children are
worked with and taken into account. They affect the music the writer plays or sings.
Secondly the writer views music therapy as facilitating the process of individuation so
her position is that of a developmental music therapist.\(^{469}\) Thirdly she stresses the
importance of musicality at the piano and lays great emphasis on the ability of the
piano to reflect the children as they present themselves. Lastly her approach, like that
of many others, is psychodynamically informed.

### 6.6 Design of Study: Development

The design of the study had to take into account the following facts: (1) the writer
wanted to look at what was happening in the music therapy sessions (2) she had come
to her project with two models, the Basic Structure and the good-enough mother. It
became necessary therefore to envisage a design which would combine a pragmatic
route and a theory-driven route. The constraints of the music therapy sessions imposed
certain pragmatic constraints on the design. Equally the theoretical models required
that particular types of data were sought. The project was thus sizeable. It was also
important to ensure that description and measurement would be undertaken in a way
that would be meaningful to both theorist and practising music therapist.

#### 6.6.1 The Pragmatic Route

The pragmatic route transfers known techniques of measurement and analysis that have
proved interesting in other areas such as psychotherapy research. It often involves
copious description of events with the aim of seeing if the data gathered generates a
theory or fits an existing one.

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\(^{469}\) The term ‘individuation’ was used by Carl Gustav Jung to mean ‘a person’s becoming himself, whole, indivisible and distinct from other people or collective psychology, (though also in relation to
these). This is the key concept in Jung’s contribution to the theories of personality development’. Andrew Samuels, Bani Shorter and Fred Plaut, *A Critical Dictionary of Jungian Analysis*, (London: Routledge and Kegan Paul, 1986). For Winnicott, individuation was a developmental process of which
The writer’s particular interest lay in the child-therapist relationship and she needed to find a way of assessing this relationship. Because the children with whom she worked lacked expressive language, it was not possible to use verbally-based measures to assess their psychological state. This state was important to measure, so the writer turned again to non-verbal measures of activity, following the approach of the ethologists. She aimed to make a total transcription of events in each music therapy session with the idea that the resultant stream of information would yield identifiable patterns which she could analyse statistically. Computer programmes needed to be written or obtained, to perform sequential analyses following the ideas of Bakeman and Gottman. These would analyse the effects of particular therapist musical behaviours on as many as possible of the observable behaviours of the children.

In contrast to this, the writer intended to draw on the new process analytic approach of the psychologist Greenberg whose work is in the field of psychotherapy. His approach, an alternative to that of correlational and experimental research traditions, focuses on establishing what leads to change in the therapeutic process, and hopefully producing lawful explanations of behaviour and experience. Greenberg proposes the study of change events during therapy sessions for which a prerequisite is the identification of critical moments. The writer’s experience showed there were many critical moments associated with the Basic Structure which she would be interested to look at. Examples of these are when the children’s musical themes are introduced, when the Hello Song is introduced and when the Bye-Bye Song is played. Because the writer used a consistent harmonic groundplan, the Basic Structure, the task of inter-session analysis of critical episodes would be relatively straightforward as well as potentially fruitful.

Reference was made in Chapter 3 to the experimental and analytical work of Krumhansl with regard to pitch and key perception (see 3.3.3 Diatonic Scale and Tonality on page 52). Certain of her findings influenced the research of the writer. Krumhansl for example found that her subjects made hierarchical judgements about the relatedness of tones in a scale and of keys to other keys. In the latter case key changes

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that were relatively near made a greater impact than those which involved modulation
to a distant key. She also found that when a wrong note was played in a melody, this
was noticed less if it was a tone from the melody’s key than when it was from another
key. Such findings prompted the writer to think in terms of observing the children’s
reactions to instances where she made mistakes at the piano. These would include
mistakes of key, single tone, harmony and rhythm. She was essentially interested to
see reactions to violation of expectancy. Most crucially, if it was found the children
did react to mistakes, or instances of violation of expectancy, it might be valid to
assume the children were following events and were involved with the therapist.

It was important to find some way of measuring the response of the children to each
music therapy session apart from that provided by video-analysis of the sessions.
Findings may relate to the therapist’s perception of their quality. One straightforward
way was to devise a rating scale which could be filled in by a teacher. This could give
an indication of each child’s state before and after a music therapy session. Such a
method is, however, primitive in that it is unrealistic to assume that the rater would be
entirely objective. It was not possible to question the children themselves: again their
level of disability and lack of expressive language prevented such a measure. It was
thought that quantitative and qualitative assessment of their vocal interactions during
the course of a session might be indicative of the extent to which they were getting
something out of the session. This measure, in conjunction with the writer’s own
recall of a session, a modified form of ‘account analysis’¹⁴⁷² might help build a picture
of the ways in which process linked with outcome. It was important here that a
videoed account be kept so that interpersonal recall might be judged against the
objectivity of this data. Of particular concern to the writer was recording those
moments where she felt she had made a particularly useful therapeutic intervention or
an unhelpful one.

6.6.2 Theory-Driven Route

The theoretical framework based on Winnicott involved the idea of a child developing
through his or her relationship with a Significant Other. The writer sought to

¹⁴⁷² In account analysis ‘the observations of behaviour can be supplemented by analyses of people’s
accounts of their behaviour’. See D. A. Good and F. N. Watts, ‘Qualitative Research’, in G. Parry and F.
N. Watts (eds.), Behavioural and Mental Health Research: A Handbook of Skills and Methods, (Hove:
determine in which ways the children in her music therapy groups changed in order to test her hypothesis that the child-therapist relationship resembles that of the child and good-enough mother. She therefore needed to develop a system for classifying behaviours so that changes can be perceived. She originally made a list of 80 observables, which were then pared down to 40. As her research proceeded, however, she observed the children with increasing intensity and found that 204 observables were necessary in order to describe the children, helpers and therapist adequately. The final list of observables is presented briefly in Table 3 on page 152 and at greater length in Table 14 on page 307 in Appendix D.

Because the writer worked with children who had severe and multiple disabilities she expected the changes in them to be small. She nevertheless predicted the direction of these changes: the children would take more part in the sessions over time. The specific changes she anticipated included an increased use of musical instruments, increased vocalisations, more eye-tracking and motoric movement. Ideally it would be possible to show that the children became more aware of themselves, of each other and of the therapist. Awareness, however, is extremely difficult to measure. But if the behaviour of the children could be shown to be more dependent on the behaviours of others during the music therapy sessions then it would be reasonable to assume they had become more aware of others.

6.6.3 Initial Research Plan

The writer wished to set up a situation that would replicate conditions at the Special Care Unit at Cheyne Centre where her research ideas were born. She originally set out, therefore, to undertake a series of 22 music therapy sessions with each of four groups of children aged four to eleven with cerebral palsy and severe and multiple disabilities. There would be six to eight children in each group, all of whom would be naive to music therapy. The sessions would be recorded by setting up a video camcorder and leaving it in a fixed position, as with a separate audio cassette recorder and omni-directional microphone, placed near the children. The sessions would take place on a weekly basis over the period of one academic year. Subsequently the videoed data would be transcribed in detail, with all visible and audible observables recorded on paper, then on computer. All sessions would employ the Basic Structure approach and microanalysis of the videoed material would focus on observing the
effects of the Basic Structure. This design was subsequently modified as practical difficulties were encountered.

6.6.4 Implementation of Research Plan

The writer obtained details of Special Education Schools in Berkshire, Oxfordshire and in London from the Local Education Authorities and from The Spastics Society, and approached some of these schools by letter, introducing herself as a therapist and researcher, and describing her research requirements. In addition to wanting to work with four to eleven year old children who were diagnosed as having cerebral palsy and who had severe and multiple disabilities, the therapist needed a quiet room, a piano, and an assistant who was available on a weekly basis. There were many positive responses to her letters with schools saying they could meet her criteria. However, when these schools were visited, few of them did in fact meet her research needs, a situation which seemed to indicate that the schools were keen to have free music therapy in their Multiple Needs Units.

The writer visited nine schools, talking with the deputy head teacher on each occasion, and often being invited to observe school activities. She found that few children were actually diagnosed as having cerebral palsy. It transpired that teachers tended to use cerebral palsy as an umbrella term. Children with diplegia, for example, were viewed as having cerebral palsy even if there was no mention of it in their medical records, and the diplegia was of unknown aetiology. It is difficult to diagnose cerebral palsy with accuracy in any case; there is at times debate about whether it is cerebral or muscular in origin. For this reason it was thought valid to group children together in terms of the similar functional effects of their disability, thus relaxing the research criteria.

Nevertheless, only two schools, School A and School B, came near to satisfying the research requirements. The writer visited both schools, taking a newly acquired camcorder, and made short video recordings of some of the children she met. It then became clear that only four children could be videoed in such a way as to reveal sufficient detail for transcribing, so that her need for smaller groups was matched by

473 The Spastics Society changed its name to ‘Scope’ on November 3rd, 1994.

474 Dr. Sheila M. Wallis, Consultant Paediatrician, West Berkshire Health Authority, personal communication.
further considerations. When therefore a shortlist of children emerged, the writer made a Vineland Social Maturity Scale (VSMS) assessment of each child (see 6.6.9 The Children on page 134), with help from the children’s teachers, and chose the four who best matched her research criteria. She then sent letters and consent forms to the parents of these children. After receiving the parents’ signed consent forms (all agreed in both schools), the therapist saw the children individually for ten minutes by the piano, partly to introduce herself and partly to get to know them a little. They were not seen individually after that, although the therapist observed them in group activities on occasions.

6.6.5 Adjustments to Research Plan

The writer had to reconcile herself to working with two rather than four groups, and four rather than six to eight children in each group. The former compromise entailed losing a possible comparison group since she had intended to work with two groups of younger children and two of older. The latter compromise fitted in with the constraints of the video facilities. But it did reduce the sample size and hence the strength of possible statistical inferences. The difficulty in finding children who met the research specifications also meant that the writer had to accept children for her clinical work whose ages were between 6 and 17 years rather than 4 and 11 years. However, all the children’s Vineland Social Maturity Scores were similar, so although this was not ideal, the age differential did not present too great a problem. There were three children who were chronologically older than eleven years (two in School A and one in School B). The mean social age of all eight children on the Vineland Scale was 4.5 months. As anticipated children who did not have cerebral palsy but presented with similar functional difficulties were included (one in School A and two in School B).

Finally the writer decided to undertake 25 rather than 22 sessions with each group. This decision was related to the high level of co-operation of the schools, their approval of the work and the availability of the rooms they offered. From a clinical point of view this was preferable because it enabled the child-therapist relationship to be strengthened still further, and in research terms this meant the writer would have more information with which to work statistically.

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475 Samples of the consent form and letter are shown in Appendix B on page 302.
6.6.6 Research Protocol

The protocol reflects the work the writer had undertaken at the Cheyne Centre. In each session the Basic Structure approach was used. In the clinical work for this study G major was used for School A, and B flat for School B with the respective Hello Songs in the dominant of each key. The therapist mainly played the piano. Each child was given the same ‘solo instrument’ in every session, chosen on the basis of s/he being able to negotiate or play it. This solo instrument was made accessible to the children at all times, without the assistance of helpers, by using stands to position the instruments: the equivalent of microphone-boom stands from which to suspend the Chinese cymbals and snare drum stands to hold the tambourines in place like a drum. There were other constants. The same helpers assisted the therapist in every session, the length of the session was always about 40 minutes, and the Hello Tambourine was the only instrument introduced in the Hello Song section.

The therapist could not video herself as well as the children with only one camera, except when she left the piano and approached them. It was thought possible nevertheless to measure significant aspects of the child-therapist relationship by considering all the writer’s instrumental and vocal output in conjunction with the audible and observable behaviours of the children and helpers.

Different types of music were played on the piano by the therapist and sung by her: pre-composed music, music gradually composed through getting to know the children, variations on this music, thematic improvisation and free improvisation. With the exception of the first category all music was elicited by the children’s effect on the therapist, and even in the pre-composed music the therapist took the children’s responses into account.

After conducting the music therapy sessions, the data for each session were analysed. The first stage was to listen to the audio cassette and transcribe all therapist’s instrumental music and vocal output onto prepared manuscript paper. The second stage was to add the times in seconds, transcribed from the corresponding videotape which displayed the time in minutes, seconds and tenths. The vocal, and instrumental output of the children was then added, and finally the observables or behavioural codes
were added. This was a very lengthy process, requiring repeated viewing of video segments with copious use of ‘freeze-frame’.

Each code was placed in the score at the position in relation to the music that indicated it onset. If it had duration (i.e. was not instantaneous) a horizontal line was drawn to its offset time. Furthermore, the exact start and end times were noted as numbers in preparation for later transfer to a computer file known as the event list. The transcription excerpts in Appendix J on page 411 show the form of the hand-written transcriptions, but for clarity certain details have been omitted. The event list is explained in Appendix E, page 314. The codes are described at length in Chapter 7, page 145. Analysis of the data is described in Chapter 16, page 224.

6.6.7 Research Aims and Questions

One of the aims of the writer was to test whether the Basic Structure was a useful clinical approach. The Hello Song, which occupied a substantial part of the session, was based on an idea used by many music therapists, while the idea of using such an organised structure in conjunction with thematic and free improvisation was new as far as the writer was aware.

In considering the Basic Structure, and drawing on her past experience of working with this approach, the writer wished to find out if the children took more part in music therapy sessions over time. It seemed to her that active participation in the music therapy groups was linked to positive shifts in the children’s inner world. When a child got something out of interacting with the therapist, this would promote further activity. If there was a decrease in activity this might shed light on what could be categorised as an unhelpful intervention on the part of the therapist, or a child’s problem.

It would also be important to find out when the major child-therapist interactions occurred. Looking at these might supply information about the needs of the children, what mattered to them, for example, what they wanted, and what elements in the music were meaningful to them. If certain types of interaction occurred more frequently than would be explained by chance, this would suggest there was an alternative explanation. Using an inductive approach there would be a potential for making generalisations about music therapy.
Thinking further about the relationship between the therapist and the child, it was useful to find out how the children manifested their thoughts and feelings when the therapist focused on them, and how could it be known that the child was aware of this attention. This was important because the children did not have the conventional repertoire of behaviours with which to respond and might draw on the resources of music therapy to sound themselves in the world. By learning about the children’s responses, one could learn more about the essence of music therapy, the very medium in which nearly all the children were able to operate.

The writer’s method was to evaluate partially the effects of music therapy intervention. This was a simple evaluation, one that is possible to criticise. The assessor of the effects could not be blind to whether the children had had music therapy or not. The ideal would be to have the children allocated randomly to two sets of groups, one set having music therapy and the other not, and the outcome would be measured by people who did not know which treatment the children had been in.

6.6.8 Problems Associated with Data Collection

Practical problems arose during the course of clinical work. Firstly the video failed to work properly on occasions because of errors made by the writer. This has resulted in the data collection comprising 49 rather than 50 tapes, and two tapes being without sound. The writer has audio cassettes of all sessions, but these cannot enable her to make a complete transcription of improperly videoed sessions. These factors influenced the course of her data analysis. Secondly, on account of poor health the children were often absent from the sessions and either in hospital or the school’s sick bay. The writer decided to view these as natural experiments which might yield relevant information. She would be looking to see if there was any significant change in the children’s behaviour on their resumption of music therapy.

6.6.9 The Children

The title of this study indicates that the therapist worked with young people. Throughout the text, however, the writer referred to them all as children. This was a slightly inaccurate, though not indefensible, measure. Five were ten years old or younger, three were teenagers aged between 14 and 17 years, but all appeared far younger than their chronological ages. Most were physically much smaller than
average young people of their age, and developmentally their skills resembled those of small children or infants. For these reasons, and for ease of reading, the writer referred to them all as children.

All the children used attendant-propelled wheelchairs, Darren additionally using a powered wheelchair when not in a prescribed activity. In School A all the children except Barnaby used Kinetic wheelchairs. These were tailor-made and provided support to both sides of the head, round the torso and, in the case of Christopher and Aaron, separated the children’s legs. Nihal and Aaron used foot straps too. In School B, Mahmoud and Rosanna, used Matrix wheelchairs. These are also tailor-made to the size and shape of each child and padded to provide comfort and support. Darren and Joe used standard wheelchairs. Both had straps over their feet to help them balance.

The writer used the Vineland Social Maturity Scale (VSMS), to assess the development of the children. The VSMS correlates highly with general intellectual skills, so this estimates the children’s cognitive abilities as well. The scale, which was produced by the American psychologist Edgar A. Doll in 1964, provided a definitive outline of detailed performances in respect of which children show a progressive capacity for looking after themselves and for participating in those activities which lead towards ultimate independence as adults.

The items of the scale represented progressive maturation in self-help, self-direction, locomotion, occupation, communication and social competence.

The scale is known to be a reliable assessment of the child’s developmental level and cognitive ability based on the informant’s ratings. The scale was appropriate since it was necessary to use informants other than the children, it related to developmental ages 0-1 years and it took into account the social age of children who had disabilities.

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477 Ibid., p. 1.

478 Ibid., p. 1.
For reasons of confidentiality both the children’s first and family names have been changed. The invented family names have been included since these are often sung by the therapist when addressing each child, and appear in the transcriptions.

The children are described further in the paragraphs below. Brief details of the children are given in Table 1 on page 136.

Table 1 Subjects, ages and disabilities

<table>
<thead>
<tr>
<th>Subject</th>
<th>Age (yrs)</th>
<th>VSA (mths)</th>
<th>DQ (%)</th>
<th>Disabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aaron</td>
<td>16</td>
<td>0.0</td>
<td>0.0</td>
<td>hypotonia, epilepsy</td>
</tr>
<tr>
<td>Nihal</td>
<td>10</td>
<td>2.4</td>
<td>2.0</td>
<td>quadriplegia, epilepsy, possible visual impairment</td>
</tr>
<tr>
<td>Christopher</td>
<td>17</td>
<td>1.2</td>
<td>0.6</td>
<td>nystagmus, quadriplegia, possible hearing impairment</td>
</tr>
<tr>
<td>Barnaby</td>
<td>8</td>
<td>8.4</td>
<td>9.0</td>
<td>diplegia, epilepsy</td>
</tr>
<tr>
<td><strong>School B</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darren</td>
<td>14</td>
<td>9.6</td>
<td>5.9</td>
<td>quadriplegia, unstable hips, possible visual impairment</td>
</tr>
<tr>
<td>Rosanna</td>
<td>7</td>
<td>4.8</td>
<td>5.7</td>
<td>quadriplegia, epilepsy, possible visual impairment</td>
</tr>
<tr>
<td>Joe</td>
<td>9</td>
<td>7.2</td>
<td>7.0</td>
<td>athetoid spastic, epilepsy</td>
</tr>
<tr>
<td>Mahmoud</td>
<td>6</td>
<td>2.4</td>
<td>3.6</td>
<td>quadriplegia, hydrocephalus, visual impairment, epilepsy</td>
</tr>
</tbody>
</table>

Note: The Developmental Quotient (DQ) is the Vineland Social Age (VSA) expressed as a percentage of the chronological age.

6.6.9.1 The Children at School A

Aaron Seale

Aaron was a pale, solemn looking boy of sixteen who had hypotonia. He was able to turn his head slightly and look around him when he wanted to but did little else. His size was similar to that of a small three year old with thin limbs. His development as rated by the VSMS was at zero years so he was totally dependant, could not balance his head, had no language, and had severe learning difficulties. He had epilepsy but did not have seizures during music therapy. The aetiology of his condition was unknown. He appeared devoid of energy and rarely moved. When he did he either turned his head slowly in the direction of some unexpected event, or puckered his face and bent his arms upwards giving the impression of extreme displeasure. He never smiled and rarely seemed moved by anyone or anything although his mother said he grunted at her
when she talked to him at night. His extreme passivity meant that he was mainly an onlooker rather than an active participant in the group.

**Nihal Hasham**

Nihal was a little South Asian girl of ten. She was able to lift her head in the direction of sudden sounds, and enjoy gentle horse-play, when she would laugh. She presented physically as a thin two or three year old, and her score as rated by the VSMS was at 2.4 months. She had spastic quadriplegia, epilepsy, possibly visual impairment and was frequently in hospital for dehydration and chest infections. She had severe learning difficulties and was withdrawn, mostly sitting hunched up in her wheelchair with head bowed and arms bent, both her hands in tight fists. It was rare to see her face. She never reached for anything and never babbled, or spoke, and it was not known if she had receptive language. She also gave the impression of being wary. Teachers had begun investigating the suspicions of the social workers that she was neglected and abused at home, her nervousness considered to be a likely reaction to this. Given Nihal’s problems her positive responses in music therapy were especially notable.

**Christopher Taylor**

Christopher was a serious looking boy of seventeen. When motivated, he was able to extend his arms in front of him and, by a great effort, lean away from his wheelchair slightly and turn his body towards the piano or the other children. He could be interested in his surroundings, and sometimes responded to the therapist with huge smiles, particularly when she addressed him or when she played high-pitched or familiar music. Sometimes, when smiling, he made unpitched vocalisations of pleasure.\(^{479}\) Although seventeen his size was that of a small, thin child of about two. His VSMS score was equivalent to 1.2 months of age. He had many problems: severe learning difficulties, no language, gross plegiocephaly and an opisthotonic neck condition, his muscles pulling his head to the right. He had spastic quadriplegia and rarely moved. On those occasions when he did move, he moved slowly. He had a

\(^{479}\) According to the short-term sequential analysis (see Chapter 16) the onset of Christopher’s smiling (SM) occurred within five seconds of the onset of his unpitched vocalisations (VOCU) with a z-score of 2.30, just below the threshold of significance. However, with a three-second window a z-score of 2.67 is achieved. This supports the idea that his unpitched vocalisations were expressions or causes of pleasure.
lateral nystagmus and the school psychologist thought he had limited hearing as well as limited sight.

**Barnaby King**

Barnaby was a cheerful boy of eight who was able to grasp and mouth objects, and lean forwards or sideways, when sitting, to do so. He was able to walk with a walking frame and the help of two assistants, imitate and improvise on the therapist’s melodies with singing, and babble, when he repeated sounds such as ‘gilli gilli’ and ‘g, g, g’. He frequently oscillated between exuberance and apparent contemplation, chuckling and vocalising at one moment then suddenly becoming still and silent at the next, as if struck by an important thought. He liked to shake his head rapidly from side to side and frequently fluttered his eyelids in a playful and amiable way. His beater was an object to mouth and tap erratically rather than use on his drum. Barnaby’s size matched his chronological age but his development as rated by the VSMS was at 8.4 months. He had severe learning difficulties of unknown aetiology, diplegia, no expressive language and was only just beginning to understand a few basic words receptively. He was mainly a wheelchair user and had curvature of the spine. Although epileptic, he had no seizures during music therapy in which he was the most able, active and assertive group member.

6.6.9.2 The Children at School B

**Darren Campbell**

Darren was a boy of fourteen who smiled broadly when pleased and tended to be alert and interested in his surroundings. He could babble and scream when excited or enjoying himself. He was able to hold objects and use them appropriately, drinking unaided from a cup, and beating his drum in music therapy, for example, which he was able to do in time with the therapist’s music. This was encouraging because outside music therapy Darren tended to watch other people’s activities rather than take part in them. He looked about eleven years old and wore glasses for astigmatism, the only child to do so. His VSMS score was equivalent to 9.6 months and though he had no expressive language it was thought that he might have some receptive language. This

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480 Throughout the thesis Barnaby’s solo instrument and that of Darren are referred to as drums. They were in fact tambourines held in snare-drum stands.
was difficult to assess because of his severe physical disabilities which made it difficult for him to achieve in performance tests. A board with Blissymbolics was kept on the tray of his standard wheelchair but staff could not assess whether or not he could understand it. He had unstable hips and spasticity in all four limbs with his right arm and hand least affected.

Rosanna Beckett

Rosanna was a spirited seven year old little girl with a great sense of humour. She kicked her right leg when excited or particularly pleased about something, and with effort was able to use her right arm to beat or nudge her Chinese cymbals with small movements. She was able to vocalise ‘Aah!’ when excited. Although she did not babble or have expressive language, and was not used, therefore, to verbal conversation, she showed an unexpected ability to use her Chinese cymbals in lieu of language, as a means of addressing the therapist and responding to her communications. As well as this she frequently played her cymbals on the downbeat, making herself heard in an organised way. She looked about three years old, and her development as rated by the VSMS was at 4.8 months. In addition to severe learning difficulties, she had spastic quadriplegia, an asymmetrical tonic neck reflex which forced her head to the right, visual impairment and epilepsy, but she had no major seizures during music therapy. She had limited receptive language, understanding a few words.

Joe Wilson

Joe was a wiry, ginger-haired boy of nearly nine. He was able to babble and could say ‘Mumma’ and ‘Dadda’ when seeing his parents. When he wanted attention he used his own ‘growly’ language. He was able to grasp objects within reach and mouth them, and he frequently mouthed his solo instrument, the Chinese cymbals. He was able to turn his head towards the therapist when she produced a contrast in sound. Joe had damaged his brain in an accident when eighteen months old, leaving him with athetosis, spasticity, epilepsy and severe learning difficulties. He frequently moved his legs uncontrollably and waved his arms in the air. Between his movements he had short spells of stillness in which he appeared relaxed. Although his size was appropriate to his chronological age, his VSMS score was equivalent to 7.2 months of age and he had
no expressive language, apart from saying ‘Mumma’ and ‘Dadda’, and appeared to have no receptive language either.

**Mahmoud Jamall**

Mahmoud was a six-year-old boy of South Asian origin. He was able to cry out if he wanted attention and/or wanted to be picked up. He cooed, smiled and gurgled when pleased and enjoyed individual attention and sensory stimulation, such as foot or hand massage. He was able to sing, unexpectedly singing part of a scale within the prevailing tonality on one occasion and echoing one of the therapist’s notes with a strong voice on another. He may be an example of the ‘music child’ within. His size was that of a child of two. His VSMS score was equivalent to 2.4 months, he had severe learning difficulties and he had no expressive language and little, if any, receptive language. In addition he had spastic quadriplegia, impaired vision, arrested hydrocephalus (with shunt) and epilepsy. He was generally placid but had episodes of grumbling or crying.

6.6.9.3 Additional School Interventions

As well as music therapy, all the children had physiotherapy and hydrotherapy. Those at School B also had speech and language therapy, while those at School A had aromatherapy.

The physiotherapy at both schools was adapted from the Peto method of conductive education developed in Budapest. In this, groups of children are encouraged to ‘verbalise their activities and produce the movements as they do so’. Since the children in this study had no expressive language, they were given individual physiotherapy in which they received language cues for each movement. School B used the conductive slatted plinths while School A used the floor, the conductive equipment being limited to slatted chairs used for standing and holding exercises. Physiotherapy usually took place on a weekly basis, although at times happened daily, depending on the needs of each child. Generally the severity of the children’s

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disabilities merited less rather than more physiotherapy and this would be at the
discretion of the teacher or physiotherapist in charge at the time.

The speech and language therapy usually took place on a weekly basis and again at the
discretion of teacher or therapist. The aim of this was to encourage the children to
make sounds. Aromatherapy took place at similar times, when the children’s heads
were massaged with aromatic oils, a process which relaxed three of the children at
School A but sometimes caused Christopher to cry. Hydrotherapy, which aimed to
relax tightened muscles, was loved by all the children.

6.6.9.4 School Activities

Both schools aimed to improve the children’s independence skills and foster their
creative awareness through sensory experience. A wide variety of activities was
organised to achieve these goals, which were similar in both schools. These included
hand painting, in which different textured materials were used, and assisted movement
to taped or live music. When movements involved the entire body this activity took
place on plastic covered mats, with cylindrical and triangular soft objects to provide an
unusual terrain. At other times the focus of movement was the hand. There were
different types of song groups, some of which were adapted to meet educational targets
so that in one, for example counting numbers was introduced. The children were
encouraged to listen to the teacher and were also helped to play percussion instruments.
Visits to farmyards, gardens and supermarkets were frequently arranged to stimulate
the senses and provide new environments of possible interest. Touching and smelling,
clay modelling and physical education were other sensory activities offered to the
children.

Western tonal music was played during every activity in which music was used. This
could be on live guitar, from tapes provided by the Learning Disabilities Association,
or from tapes of pop music. According to one teacher, the children at School B were
‘very keen on the group Oasis’. The music was simple and hopefully memorable so
that ‘Welcome Songs’, for example, could easily provide a familiar landmark in the
school’s curriculum. Since many activities used, or were accompanied by music, it
can be seen that the children were exposed to a great deal of tonality and must have
been accustomed to this idiom.
6.6.9.5 The School Environment

The rooms in which the music therapy sessions were held were different at each school. That of School B was a small, carpeted, rectangular empty room, with a floor-length yellow cotton curtain instead of a door and windows all along one wall that faced a garden. Children, helpers, piano, stands for the cymbals, table for the instruments, video equipment and therapist only just fitted into it. The room was reached by a short passage which led off the main area of the unit or hall, in which children had physiotherapy and group activities. Despite not having a door to the room, it had a feeling of privacy about it, and few sounds from the hall filtered through. The piano, an iron-frame upright, was kept in the hall and needed two or three people, of which the therapist was one, to push it into the music therapy room. The unit in which music therapy was held was dedicated to Multiple Needs children and was modern and self-contained and separate from the main school. Adjacent to it was a field in which there were ponies. The atmosphere of the unit was calm and friendly. Music therapy sessions were held on Thursdays at mid-day. It took about twenty-five minutes to set up the room and settle the children with their instruments for the session which lasted between forty and forty-five minutes. The children sat in a row around the perimeter of the room, facing the windows. Two helpers assisted the therapist, both middle-aged friendly women, who were enthusiastic about music therapy, and adapted well to helping the children beat and generally attending to their needs.

The room which was lent to the therapist at School A for music therapy was the classroom of a large, busy Special Education school, and unlike that of School B was filled with tables, chairs and a great number of miscellaneous objects. It was situated at the end of a long corridor off which there were classrooms on both sides. This in turn led off the main hall, which, like that of School B, was used for a variety of purposes, physiotherapy included. The helper was a mature, lively and highly cooperative woman. She brought the children one by one from the Multiple Needs Unit at the opposite end of the school, as the therapist set up the equipment, having made a space for it. This preparation necessitated pushing a heavy, upright piano from one end of the corridor to the other, usually without any assistance. The children sat in a group in the middle of the room, at right-angles to the windows, facing the camcorder and with the piano to their left. Music therapy sessions were held on
Tuesdays at mid-day and lasted forty to forty-five minutes, the same time as for School B.

Ideally the therapist should have had more time in which to set up her equipment so that the children did not have a long wait in the music therapy room before the session started. In neither school was this possible. The stands from which the cymbals were suspended should have been sturdier so the cymbals, once positioned close to the children’s hands, stayed in position. Finally the therapist found it difficult to push heavy pianos and then focus on her job as a music therapist. Ideally the piano should have been ready in position for her.

6.6.9.6 Details of Clinical Work

Clinical work was undertaken from September 1988 to May 1989 at School A and School B. The children, who arrived at the sessions in their wheelchairs remained in these for the duration of every session. At every session each child was given the same solo instrument, the greater number of children having the Chinese cymbals from which the tiniest movement may elicit a sound. This was important for the children with spastic quadriplegia. The Chinese cymbals hung by a thin cord from wooden stands which were similar to microphone boom-stands. These were placed behind each child and adjusted so the cymbals were close to the children’s hands. One child in each group had good arm mobility and was given a tambourine positioned in a snare drum stand which was weighted down. This provided good sound feed-back.

The length of time it took the therapist to set up the room for music therapy and for the children to arrive and adjust their solo instruments meant that the therapist could not immediately work with the children’s output. Some opportunities were therefore lost in respect of the children’s frequent initial burst of enthusiasm and energy.

6.6.10 Comments following Clinical Work

The subjective opinion of the writer was that the children benefited from music therapy. They very often moved from being inert and unfocused to being active and focused, from being very isolated in the classroom to being aware of each other. Those staff members who provided assistance during the sessions were of the same opinion. A video shown of Session Eight from the music therapy group at School B prompted the
same comments from the head-teacher who particularly commented on the ‘high level of activity’ of the children. There was, however, no consistent developmental progress from week to week. The impression was that responses during the sessions peaked mid-way in the series then tended to taper off. Analysis of the teacher’s ratings needed to be undertaken as well as an in-depth process analysis of the early and late sessions.
Chapter 7
Measures of Behaviours

7.1 Introduction

This chapter covers the choice of sessions for transcription, the reliability re-test and the two types of measures of behaviour used viz. observational measures and ratings by the teachers. It concludes with an overview of the complete catalogue of observables which is given, together with definitions, in Table 3 on page 152.

7.2 Choice of Sessions

The writer originally chose to transcribe sessions 1, 8, 16 and 24 from each school. They were approximately equi-distant, would yield a sizeable amount of data and enable the tracking of changes over time. These plans were disrupted, however, due to the length of time transcribing took: far longer than ever imagined. Therefore, transcription was restricted to two sessions per school.

Given the restraints on transcription, it was decided to transcribe one early and one late session from each school. This would still give some idea of changes in the children’s behaviour over time. The choice of early session was largely governed by the attendance level of the children, and by considerations of whether they had got used to the therapy sessions. It was preferable that they had, so their behaviour would be more normal. In Session Eight of each school all the children were present. A transcription of this session would therefore make it possible to compare sessions more easily than the initial sessions and have maximum information available for analysis.

The choice of late sessions was also governed by attendance figures as well as technical considerations. In Session Twenty-four of each school one child from each group was absent and it was necessary to transcribe an alternative session. Sessions Twenty-three and Twenty-five were considered for both schools. In School B there were absentees in Session Twenty-three but not in Session Twenty-five (see Table 13 Register of Attendance in Appendix C on page 306). In School A there were no absentees in either session, but in Session Twenty-five poor quality of video tape made eye and mouth observables difficult to discern. Therefore the writer opted to transcribe the
tapes for School A Session Twenty-three and School B Session Twenty-five, both being sufficiently near the end of the series to give some idea of change in the children, if any, over time.

### 7.3 Choice of Observables

In principle every movement might have a special significance and these might combine to form different patterns with a unique significance. For the purpose of analysis a finite set of observables had to be devised. Ideally such a list should be comprehensive. The writer focused on the movements of head, arms and legs in order to address movements of the majority of children. Eye observables were included even though they were difficult to discern properly. The children’s repertoire of behaviour was, in certain cases, limited to little else but eye movement for extended periods, so it was important to record whatever behaviour the child presented.

The functional significance of behaviours has not been considered when compiling the catalogue of observables. Rather the aim has been to give as complete a description as possible of the chosen sessions with the idea of attempting to find the significance of observables afterwards, using an inductive approach. This means the writer intended to generate hypotheses from her observations and test them against the evidence she had already obtained. In a deductive approach she would have set up all the hypotheses first and then collected the data.\(^{483}\)

### 7.4 The Number of Observables

The number of identifiable behaviours increased as the transcription progressed, there being 204 in the final count. Two factors were responsible for this: firstly the intensity with which the writer viewed the data and, secondly, the desire to give as total a description as possible of the data.

While there was a very high number of observables it was always possible to group these together. If a broader brush had been used it would not have been possible to divide the observables into finer units of analysis.

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7.5 Reliability Test

The large number of observables made the inclusion of a second observer for a reliability check on the behavioural measures out of the question. Calculations showed the transcription would take a second observer about six months to do, at a prohibitive cost. The writer therefore decided to do a re-test herself. This follows the precedent of Dallas, Stevenson and McGurk\textsuperscript{484} where it was also impossible for practical reasons to look at inter-rater reliability.

It was decided to take a five minute segment from each session, random numbers being generated by computer and used to calculate the start time for each segment in a predetermined order. The video tapes were then transcribed as they were initially, first onto manuscript paper then onto an event list as a computer file. The original transcriptions were not referred to during the re-test by the writer. A comparison was made between the original data and that of the reliability check. For each observable a calculation was made to assess the measure of agreement using Cohen’s kappa. Values of kappa ranged from around 0 to 1, the majority being in the high part of the range as shown in Figure 5.

The left hand bar comprises observables that occurred in only one of the two data sets, in which case the resulting kappa is 0. This would normally indicate lack of agreement, but this is a degenerate case where kappa is not really applicable, so these are set aside. The question arises: what value of kappa is good enough? A commonly used rule of thumb classifies kappa below 0.4 as ‘poor’, 0.4 to 0.6 as ‘fair’, 0.6 to 0.8 as ‘good’ and above 0.8 as ‘excellent’. According to this, a minority of these kappa values were poor, and the majority were fair to excellent.

A better method of assessing the quality of kappa involves calculating a standard score (or z-score). Following the method of Fleiss et al., z-scores were calculated for all

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observables for which there were sufficient data to perform the calculation, a total of 112 observables. Of these 105 had very high $z$-scores in the range 30 to 213, leaving 7 in the range -1.2 to 0. Those with low scores are shown in Table 2. The full set of figures and explanations are given in Appendix F, page 317, and Appendix N, page 474, respectively.

### Table 2 Observables with low agreement

<table>
<thead>
<tr>
<th>Number</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 53</td>
<td>SIN/V</td>
<td>Solo instrument not visible</td>
</tr>
<tr>
<td>C 56</td>
<td>IN/V</td>
<td>Not clear whether or not I</td>
</tr>
<tr>
<td>C 83</td>
<td>VOC</td>
<td>Pitched sung note outside tonality</td>
</tr>
<tr>
<td>C 89</td>
<td>VOCPX</td>
<td>Pitched vocalisation approximately matching therapist’s current/last note</td>
</tr>
<tr>
<td>C 96</td>
<td>SBEAT</td>
<td>Sound elicited from SI without child beating, on the downbeat</td>
</tr>
<tr>
<td>T 20</td>
<td>THB</td>
<td>Therapist beats on non-solo instrument</td>
</tr>
<tr>
<td>T 56</td>
<td>IMREP</td>
<td>Improvisation on repertoire (REP)</td>
</tr>
</tbody>
</table>

In view of the generally good results it was decided to retain all the observables for future analysis, while viewing with caution those listed in Table 2.

### 7.6 Rating Scales

It was important to find some way of measuring the response of the children to each music therapy session apart from that provided by video-analysis of the sessions. Findings may relate to the therapist’s perception of their quality. One simple way was to devise rating scales and a form which could be filled in by a teacher (see example in Appendix K, page 457). Therefore a teacher from each school was given two rating forms every week, one which she was asked to fill in before the music therapy session and one after it. *Before* and *after* ratings hopefully give an estimate of the change due to that particular session and potentially reveal short term gains. The scale from 1 to 10, representing poor to good, provided an assessment of the children’s physical condition, emotional condition and level of vocalisation over the past week, and on the day of the session. The writer did not agree with the teachers what the rating forms meant. They were designed to enable teachers to report quickly and easily on the children’s states. The teachers knew the children very well, and because of this, though the ratings were not highly specified, the writer thought they would be useful.
The ratings are presented in tabulated form in Appendix K (page 457) and discussed in Chapter 15 (page 218).

7.7 Definitions of Observables

A complete list of observables and their definitions is given in Table 3 on page 152. The children’s visibles have been categorised according to the region of the body to which they belong. The children’s audibles are grouped together separately as are the therapist’s observables. In the table the subsets of similar observables are separated by dotted lines. Another list of observables in alphabetical order is presented in Table 14 of Appendix D giving a more detailed description of the definitions (page 307).

7.8 Overview of Catalogue of Observables

The writer now states which audibles and visibles she observed and recorded.

7.8.1 Children’s Visibles

All movements were observed, however slight, of each child’s head, arms and hands, legs and feet. Tensing of the torso was also included. If any part of the child’s body was obscured, this was observed. Certain movements, such as beating or mouthing, were subdivided and assigned separate codes. Beating was further differentiated so that different types and qualities of beating were described viz. erratic beating, beating in a child’s own pulse or beating in time with the music. Separate codes were also used to distinguish beating on an instrument or on a child’s own body.

In addition to movements of the head and limbs, movement of the mouth and eyes was observed. The former occurred when children repeatedly open and shut their lips as if tasting something or when they made chewing movements. Eye movements were noted when a child’s eyes were looking towards the piano then changed their position though still looking at the piano.

As well as visible activities, certain static conditions of the mouth, head and eyes were observed. For example the duration of a child’s smile, open mouth, the head being turned towards the piano or the head being turned towards the therapist when she was away from the piano.
7.8.2 Children’s Audibles

All the children’s audible output which comprised both pitched and unpitched vocalisations of various kinds was observed. Pitched vocalisations were described with note codes that showed their tonal relationship to the current or recent piano and vocal output of the therapist, and evaluated their degree of connectedness. Sung notes that were approximately pitched in terms of the therapist’s current key were described as such. Scales, or scale parts, and melodic phrases were assigned phrase codes in addition to note codes so that a fairly detailed picture of the music was recorded.

Unpitched vocalisations were observed also and consisted of laughs, cries and hiccoughs. As with the other observables the onset and duration of these was noted. Where the observable was instantaneous or immeasurably short, an event of no duration was recorded.

7.8.3 Therapist’s Audibles

The therapist’s observables were nearly all audibles. This was partly because the therapist’s method of self organisation in relation to the children was principally sonic, with copious use of piano and voice. It was also true that the physical impossibility of including the piano in the video film helped determine the kind of therapist observables recorded.

The therapist’s audibles were treated with the same level of detail as the children’s observables. Firstly all the major structural elements of the music were observed such as sections of the Basic Structure e.g. Context Music, Hello Song etc. (the music for the Basic Structure is given in Appendix A, page 283), then segments of music consisting of recognisable themes or fragments thereof, and/or improvisations. Secondly the music was further sub-divided into smaller structures which comprised such observables as the downbeat of each bar, change of time signatures, and end of section. Thirdly the contour changes in the music were observed: instances of pause, ritenuto, rubato and delayed presentation of the downbeat.

Lastly, the writer observed and recorded when the piano or other instrument was being played, when the therapist was singing, making an unpitched (non-verbal) vocalisation or speaking, when a particular child was being addressed, a child’s name being sung,
when dominant-tonic shifts occurred, when cadences occurred and when the therapist mirrored the children’s sonic output either vocally or instrumentally.

7.8.4 Therapist’s Visibles

Almost all the therapist’s visibles cover the time when she was away from the piano and stood or knelt by the children. Instances of the therapist touching and/or holding a child, intervening in some other way or being in close proximity to a child were observed as were those occasions when the therapist was in the middle of the group of children but not near a specific child. Observables of the children touching or holding the therapist were also recorded.

Instances of the therapist totally obscuring a child were observed when occasionally the therapist stood by a particular child or leant over him. If a child was held or touched by the therapist and this state was obscured this too was observed.

One observable was included through inference and that was having Mahmoud on the therapist’s lap and helping him play the piano.

7.8.5 Helpers’ Observables

There were two observables relating to the helper, one indicating that a specific child was being assisted, and the other indicating merely that the helper was in the group area.

7.8.6 Miscellaneous Observables

The writer observed an unexpected visitor’s contact with the group. This comprised either the visitor touching and/or holding a child or simply being near the group of children.

<table>
<thead>
<tr>
<th>Number</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 1</td>
<td>H</td>
<td>Moves head</td>
</tr>
<tr>
<td>C 2</td>
<td>HBEAT</td>
<td>Moves head on downbeat</td>
</tr>
<tr>
<td>C 3</td>
<td>HSH</td>
<td>Shakes head</td>
</tr>
<tr>
<td>C 4</td>
<td>HP</td>
<td>Head towards piano</td>
</tr>
<tr>
<td>C 5</td>
<td>HTH</td>
<td>Head towards therapist when not at piano</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>C 6</td>
<td>HN/V</td>
<td>Head not visible</td>
</tr>
<tr>
<td>C 7</td>
<td>P</td>
<td>Face pucker</td>
</tr>
<tr>
<td>C 8</td>
<td>SM</td>
<td>Smiles</td>
</tr>
<tr>
<td>C 9</td>
<td>SMBEAT</td>
<td>Smiles on the downbeat</td>
</tr>
<tr>
<td>C 10</td>
<td>Y</td>
<td>Yawns</td>
</tr>
<tr>
<td>C 11</td>
<td>E</td>
<td>Eye moves during EP</td>
</tr>
<tr>
<td>C 12</td>
<td>EP</td>
<td>Eyes towards piano</td>
</tr>
<tr>
<td>C 13</td>
<td>ETH</td>
<td>Eyes towards therapist</td>
</tr>
<tr>
<td>C 14</td>
<td>EN/V</td>
<td>Eyes not visible</td>
</tr>
<tr>
<td>C 15</td>
<td>MM</td>
<td>Mouth movements other than SM or MO</td>
</tr>
<tr>
<td>C 16</td>
<td>MO</td>
<td>Mouth open</td>
</tr>
<tr>
<td>C 17</td>
<td>MN/V</td>
<td>Mouth not visible</td>
</tr>
<tr>
<td>C 18</td>
<td>A</td>
<td>Moves arm/s or hand/s</td>
</tr>
<tr>
<td>C 19</td>
<td>AN/V</td>
<td>Arms not visible</td>
</tr>
<tr>
<td>C 20</td>
<td>HM</td>
<td>Hand or instrument to mouth</td>
</tr>
<tr>
<td>C 21</td>
<td>B</td>
<td>Beats solo instrument (&amp; makes sound)</td>
</tr>
<tr>
<td>C 22</td>
<td>BNOS</td>
<td>Beats without a sound on SI</td>
</tr>
<tr>
<td>C 23</td>
<td>BBEAT</td>
<td>Beats SI on downbeat</td>
</tr>
<tr>
<td>C 24</td>
<td>BM</td>
<td>Beats SI in time with music</td>
</tr>
<tr>
<td>C 25</td>
<td>BP</td>
<td>Beats in own pulse</td>
</tr>
<tr>
<td>C 26</td>
<td>BT</td>
<td>Beats tambourine</td>
</tr>
<tr>
<td>C 27</td>
<td>BTBEAT</td>
<td>Beats tambourine on downbeat</td>
</tr>
<tr>
<td>C 28</td>
<td>BTM</td>
<td>Beats tambourine in time with music</td>
</tr>
<tr>
<td>C 29</td>
<td>BTP</td>
<td>Beats tambourine in own pulse</td>
</tr>
<tr>
<td>C 30</td>
<td>BB</td>
<td>Beats non-solo instr. or beats against beater</td>
</tr>
<tr>
<td>C 31</td>
<td>BBBEAT</td>
<td>Beats non-SI on downbeat</td>
</tr>
<tr>
<td>C 32</td>
<td>BBM</td>
<td>Beats non-SI in time with music</td>
</tr>
<tr>
<td>C 33</td>
<td>BBP</td>
<td>Beats non-SI in own pulse</td>
</tr>
<tr>
<td>C 34</td>
<td>!</td>
<td>Beats on self</td>
</tr>
<tr>
<td>C 35</td>
<td>!BEAT</td>
<td>Beats on self on downbeat</td>
</tr>
<tr>
<td>C 36</td>
<td>!M</td>
<td>Beats on self in time with music</td>
</tr>
<tr>
<td>C 37</td>
<td>!P</td>
<td>Beats on self in own pulse</td>
</tr>
<tr>
<td>C 38</td>
<td>SH</td>
<td>Shakes instrument</td>
</tr>
<tr>
<td>C 39</td>
<td>SHBEAT</td>
<td>Shakes instr. on downbeat</td>
</tr>
<tr>
<td>C 40</td>
<td>SHM</td>
<td>Shakes instr. in time with music</td>
</tr>
<tr>
<td>C 41</td>
<td>SHP</td>
<td>Shakes instr. in own pulse</td>
</tr>
<tr>
<td>C 42</td>
<td>!SH</td>
<td>Shakes instr., beating on self</td>
</tr>
<tr>
<td>C 43</td>
<td>!SHBEAT</td>
<td>Shakes instr., beating on self on downbeat</td>
</tr>
<tr>
<td>C 44</td>
<td>!SHM</td>
<td>Shakes instr., beating on self in time with music</td>
</tr>
<tr>
<td>C 45</td>
<td>!SHP</td>
<td>Shakes instr., beating on self in his /her own pulse</td>
</tr>
<tr>
<td>C 46</td>
<td>D</td>
<td>Beats on surface other than instrument or self</td>
</tr>
<tr>
<td>C 47</td>
<td>DBEAT</td>
<td>D on the downbeat</td>
</tr>
<tr>
<td>C 48</td>
<td>DM</td>
<td>D in time with music</td>
</tr>
<tr>
<td>C 49</td>
<td>DP</td>
<td>D in own pulse</td>
</tr>
<tr>
<td>C 50</td>
<td>BSH</td>
<td>Beats with shaker</td>
</tr>
<tr>
<td>C 51</td>
<td>SI</td>
<td>Moves solo instrument unaided</td>
</tr>
<tr>
<td>C 52</td>
<td>SIBEAT</td>
<td>Moves solo instrument on the downbeat</td>
</tr>
<tr>
<td>C 53</td>
<td>SIN/V</td>
<td>Solo instrument not visible</td>
</tr>
<tr>
<td>C 54</td>
<td>I</td>
<td>Moves non-SI unaided</td>
</tr>
<tr>
<td>C 55</td>
<td>IN/V</td>
<td>Not clear whether or not I</td>
</tr>
</tbody>
</table>
C 56 AB Child assisted by helper to beat/shake SI
C 57 ABB Assisted beating on non-solo instrument
C 58 ABT Assisted beating on the tambourine
C 59 AI Assisted moving/stroking of non-SI
C 60 T Tenses body
C 61 F Moves one or both legs/feet
C 62 FBEAT F on the downbeat
C 63 FN/V Feet/legs not visible
C 64 CH Child being physically held/touched by hlpr./th.
C 65 CHN/V Not clear whether or not CH
C 66 CHV Child being physically held/touched by visitor
C 67 CHVN/V Not clear whether or not CHV
C 68 HLPX Child assisted by helper
C 69 XX Child assisted by therapist
C 70 TO Child totally obscured by therapist
C 71 COF Cough
C 72 CUP Hiccough
C 73 CUPN/V Not clear whether or not CUP
C 74 LAU Laugh
C 75 VOCU Unpitched vocalisation
C 76 VOCUBEAT Unpitched vocalisation occurring on downbeat
C 77 VOCUM Unpitched vocalisation in time with music
C 78 VOCUP Unpitched vocalisation reoccurring in own pulse
C 79 V Pitched vocalisation outside scale of current key
C 80 VM Vocal note/phrase in time with the music
C 81 VP Vocal note/phrase in own pulse
C 82 VOC Pitched sung note outside tonality
C 83 VO CX As VOC but out of tune
C 84 VOCP Pitched vocalisation matching th.’s current/recent note
C 85 VOCPN Pitched vocalisation matching th.’s current/last note
C 86 VOCPNBEAT VOCPN on downbeat
C 87 VOCPNT Pitched vocn. forming triad with th.’s current/last note
C 88 VOCPX As VOCP but out of tune
C 89 VOCPXN As VOCPN but out of tune
C 90 VOCPXNT As VOCPNT but out of tune
C 91 VSC Scale/melodic phrase of 3 or more notes
C 92 VWMIRR Word/sound mirroring therapist’s syllable
C 93 VMIRR Vocalisation (2 or more notes) mirroring th.’s melody
C 94 S Sound elicited from SI without child beating
C 95 SBEAT S on the downbeat
C 96 SMU S in time with the music
C 97 SBB Sound elicited from non-SI without child beating
C 98 SBBMU SBB in time with music
T 1 CHRA (Therapist) touched by Aaron
T 2 CHRN (Therapist) touched by Nihal
T 3 CHRC (Therapist) touched by Christopher
T 4 CHRB (Therapist) touched by Barnaby
T 5 CHRD (Therapist) touched by Darren
T 6 CHRR (Therapist) touched by Rosanna
T 7 CHRJ (Therapist) touched by Joe
| T 8  | CHRM | (Therapist) touched by Mahmoud |
| T 9  | HLP  | Helper intervenes with one child |
| T 10 | UV   | Unexpected visitor with group |
| T 11 | UVJ  | Unexpected visitor by Joe |
| T 12 | X    | Therapist with group, not by specific child |
| T 13 | ABPIM| Therapist helps Mahmoud play piano |
| T 14 | SO   | Therapist singing |
| T 15 | SP   | Therapist speaking |
| T 16 | VOCUT| Therapist’s unpitched vocalisation (VOCU) |
| T 17 | PI   | Therapist plays piano |
| T 18 | GLOCK| Therapist plays glockenspiel |
| T 19 | CL   | Therapist plays clarinet |
| T 20 | THB  | Therapist beats on non-solo instrument |
| T 21 | THBA | Therapist beats on Aaron’s instrument |
| T 22 | THBN | Therapist beats on Nihal’s instrument |
| T 23 | THBC | Therapist beats on Christopher’s instrument |
| T 24 | THBB | Therapist beats on Barnaby’s instrument |
| T 25 | THBD | Therapist beats on Darren’s instrument |
| T 26 | THBR | Therapist beats on Rosanna’s instrument |
| T 27 | THBJ | Therapist beats on Joe’s instrument |
| T 28 | THBM | Therapist beats on Mahmoud’s instrument |
| T 29 | THSH | Therapist shakes shaker |
| T 30 | CX   | Context Music |
| T 31 | HS   | Hello Song |
| T 32 | CA   | Aaron’s theme |
| T 33 | CN   | Nihal’s theme |
| T 34 | CN2  | Nihal’s second theme |
| T 35 | CC   | Christopher’s theme |
| T 36 | CB   | Barnaby’s theme |
| T 37 | CD   | Darren’s theme |
| T 38 | CR   | Rosanna’s theme |
| T 39 | CM   | Mahmoud’s theme |
| T 40 | CJ   | Joe’s theme |
| T 41 | CONXR| Context Music reprise |
| T 42 | BBS  | Bye-Bye Song |
| T 43 | REP  | Repertoire (non-B.S. material already known to children) |
| T 44 | IMCX | Improvisation on Context Music |
| T 45 | IMHS | Improvisation on Hello Song |
| T 46 | IMCA | Improvisation on Aaron’s theme |
| T 47 | IMCN | Improvisation on Nihal’s theme |
| T 48 | IMCN2| Improvisation on Nihal’s 2nd theme |
| T 49 | IMCC | Improvisation on Christopher’s theme |
| T 50 | IMCB | Improvisation on Barnaby’s theme |
| T 51 | IMCD | Improvisation on Darren’s theme |
| T 52 | IMCR | Improvisation on Rosanna’s theme |
| T 53 | IMCJ | Improvisation on Joe’s theme |
| T 54 | IMCM | Improvisation on Mahmoud’s theme |
| T 55 | IMBBS| Improvisation on Bye-Bye Song |
| T 56 | IMREP| Improvisation on repertoire (REP) |
| T 57 | IM | Improvisation not linked to B.S. |
| T 58 | CAD | Root position V7-I or IV-I shift ending a phrase |
| T 59 | CADD | Transient root posn. V7-I/IV-I shift not ending phrase |
| T 60 | RIT | Ritenuto |
| T 61 | PAU | Pause in music |
| T 62 | SUS | Delayed downbeat or resolution of cadence |
| T 63 | RUB | Tempo rubato |
| T 64 | ERR | Therapist make an error |
| T 65 | BAR | Downbeat of therapist’s music |
| T 66 | END | End of section |
| T 67 | TS14 | Time signature changes to 1/4 |
| T 68 | TS24 | Time signature changes to 2/4 |
| T 69 | TS34 | Time signature changes to 3/4 |
| T 70 | TS38 | Time signature changes to 3/8 |
| T 71 | TS44 | Time signature changes to 4/4 |
| T 72 | TS54 | Time signature changes to 5/4 |
| T 73 | TS64 | Time signature changes to 6/4 |
| T 74 | TS68 | Time signature changes to 6/8 |
| T 75 | TS74 | Time signature changes to 7/4 |
| T 76 | CTEXT | Context Music Section |
| T 77 | HSONG | Hello Song Section |
| T 78 | DEVL | Development Section |
| T 79 | CTEXTR | Context Reprise Section |
| T 80 | BYE | Bye-Bye Section |
| T 81 | ADDRA | Therapist addressing Aaron |
| T 82 | ADDRN | Therapist addressing Nihal |
| T 83 | ADDRC | Therapist addressing Christopher |
| T 84 | ADDRB | Therapist addressing Barnaby |
| T 85 | ADDRD | Therapist addressing Darren |
| T 86 | ADDRR | Therapist addressing Rosanna |
| T 87 | ADDRJ | Therapist addressing Joe |
| T 88 | ADDRM | Therapist addressing Mahmoud |
| T 89 | NAMEA | Therapist names Aaron |
| T 90 | NAMEN | Therapist names Nihal |
| T 91 | NAMEC | Therapist names Christopher |
| T 92 | NAMEB | Therapist names Barnaby |
| T 93 | NAMED | Therapist names Darren |
| T 94 | NAMER | Therapist names Rosanna |
| T 95 | NAMEJ | Therapist names Joe |
| T 96 | NAMEM | Therapist names Mahmoud |
| T 97 | NAMEL | Therapist names Helper L |
| T 98 | NAMES | Therapist names herself (Sue) |
| T 99 | MIRRA | Therapist mirrors Aaron’s sound |
| T 100 | MIRRN | Therapist mirrors Nihal’s sound |
| T 101 | MIRRC | Therapist mirrors Christopher’s sound |
| T 102 | MIRRB | Therapist mirrors Barnaby’s sound |
| T 103 | MIRRD | Therapist mirrors Darren’s sound |
| T 104 | MIRRR | Therapist mirrors Rosanna’s sound |
| T 105 | MIRRJ | Therapist mirrors Joe’s sound |
| T 106 | MIRRRM | Therapist mirrors Mahmoud’s sound |
Chapter 8

Descriptive Analysis of Observables

8.1 Introduction

This chapter gives a descriptive account of the visibles and audibles, beginning with a general account of the frequency and duration of the observables then considering the children’s visibles under the broad headings of (1) head, (2) arms and torso, and (3) legs and feet. The children’s audibles are then discussed, and finally the therapist’s and helpers’ visibles and audibles.

8.2 Frequency of Observables

There was a wide variability in the occurrences of the observables, from 1 occurrence to 4210. There were 7 observables with occurrences in the thousands, 42 in the hundreds, 81 in the tens and 63 with single-figure occurrences. Numbers of occurrences of all observables are given in Appendix E, Table 16 on page 322.

The most frequent children’s observables were H (head movement), 4210 occurrences, A (arm and/or hand movement), 2925 occurrences, F (leg and foot movement), 2081 occurrences, SI (moves solo instrument), 1580 occurrences, M (mouth open), 1206 occurrences and MN/V (mouth not visible), 1022 occurrences.

The most frequent therapist observable was BAR, the downbeat of each bar played by the therapist. There were 2311 occurrences of BAR which indicated the music was predominantly governed by time signatures. There were about two head movements per bar but these occurred in bursts.

The next most frequently occurring observables were those which occurred in hundreds, and there was a wide variety of these. The observable EP (eyes towards the piano) occurred most frequently, 939 times, ! (beats on self) occurred 912 times, VOCU (child’s unpitched vocalisation) occurred next frequently, 821 times, EN/V (eyes not visible) occurred 743 times, B (beats on solo instrument) occurred 734 times. HP (head towards the piano) occurred 688 times. The rest of the observables in this bracket occurred between from 101 to 584 times.
Lastly there were observables which occurred infrequently, less than ten times and sometimes only once. In certain cases this was to be expected. The Hello Song section, for example, occurred four times for structural reasons (one occurrence per session), though it did in fact occupy a significant amount of time. In other cases the number of occurrences was small because the observable was unusual, in the sense that a child was unlikely to present it often. Examples of these were VMIRR, (a child vocally mirroring therapist’s notes), and VWMIRR (a child mirroring therapist’s vowel sound) both of which occurred three times. Rare events are discussed later in this chapter.

8.3 Duration of Observables

The total duration of each observable was recorded and computed into a percentage of session-time filled. These are also shown in Table 16, page 322 in Appendix G. Very short duration events were not timed but were recorded as having zero duration. This is because, in the absence of more sophisticated equipment, it was not possible to measure times below the resolution of the digital clock display on the video, showing minutes, seconds and tenths. For example, to measure the duration of a drum beat it might be necessary to filter or digitally process the audio waveform and to print or otherwise display the result in a magnified form alongside a fine time-scale. As another example, to measure the duration of a brief visual event would require video editing equipment indicating the time in terms of frame numbers, but this would only improve resolution to one twenty-fifth of a second. Even if short durations were measurable, they would not necessarily be meaningful in the context of this research: the duration of a drum beat depends on the properties of the drum whereas the writer is more interested in the actions of the child. Certain observables are inherently instantaneous in that they represent points in time rather than periods of time, for example BAR (downbeat of therapist’s music).

The majority of observables, 75 of the children’s and 41 of the therapist’s, had less than 1% duration. In the case of the children’s observables this was due to the fact that a large number were beating behaviours. In the therapist’s case there were a few beating observables too but also changes of time signature and infrequent improvisation on the children’s themes as well as rare events of short duration.
Certain children’s observables had more than 1% duration. These occurred in each category of behaviour but not in sufficient numbers to warrant describing them in terms of another band. They were most numerous in the head region category where four observables each had between 1.2% and 9.2% duration, and three observables between 13.2% and 34.6% duration. In the arms and torso category, however, there were only two observables of 1% to 10% duration, one of 13.3%, and one of 31.3% duration. These last two were SI (moves solo instrument) and A (moves arms or hand), which were also the most frequent in terms of number of occurrences. The legs and feet category only had one observable with a duration above 1%, namely F (moves leg and/or feet) which had a duration of 13.3%. All the children’s audibles with the exception of VOCU (unpitched vocalisation), which had a duration of 3.3%, had under 1% durations. MN/V, AN/V and FN/V (mouth, arms and feet not visible) also occurred with moderately high durations: 39.8%, 14.2% and 7.4% respectively.

The durations of the therapist’s observables differed from those of the children’s. Firstly the therapist’s observables had the highest durations overall. PI (therapist plays the piano) filled 61.3% of the time, and SO (therapist sings) 58.8% of the time. Secondly three different duration bands were discernible: the under 0.7% band, the 0.7% to 10% band (which had 50 durations) and the 10% and over band (which consisted of 8 durations). This probably reflected the fact that the therapist set out to do things but the children were at a level where sustained behaviour, except crying, would not be expected.

8.4 Children’s Observables of the Head

The observables of the head region included all head movements and certain movements of the eyes and mouth. The observable H (head moves) was, as we have seen, by far the most frequent of the head region observables. It occurred 4210 times, had a duration of 13.2% of session time and was also the most frequent of the entire catalogue of observables. H was presented most frequently by Darren (986 times), Barnaby (739 times) and Joe (729 times).

HP (head turned towards piano) was a less frequent head observable but with a higher duration of 23.7%. It occurred 688 times overall. Rosanna presented the observable most frequently, 183 times. In contrast Nihal did not turn her head towards the piano
at all, the only child not to do so. The observable HN/V (head not visible) occurred relatively frequently, 286 times, but only occupied 2.3% of the sessions.

There were four eye observables: EP (eyes towards the piano), E (eye movement during EP), EN/V (eyes not visible i.e. it is not clear if the eyes are EP or towards the therapist when she is away from the piano) and ETH (eyes toward the therapist when she is away from the piano).

EP (eyes towards the piano) was the most frequent eye observable and seventh most frequent of all the observables. It occurred 939 times and occupied 9.2% of session time. Mahmoud presented EP the most frequently, 495 times. This figure appeared high when compared to those of Christopher and Nihal who moved their eyes towards the piano 6 and 0 times respectively.

E (eye moves during EP) was the least frequent children’s observable, occurring three times in Mahmoud alone, and occupying zero session time. EN/V (it is unclear whether the eyes are towards the piano/therapist or not) occurred 743 times with a duration of 14.2%. This meant that a significant amount of potential information about EP and ETH was lost.

There were four mouth observables: MM (mouth movements that resemble tasting or chewing movements), MN/V (mouth not visible i.e. it is not clear if the mouth is open or not), MO (mouth open) and SM (smile). There was originally used a fifth category, MWO, denoting mouth wide open but since this was a relative concept the observable was subsequently subsumed in the MO category.

MO (mouth open) occurred 1206 times. It was the sixth most frequent observable, occurring a quarter as much as head movement, and filling 34.6% of the time. This duration was the second highest of the children’s observables and the fifth highest duration overall, two figures which made it significant. MO was recorded in every instance where the children’s lips were parted so that the writer included mouthing an instrument or hand as MO, a fact which may have influenced the number of MO occurrences. There were instances of MO in all the children, the highest number of occurrences being presented by Barnaby, 331 times. Interestingly three of the children, Darren, Rosanna and Mahmoud, all presented MO around 100 times, while Christopher and Joe presented MO around 235 times.
As with EN/V (eyes not visible) the observable MN/V (mouth not visible) was frequent. It occurred 1022 times with a duration of 39.7% making it the seventh most frequent observable overall, with the highest duration of the children’s observables. While ‘mouth wide open’ was easy to perceive, slight parting of the lips was difficult. The number of occurrences of MN/V reflected this and indicated once again a loss of clean data.

8.5 Children’s Observables of the Arms and Torso

There were 43 observables involving the hand and arm, over double the number for the head region. The majority of these observables involved a child beating or shaking an instrument, or being helped to do so, and they are considered in paragraph 7.5.1.

Those observables of the arms and torso which did not involve beating and which occurred frequently were A (moves arm/hand), SI (moves solo instrument), HM (hand or instrument to mouth) and AN/V (arms not visible). A, which occurred 2925 times, was the most frequent arm observable and had an overall duration of 31.3%. This represented the third highest duration of the children’s observables and the sixth highest overall. Rosanna moved her arm/hand the most often, 643 times, followed by Barnaby, 595 times. Aaron presented observable A the least with 48 occurrences. AN/V occurred 584 times and had a duration of 7.4%.

SI (moves solo instrument) occurred 1580 times and was the second most frequent arm observable. Because SI was usually recorded during beating, when instantaneous movements occurred, its overall duration was relatively low at 13.3%. All the children moved their solo instruments. Aaron once again presented with the least number of occurrences, this time with observable SI, which occurred just 4 times while Rosanna moved her solo instrument 592 times, the most frequent number of occurrences. The other children moved their SI between 31 and 291 times.

HM (hand or instrument to mouth), with 268 occurrences was the eleventh most frequent observable in the category. It had a duration of 5.6%, the fourth highest duration in the arm and torso category. Just two children, Darren and Joe presented this observable in School B, with 95 and 27 occurrences respectively, and likewise two children from School A, Aaron and Barnaby with 3 occurrences and 143 occurrences respectively.
Less frequently occurring observables in this category included T (body tenses) and AI (assisted moving or stroking of an instrument). T occurred 49 times, presented 46 times by Rosanna, and had a short duration of 0.27%. AI occurred rarely, 3 times, and also had a low duration of 0.03%.

### 8.5.1 Children’s Beating

Thirty-one different sorts of children’s beating were distinguished. Some of the codes used to identify these were composite, made up of one or more descriptive elements that could be ascribed to that action of beating. These elements included ! (beats against body), D (beats on surface other than self or body), P (beats in own pulse) and B (beats solo instrument and makes a sound). The beating observable with the highest number of occurrences was ! (beats on self) which was mainly presented by Darren, and occurred overall 912 times. There were 11 other beating observables which each occurred in their hundreds, 13 that occurred in tens to nineties and 6 that occurred under ten times; thus there was a fair amount of beating behaviour which half the children presented. During the Hello Song, and on some other occasions, the therapist or helper assisted the children to beat. This was coded as AB (assisted beating on solo instrument), ABB (assisted beating on non-solo instrument) or ABT (assisted beating on tambourine). The overall number of occurrences for these were 142, 67 and 133 respectively.

### 8.5.2 Children’s Beating in Time with the Music

If a child was observed to be beating or moving in time with the therapist’s music, the suffix M was attached to the code.

<table>
<thead>
<tr>
<th>Occurrences</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>216</td>
<td>BM</td>
<td>Beats solo instrument ITWM (in time with music)</td>
</tr>
<tr>
<td>95</td>
<td>BTM</td>
<td>Beats tambourine ITWM</td>
</tr>
<tr>
<td>44</td>
<td>BBM</td>
<td>Beats other instrument or against beater ITWM</td>
</tr>
<tr>
<td>142</td>
<td>!M</td>
<td>Beats on self ITWM</td>
</tr>
<tr>
<td>14</td>
<td>SHM</td>
<td>Shakes instrument ITWM</td>
</tr>
<tr>
<td>33</td>
<td>!SHM</td>
<td>Shakes instrument, beating on self ITWM</td>
</tr>
<tr>
<td>72</td>
<td>DM</td>
<td>Beats on other surface ITWM</td>
</tr>
</tbody>
</table>
There were seven codes with the suffix M (see Table 4) and occurrences of these appear significant. There were, for example, 912 occurrences of ! (beats on body) and 142 occurrences of !M (beats on body in time with the music), one sixth of the total. There were 734 occurrences of B (beats SI and makes sound) as against 216 of BM (beats in time with the music), 195 occurrences of BB (child beats non-solo instrument) but 44 of BBM (child beats non-solo instrument ITWM).

The relationship between the number of occurrences of BTM (beats tambourine in time with the music) and BT (beats tambourine) was noteworthy in that a considerable proportion of the beating was in time with the music. The observable BT occurred 274 times while the observable BTM occurred 95 times, Darren presenting BTM 74 times, and Rosanna presenting it 20 times. A child was considered to be playing in time with the music if his or her beats coincided with the downbeat or crotchet pulse of the therapist’s music, so the frequency of BTM indicated a strong connection with this. The tambourine was usually introduced in the Hello Song. During and immediately after this song the therapist always focused on a specific child. The fact that the majority of beats on the tambourine (the only available instrument during the Hello Song turn) were in time with the therapist’s music indicated that Darren and Rosanna were particularly motivated to beat in time with the music when it was their turn, although the therapist also followed them with her piano accompaniment. It was striking that the majority of times children played their non-solo instrument they did so in time with the music.

Darren and Rosanna from School B presented BM (beats on solo instrument in time with the music) the most often, 133 and 81 times respectively. These figures greatly contrasted with those of the other children. With the exception of Joe, who presented BM twice, the rest of the children did not present BM at all. Beating on the downbeat is considered separately in section 7.7 but the figures indicated that the two children who connected most overtly to the pulse of the therapist were Darren and Rosanna.

Darren stood out as the child most obviously connected to the therapist’s pulse through his beating. He was the only child to present !M (beats on self in time with the music), which he did 139 times in a very zestful way, !SH (shakes instrument as beats against self), which he did 155 times, and SHM (shakes instrument in time with the music) which occurred 14 times. He was one of three children who presented BTM (beats on
the tambourine in time with the music). Darren presented this 74 times, Rosanna 20 times and Barnaby once. The superior mobility of Darren over Rosanna may have influenced the frequency differential between respective occurrences of BTM. Both Darren and Barnaby presented BBM (beats non-solo instrument in time with the music), 37 and 7 times respectively. Darren and Rosanna appeared the most connected to the therapist’s pulse in their beating. They also presented DM (beats on other surface in time with the music) 6 and 65 times respectively. The other children did not present DM at all.

8.6 Children’s Observables of the Legs and Feet

There were only three observables for the children’s legs and feet, a number commensurate with the children’s disabilities. However, all the children did move their feet, even Aaron who had the most disabilities, and the total number of occurrences of F (moves leg and/or feet) made this observable the third most frequent. Only one FBEAT (child moves foot on downbeat) occurred.

8.7 Children’s Observables and BAR

The downbeat, code BAR, was considered a reference point to which the children might relate. Where the children had an observable which occurred on the downbeat, the suffix BEAT was attached to the code for that behaviour e.g. BT (child beats tambourine) and BTBEAT (child beats tambourine on the downbeat) or BB (child beats non-solo instrument) and BBBEAT, child beats non-solo instrument on the downbeat. There were 13 compound beat codes and in total they occurred 153 times. The extent to which observables occurred in the vicinity of BAR is analysed in Chapter 10.

8.8 Children’s Vocalisations

There were approximately twice as many unpitched vocalisations as pitched ones, 821 against 468, but over five times the quantity in terms of durations, 3.3% against 0.6%. Of the pitched vocalisations the categories VOCPXN (an approximately pitched vocalisation that is close temporally and in pitch to the therapist’s) and VOCPN (a pitched version of same) were the most frequent, occurring 103 times and 86 times respectively, with durations 0.13% and 0.06%. Barnaby presented both VOCPXN and VOCPN the most often, 59 times each. Both categories denote temporal proximity to
the therapist’s music so that a significant percentage of the pitched vocalisations indicated a strong, immediate child-therapist relationship.

The same was true of VOCP (pitched vocalisation that forms a unison with, or matches, therapist’s note in the current or preceding bar). It occurred 79 times with 0.08% duration, Barnaby presenting VOCP 48 of these. Its approximate counterpart VOCPX occurred 41 times with 0.09% duration, Barnaby presenting VOCPX 24 times. The majority of pitched vocalisations showed a significant degree of connectedness with the therapist’s music. The least related of the pitched vocalisations was V (pitched vocalisation outside the scale denoted by the key signature belonging to the current or most recent key). It occurred 23 times, the highest number of occurrences being seen in Mahmoud who presented V 10 times. VM (V in time with the music) occurred 3 times, the lowest occurrence figures of the pitched vocalisations. This suggests that when the children did vocally pitch they were more likely to do so in a way that related to the music of the therapist.

8.9 Therapist’s Visibles

As has already been mentioned, the majority of therapist observables were audibles. There were just 17 visibles as against 89 audibles, and of these 6 were classified as children’s observables since the child was considered to be the focus of the action. An example of such a ‘passive’ observable is AB (assisted beating), when the helper or therapist actually assists the child but the information is recorded in the data as ‘Child x is assisted’.

Most of the visibles concerned the therapist in physical contact with a particular child and either engaged in an activity, such as beating an instrument, or simply holding a child. There was only one visible that described the therapist’s presence among the group of children without her being in close proximity to any one individual child and that was X (therapist visible on screen but not intervening with one particular child). It occurred 51 times and filled 6.1% of the time, interestingly about the same amount of time filled by the HLPX (helper intervenes with one child).

486 When transcribing the sessions, it seemed natural to place the notes and the codes for assisted beating on the stave of the child involved, even though technically the agent of the action was the helper or therapist. The alternative would require eight separate codes, one for each child, in place of one code.
The visibles included AB (therapist helps child to beat/shake instrument), ABB (therapist helps child beat/shake non-solo instrument, AI (assisted moving/stroking of instrument), ABPIM (therapist helps Mahmoud to play piano), CH- (child is held by therapist), and XX (therapist intervenes with one child). AB and AI were usually performed by the helper and this is indicated in the data where appropriate. Additional observables were THB (therapist beats non-solo instrument) and THB- (therapist beats on Child x’s instrument). This occurred most in relation to Mahmoud. There were 34 occurrences of THBM with whereas there were only 9 THBN, 8 THBD, and 7 THBA.

8.10 Therapist’s Audibles

There were 89 therapist audibles. The most frequent audible was BAR (downbeat of therapist’s music) which, as we have already seen, occurred 2311 times. This figure was in marked contrast to the number of occurrences of the second and third most frequent audibles which were PAU (pause in music) occurring 319 times, and SO (therapist sings) occurring 223 times. PAU had a duration of 10.4% and SO a duration of 58.8%, a considerable percentage of time. It would seem that BAR and SO had something in common. Both had a persistent presence.

Eight audibles had occurrences in the one-hundreds. The audible with the highest number of occurrences in this bracket was SP (speech) with 160 occurrences. Unlike SO (therapist sings) the duration of SP was low at 4.4% reflecting the type of speech the therapist used, short phrases rather than lengthy speeches. Most of the eight audibles tended to have low durations, between 0% and 4.4%, with the exception of PI (piano being played) and IM (improvisation not linked to Basic Structure). The duration of PI was 61.3% which was slightly higher than the duration of SO, indicating that as well as singing for more than half the time the therapist played the piano a lot. The duration of IM was 29.6%. IM was an important observable because it represented that part of the session in which the therapist departed from the Basic Structure and introduced completely new material. This may have reflected a shift within her or a shift in the children which caused a new response.

Also in the category of occurrences in the one-hundreds were CADD (transient V7-I shifts that do not occur at the end of phrases), RIT (ritenuto) and TS44 (time signature changes to 4/4). CADD, which had a duration of 1.9%, occurred 118 times and was
the therapist audible with the seventh highest number of occurrences. Its frequency indicated the diatonic quality of the music. RIT occurred 104 times with a duration of 3.0% and TS44 occurred 103 times with nil duration. The observable NAMEM (therapist names Mahmoud) was the last one of the group with occurrences in the one-hundreds. It occurred 101 times and had a duration of 1.8%.

The next group covered observables occurring 83 to 34 times. This group contained most of the audibles ADDR- (therapist addresses Child x or self) and NAME- (therapist names Child x or self). The most frequent occurrence of NAME- here was NAMEA (therapist names Aaron) with a duration of 1.6%. Aaron was the least active of all the children and it seemed that the therapist was repeatedly singing his name as a way of trying to reach him. The least named child was Joe whose name was mentioned 43 times with duration 1.1%. Joe was very active although much of his activity appeared unconnected to the therapist. The therapist also named herself when singing to the children and NAMES occurred 77 times with duration 1.1%.

The code ADDR- (therapist addresses Child x) was used if a child’s name was mentioned by the therapist during the course of a musical passage, if a child’s theme was used by her and if there was any thematic or rhythmic link between the material of the child and the therapist. The child who was addressed the most times was Aaron, suggesting an inverse relationship between addressing a child and a child’s responsiveness. ADDRA occurred 76 times with duration 4.6%, the third highest duration of all ADDR- audibles. ADDRM, which occurred 60 times, had a duration of 7.6%, the therapist addressing Mahmoud for the longest of the children’s times. Possibly here the total duration was a better measurement of how long a child was addressed than the number of times. Strikingly, many of the children had their names sung and were addressed a similar number of times.

CX (Context Music), which also fell into the same group (observables occurring 83 to 34 times) had the highest number of occurrences of an audible belonging to the Basic Structure. It occurred 48 times with a duration of 5.9%. It was noticeable, however, that nearly all the Basic Structure audibles had lower rather than higher numbers of occurrences. The same was true of improvisations thematically connected to the Basic Structure.
There was a wide variety of audibles with occurrences from 31 to 6. Included in this category were 16 audibles which were part of, or connected to, the Basic Structure, 4 TS- (time signature x), 3 MIRR- (therapist mirrors Child x’s sound), 29 ERR (therapist makes error in music) and GLOCK (therapist plays glockenspiel). Examples of the Basic Structure audibles were IMCX (improvisation on Context Music), HS (Hello Song), IMC- (improvisation on Child x’s theme) and C- (Child x’s theme). IMCX occurred 28 times with duration 3.3%, a relatively small percentage. HS occurred 23 times and with duration of 8.9%, so that a moderate portion of each session was taken up with the Hello Song and its accompanying activity of Assisted Beating. CA and CB occurred 16 and 15 times, CN 14 times, and CJ and CC 11 and 10 times respectively so that five of the children’s themes were played a similar number of times. Each had a duration of between 1.00% and 2.8%. CM, CD and CR, the remaining children’s themes occurred 8, 7 and 5 times respectively. Audibles with 5 or less occurrences are considered in detail under section 9.2 Rare Events, page 169, which deals with rare events.

8.11 Helper Observables

The music therapy group at School A had one helper, Helper L, and that at School B had two helpers, Helper P1 and Helper P2. There were 7 observables which were true actions of the helper but 6 of these were treated as child observables because the child was considered to be the focus of the action. This was the same as the treatment of most of the therapist observables. In the data on the computer, information was recorded in the form of start time, end time, subject and observable. In the above cases the observable could be thought of as a passive verb. For example, Joe was assisted (by the helper) to beat. Although the helper initiated the action this was categorised as an observable performed by each child. The observables were AB (child assisted to beat by the helper) ABB (child assisted to beat non-solo instrument), ABT (child assisted to play the tambourine) and AI (child assisted to move or stroke instrument), CH (child being physically touched by helper) and HLPX (child has helper close-by and/or intervening). The code HLP (helper visible on screen but not intervening with one particular child) is the only observable which was recorded as the helper’s own action. It occurred 49 times.
Chapter 9
Rare Events and Change Events

9.1 Introduction

This chapter outlines two different types of events, rare events and change events, both of which were thought to have the potential to yield insights into the process of music therapy. Detailed descriptions of these events are given in Appendices H and I, starting on pages 328 and 363 respectively.

9.2 Rare Events

In this study a rare event is defined arbitrarily as one that occurs five or less times and does not last longer than two minutes, (5% of total duration of all four sessions). It was thought that a consideration of such rare events could provide a special kind of information about the children’s capacity, or the limits of their ability in connection with the music therapy process. Two categories were omitted: xN/V (observable x not visible or cannot be discerned), and those denoting sections of the Basic Structure, of which there were few occurrences by design.

Table 5 shows the instances of rare events classified under different categories of events and placed in descending order. The category containing the highest number of rare events is that of the therapist audibles with 15 different types of these. There are 10 types of rare events in the category of the children’s audibles, 6 in the category of the children’s arms and torso, 3 in the miscellaneous category, 3 in the category of the head region and one involving the children’s legs and/or feet.
The distribution of rare events over the different schools shows that a greater number of rare events occurred in School B than in School A, with only five rare events occurring in the early session of School A. This suggests more fluidity in the sessions of School B and greater creativity. It may indicate additionally a greater range of skills among the children in School B than in School A.

The rare events of the therapist were mainly a consequence of the Basic Structure, but there were some unusual tempo changes and improvisation on the children’s themes. Certain observables appeared rare though the number of their occurrences was only marginally different from that of similar observables just outside the threshold of rarity. Interestingly the therapist rarely improvised on the themes of three out of the eight
children. This was largely due to the long phrase structure of their respective themes, and did not necessarily reflect a lack of interaction.

9.3 Discussion of Rare Events

It was hoped that rare events would reveal extreme aspects of the children’s abilities, and to some extent they did. It was found, for example, that Mahmoud could sing. He joined in a pre-composed song delivering his note at the appropriate pitch and time on the resolution of a V7-I shift. Some children could mirror a word or a sound of the therapist such as ‘o’ in response to ‘go’ or ‘hello’. Barnaby echoed the word ‘play’. He also tended to pitch when the therapist was physically near. In all these cases the children were reacting to the therapist. Mirroring words or joining in a song suggested they wanted to be close to her. Sometimes the quality of her voice facilitated this interaction, or the logic of the music.

Certain children behaved in an unusual fashion when under pressure. Joe flopped over his tray, his face hidden, when his teacher unexpectedly stood by him. He had not done this before in music therapy. Barnaby appeared to grab his neighbour’s cymbals in order to attract the therapist’s attention, holding her arm when she was by him. This raised the issue of whether or not it was important for the therapist to be in physical proximity to the child.

The therapist changed to unusual time signatures when dividing her attention between two children. This gave an insight into the close link between her music making and her relationship with the children. It also pointed to the advantages of individual music therapy. Another finding was that the therapist tended to improvise more when the children asserted themselves in some way. They might smile, for example, vocalise, turn their heads in the therapist’s direction, or make a sound on their instruments. Any of these gestures facilitated her musical flow, and ability to relate to them. This interplay of feelings was seen as resembling that of mother and infant, when both participated to form a relationship. It was more difficult therefore to form a relationship with children who were unresponsive or impassive. This is the case, for example, with autistic children.

The children’s rare events suggested a pattern of reaching out to the therapist. A vocalisation or a gesture was on the beat of her music, in her tonality, a mirroring of
what she sang. While these were rare occurrences they demonstrated the capacity of
the children to connect with the therapist and a tendency to resonate in some way with
her music. Similarly the therapist’s rare events showed her reaching out to the
children. The odd time signature changes revealed a struggle to relate to all the
children, to take them all into account. The improvisation on their themes reflected
developments in the children, and consequent changes in the child-therapist
relationship. The therapist’s mirroring of the children was like that of the mother with
her infant, endeavouring to help the infant hear him or herself and thus work towards
having a sense of his or her own identity.

The rare events form an extensive body of data and are presented in Appendix H, page
328. The writer selected three of these on which to perform in-depth analyses and
these are presented in Chapters 10, 11 and 13.

The rare events were found by counting the number of occurrences of each observable
code in the data coded computer file. In hindsight it might have been better to have
looked at the video tapes again in order to find them, since many were not coded.
Another disadvantage was the lack of uniformity in the descriptions of the rare events.
The amount of antecedent material described varied according to its perceived
relevance, sometimes obscuring the significant episode enclosing the event and
obscuring the similarities or differences between rare events. Having learnt from this
experience, change events were described more uniformly using a ten-second window.

9.4 Change Events

A change event is defined as one in which the observer can see a marked and sustained
contrast in the expression and actions of a child. This may identify the critical moment
when the child gained a new understanding. The question is whether the therapist had
intervened in some way or if there had been some internal shift in the child. It is hoped
that the therapist had caused changes, (so the writer is looking for something the
therapist has done). The change episode is considered to be the process out of which a
change arises. This includes fairly fast or near instantaneous processes. Detailed
analysis of a change event is made in Chapter 14, page 210.

A ten-second window is used for the description of change events and episodes, five
seconds on each side of the moment of change. The five-second period before the
moment of change is referred to as the lead-in and the five-second period after the
change event is called the lead-out. A change is deemed to be sustained when it lasts
five or more seconds. A few instances of no-change are given when looking at the
start of each session when change might be expected. When the onset of a change
event is not clear because the observable involved is not visible immediately before the
moment of change, the episode is not included. There are a few exceptions to this rule
and the reasons for these are given when the relevant change events occur. The
description in change episodes is generally limited to the child who is the subject of the
change episode and the therapist. It is their relationship that is being explored.

Change events were initially found by examining the videotapes of each School in turn.
Use was subsequently made of computer programmes with respect to School B to
locate further events of the types already found. These were checked to see whether
they were in fact change events, or simply observables that lasted five seconds. In
Appendix I, page 363, a description of change events is given for each School, looking
at one example of each type that occurred.

9.5 Summary of Change Events

The types of change events rather than the number of occurrences of change events are
described here as an exact check on the number of these was not made for School A.
There were 36 types of change events, a few of which were also rare events. In
Session Eight of School B and School A all the children exhibited change events, the
most types occurring for Darren and Christopher and least for Aaron, Barnaby,
Mahmoud and Nihal. Interestingly Barnaby, who presented 3 types of change events
in Session Eight presented 11 in Session Twenty-three, appearing to have been more
focused in the later session. His not having a beater in this session may have affected
the degree to which he took note of the therapist. In contrast Darren presented
considerably fewer types of change events in Session Twenty-five, this fitting in with
his apparent lack of interest in the session. There was also a 50% reduction in the
number presented by Rosanna. Joe and Mahmoud in School B showed approximately
the same number of types of change events, as did Aaron in both sessions, suggesting
that overall their response to the therapist was consistent. Nihal was the only child
who had no change events in the later session of School B.
Twenty types of change events were uncoded and many of the potential stimuli of the therapist were also uncoded, including the quality of her singing voice, its pitch (in particular if it was low or high), her presenting a dissonance on the piano, and her music being unpurposeful or not attuned to the children. The children appeared to respond to a variety of therapist stimuli with both stimulus and response being difficult to quantify at times. Nevertheless a picture emerged of the children apparently relating to the therapist and being affected by what she did. There were only seven instances in which it was hard to make sense of a child’s change episode.

9.6 Conclusions

The meaning of the change events was difficult to prove. Attempts to gain insight into the minds of the children was hampered by the possibility that reasons for events could be rationalised by the writer in a number of different ways. One example of this was the interpretation of Barnaby putting his arms around his drum, his solo instrument, and leaning his head on it. In the context in which this occurred it was possible to rationalise this as an alternative to hugging the helper or therapist. There was, however no means of providing evidence that this was the case. He may have felt tired, or wanted to explore the drum. The gesture may have been over-determined. There was no scientific way of knowing the ‘truth’, and for certain change events it was difficult to even guess why they happened.

The writer intended to find patterns and relationships in the data in her final chapter and to re-appraise her conclusions about the change events (and the rare events) in the light of the statistical analyses described therein. Firm evidence-based conclusions did not materialise, yet the writer had strong feelings about the underlying explanation for the children’s behaviour, so she compromised. Firstly she analysed five specific events in depth (see Chapters 10-14) and secondly she checked her general subjective impressions about the change events (see Chapter 16), many of which were found to be consistent with results of the statistical analyses.

Her overall impression was that the children had a high level of awareness of the therapist. This showed in their apparent sensitivity to rhythmic, temporal, dynamic and textural changes in her music, and to the fluctuations in the quality of her voice. Secondly, the children seemed to have had a remarkable understanding of how the
therapist’s music worked. They could anticipate the downbeat, and often followed cadential V7-I shifts, marking the resolution with a movement of some kind or a beat on their cymbals or drums. Unusual features such as delayed resolution of a cadence or dissonances caught their attention, and they turned their heads to the piano. Since the children had some expectation of what the music would do, it is likely they experienced a violation of expectation. At such moments the children might pucker their faces or turn their heads towards the piano. Thirdly, the majority of children took a very active part in the session, and were responsive to the therapist, either pitching in the tonality of her music, beating in time with her music, or completing words or phrases vocally or instrumentally. Certain children engaged in dialogue of some kind with the therapist, sometimes initiating it.

All the children clearly enjoyed a variety of musical moments, particularly when there was an interpersonal exchange between a child and the therapist, even if they were not taking part in this themselves. Finally the children demonstrated their degree of connection with the therapist by turning their heads away from her when she was not attuned to them, and conversely looking towards her when there was something in her music for them. The change events indicated the potential of children with severe disabilities and that of interactive music therapy with them. They also showed how different children were able to use the sessions at their own level, in their own way, so that there seem to be few prerequisites for participation in music therapy.
Chapter 10
Therapist’s Time-Signature Change

10.1 Introduction

This chapter describes an episode in which the therapist, singing and playing the piano, changed her time signature from 4/4, via 3/4, to 3/8 (coded as TS38)\(^{487}\) in response to the smile and chuckles of Barnaby. The episode was the first of two rare events\(^ {488}\) in which the therapist presented TS38 and it occurred at 38:29.2 near the end of Session Eight, School A. TS38 did not occur in School B.

A background to the episode is given, comments about this are made, and a conclusion drawn. The episode itself is then described and this is followed by a discussion of some of the issues that arise out of it. Two transcriptions are given. The first, Transcript 1 on page 413, concerns Barnaby and shows the way he embroiders the therapist’s vocal line even though she is addressing Christopher. The second, Transcript 2 on page 415, relates directly to the episode. This shows an introduction to the Context Music (CX) in the Context Reprise Section (CTEXTR), the CX itself, the change of time signature to 3/8 and the resultant improvisation.

10.2 Background to Episode

Barnaby’s vocalisations permeated Session Eight. He often accurately shadowed the therapist’s piano or vocal melodic lines and often filled in passing notes as well, especially in the first part of the session (see Transcript 1, page 413). He was much in evidence and, when singing in pitch, gave the impression of a child in individual therapy who was the centre of attention and connected strongly with the therapist.

The therapist responded to a number of Barnaby’s many vocalisations, sometimes feeling torn between the children when his output eclipsed that of the child she was addressing. In Session Eight Barnaby presented 208 vocalisations, whereas Christopher presented 45, Nihal 3, and Aaron 0. These vocalisations included 34 VOCPXNT (approximately pitched vocalisation forming triad with therapist’s current

\(^{487}\) Full definitions of all the codes are given in Appendix D, page 307.

\(^{488}\) See Appendix H starting on page 328 for description of rare events.
or last note) a large number given that Christopher sang 2 and the other two children sang none, and 27 laughs. None of the other children laughed at all in Session Eight while in Session Twenty-three the only other child to laugh was Nihal, and she laughed just once.

Barnaby’s vocalisations were met in different ways by the therapist. Sometimes she momentarily broke off from addressing another child, at other times she mirrored him in extended interactions, and occasionally, though aware of him, she made no overt response. Subjectively a number of possible reasons for different reactions could be described. There was a tendency for her to respond if Barnaby pitched in the prevailing tonality, articulated a particular sound, smiled or laughed, or presented an intense affective quality. On these occasions his need to make contact with the therapist felt more pressing.

Barnaby also mouthed his beater a great deal, instead of using it to beat his drum, and he did this just before and during the episode. He often made a drone sound as he was mouthing the beater.

10.3 Comments on Background

It can be seen that Barnaby was a lively and vocal child who contrasted with the other children in his group. His ability to pitch in the therapist’s tonality indicated awareness of her, the frequency of his pitched vocalisations showed eagerness to connect with her and his melodic fragments showed he had a strong sense of tonality.

Barnaby’s frequent mouthing of his beater, especially when accompanied by a vocal drone, suggested oral stimulation was important to him. This resonates with a theme linking many of his behaviours: a desire for closeness, taking in his beater, for example, taking in people by touching them and, importantly, taking in the therapist’s music. In that way he could make them all his own.

10.4 Conclusion

Working with Barnaby exposed the problems of reconciling the demands of one child who presents a varied and constant output, with those of the other children who are not as vocal, and less able physically.
10.5 Description of Episode

At 36:46.2, 1 min 43 s before the change of time-signature episode, the therapist crouched in the middle of the group, away from the piano, and sang without accompaniment ‘Let’s Play Listening’, first addressing Nihal, then Barnaby at 37:16.0. Although Barnaby moved during this he was relatively still each time the therapist sang his name, only moving as a result of his mouthing his beater. He was completely still for 3.5 s after the song finished. A period of silence followed in which Barnaby resumed mouthing his beater, then additionally began a vocal drone at 37:56.4 on an approximately pitched ‘a’, the dominant of the therapist’s previous key, D major. The drone lasted until 37:59.6 when the third beat of the Context Music (CX) introduction occurred in its first bar (see Transcript 2, page 415).

The therapist resumed playing the piano at 37:58.2 when she presented a steady improvisation in 4/4 on the Context Music (CX) as an introduction to the song itself (see Transcript 2, page 415). When she started singing ‘Here we were today’ at 38:11.0, Barnaby almost immediately began smiling (1 s later) for 4.7 s and chuckled at 38:13.5 for 0.4 s. The therapist continued with the CX as the other three children were quiet and she was trying to reach them. However, at 38:22.0 Barnaby smiled and chuckled again in such a way as to elicit a specific response from her, a change from 4/4 to 3/4. This time signature felt more affectionate and gentle to the therapist and empathetic with the chuckle. She sang Barnaby’s name and vocally improvised over a piano pedal on D11, constantly addressing him. After two bars of 3/4 she paused then resumed more slowly than before, modifying the tempo and time signature. This has been transcribed as a change to 3/8 in order to accommodate a certain lilt and ambiguity in the stresses of the therapist’s music; it could not be uniformly described by a single compound time signature such as 6/8 or 9/8.

The change of time-signature to 3/8 (TS38) occurred at the start of a new 13 s rubato passage, over the same sustained pedal, in which the therapist once again sang Barnaby’s name, then two glissandi resembling the cooing of a mother to her baby

489 This has been classified by the writer as VOCPXNT.

(Transcript 2, page 415, at 2, 38:30.0 to 38:34.0). Barnaby became still for about three seconds after the first glissando then smiled and laughed, beating on his beater in his own pulse. Although the therapist was addressing someone else, Christopher leaned forwards out of his chair during the first glissando, and Nihal’s head moved slightly. Only Aaron appeared untouched.

10.6 Comments on Episode

10.6.1 Therapist’s Vocalisation

The therapist was not sure why Barnaby chuckled during the reprise of the Context Music (CX), though it appeared to be linked to the onset of her singing, but she recalled that her own feelings in response to the chuckle were ones of delight and amusement, Barnaby’s laughter sounding mischievous and having an infectious quality. Barnaby was smiling, vocalising and mouthing his beater, generally being extremely busy in a way that did not obviously correspond with the therapist’s music. His totality elicited a feeling of endearment in the therapist, making her break off the CX and make an empathetic vocalisation (38:23.2). This resonated with the outgoing quality of his facial expressions, gestures, and intermittent vocalisations. When repeating c´ during the bars between 38:24.0 and 38:27.0 it was as though the therapist was savouring the moment, like the mother gazes at her infant.

One point of significance is that Barnaby presented fewer VOCP (pitched vocalisation matching therapist’s current or recent note) and VOCPXNT (approximately pitched vocalisation forming triad with therapist’s current or last note in therapist’s tonality) when the therapist was singing. The z-scores for co-occurrence of VOCP and VOCPXNT with the therapist’s SO (singing) were -2.8 and -2.9 respectively. This suggests Barnaby may have been interested in listening to the therapist sing, a fact which may account for his own frequent pitching. It is arguably the case, therefore, that after a period of silence as in the episode described above, Barnaby’s smiling and laughter can be seen as pleasure on hearing the therapist sing again.

\[491\text{ See Appendices p. 312 for definition of VOCP.}\]
10.6.2 Therapist’s Change of Time-Signature

Triple rhythms are associated with light-hearted movement. The waltz is conventionally a light-hearted dance, and many folk tunes that accompany lively jigs and other similar dances are in triple time, usually in 6/8 or 9/8. Even the lullaby ‘Hush a Bye Baby in the Tree Top’ has movement as it is associated with the cradling and rocking of a baby. By shifting to a 3/8 time signature, the therapist was metaphorically dancing with Barnaby, presenting like a mother who holds her child in the air and moves it from side to side in a playful and affectionate way.

This is another example of affect attunement showing how strong the response of the music therapist can be. In this example there is no way of proving that Barnaby was in turn responsive, or felt understood, although his chuckles started once the therapist began singing, suggesting he was affected by her, and occurred again after she addressed him in 3/8. Nevertheless such striking responses in the therapist point to the potential of music therapy, since clients often do respond and may feel that the therapist is empathetic, as a mother is with her infant.

10.6.3 Priority Given to Barnaby

Barnaby’s chuckles were in contrast to the quality of the reprise of the Context Music (CX) but the therapist decided to commune with him, and give him priority over the group. If a child has strong feelings, it is important to listen to them. It is also important for the therapist to listen to her own feelings, as they can be a guide to how the child feels and what intervention may be most appropriate. In this case the therapist was affected by Barnaby who was happy. This made the therapist feel happy and it made the session more fun.

Freud called these elements of a relationship transference (here Barnaby’s feelings) and counter-transference (the feelings of the therapist in response to Barnaby) and are central aspects of psychodynamic psychotherapy. Transference is generally agreed to
refer to those aspects of the therapeutic relationship which reflect and impinge on the patient’s (often) unexpressed fantasies, conflicts and expectations.\textsuperscript{492}

Counter-transference is an extension of the transference and refers to the attitudes that a therapist develops to his patients during therapy and that reflect his own feelings and attitudes to important persons in his life, past and present.\textsuperscript{493}

This ‘layer’ of the child-therapist relationship in music therapy is vast and complex and it was not examined in depth by the therapist for whom it was not a central issue.

\textbf{10.7 Conclusion}

The episode provides an example of a child affecting the therapist, and one way in which the therapist channels her feelings through her music and directs them to the child. Her response here gives an example of ‘affect attunement’ (another is given in Chapter 14, page 210 and Transcript 9, page 443). The episode also shows how the therapist gives importance to children, taking them seriously and attending to their needs.

When the therapist addressed Barnaby, she altered the type of music she presented in addition to singing his name, because what she was communicating to him differed from her musical communication to the group. His chuckle, which broke the calm beginning of the reprise of the Context Music (CX) demanded attention and was a statement of Barnaby’s current way of being-in the world which the therapist thought important to acknowledge. In this way a child is able to affect the therapist and thereby initiate a new course for the music, which as can be seen, is interactive.

The episode primarily shows how the therapist is sensitive to the children’s feeling states, and in this way has the potential for establishing a relationship with them which can lead to the fulfilment of therapeutic objectives. It is important to emphasise that the therapist was not sure why Barnaby was chuckling and smiling in this instance, but


\textsuperscript{493} Sidney Crown, ibid., p. 46.
accepted him just as he was in an attempt to make contact. The issue of the therapist not knowing why a child is behaving in a certain way arises in Chapters 13 and 14.
Chapter 11
Mahmoud’s Vocalisation

11.1 Introduction

This chapter examines a sung e♭ flat produced by Mahmoud in Session Eight, School B at 39:41.0, about six minutes before the end of the session. It was a VOCPNBEAT (pitched vocalisation matching therapist’s current or last note and occurring on the downbeat of therapist’s music) which matched the current note of the therapist and was a rare event which only occurred once. Mahmoud sang ‘Aah’ on the e♭ flat (see Transcript 3, page 418) occurring on the downbeat of the fifth bar of the Chime-Bar Song.

The writer chose to examine VOCPNBEAT because it was rare, because it appeared to be an organised response, and also because it appeared that Mahmoud was singing in a positive and happy way, whereas many of his other vocalisations appeared to be protestations of some kind. For these reasons it merited attention even if it was only possible to hypothesise about it rather than produce hard evidence as to its existence.

Mahmoud’s sung e♭ flat was striking. It gave the impression that he was following the therapist’s music and, moreover, could anticipate it. It also sounded as though Mahmoud relished the note, producing a full and rich sound that indicated a feeling of pleasure. For the therapist it was a marvellous moment of focused contact with Mahmoud.

This chapter considers the above factors, first describing the background to VOCPNBEAT and making interpretations about its salient features, secondly describing the VOCPNBEAT itself and the episode immediately after it, and thirdly discussing the possible reasons that could give rise to VOCPNBEAT. Finally, conclusions are drawn.

494 Full definitions of all the codes are given in Appendix D, page 307.
11.2 Background to Episode

In Session Eight, School B, Mahmoud’s eyes and/or head were nearly always turned towards the therapist, who was at the piano most of the time. Mahmoud often vocalised, producing notes pitched in the therapist’s tonality, unpitched sounds, and variety of guttural noises. He frequently echoed, or sang with the therapist’s cadential notes, or those at the end of her musical phrases.

Mahmoud’s vocalisations sometimes occurred when he had not received much attention. For example, at 16:38 when the therapist was singing to Rosanna, Mahmoud had only been addressed for 6 min 11 s since the session began. He moved his foot for the first time at 16:25.5. The therapist noticed this and briefly alluded to him in song before resuming and finishing her music directed to Rosanna. As she did so, Mahmoud made snuffy sounds, snorts and exclaimed ‘oy!’ loudly. After the therapist closed her interaction with Rosanna, he vocalised f’ even more loudly, this note being the dominant of the therapist’s closing cadential chord. He then vocalised a downward glissando, turned his head away from the piano, and made throat and nasal snorts, sounding upset. The therapist finally addressed him, playing and singing his theme (CM), whereupon Mahmoud’s snorts and snuffles gradually lessened, then ceased. Once more his head was towards the piano. He was motionless, until 18:8 when the therapist, still playing the piano and singing, additionally assisted him to play his cymbals.

Mahmoud vocalised on other occasions. His vocalisation, following Joe’s turn in the Hello Song in Session Eight, is particularly significant and relevant to VOCPNB1 (pitched vocalisation matching therapist’s current or last note and occurring on the downbeat of therapist’s music). In a pause at 27:17.8 during the postlude in F-major, Mahmoud sang an approximately pitched d’ then made an upward glissando to f’ which he sustained for two seconds (see Transcript 4, page 425). He then briefly extended the glissando which ended on a dissonant g’ flat. In response to this, the therapist, while continuing to sing about Joe, directed her music to Mahmoud, turning towards him495 as she sang and played the piano and sharing her thoughts in song with him. When she finished at 27:50.0 there was a silence during which the therapist adjusted

495 The therapist recalled turning her face and torso towards Mahmoud as she sang. This is not evident from the transcription.
Mahmoud’s Chinese cymbals so they were nearer to his hands. This activity lasted until 27:59.5. Less than 1 s later, at 28:00.1, as she sat at the piano, Mahmoud sang the last four notes of an F-major ascending scale, starting on c’. He sang in perfect tune with a clear and firm voice.

At times, Mahmoud’s vocalisations gave the impression that he wanted physical contact with the therapist and shortly before the Chime-Bar Song (Example 4 on page 287 of Appendix A) was introduced, the therapist found it necessary to hold Mahmoud’s hand. She did this because despite her pianistic and vocal responses to his snorts and ‘Na’ vocalisations, which gave the impression he was emotionally uncomfortable, his vocalisations did not abate and he sounded as though he was asking to be physically picked up by her. This, in fact, is what happened towards the end of Session Twenty-three, when the therapist lifted Mahmoud out of his chair and carried him to the piano where he sat peacefully on her lap while she played and sang.

11.3 Comments on Background

11.3.1 Pitching in the Tonality

Mahmoud’s vocal pitching, when his snorts and snuffles gave way briefly to focused sound after the therapist ended her interaction with Rosanna, was significant. It suggests that he pitched in the therapist’s tonality because he was aware of her and wanted her attention, becoming less upset when she eventually gave it. Maratos has shown that ‘infants under one month of age may imitate pitch and duration of sounds’, so this behaviour is rooted in early life and must be important to visually impaired children since it provides a potential source of contact.496

11.3.2 The Four-note Scale

The four-note scale shows that Mahmoud had a grasp of tonality, was able to retain the memory of a key over a period of at least twelve seconds, and was apparently able to use the musical phrase to address the therapist, make contact with her, and hopefully continue their interaction. It is relevant to the VOCNPBEAT, in the writer’s opinion,

because it shows a relatively sophisticated grasp of tonal music and this suggests that Mahmoud was cognisant of the way in which the Chime-Bar Song unfolded. In short, he knew the next bit of the tune at the point where he entered the song.

**11.3.3 Physical Proximity and Attention**

Clearly there was a connection between the therapist’s physical proximity when Mahmoud sat on her lap at the piano, her giving Mahmoud attention, and the reduction of Mahmoud’s grumbling vocalisations. This is similar to the distressed infant whose cries abate once nestling in the arms of its mother. It may have been especially important for Mahmoud to have physical contact with the therapist. Having a visual impairment probably meant he needed tactile information about the therapist, and physical proximity would allow him to get to know her better. This suggests too that the therapist was a significant figure for Mahmoud just as the mother is for the infant.

**11.3.4 Mahmoud’s Displeasure**

There is a similarity between the way Mahmoud fretted and the way infants sometimes vocalise when feeling uncomfortable, not getting what they need and communicating this to their mother. Similar episodes of Mahmoud snuffling and snorting occurred throughout Session Eight, usually when the therapist was interacting with another child. These episodes also bear a similarity to those occurring when small children are jealous of their siblings receiving the undivided attention of their mother.

**11.4 Conclusion**

These examples show that Mahmoud was able to use his voice communicatively in a variety of ways, could pitch in the prevalent tonality, vocalise to attract the attention of the therapist, and had the ability to sing melodies. Importantly they also show his desire for contact with the therapist, a desire of infants in respect of their mothers and caregivers.

**11.5 Description of Episode**

Mahmoud’s e’ flat VOCPNBEAT (pitched vocalisation matching therapist’s current or last note and occurring on the downbeat of therapist’s music) occurred during a specially composed song in E-flat, ‘Once Upon a Chime-Bar’ (see Appendix A,
Example 4 on page 287) in which each child was helped in turn to play a different instrument, beginning and ending with the e’ flat chime-bar. The therapist began the song, vocally and pianistically, at 32:34.4. Mahmoud had the first turn in this at 33:34.4, having been alert since the therapist first presented the song. During Joe’s turn, when Joe was helped to play the tambourine, at 38:29, Mahmoud’s eyes increasingly turned towards the piano and his arms increasingly moved. The therapist, aware of this, gave him another turn at 39:28.2 (see Transcript 3, page 418). She placed his cymbals out the way and the helper held his left hand. The song resumed. Mahmoud made a faint unpitched vocalisation at 39:36.2, at the end of the third bar of the song. The therapist played and sung a dominant seventh in the fourth bar of the song and the helper unexpectedly assisted Mahmoud to beat the chime-bar at the same time. On the downbeat of the next bar he sang ‘Aah’ beautifully on an e’ flat for the length of a slow dotted minim, sliding down to a c’ towards the end of the note. His voice was very firm and clear.

During the rest of the song, which was the final verse and chorus, Mahmoud continued to vocalise, fleetingly pitching into the tonality, gurgling, as babies do with delight, and making a mouth snort. Importantly, after the final notes had been sounded, he re-opened the song by immediately, and loudly, echoing the cadential e’ flat of the therapist, and imitating her word ‘go’ by singing ‘oh’ at 40:25. There followed a ‘dialogue’ between the therapist and Mahmoud, comprising a mixture of vocalisations on the latter’s part, and finishing with a tentative e’ flat.

The therapist was taken aback by Mahmoud’s imitation of her vocalisation, and did not accurately gauge the rhythm of his ensuing vocalisations. Additionally she responded vocally to him with tones below c’ which rendered her voice unusually deep, his vocalisations becoming tentative and quiet. He nevertheless returned to e’ flat just before the end of the interaction, albeit softly.

11.6 Comments on Episode

11.6.1 The VOCPNBEAT was a Coincidence

It is just possible that Mahmoud’s e’ flat VOCPNBEAT was a coincidence since he had been frequently pitching in the therapist’s tonality. Further, since it is a unique rather than a repeated event, the likelihood of its being a coincidence is increased. However,
the chance of this single event occurring at any specific moment within the two sessions is small. For example, the statistical probability of the event occurring within a particular five-second segment is 0.12% (the total time of the two sessions is 4224.4 s, and 5/4224.4 = 0.0012). Therefore it is unlikely that VOCPNBEAT was a coincidence.

11.6.2 Mahmoud Enjoyed Attention

Mahmoud appeared to enjoy physical proximity and attention, something he received at the time of his e´ flat VOCPNBEAT. One way of checking this was to search for instances of smiling (SM) in the event list and see what other observables occurred simultaneously or nearby. This search revealed six instances of SM, all in Session Twenty-five, and common to all of them was that attention was given to Mahmoud by the helper or therapist. Thus giving attention may be a pre-requisite for SM.

The first two instances when Mahmoud smiled, at 14:33.5 and 14:43.0, the therapist was assisting him to beat his SI (solo instrument), the Chinese cymbals. In the third at 25:53.5, the helper was standing next to him, removing his cymbals and introducing the Hello Tambourine, getting ready for Mahmoud’s Hello Turn, something which he might have been looking forward to. In the fourth instance at 26:05.4, the therapist was close to him, tapping on the tambourine, and singing his theme, before his Hello Song turn, (in which he was half-smiling throughout). In the fifth instance at 28:00.4 Mahmoud smiled when the therapist was addressing cadential music to him, and in the last instance at 32:12.4, he smiled when the therapist was holding his hand and helping him once again to play his solo instrument.

It is reasonable to assume that Mahmoud may have derived pleasure from attention even when not overtly expressing it by smiling. At times the way he raised one leg, which he did only on rare occasions, seemed indicative of it, as this behaviour occurred both when he was given attention and when he was paying attention, his motoric gesture part of making an effort in the proximity of the therapist. Because Mahmoud was given attention when he was assisted to beat the e´ flat chime-bar and it was his turn in the song, it is reasonable to assume that he was enjoying himself. It is likely that this played a part in prompting him to sing and vocalise the ‘Aaah’, a sound of satisfaction, one pitched in unison with the therapist. When children are comfortable
and secure they are more likely to interact harmoniously with their mother or indeed with their therapist, as Mahmoud does in the event under discussion here. When Mahmoud’s immediate needs were met by having attention, he presumably felt more comfortable and this allowed him to look outwards, to make music. Even the early responses of the newborn support the idea that when conditions are right, they are more likely to attend to their mother or caregiver. Brazelton and Cramer, for example, found this to be true.

When positive rather than intrusive stimuli are utilized, the newborn has amazing capacities for alerting and attention, and for suppressing interfering reflex response in order to attend.497

11.6.3 Mahmoud Enjoyed Anticipation

Out of the six instances of SM, the therapist tried to facilitate the experience of anticipation in all except the fourth. This may have contributed to Mahmoud’s pleasure since anticipation can be an ingredient of play. For example, at 14:33.5 she sang a 4 s downward glissando from b’ flat to c’ while guiding Mahmoud’s hand down the cord from which his Chinese cymbals were suspended. As she sang the last note, she helped him beat his cymbals. Mahmoud began smiling a fraction of a second before this, and continued until 14:36.8. A similar example occurred at 32:12.6. Again the therapist held Mahmoud’s hand, guiding it down his cymbals’ cord, this time singing a glissando from c’’ to c’ until she reached the cymbals. In both cases the therapist sonically delineated the trajectory of Mahmoud’s arm, thereby reinforcing his preparation for the final note. This is somewhat akin to the anticipation games that mothers play with their babies. An example of this is ‘Round and Round the Garden’ in which the mother makes her fingers walk up the infant’s arm in stages, preparing for the climax of the game, the underarm tickle.

On another occasion at 28:00.4 when Mahmoud smiled, the therapist assisted him to beat on the resolution of a V7-I cadence. In so doing she was teaching him about the language of tonal music, or perhaps reinforcing his knowledge of it. Both these instances entailed the therapist giving attention to Mahmoud and also facilitating the

experience of anticipation. The glissandi described above and the assisted beating on the close of a V7-I shift have an important element in common: they both involve falling on to a strong reference note, the tonic. The writer suggests this is reflected in Mahmoud’s choice to move downwards from the therapist’s f’, moving from a higher to a lower position. Assisted beating in the Hello Song reinforces this and may have been re-experienced in the Chime-Bar Song which also stresses the tonic and requires assisted beating. Each assisted beat includes the preparation for a climax in which the state of tension is released as the instant of the beat is reached. Therefore assisted beating (AB) may well have influenced the timing of Mahmoud’s VOCPNBEAT.

There was evidence in the data that Mahmoud was aware of the convention of the dominant seventh shift to the tonic (V7-I). It was shown in the short-term sequential analysis (see 16.2.2.8 Mahmoud of School B, page 228) that he presented VOCU (unpitched vocalisation) after the start of CADD (transient root position V7-I/IV-I shift not ending phrase) and at PI- (the moments when the therapist stopped playing the piano) and SP- (when she stopped speaking). These examples suggest Mahmoud was aware of closure.

It appears, therefore, that the dominant-tonic shift under examination, together with the assisted beating, facilitated Mahmoud’s VOCPNBEAT, giving him the opportunity to tell the therapist, in the tonal language of music, that he was there. In this way he was able to connect with her, and probably feel a sense of satisfaction.

11.6.4 Mahmoud felt Comfortable

In some circumstances Mahmoud communicated that he felt uncomfortable by grizzling or whining, as has been described. On occasions the therapist’s attention helped him to feel better. Her physical presence, for example, calmed him down and he became quiet when he sat on her lap at the piano. This is similar to a baby stopping crying when their own mother lifts them up. Here the reduction of vocalisations represents a shift in his mood.

It is possible, of course, for a shift in mood to be represented in a different way, when a different type of mood is experienced. In the Chime-Bar Song, the therapist interacted with Mahmoud when he was already calm and quiet, that is to say when he was relaxed or comfortable, and he became absorbed in the activity of playing the chime-bar, and
consequently focused. This time, instead of crying in order to communicate and obtain the therapist’s attention, he made music, sharing a moment with her when singing e’ flat. The fact that he was comfortable is importantly borne out by his subsequent re-introduction of e’ flat which he vocalised loudly at 40:24.8, and in the following bars as described above.

11.6.5 The Chime-Bar Prompted Mahmoud’s VOCPNBEAT

It can be argued that Mahmoud’s VOCPNBEAT (pitched vocalisation matching therapist’s current or last note and occurring on the downbeat of therapist’s music) was prompted by the first e’ flat chime-bar notes he was helped to produce, and which preceded it, clashing with the dominant 7th of the therapist piano accompaniment. However, the loudness of the therapist’s vocal f’ exceeded that of the chime-bar notes, and it was a sustained note whereas those of the chime-bar were percussive. Because of these factors the writer thinks that the therapist’s vocal f’ was the dominating feature. It is probable too that Mahmoud was paying attention to the therapist’s singing, which had started well before the first notes of the chime-bar, and during which he had already made an unpitched vocalisation, his eyes twice darting towards the piano, and his arms moving as his energies gathered towards his VOCPNBEAT. This is supported by the fact that Mahmoud had imitated the therapist’s sung tones on many occasions, or sung in her tonality. For example, he presented VOCP (pitched vocalisation matching therapist’s current or recent note) 16 times and for a total duration of 0.35% of the sessions. These compare with 10 and 0.08% which represent means over eight children.

11.6.6 Repetition of e’ Flat

The note e’ flat is repeated 14 times during the eight-bar refrain of the Chime-Bar Song and 3 times during its eight-bar chorus. As with the Hello Song, the therapist thought it would provide an opportunity for the children to have a reference note which they could learn, anticipate and enjoy. Mahmoud will have heard the e’ flat he sang during the turns of the other children, repeatedly at the beginning of the song and a total of 17 times throughout the song. Given that Mahmoud was capable of retaining the memory of notes over at least twelve seconds, it can be argued that he was dominated by it, and that is one of the reasons he sang e’ flat on the downbeat.
11.6.7 Mahmoud was Pleased to Play his Cymbals

Mahmoud, in addition to being offered the opportunity to assert himself, was actively helped to beat. This is part of facilitation when the child or novice is helped to solve a problem, carry out a task or achieve a goal which would be beyond his unassisted efforts.

Jerome Bruner called this ‘scaffolding’. 498

Mahmoud never played an instrument by himself, (for reasons that are not clear since he was able to move his arms a little), so it could be construed that when he was helped to play his cymbals he was particularly pleased and felt important at some level. This delight could have been transposed into an expressive sung note, and may have been a contributory factor to his VOCPNBEAT. The type of attention afforded by assisted beating is different from that which is given when the therapist addresses a child pianistically and in song. In both cases Mahmoud showed he was pleased.

11.7 Conclusion

Mahmoud presented as a sensitive, musical child. His visual impairment may have resulted in his feeling cut off when the therapist was not focusing on him, and the helper’s physical touch, as in the assisted beating during the Chime-Bar Song may have helped confirm relatedness between him and the external world including the therapist, when she sang to him. His frequent pitching in the tonality of what she was playing and singing showed awareness of her. In the right circumstances, he was more than able to interact musically.

It is erroneous to imagine that the song was solely responsible in some way for Mahmoud’s singing. It appeared to the therapist that Mahmoud was particularly wanting contact with her during this session and was at his most vocal during it for that reason. He vocalised during an earlier part of the session in such a way as to cause the therapist to break off with the child she was addressing and focus on Mahmoud instead.

The good-enough mother facilitates successful experiences for her infant. This is one of the ways in which his or her confidence is built up. In the episode that has been described here, it can be seen that the music therapist offered a generally passive child the opportunity to assert himself, have a sense of agency, take part in a musical event and connect strongly with another person, the therapist or ‘music mother’. 499

The writer concludes that Mahmoud’s VOCPNB‭‬EAT was the culmination of several conditions which met the criteria for a harmonious engagement: Mahmoud was being physically held, addressed by the therapist, helped to play an instrument and provided with familiar harmonic, melodic and rhythmic patterns in the therapist’s music. The plurality of factors which prompted Mahmoud’s e’ flat vocalisation is supported by Sigmund Freud’s theory of ‘Over-Determination’. Freud writes that

\[
\text{psychoanalysis…first discovered that psychical acts and structures are invariably overdetermined.} \, 500
\]

While the phrase ‘Over-Determination’ was used by Freud, its meaning is Multiple Determination since Freud was saying that people’s symptoms, dreams etc. have several determinants. 501

In the episode described above by the writer, it was a variety of factors which resulted in Mahmoud feeling sufficiently comfortable to assert himself in a musical way. This allowed him to share a musical moment with the therapist. With Mahmoud’s one e’ flat, sung on the downbeat, an instance of how music therapy can be an opportunity for the development of communication and self-expression was presented.


Chapter 12
Making Music with an Instrument

12.1 Introduction

This chapter looks at Rosanna’s use of her solo instrument, a pair of Chinese cymbals, focusing on one particular episode in which she played them in Session Eight, School B from 14:58.2 to 16:07.0, engaging with the therapist.

As in the previous chapter, a background is given to the episode followed by the writer’s comments on it and her conclusions. Then a description of the episode itself is given, followed by comments on this. Finally conclusions are drawn.

12.2 Background to Episode

From the start of Session Eight, Rosanna was alert and active, her foot and leg movements indicating pleasure according to those who knew her well. She frequently turned her head towards the piano, facing it for 45.7% of the period from 10:27.0 (the session onset) to 14:58.2, as compared with 26.2% throughout the session. She also beat almost twice as much during that period as during the session overall (9.5 beats per minute as compared with 4.7), beating her cymbals 43 times in an assertive and robust way, giving the impression that she had made them her own, and knew how to use them. She beat on her tray 33 times in this period, giving the impression that she had misjudged the position of her cymbals and had intended to beat them, but missed.

During this period, however, the therapist mainly addressed Darren and Joe, who were active too, and did not engage with Rosanna or sing her name. Although Rosanna gave the impression that she enjoyed playing her cymbals, the rate at which she beat them gradually decreased (see Figure 6, page 198).

While addressing Joe in a transitional passage starting at 14:24.0, the therapist modulated from G major to B-flat major via D7 and F7, pausing each chord, then sang and played a passage based on the Context Music (CX) from 14:33.0 to 14:57.2. Rosanna, who had stopped beating but whose arms had been moving for most of the time during the modulatory passage, stopped moving completely at 14:32.8 towards the end of the F7 paused chord in which Joe’s name was being sung by the therapist. Her
only movements during CJ (Joe’s theme) in the CX were four instantaneous and small head movements, which may have been posturally induced tremors, and two movements when she averted her head from the piano for three seconds then turned her head towards it once again. Apart from this latter behaviour, Rosanna kept her head facing the piano during CJ and CX until 14:56.9. Her body was turned towards the piano as well during this period.

12.3 Comments on Background

12.3.1 Beating the Tray

Prior to beating on her tray (D) Rosanna frequently nudged the cymbals with her elbow or forearm, making them move. This observation is supported by the very high $z$-score of 13.3 yielded by the co-occurrence analysis\(^502\) for the pair of observables D (beats on surface other than instrument) and SI (moves solo instrument) throughout the two sessions. This suggests Rosanna was in fact trying to beat her cymbals rather than the tray. The observable D occurred 245 times, occurring in time with the therapist’s music 65 times and on the downbeat 19 times. These figures, when added together with those for B (beats solo instrument) show that Rosanna beat twice as much as any other child, the second most active beater being Darren who was more able physically than Rosanna. They also suggest that Rosanna had a rhythmic sense, an observation which is reinforced by the downbeat analysis (see 16.4 Analysis of Observables on the Downbeat, page 247). This shows that she presents several observables, including B (beat) and SI (solo instrument), significantly more on the downbeat (see Table 10, page 252).

12.3.2 Beating the Cymbals

A diagram of Rosanna’s beating in the first seven minutes of Session Eight is given in Figure 6, page 198, together with three therapist observables, NAMER (therapist names Rosanna), ADDR (therapist addresses Rosanna) and GADDR (composite of ADDR, NAMER, MIRR, THBR, CR, IMCR and CHR). For full definitions of codes see Appendix D, page 307. Types of beating are classified as (1) ‘cymbal’ for

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\(^{502}\) For explanation, see Appendix section N.2 Co-Occurrence Analysis and Long-Term Sequential Analysis, page 478. This $z$-score does not appear in any tables of results, because these only include therapist-child relationships (such as S PAU / R A) and not child-self relationships (such as R D / R SI).
B, (beats solo instrument), (2) ‘other’ for D (beats on surface other than instrument or self), BT (beats tambourine), ! (beats against self), BB (beats non-solo instrument or beats against beater) and (3) ‘all’, a combination of types of beating (1) and (2). It is assumed all Rosanna’s beating was directed at her cymbals, but with only partial success (see 12.3.1 Beating the Tray). Beats are shown as individual marks and also as a graph of approximate rate of beating. Therapist’s observables are shown against time as grey blocks.

Rosanna’s total beating initially peaks at 11:30, then gradually tapers off, culminating in a silence of over 30 s. Rosanna resumes beating at about 15:00, almost immediately the therapist has begun addressing her. This suggests that she wanted the therapist’s attention, since she gradually reduced her rate of playing the cymbals and stopped for over 30 s when she did not get it. Similar patterns of beating exist in three other places in the session (see Figure 7, page 199), at 22:25, 35:00 and 42:00. In each of these incidences she has either stopped or reduced her rate of beating, and resumed it when the therapist has sung her name. Figure 7 shows Rosanna is primarily responding to being named. Her beating during the postlude of her Hello Turn at 22:54.0-23:36 in Session Eight is one of these instances (see Transcript 5, page 428). Figure 7 also shows that Rosanna has a higher peak rate in the first 12 min of the session which suggests she was fatigued in the second part of the session. It was found that Rosanna beat less when she was addressed. This suggests that having obtained the therapist’s attention she did not need to beat so much, and now used her cymbals as a means of engaging in dialogue with the therapist.

Another possible reason for Rosanna’s initial beating of her cymbals is that she found some enjoyment in the activity itself and it was not therapist-directed. In this sense it could have been a toy, and one with no communicative potential. However, given that her head was already turned towards the therapist at the beginning of the session, and thereafter her head was towards the piano 46% of the time, it was unlikely to be a toy. Also, importantly, as her playing of the cymbals varied a great deal in relation to what the therapist was doing they were unlikely to be a toy. If Rosanna’s beating had been

503 The long-term sequential analysis result for S ADDRR / R B (therapist addressing Rosanna / Rosannaa beating her cymbals) was a z-score of -2.14, on the borderline of significance, and consequently not listed in Table 26, page 471.
at a constant level through the session, this might have suggested the absence of any relationship.
Figure 6  Rosanna’s beating in early part of session 8, school B
Figure 7  Rosanna’s beating during entire session 8, school B
12.3.3 Rosanna’s Head Turned Towards the Piano

Rosanna kept her head turned towards the piano (HP) when still from 14:32.8 to 14:56.9, giving the impression she was concentrating on the therapist. Her body was turned towards the piano as well, emphasising her interest in the therapist. Unfortunately this observable has not been quantified but for the writer it emphasises the idea that Rosanna was keen to watch the therapist at this point, probably in order to be ready to communicate with her if the latter addressed her.

12.4 Conclusion

The background to the first interaction between Rosanna and the therapist suggests that Rosanna was using her cymbals to signal her presence to the therapist. Her rate of beating, twice as much in the first part of the session as in the session overall, suggests she was eager to make contact with the therapist and was open to engaging with her.

12.5 Description of Episode

The therapist, after ending her interaction with Joe with a tonic paused chord at 14:57.2, almost immediately began playing and singing Rosanna’s theme (CR) from 14:58.2 (see Transcript 6, page 432). During the pause Rosanna made one instantaneous arm movement, then as the therapist presented Rosanna’s theme (CR), simultaneously started moving her head. She did this before the therapist had actually sung her name or presented the second and third pitches of her tune.

Rosanna became more active as her theme proceeded. She notably responded when the therapist sang her name (NAMER), beating her cymbals after NAMER each time. She also responded with head movement as described later in 12.6.3 Rosanna’s Name, page 202. Almost simultaneously with the onset of the second NAMER at 15:10.2 she jiggled her leg, and tensed her body, then nudged her cymbals and beat on them in time with the third beat of the therapist’s bar. She presented as aware and enjoying herself. Indeed at 15:15.6 she smiled, the onset of her smile coinciding exactly with therapist’s downbeat.

The therapist came to the end of Rosanna’s theme (CR) but without pausing, and began an immediate repeat of it at 15:20.4. Rosanna, her arm already moving and her mouth
open, placed a beat on her cymbals 0.1 s before the therapist’s first downbeat at 15:21.0, to all intents and purposes in tempo. She went on to beat five times over the ensuing two bars, placing her beats on the wooden tray attached to her wheelchair without matching the therapist’s beats. The therapist continued with CR, elaborating the fourth whole bar onwards with arpeggios in the left hand, and playing and singing CR loudly. She then suddenly broke off and, after quietly singing Rosanna’s surname, she paused. Shortly after this, at 15:34.4, Rosanna beat her cymbals. It was a reflective and more intimate moment for the therapist, one in which she sang more directly to Rosanna than before, and one in which she had begun improvising on Rosanna’s theme (CR).

The therapist paused again for three seconds on ‘he-’. Rosanna gave the impression of being aware that she could use the pause at as an opportunity to gather herself for beating her cymbals at 15:41.9. Since the therapist accompanied her beat vocally and pianistically with the second syllable of the word ‘hello’, it was as though the significance of Rosanna’s beat was to complete the word. However it felt to the therapist that this indeed was what Rosanna did: she beat in lieu of saying ‘-llo’.

Rosanna’s body tensed immediately after this. She beat again on the downbeat and smiled, once more tensing her body then resting as though she could not think what else she could do apart from once more beating after her name had been sung, which she did. From 15:53.0 until the end of the IMCR (improvisation on Rosanna’s theme) at 16:07.0 Rosanna was mostly still, the therapist played a formal ending to an intense and focused interaction. The IMCR here matched the creative aspect of Rosanna, which was largely responsible for it.

12.6 Comments on Episode

12.6.1 Rosanna’s Use of the Cymbals

Rosanna opened her mouth 39 times in Session Eight, yet did not make a sound. This supports the idea that Rosanna invested communicative significance in her cymbals as she needed a sonic medium through which to make herself heard. On the two occasions she vocalised in Session Twenty-three, her vocalisations were unpitched exclamatory cries. Her use of the cymbals was more controlled. For example she beat her cymbals on the downbeat of the therapist’s music 24 times in Session Eight, 14
in Session Twenty-five, a considerable feat for a child with spastic quadriplegia and severe and multiple disabilities.

12.6.2 Rosanna’s Open Mouth

Rosanna’s open mouth may have denoted a high level of concentration and excitement, and may have been a window on her effort to beat, and to place a beat or movement at a structural point in the music. In the co-occurrence analysis (see Appendix N.2 Co-Occurrence Analysis and Long-Term Sequential Analysis, page 478) the observables SI (moves solo instrument) and MO (open mouth) have a strong tendency to occur together, with a $z$-score of 3.2. This suggests Rosanna was making an effort to beat, MO indicating effort and concentration. It appears that MO is associated with physical effort which Rosanna almost always made when she was beating her cymbals, or playing the Hello Tambourine. Since it was difficult for her to play a musical instrument because of her disabilities, it follows that she was highly motivated when she did. MO reflects this.

12.6.3 Rosanna’s Name

Rosanna seemed aware of the therapist’s music, aroused by it and keen to join in with it. As shown in Figure 6, Rosanna responded to her name being sung by the therapist. This ties in with the fact that Rosanna moved her head (H) significantly more than normal during lagged periods when she was being named (NAMER). The lag was by 0.5 s and the resulting $z$-score was 2.43.\textsuperscript{504} Rosanna’s head movement denoted she was activated.

Since Rosanna’s name was spoken by the teachers at school and her family when at home, it is interesting to consider why Rosanna should have been excited when the therapist addressed her and called her name.\textsuperscript{505} It is possible that Rosanna was better equipped to respond now that she had a musical instrument with which to make sounds, and that she looked forward to using them in an interaction with the therapist on an

\textsuperscript{504} In the long-term sequential analysis (using a lag of 2 seconds) the result for S ADDR / R H was $z = 2.17$, a value too low to be listed in Table 26, page 471. However, at a lag of 0.5 s, this improved result of $z = 2.43$ occurred, reflecting a fast response.

\textsuperscript{505} Sandra E. Trehub found that infants were ‘more attentive to maternal singing than to maternal speech’ which helps explain the effect of the therapist’s singing. ‘Musical Predispositions in Infancy’, \textit{Annals of the New York Academy of Sciences}, 30, 2001, p. 1.
individual basis. This idea is supported by her determined and lengthy tambourine improvisations in the Hello Song after assisted beating (see Transcript 5).

12.6.4 Pauses and Silences

The long-term sequential analysis showed a strong relationship, indicated by a $z$-score of 3.45, between the therapist’s pausing (PAU) and Rosanna moving her arms (A) (see Table 26 Long term sequential analysis results, starting on page 471 in Appendix M). This suggests that these pauses signalled an opportunity for engagement with the therapist or that some new event was about to occur. Rosanna’s arm movement during the pause may have indicated that she was preparing to play her cymbals in the hope that the therapist would address her.

12.7 Conclusion

Rosanna used her solo instrument, the cymbals, in lieu of language or song to announce her presence and attract attention, then to engage in musical dialogue with the therapist. The therapist’s failure to respond caused a lull in her beating but she resumed this when the therapist addressed her by singing Rosanna’s name.

Rosanna was eager to make contact with the therapist, her actions indicating that the therapist was an important figure with whom she wanted to be in a relationship. The therapist, by singing Rosanna’s name and playing her theme, showed that Rosanna was important to her too, wanted to offer her a space in which she could assert herself and would take her output seriously. In this way the therapist resembled the facilitating good-enough mother with her infant. This aspect could also be seen in Rosanna’s theme with its leaning notes, anticipation and glissandi which was similar to the coaxing and encouraging of maternal singing. By joining in with the therapist’s music Rosanna could share the therapist’s language and experience herself in a meaningful relationship in which she took an active part.
Chapter 13
Barnaby’s Imitative Behaviour

13.1 Introduction

This chapter examines the imitative behaviour of Barnaby from School A, focusing on his near-complete imitation of the therapist’s word ‘played’, at 32:35.5 to 32:37.5 in Session 23, after which Barnaby said ‘play’. This was a rare event, one of three instances of VWMIRR (word or sound mirroring therapist’s syllable) which occurred over the four sessions, and the only one from Barnaby. It was also unique since no other child spoke or sang a complete word at any time during the sessions.

The structure of the analysis is the same as that used in the two preceding chapters. A background to the episode is given, and is followed by the writer’s comments and conclusions. The episode is then described in detail, comments on the episode are made and, finally, conclusions are drawn.

13.2 Background to Episode

Barnaby (as described in 10.2 Background to Episode, page 176), was the most extrovert of all the children. He was also often unfocused, frequently turning his head in different positions and moving his arms and legs in all directions. Despite this, 26% of his vocal output (in terms of time) was pitched in the therapist’s tonality, as compared with the average of 17% over all eight children, and he often shadowed and/or extended the therapist’s vocal melodic line. Examples of this are given at the beginning and end of Transcript 7 Barnaby A08 13:44, page 437.

Barnaby was affectionate and twice physically touched the therapist when she was nearby, holding her arms and leaning his head on her, something he did with the helper too. In hindsight the therapist felt she had not sufficiently responded to his vocalisations, and because of this given him insufficient attention. Her concern had been that Barnaby might dominate the group and she would not have been able to attend to the other children, whose responses were much slower.

In Session Eight he was given a beater and a tambourine held by a snare-drum stand, referred to as his drum. Since Barnaby did not use the beater for beating his drum but,
instead, for oral stimulation, erratically tapping it while it was in his mouth by beating upwards with his fist, the therapist did not give it to him in Session Twenty-three, hoping he might be encouraged to beat his drum, and be less distracted.

Barnaby often reached out physically to people and objects, pulling them, fingering them, rocking them and stroking them. He interfered with another child 9 times in Session Eight and 13 times in Session Twenty-three. For example, when he sat next to Christopher in Session Eight, he touched and fingered the latter’s chair at 17:12.0 while the therapist was addressing Aaron and improvising on Aaron’s theme (IMCA). At 21:59.0, when the therapist had been addressing Christopher and had briefly presented Barnaby’s theme on the piano in response to a vocalisation he had made, Barnaby touched Christopher’s face, obliging the therapist and helper to move his chair out of reach of Christopher.506 In Session Twenty-three, when sitting next to Aaron, he seized Aaron’s cymbals at 29:9.5 (Transcript 13, page 453), while the therapist was addressing Nihal during the postlude of her Hello Song turn, singing and playing, on the piano, a variation of Nihal’s theme (CN). This caused the therapist to leave the piano almost immediately and approach Barnaby in order to restore the cymbals to their rightful owner, the helper being unavailable at that moment. As she disentangled the instrument, Barnaby held her arm, turned his head towards her and smiled for several seconds. He laughed as she exclaimed: ‘Barnaby has got Aaron’s cymbal…ooh my goodness that is very naughty’. She was not able to resume addressing Nihal until 30:5.2. At 31:11, Barnaby grabbed the Hello Tambourine the helper was bringing for Aaron. This time the helper firmly took hold of Barnaby’s arm, held it at a distance and did not look at him.

Barnaby did not reach out to the helper or interfere with the other children during his Hello Turns. He smiled almost continuously during the assisted beating (AB), and this clearly showed he felt happy, but he appeared disinterested in the rhythmic aspect of AB despite having good mobility in his arms and hands. The evidence for this is that he rarely watched the trajectory of his hands when beating, watching the helper or looking at the ceiling instead, and he did not display many anticipatory facial expressions before the downbeat. During the postlude of his Hello Turn in Session

506 It should be noted that there were no codes for a child touching or interfering with another child. This information was recorded in writing on the transcription.
Eight he resumed beating his beater, using his fist in erratic upward movements as he usually did. Near the close of the postlude, he stopped agitating the beater, removed it from his mouth and made seven vocalisations, four of which were VOCP (pitched vocalisation which forms a unison or an interval of some number of octaves with a note sung or played by the therapist in the current or preceding bar) and one of which was a VOC (pitched vocalisation which is a note of the home scale of the current or most recent key). In the postlude of his Hello Turn in Session Twenty-three, Barnaby held the Hello Tambourine throughout and presented laughter rather than singing.

13.3 Comments on Background

13.3.1 Singing in the Therapist’s Tonality

As was discussed in Chapter 10, Barnaby had a creative musical ability to sing in the therapist’s tonality. His imitating her vocally, extending or elaborating her melodic line showed that he was aware of her and suggested he had a desire to connect with her. This is supported by the fact that there is a strong relationship between ADDRB (therapist addresses Barnaby) and each of LAU (Barnaby laughs) and SM (Barnaby smiles). The z-scores are 2.78 and 3.42 respectively showing that Barnaby was pleased to have her attention.

13.3.2 Interfering with Another Child

The instances when Barnaby interfered with another child suggest two separate issues. The first of these is that Barnaby wanted the therapist’s attention. Each time the therapist was addressing another child he managed to disrupt the interaction, and gain her attention for himself.

The second issue is that Barnaby may have wanted the therapist’s physical proximity. In two of the cases when the therapist was addressing another child and was interrupted by Barnaby, she was obliged to leave the piano, (and the child with whom she was interacting), and go up to Barnaby. He touched her arm on these occasions, and rested his head on her body, presenting as an affectionate child who enjoyed tactile communication.
13.3.3 Barnaby’s Hello Turn

It is clear that Barnaby enjoyed his Hello Turns in Session Eight and Session Twenty-three, but his apparent failure to register any of the rhythmic qualities therein give the impression that it was the tactile aspect of the Hello Turn that he enjoyed the most, together with the attention of both therapist and helper.

13.3.5 Touching the Helper

The fact that Barnaby touched the helper and the Hello Tambourine she was carrying at 31:11.7 before Aaron’s Hello Turn might have suggested that he wanted the Hello Turn for himself, an event he enjoyed. This could have meant that he wanted help to play the tambourine, wanted the attention that went with the Hello Turn or wanted both. Since Barnaby did not beat his own drum or the Hello Tambourine by himself, he may well have wanted assisted beating despite showing little if any rhythmic proclivity. However, since he held and played with his drum and the Hello Tambourine and never beat on them, he may have understood the Hello Turn as a chance for an extended period of attention, physical proximity and its concomitant pleasure.

Common to all these possibilities is the idea that Barnaby wanted attention and chose to touch the helper at the outset of the Hello Song to communicate this. In short, the helper was attending to another child when Barnaby wanted her to attend to him.

13.4 Conclusion

The background to the episode shows that Barnaby was creative, musical and had a strong imitative vocal ability. His capacity to engage with the therapist’s music was at times compromised by his oral fixation and his lack of rhythm, but his strong tonal sense helped him interact with her in a focused way. Despite being able to sing, Barnaby presented in a disorganised way and gave the impression of being fragmented within himself. There was thus a contrast between his developmental state and his ‘music child’ within, which was at least tonally was assured.

13.5 Description of Episode

It was Aaron’s turn in the Hello Song (HS) at 31:29.2 and the helper was standing by Aaron, moving his hand over the skin of the tambourine. The therapist played a sub-
dominant pedal on the piano as an introduction to the HS, ending on the upbeat of the HS, an A7 chord at 31:45.7. Barnaby reached out and touched the helper just before the first downbeat of the song. She smiled but did not try to restrain him. As if realising he was interrupting Aaron, he removed his arm but a few moments later at, 31:56.7, touched the helper again. Finally Barnaby was self-contained and turned his head turned away from both the helper and the therapist.

During the HS he presented a variety of facial expressions and head and body positions, having his head cocked on one side as though listening to the HS, then shaking his head rapidly, and moving his legs. Eventually he kept a contemplative look on his face, his eyebrows in a slight frown, his facial muscles relaxed and his mouth slightly pursed. During the postlude (see Transcript 8, page 440) the therapist first played the piano without singing, presenting four bars of Aaron’s theme (CA). As she introduced her voice and sang ‘Aaron played Hello’ continuing the music of CA, Barnaby began vocalising softly, almost inaudibly. One bar later, during a pause, Barnaby said ‘play’, then cocked his head on one side again so that his ear was aimed at the therapist’s music. The therapist vocally mirrored his word ‘play’ (see Transcript 8, page 440). Barnaby remained still until 32:51.0, the angle of his head giving the impression he was listening intently to the therapist. At 32:56.2 Barnaby made six rapid unpitched vocalisations which the therapist mirrored over the next two bars, trying to incorporate Barnaby’s output while maintain a thread of music for Aaron. Shortly after this the therapist brought the music to a close.

13.6 Comments on Episode

13.6.1 Barnaby’s Vocalisation ‘Play’

Barnaby was comparatively still and quiet during Aaron’s Hello Turn. The angle at which he cocked his head strongly suggested he was listening intently to the therapist’s music and the words she was singing. Barnaby did not have expressive language so that his VWMIRR (word or sound that is the same or similar to that sung by the therapist) was ambiguous. One could not tell whether he had suddenly acquired a degree of linguistic skill or if he was imitating the sound without it having any semantic content for him. Either way, VWMIRR appeared to be important: the word ‘play’ is
difficult to pronounce, requiring a degree of effort and motivation on the part of Barnaby.

13.6.2 The Meaning of ‘Play’

The attempts of Barnaby to disrupt the music therapy sessions suggest that one of the things he wanted most was attention. As the therapist was a giver of attention, Barnaby probably took her very seriously, and her output, by the same token, would have been important to him. He may, therefore have associated the word ‘play’ with the therapist giving attention to Aaron, and by imitating it he may have been trying to absorb the quality of this attention for himself.

13.7 Conclusion

It cannot be proved what meaning, if any, Barnaby invested in the word ‘play’. He may have used it to indicate that he wanted Assisted Beating, he may have been reflecting on another child’s activity or he may have been imitating the therapist’s sound in the same way as he imitated her musical notes. What is important though is that he was receptive to the therapist, and regarded her as significant. Imitating a difficult word she sung, Barnaby, who had no expressive language, indicated impressively the extent to which children can take notice of therapists, and how children have the capacity to respond and interact with them. With this in mind the potential of music therapy can once again be seen.
Chapter 14
Christopher’s Smile

14.1 Introduction

This chapter considers the smile of Christopher, looking in particular at one smile that was a change event and occurred at 28:48.1 in Session Twenty-three at School A.

The writer thought Christopher’s smile important since it was radiant, and contrasted with the serious facial expression that he usually presented, thus indicating a pronounced inner shift. It was also a behaviour that showed he was feeling happy, and compared to his other behaviours was presented for long periods of time.

A background to the episode is given first in the form of a description of two incidents in which Christopher smiled. This is followed by comments and a conclusion. The episode is then described, and is set in the context of the Hello Section in which it occurs. Possible reasons for it are discussed and, finally, conclusions drawn.

14.2 Background to Episode

When Christopher smiled, he presented enormous smiles, and his face lit up with pleasure. At times he looked ecstatic. Overall he smiled 30 times, 21 times in Session Eight and 9 times in Session Twenty-three. This contrasted with the combined total number of 3 times Aaron and Nihal smiled, and also with that of Barnaby, who smiled 309 times. However there was a difference between the smiles of Christopher and Barnaby. The former’s smiles usually gave the impression of being context-appropriate in some way and lingered, whereas those of Barnaby were often transient, so that his face was repeatedly full of smiles but then looked serious within a short space of time. This often gave the impression that his smiles were due to an intra-psychic process rather than an external stimulus, although there were occasions when this was not the case.

The smile in the episode under discussion lasted 23.3 s but there were three other episodes in which the duration of his smiles were of a similar length. One of these, in Session Eight School A when the onset of his smile was at 18:24.1, lasted 27:3 s and was significant (see Transcript 9, page 443). It occurred when Christopher managed to
move his solo instrument (SI), a pair of Chinese cymbals, by himself. Whether or not this was intentional was not clear. What is significant is that almost immediately he began smiling, and looked triumphant. In response the therapist played a romping piano improvisation on his theme (IMCC), taking it from its leisurely 4/4 tempo to a brisk 2/4, thereby attuning to Christopher’s excited and happy mood (see Transcript 9, page 443, 18:36 to 18:59).

Prior to this episode the therapist had assisted Christopher to beat once on his cymbals (in Session Eight, School A at 17:59.5; this is not transcribed). He moved his arms after this and in so doing, without seemingly being aware moved his cymbals. The therapist had then sung to the group of children how Christopher had ‘played hello’. He had smiled after this for 6.7 s. His second smile, however, was 20.6 s longer, probably reflecting the fact that his action this time had greater significance for him and he had been aware of moving his cymbals.

In another episode later on in Session Eight, Christopher smiled again (see Transcript 10, page 448). The therapist had been singing ‘Let’s Play Listening’, one of her repertoire songs, and playing it on the piano. She had varied her accompaniment by playing it in the treble. At 35:25.9, she made a cadence as if to finish, but presented the theme from its opening bars in the very next bar, this time without singing and with the accompaniment in the bass, making the melody stand out more clearly. Christopher, who had been silent since the beginning of the song, made an unpitched vocalisation (VOCU) ‘uh’ at 35:31.5 as she started the song again, and began smiling at 35:32.6, 0.1 s after the therapist’s downbeat of the second bar. His smile lasted for 24.9 s.

These episodes show Christopher responding actively. He also responded when the therapist sang or spoke his name. The long-term sequential analysis showed that there was a strong relationship between the therapist naming Christopher (NAMEC) and Christopher moving his arms (A), with a z-score of 3.41. Christopher was also active when leaning forward out his chair and turning his head round but this has not been quantified.
14.3 Comments on Background

14.3.1 Moving his Cymbals

Christopher smiled after his assisted beating on the cymbals when the therapist told the group that ‘Christopher has played Hello’(in Session Eight, School A at 18:04.5). This suggests that he was pleased to have done something and to have had his name sung. Being named in his own theme (CC) was less important. Usually he was passive during CC while in this instance Christopher was physically involved in beating his cymbals, even though it was assisted, and this made a difference.

Following on from this, it is likely that Christopher must have been more pleased when he moved his cymbals by himself (in Session Eight, School A at 18:23 ). His facial expression of triumph was clearly caused by the pleasure of operating his cymbals independently because he smiled almost instantly, 0.9 s after moving his cymbals. The interpretation must be that he was delighted by his action, and by the therapist’s recognition of it. Her acknowledgement of it being important to Christopher is supported by the fact that his smile ceased once the therapist turned her attention to another child, and began singing their name.

Part of a mother’s task is to reflect back to their own infant how she sees them. In this way the child’s feeling of self is reinforced and a gradual sense of their own identity is built up. The therapist’s acknowledgement of the fact that Christopher had moved his cymbals and was pleased as a result, was similar to this aspect of the mother-infant relationship. The quality of the therapist’s music here provides an example of affect attunement.

14.3.2 Let’s Play Listening

The writer sees a connection between Christopher’s ‘uh’ vocalisation and subsequent smile (see Transcript 10, page 448), and the therapist’s apparent ending of the song, then resumption of it. The song, in its new version, had a musical texture in which the melody was more prominent than before and, because of this, it is likely that Christopher finally recognised it. This is supported by the fact that there is a negative relationship between the therapist improvising (IM) and Christopher smiling (SM), with a z-score of -2.07, indicating a borderline significance. The evidence is that
Christopher does not smile and therefore does not like the therapist improvising (IM) but is curious about her improvising on his theme (IMCC). The long-term sequential analysis showed that there was a strong relationship, indicated by a z-score of 2.46, between the therapist improvising on Christopher’s theme (IMCC) and his turning his head towards the therapist (HTH). In the therapist’s opinion, Christopher was curious when she moved away from simply constructed tonal music, and played more elaborate or unfamiliar material.

14.4 Conclusion

Despite having severe physical disabilities Christopher was able to register his feelings in different ways, both enjoyment and apparent curiosity, and was aware and interested in his environment. His capacity to present a mood of elation by ecstatic smiling was striking and his happiness at moving his cymbals by himself suggested he wanted to assert himself.

14.5 Description of Episode

The main smile of Christopher under consideration occurred in Session Twenty-three, School A at 28:48.1 (see Transcript 13, page 453) during Nihal’s turn in the Hello Song (HS). The HS began at 28:26.0, and like each HS, was in D major. It was preceded by Hello Songs which were first addressed to everyone with the therapist sitting in front of the children away from the piano (beginning at 22:48.8), then to Barnaby (at 24:00.5) and then to Christopher himself (at 26:14.4). Christopher made several vocalisations during the songs. The first one, which occurred a few seconds before the onset of the first HS, was a single unpitched vocalisation (VOCU) and came at the end of a cadential paused chord. The second, at the end of the first HS which the therapist had sung unaccompanied, was an approximately pitched e´ (VOCPX),507 the supertonic of D major, and it was followed by a two-second downward glissando. The therapist responded vocally to Christopher with pitches b, a and g, (see Transcript 11, page 450) which made her voice deep and slightly unusual, but empathetic with the quality of Christopher’s vocalisation. Barnaby gazed into her face as she sang (at 23:31.7). Christopher responded with an approximately pitched a´ (VOCPX) at 23:44.2 echoing the therapist’s a´ and following the VOCPX with a another downward

507 See Table 14 on page 307 for full description of VOCPX.
glissando. During the first Hello Song Christopher was motionless but suddenly started moving his arms on the upbeat of the second bar of the Barnaby’s HS turn. A few moments later he moved his head and feet as well, on another upbeat, this time on the last beat of the third bar (at 24:10.0). This was interesting since with the exception of Barnaby, all the children moved their heads at the identical moment, Nihal moving her feet as well, and both Aaron and Nihal made those movements having been still beforehand. Christopher continued to move his arms until the end of the HS, and his mouth was open all the time.

During the improvisatory postlude to Barnaby’s Hello Song (HS) when the therapist was again seated at the piano, Christopher looked at her as she was mirroring Barnaby’s vocalisations. He then presented two unpitched vocalisations himself. The second one consisted of Christopher loudly exclaiming ‘nnyeah’, and followed the therapist singing ‘dududu’, a completely new sound. His head was turned towards the therapist during ‘nnyeah’ which the therapist answered with a ‘yeah’ as though he had asked a question. He then became passive once more.

The Hello Song turn of Barnaby came to a conclusion with a paused D major cadence (at 25:39.5). Christopher, within a second, vocalised e’ then b, smiling as he did so (see Transcript 12 on page 451). He then approximately pitched an f”# and smiled again. The therapist asked the redundant question ‘Who’s going to play Hello next ?’. The second time she asked this Christopher made an unpitched vocalisation.

Christopher was silent during his own turn, and after it had ended he was motionless. He did not begin to move until the first bar of Nihal’s Hello Song (HS) turn, which was next (see Transcript 13, page 453). The HS was played an octave higher than usual on the piano during this.

It can be seen that his first stirrings in Nihal’s Hello Song (HS) were expressed through arm movements at the beginning of the HS. Then, in the third bar, (bar 4 in transcript) he began vocalising loudly, starting with an unpitched vocalisation on the upbeat with the sound ‘whoa’. This continued as he sang three loud, approximately pitched notes beginning at 28:41.0. Each note had a strong relationship with those the therapist was playing and singing, the approximate d’’ and b’ fitting in with the E minor 7 harmony, and the a’ matching the A major harmony on the third beat of the bar. These were
each classified by the writer as VOCPXN (an approximately pitched note which forms a unison or an interval of some number of octaves with one of the therapist’s vocal or instrumental notes which are concurrent with it or immediately precede it, with or without an intervening silence). This struck the therapist as being an unusual occurrence.

At the end of the fifth bar, (bar 6 in Transcript 13) Christopher started smiling, a smile which lasted for 23.3 s. During the sixth bar, while he was smiling, he made an unpitched vocalisation ‘uh’ which lasted 9.6 s. This gave the impression of pleasure as did his smile t at 29:25.4 when the therapist said Barnaby was ‘naughty’. This incident was mentioned in section 13.2 Background to Episode, page 204.

14.6 Comments on Episode

14.6.1 Christopher’s Possible Enjoyment of the Hello Song

It has been shown that Christopher’s singing prior to his smile was probably not a chance occurrence. The question then must be asked what prompted Christopher to sing the sequence of approximately pitched notes, and did he sing because he was enjoying himself?

The facts show that Christopher was alert during the Hello Songs in Session Eight and in Session Twenty-three. His head was towards the therapist at times, he watched events around him, and he vocalised on 26 occasions. It is also clear that he was activated during the Hello Song turn since the rate and duration of his movements increased after it. During the two-minute period from 29:00 the proportion of time that he moved his arms (A) was almost three times that for the session, and the proportion of time that he moved his head (H) was three times that for the session.

In short one could speculate that he was familiar with the song, enjoyed it, and once free from the constraints of assisted beating he wanted to sing it. It is possible that he was pleased to have been helped to beat as well as having been the focus of attention during his turn. Part of this pleasure may have been aired when he sang, and his ensuing smile was another way of expressing it. He may, of course, have been smiling because he was pleased with himself for singing along with the therapist. However,
while it is clear that Christopher became more active during the Hello Song, it is not certain that he enjoyed it.

14.6.2 Clarity of Therapist’s Music

Although Christopher sang in the Hello Song and appeared pleased when he did so, the long-term sequential analysis only yielded one significant relationship involving Christopher’s pitched vocalisations (VOCP, VOCPX, etc.). This indicated that the therapist addressing Aaron (ADDRA) was strongly related, with a z-score of 3.51, to Christopher’s pitched vocalisation which formed a triadic relationship with the therapist’s last notes (VOCPNT). Christopher only presented VOCPNT twice in Session Eight of School A at 17:27.2 to 17:27.4 and 17:27.4 to 17:28.3, and not at all in Session Twenty-three. The therapist, at the piano, sang and played Aaron’s theme in G major from 16:55.4 (in Session Eight), then improvised on it, using notes sparingly. For example at 17:25 she sang three pitch classes without accompaniment, and sustained the last note of the phrase, c’, for about 5 s. Christopher vocalised g’ then e’ while she sustained the c’. Here is an example of the music being uncluttered and accessible. It is these qualities in the music to which Christopher appeared to respond.

14.6.3 Smiling/Singing During Assisted Beating

The writer thinks that Christopher could not vocalise or smile during his own Hello Song turn because the physical effort required in assisted beating on the tambourine was too demanding. Additionally he may have been concentrating on the experience of beating which occurred during the song. In the postlude, the tambourine was made accessible but no further interventions were made.

In Session Eight, when he was helped to beat his cymbals instead of the Hello Tambourine during his HS turn, an unusual departure, he only moved a little during the song, but during the postlude he moved his head, arms and feet much more. During the postlude from 26:34.2 to 27:34.0 the proportion of time that he moved his arms (A) was three times that for the session, and the proportion of time that he moved his head (H) was seven times that for the session.

In Session Twenty-three he did not vocalise, smile and barely moved of his own accord during the song, but again moved his head, legs and arms afterwards during the
postlude, something he often did when reacting to a stimulus. During the postlude of his Hello Turn from 26:39.2 to 27:52.6 his arms were not visible, except for three seconds, but the proportion of time that he moved his head (H) was seven times that for the session. The first movements were of his head, feet and arms and they occurred simultaneously at 0.1 s before the therapist’s third downbeat in the postlude suggesting that he had a feel for the music she directed to him.

14.6.4 Christopher Enjoyed Vocalising

The short-term sequential analysis showed that there was a fairly strong relationship, indicated by a z-score of 2.30, between Christopher’s unpitched vocalising (VOCU) and his smiling (SM). This suggests he enjoyed vocalising and Christopher’s smile might well have been related to having sung pitched notes, of which he sang 32 out of 91 vocalisations over the two sessions. However, the delay between VOCPX and SM, circa 5 s, was too great for a relationship to be yielded by the short or long-term sequential analysis so this explanation cannot be proved.

14.6.5 Christopher was Pleased to Assert Himself

It has been suggested that Christopher was pleased to have asserted himself when he moved his cymbals by himself. By the same token, Christopher may have felt that by singing along with the Hello Song, he was also asserting himself in that he was ‘saying hello’ to the therapist, and this may have pleased him. She in turn may have been perceived as ‘saying hello’ to him, or so he might have thought as she repeated the word ‘hello’ to Nihal, and this too may have pleased him. There is, however, no evidence to support any of these hypotheses.

14.7 Conclusion

Christopher’s smile, which occurred during Nihal’s Hello Turn, must be considered important rather than significant, as the writer was not sure what it signified other than Christopher was feeling happy.

This limited understanding of a child’s smile reflects a state of affairs that often occurs in music therapy. The therapist does not always know the reason for a child’s feelings and has to tolerate not knowing until a path is found to a better understanding.
Chapter 15
Teachers’ Ratings

15.1 Introduction

This chapter presents, analyses and discusses the teachers’ ratings. The ratings were made by the same teachers every week and were on a scale of 1-10 where 1 was poor and 10 was very good. They indicated the teachers’ view of the children’s physical, emotional and vocal states during the week generally, before music therapy and after music therapy (see 7.6 Rating Scales, page 149). The idea was to find out if the children got something out of the sessions without being biased by the feelings of the therapist. The teacher’s views were sought as it was not possible to question the children. The ratings were also a way of getting information about short-lasting bursts of happy or other types of moods and states of the children immediately after the session.

The aim of analysing the ratings was to obtain a measure of the extent to which the children had changed, if at all, and to estimate how much weight or significance can be attached to this figure. The significance is high if the probability of getting these results by chance is small.

15.2 Changes in Ratings across each Session

An initial investigation was made to examine changes of each child’s physical, emotional and vocal states that might be attributable to the music therapy sessions. For each child, for each Session and for each attribute (physical, emotional and vocal), an amount of change was calculated by taking the after session figure and subtracting the before session score. These are shown under Changes P, E, V in Table 17 onwards, page 458 of Appendix K. An initial picture of these changes was obtained by plotting 24 histograms. These show the distribution of the changes in each of the three attributes of each child, and are shown in Figure 8.
Figure 8  Distribution of changes in physical, emotional and vocal ratings (P, E, V) for each child
Fourteen of the histograms peaked at one, 7 at zero, 2 peaked equally at zero and one, and 1 peaked at minus one. This indicated that in the majority of cases there was a small improvement, but only by one unit. For School A (the first four children in Figure 8) the majority of the changes had the value zero, whereas for School B the majority was at plus one.

15.3 Mean and Standard Deviation of Change Scores

To further examine the change scores, the mean ($\mu$) and standard deviation ($\sigma$) were tabulated for each attribute of each child, (see Table 6).

<table>
<thead>
<tr>
<th>School A</th>
<th>P</th>
<th>E</th>
<th>V</th>
<th>School B</th>
<th>P</th>
<th>E</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaron</td>
<td>$\mu$</td>
<td>-0.05</td>
<td>0.15</td>
<td>0.05</td>
<td>Darren</td>
<td>$\mu$</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>$\sigma$</td>
<td>1.39</td>
<td>1.24</td>
<td>0.22</td>
<td></td>
<td>$\sigma$</td>
<td>1.17</td>
</tr>
<tr>
<td>Nihal</td>
<td>$\mu$</td>
<td>0.42</td>
<td>0.56</td>
<td>0.11</td>
<td>Rosanna</td>
<td>$\mu$</td>
<td>0.81*</td>
</tr>
<tr>
<td></td>
<td>$\sigma$</td>
<td>1.23</td>
<td>1.17</td>
<td>0.87</td>
<td></td>
<td>$\sigma$</td>
<td>0.85</td>
</tr>
<tr>
<td>Christopher</td>
<td>$\mu$</td>
<td>0.13</td>
<td>-0.13</td>
<td>-0.35</td>
<td>Joe</td>
<td>$\mu$</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>$\sigma$</td>
<td>1.26</td>
<td>1.42</td>
<td>1.17</td>
<td></td>
<td>$\sigma$</td>
<td>1.46</td>
</tr>
<tr>
<td>Barnaby</td>
<td>$\mu$</td>
<td>0.13</td>
<td>0.52</td>
<td>-0.67</td>
<td>Mahmoud</td>
<td>$\mu$</td>
<td>1.09*</td>
</tr>
<tr>
<td></td>
<td>$\sigma$</td>
<td>1.48</td>
<td>1.56</td>
<td>1.39</td>
<td></td>
<td>$\sigma$</td>
<td>0.78</td>
</tr>
</tbody>
</table>

In the cases where the mean ($\mu$) is positive, if the standard deviation ($\sigma$) is of a similar magnitude to the mean, or better still less than the mean, then the major part of the distribution of the amounts of change lies above zero (such entries are marked with an asterisk in the table). There are four such cases, all in School B, and they apply to three children.

15.4 Student’s $t$-Test

This test is more sophisticated than those above and is applied here to give a number that measures the ‘quality’ of the results. It takes into account the amount of variation in a data set and gives a measure of the extent to which the mean is significantly greater than zero.

The aim was to discover, for each child and each rating category, whether music therapy made a difference. In accordance with usual statistical procedure a null
hypothesis was considered and an attempt made to show that it was false, or likely to be so. Where \( t \) is greater than 1.72 the table is marked with an asterisk.

### Table 7  \( t \)-test for physical, emotional and vocal changes

<table>
<thead>
<tr>
<th>School A</th>
<th>P</th>
<th>E</th>
<th>V</th>
<th>School B</th>
<th>P</th>
<th>E</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaron</td>
<td>-0.16</td>
<td>0.53</td>
<td>1.00</td>
<td>Darren</td>
<td>2.95*</td>
<td>3.56*</td>
<td>0.74</td>
</tr>
<tr>
<td>Nihal</td>
<td>1.46</td>
<td>1.97*</td>
<td>0.52</td>
<td>Rosanna</td>
<td>4.25*</td>
<td>3.22*</td>
<td>1.61</td>
</tr>
<tr>
<td>Christopher</td>
<td>0.48</td>
<td>-0.43</td>
<td>-1.40</td>
<td>Joe</td>
<td>1.47</td>
<td>0.40</td>
<td>-1.26</td>
</tr>
<tr>
<td>Barnaby</td>
<td>0.41</td>
<td>1.57</td>
<td>-2.14</td>
<td>Mahmoud</td>
<td>6.58*</td>
<td>4.86*</td>
<td>1.36</td>
</tr>
</tbody>
</table>

Note: the \( t \)-values that have been marked with ‘*’ denote a significant increases in the rated attribute \((p < 0.05)\).

In School A, Nihal shows an emotional increase and in School B Darren, Rosanna and Mahmoud all show both physical and emotional increases. It is notable that the \( t \)-value for Barnaby’s vocal change is -2.14. This is significantly negative, being less than the corresponding negative critical value of -1.72, indicating a significant vocal decrease. There are no vocal increases.

The \( t \)-test agrees with all the significant changes that were discovered by examining the mean values in the preceding section, but additionally reveals three significant improvements and one significant negative change.

#### 15.5 Discussion

The above figures show a marked difference between the ratings in the two schools. In School A there is one significant increase for Nihal on the E (emotional) scale only, and one significant decrease for Barnaby on the V (vocal) scale only. In School B, however, three children, Darren, Rosanna and Mahmoud all show significant increases on both P (physical) and E (emotional) scales.

This might suggest that the children in School B were affected more positively by music therapy than those in School A, at least according to the views of the respective raters. The perceptions of the raters and the way they interpreted the rating scale may of course have been different. Both teachers were enthusiastic about the effect of music therapy, yet paradoxically the teacher in School A gave low scores. Overall the children in School A were less able than those in School B, and this may have also
affected the ratings. Possibly the rating scheme itself was not sufficiently subtle so teachers could not use it to rate change.

Barnaby was the most able of the children in School A, and he was very vocal, unfocused and excitable. His poor V (vocal) rating may indicate that music therapy calmed him down. It is also possible that since he appeared to enjoy the sessions, he felt disappointed when each finished. Lastly he may have felt subdued because the therapist did not engage that much with his vocalisations. Certainly she did not respond to his every vocalisation or movement, of which there were many. However, sensitive mothering is about quality of response rather than responding to everything a child does.

Nihal was very apprehensive and tense. Her being in music therapy gave her the chance to relax and play, contrasting with the difficult circumstances of her life at home. She smiled occasionally, especially when it was her turn to be assisted to beat. It is understandable that her E (emotional) rating increased.

Aaron was very poorly and not surprisingly he showed no significant changes. He took little part in the sessions, mainly moving his eyes. He may have benefited by being in an environment that stimulated him to look around; normally he took little or no notice of his surroundings. Christopher showed great interest in and awareness of the therapist, smiling on several occasions, so it is puzzling that he too showed no significant changes. Like Barnaby he may have felt disappointed when a session was over and this may have accounted for his poor ratings. He may also have felt tired from the great physical efforts he made to turn his head towards the piano, and lean forwards out of his chair. Christopher benefited from music therapy because he tended to be socially isolated and in the sessions he was able to communicate vocally, and with facial expressions, affecting his environment. He also took notice of the other children from time to time, and therefore experienced being a member of a group of children as well as having a relationship with the therapist.

The three children in School B who showed significant changes in their P (physical) and E (emotional) scales, all seemed to benefit from music therapy. Darren and Rosanna were both able to use their solo instruments for beating, and they became more assertive as a result. Although Mahmoud did not beat, he too became more
assertive, his usual tearfulness giving way to smiles and even singing. He benefited
from being in an environment which interested him and engaged his attention, and he
enjoyed assisted beating. Rosanna particularly benefited from being able to
communicate independently with the therapist in ‘music conversations’. In all these
cases the children enjoyed themselves and were active, so that their physical condition
must have necessarily improved. Joe was the least focused of the children, playing
with his cymbals rather than using them as an instrument, and rarely pitching in the
therapist’s tonality. The teachers’ ratings for him were therefore not surprising.

It must be borne in mind that the teachers’ ratings were entirely subjective and cannot
be taken as objective, accurate or reliable measures. Also there is no information
about factors other than music therapy that could have caused change. Any
conclusions drawn about the effects of music therapy are based on the assumption that
there are no interfering factors, and that the ratings were reliable. Nevertheless it is
worth taking note of the results because they may be consistent with indications
discovered in other parts of the research.
Chapter 16

Examining the Process of Music Therapy

16.1 Introduction

The process analytic research described in Chapter 8 suggested that there was a strong connection between the therapist and child, one that manifested itself in different ways. This chapter seeks to validate this finding by using two types of sequential analysis, short term and long term, both of which draw on the ideas of Bakeman and Gottman. In addition there is an investigation of the extent to which activities occurred on the downbeat. The chapter gives the results of observation, compares and contrasts the two schools, discusses the Basic Structure and concept of the good-enough mother and the emergence of music therapy guidelines. The research questions posed at the beginning of this study are addressed, and consideration given as to how the research process might have been more efficient. Finally conclusions are drawn and suggestions made for further research.

16.2 Short-Term Sequential Analysis

16.2.1 Introduction

Short-term sequential analysis was undertaken because it was thought that it would complement the long-term analysis, and would be more sensitive to short bursts of activity, important aspects of interaction. It examined changes (the onsets and the offsets) of the children’s observables in response to changes in the therapist’s observables. Each type of stimulus and response was denoted by the letter for the agent (S, D, J etc.) followed by the observables code in the case of an onset or instantaneous occurrence, or code with a ‘-’ suffix in the case of an offset. Only the therapist’s observables were considered as (potential) stimuli, and only the children’s observables as (potential) responses. For each type of response (y) and each type of stimulus (x), a count was made of the number of occurrences of y falling within 5-second windows, or catchment areas, following occurrences of the stimulus x. A z-score was calculated, representing the extent to which the rate of occurrence of y

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within windows following occurrences of \( x \), differed from its average rate for the session generally. The top-scoring 1% (corresponding to \( p < 0.01 \)) were deemed significant. Results are given in Table 25 of Appendix L on page 466.

### 16.2.2 Results of Short-Term Sequential Analysis

#### 16.2.2.1 Aaron of School A

Aaron had a small repertoire of behaviours. He appeared to respond only with his eyes, turning them towards and away from the therapist (ETH, ETH-) in response to her entering and leaving the middle of the group (X, X-), and turning them towards the piano (EP) when the therapist left the middle of the group (X-) and returned to the piano.

#### 16.2.2.2 Nihal of School A

There was only one response from Nihal and that was moving her foot/feet (F) following a rubato (RUB). Since she tended to be still, F suggested that she was following the music and became disconcerted when the tempo was varied in a way that could not easily be anticipated.

#### 16.2.2.3 Christopher of School A

Christopher appeared to respond only to Nihal being named or addressed (NAMEN, ADDRNR) by opening or closing his mouth (MO, MO-). This probably reflected the fact that he was very slow to respond and that he may have wanted to vocalise. It was not clear why he responded to NAMEN and ADDRNR, and not the equivalents for the other children.

#### 16.2.2.4 Barnaby of School A

Barnaby mainly expressed himself by beating against his beater, beating against himself and vocalising, sometimes singing in the therapist’s tonality and appearing to connect strongly with her. The vocalisations were apparently in response to the end of his theme (CB-), the start and end of the therapist’s piano playing and speaking (PI, PI-, SP, SP-), and to her leaving her place in the middle of the group of children (X-). Barnaby apparently responded to the therapist’s taking a position among the children...
(X) by turning his head towards her (HTH). He apparently responded with beating behaviours to the remaining stimuli. Most notably he responded only to his own theme (CB, CB-) and improvisations thereon (IMCB), and never to those of the other children, suggesting that he recognised his own theme. He further responded to being named (NAMEB, NAMEB-) and addressed (ADDRB, ADDRB-), to Christopher being named and addressed (NAMEC, NAMEC-, ADDR, ADDRC-), and to Nihal being named (NAMEN). It was not clear why he responded to the stimuli just described in respect of Christopher and Nihal.

Apparent responses were also made by Barnaby to cadences (CAD, CAD-), the end of the Hello Song (HS-), the end of a ritenuto (RIT-), time signature changes (TS44), the therapist’s singing (SO), and unpitched vocalisation (VOCUT). His responses to endings of various sorts possibly denoted a release of tension or simply exuberance at the possibility of something new.

16.2.2.5 Darren of School B

Darren had 18 different responses of which all except one were forms of beating. The exception was his moving a non-solo instrument (I), which probably resulted from his beating movements. It was hard to see a pattern in his behaviours as he appeared to be responding indiscriminately to those therapist observables aimed at a particular child. He responded to his own theme (CD), that of Joe (CJ, CJ-), to improvisation on his own theme (IMCD) and that of Joe and Mahmoud (IMCJ, IMCM, IMCM-), and to the therapist naming and addressing him, Joe and Mahmoud (NAMED, NAMED-, NAMEJ, NAMEJ-, NAMEM, NAMEM-, ADDR, ADDR-, ADDRJ, ADDRJ-, ADDR, ADDR-). Darren’s extra activity at the times when the children were being addressed and named tied in with the long-term analysis (see below) in that he was particularly active during the Context Music Section (CTEXT) and the Hello Song Section (HSONG), during which most of the instances of NAMEx and ADDRx occurred.

Darren responded strongly to pauses (PAU, PAU-), to passing V7-I shifts (CADD, CADD-) and the end of the therapist’s singing (SO-). Possibly Darren’s beating may have been to encourage the therapist to play or sing more. He responded to the end of the Bye-Bye Song, (BBS-), the ends of cadences (CAD-), the ends of sections (END)
and to mistakes (ERR). He also responded to the onset and offset of the following: improvisation, (IM, IM-), improvisation on the Bye-Bye Song (IMBBS, IMBBS-), repertoire (REP, REP-), speech (SP, SP-) and delayed presentation of the downbeat or resolution of cadence (SUS, SUS-). The remaining stimuli to which he apparently responded were changes of time signature to 3/4, 4/4 and 6/4 (TS34, TS44, TS64), the therapist beating on Mahmoud’s instrument (THBM) and her being away from the piano in the middle of the group of children (X). The wide range of therapist stimuli to which he responded was indicative of his high level of participation in Session Eight of School B, and of a strong connection with the therapist.

Observables such as PAU (pause), CADD (passing V7-I shifts) and SUS (delayed presentation of the downbeat or resolution of a cadence) had durations of typically less than five seconds, therefore there was little difference between responses to the onset and those to the offset. However, the Bye-Bye Song (BBS), for example, lasted much longer than five seconds so a response to the end of it (BBS-) was more strongly related to the offset time specifically. In the case of the Bye-Bye Song, Darren may have had feelings about the end of the session, and may have beat in an effort to prolong it. His beating in Session Eight at BBS- led to the therapist improvising at the piano to accommodate his surge of energy which continued even after she stopped playing.

16.2.2.6 Rosanna of School B

The repertoire of behaviours for Rosanna consisted of three types of beating and leg/foot movement (F, F-). She beat on her solo instrument (B), the tambourine (BT) and on her tray in time with the music (DM). She responded to being named and addressed (NAMER, NAMER-, ADDR, ADDR-) by beating, and similarly to the therapist naming herself. Rosanna did not appear to respond to anybody else being named or addressed, suggesting she recognised her own name and when she was being addressed. She also appeared to respond when the therapist started and stopped speaking (SP, SP-), to delayed presentation of the downbeat or resolution of cadence (SUS) and the end of ritenuto (RIT-). Interestingly, Rosanna seemed to know when a SUS represented an invitation to her to complete a resolution or phrase with a beat on her cymbals, and she often accepted it. Her DM response showed a high level of interaction with the therapist.
16.2.2.7 Joe of School B

Joe showed three different responses: starting and stopping unpitched vocalisations (VOCU, VOCU-) in response to the end of being named and addressed (NAMEJ-, ADDRJ-) and making a sound with his cymbals without beating them (S) in response to Rosanna being addressed (ADDRR). As he did not respond to any other names it seemed that he recognised his own name and the fact that he was being addressed.

16.2.2.8 Mahmoud of School B

Mahmoud had three responses: making an unpitched vocalisation (VOCU) turning his eyes towards the piano (EP) and finishing an unpitched vocalisation (VOCU-). His most frequent response was EP which he did when the therapist started to sing (SO) and when she ended a pause (PAU-). He also responded with VOCU to the end of his own name (NAMEM-) and to no other names, suggesting he recognised his own. He appeared to respond to transient V7-I shifts (CADD) with VOCU, to those moments when the therapist stopped playing the piano (PI-) with VOCU, and when she stopped speaking (SP-) with VOCU or VOCU-. His apparent responses to PI- and SP- suggested that he wanted to engage with the therapist, while VOCU- suggested that he was listening out for what might happen next.

16.2.3 Discussion

The levels of activity of the children were very different and each child had a different and limited repertoire of behaviours. For example Darren and Barnaby were very active, using forms of beating as their stock response, while Aaron only moved his eyes a small number of times. It emerged that the more active the child, the larger was his/her repertoire of behaviours, the larger was the number of significant apparent stimulus-response relationships, and the larger the number of occurrences of the response involved in each relationship.

A child was deemed to recognise his own theme if he responded to his own theme and no other child’s theme, and similarly for a child being named and addressed. According to these criteria it was found that Joe, Mahmoud and Rosanna were aware of being named, Rosanna of being addressed, and Barnaby was aware of his own theme. In as much as the children responded, they tended to respond to similar things, in
particular the various ‘punctuation’ marks in the therapist’s music. Examples of these were cadences, ritenuto, pauses, rubato, delayed presentation of downbeat/resolution and time signature changes, all of which corroborated the writer’s interpretations of the change events. The children also seemed to respond to the therapist’s speech which occurred when she was away from the piano. This suggested interest in what she was doing.

Interestingly there were no significant responses to Aaron’s theme, nor those of Nihal, Rosanna or Christopher, and there were no responses to improvisation on any of these children’s themes either. Possibly the phrases in the themes of Rosanna and Christopher were too long to be memorable, while the themes of Aaron and Nihal tended to be presented in so gentle a way as to have had no impact. The subject of themes needs further investigation.

16.3 Long-term Sequential Analysis

The long-term sequential analysis tested whether there was a lawful connection between each pair of observables, suggesting a possible cause and effect, or stimulus and response. A lagged correlation test in which there was a two-second lag between ‘given’ and ‘target’ was performed. This yielded $z$-scores which showed the extent to which a child’s observable $y$ occurred more than average shortly after the therapist’s observable $x$. The catchment area consists of all the durations of occurrences of observable $x$, but delayed by two seconds. Lag analysis can reveal statistically meaningful correlations between the behaviours $y$ and behaviours $x$, leading to an understanding of how the therapist had influenced the child.

A list of the most significant $z$-scores is given in Table 26 of Appendix M on page 471, comprising those having an absolute value greater than 2.48, corresponding to $p$-values less than 0.0066. Compared with the traditionally acceptable ‘$p < 0.05$’ this is more stringent, thus giving a more reliable result and restricting the number of significant $z$-scores to a manageable level.

16.3.1 Correlations for each Child

In the following descriptions for each child, positive correlations are assumed except where explicitly described as negative.
16.3.1.1 Correlations: Aaron of School A

Aaron had 8 significant correlations. He kept his head turned towards the piano (HP) a significant amount during the CTEXT section and when the therapist played Nihal’s music (CN). The CTEXT section may have interested him at some level, being the first part of the session, while Nihal’s theme may have caught his attention because there were low sung notes in it when presented in the key of C (which happened four times) the therapist singing the g, a and b below middle C. Aaron also presented HP when the therapist sang Nihal’s name (NAMEN), and opened his mouth (MO) significantly more during NAMEN. Interestingly, he looked towards the piano (EP) when the therapist sang Barnaby’s theme (CB). It is hard to explain this. Possibly he was interested by the dotted rhythms in it. This was the only theme that contained dotted rhythms. His head was turned towards the therapist (HTH) when she was away from the piano (X) which showed he was aware of her change of position, and he also looked at her (ETH) a significant amount on these occasions. Both behaviours indicated an interest in the therapist. His head was significantly away from the piano during the Hello Song section (HSong) which initially suggested he was watching the children play ‘Hello’, but subsequent analysis suggested he did not like the suspensions and resolutions in the Hello Song. Despite being a passive child, there were indications that Aaron was taking note of the therapist and the other children.

16.3.1.2 Correlations: Nihal of School A

Nihal had 5 significant correlations. There was a negative correlation between the therapist being by the children (X) and Nihal moving her head. The reason for this is not clear. Possibly Nihal was listening out more than usual, knowing the therapist was close, and reduced her head movement in order to focus better. It is also possible she felt apprehensive, not knowing what actions the therapist might take when usually she was at the piano. There was a strong positive correlation between the therapist playing V7-I cadences (CAD) and Nihal making mouth movements (MM). The MM seemed to denote that Nihal was considering what she had heard, and gave the impression that she was registering the cadences and finding them meaningful.

There was a correlation between the therapist playing the piano (PI) and Nihal moving her feet (F). Nihal’s foot movements were part of her very small repertoire of
behaviours. She tended to respond to ends of phrases by moving her feet to PI. There was a very strong correlation between the therapist addressing her (ADDRN) and Nihal smiling (SM). Clearly she was pleased to be taken notice of but also probably responded to the warm tones of the therapist’s voice.

A correlation existed between the therapist playing the piano (PI) and Nihal moving her head (H). This tied in with the therapist’s view of Nihal whose limited head movements often occurred at special moments in her music, such as at cadences or the ends of phrases.

16.3.1.3 Correlations: Christopher of School A

Christopher had 5 significant correlations. There was a correlation between his arm movements (A) and the Hello Song section (HSONG). The observable A was part of what appeared to be a generalised interest response. It usually occurred when Christopher turned his head towards the piano or appeared moved in some way by the therapist’s music. When his arms were extended they often rose upwards, marking awareness of a new sound, or event, and suggesting new resultant inner feelings.

For some reason there was a correlation between the therapist addressing Barnaby (ADDRB) and Christopher moving his feet (F). Christopher may have been responding to the infrequently used dotted rhythms of Barnaby’s theme. Had Christopher been in individual music therapy the therapist may well have worked with this response. Another correlation was between the therapist’s improvisation (IM) and Christopher pitching outside the therapist’s tonality (VOC). This is another correlation which was hard to explain. VOC was also an observable which may have been unreliable (see Reliability Test, page 147, and Table 2 Observables with low agreement, page 149). It can only be said that Christopher appeared to be responding to the therapist’s improvisation and may have been excited by the new material she introduced. His VOC may be indicative of his trying to connect with her but finding it hard to sing. Another correlation in which he did sing notes in the therapist’s tonality was between the therapist addressing Aaron (ADDRA) and Christopher presenting a pitched vocalisation that formed a triad with the therapist’s current or last notes (VOCPNT). This appeared to indicate that Christopher was listening to the therapist’s output and possibly wanting her to address him instead of Aaron, though he may have
just been joining in with the music. Finally, there was a strong correlation between the therapist speaking (SP) and Christopher moving his head (H). This suggested that he was interested in what the therapist was saying, was possibly curious as to why she had stopped playing the piano and wanted to know what she would do next. His head movements at such times tended to be part of an effort to turn his head round so that he faced the therapist and could see her.

16.3.1.4 Correlations: Barnaby of School A

Barnaby had 24 significant correlations. He moved his arms a significant number of times during pauses in the therapist’s music (PAU). It was not clear why. Possibly he wanted to gain the therapist’s attention or to fill the space left by her. Maybe he felt uneasy when the therapist’s music halted and he did not know what she would do next, or maybe he did not want her to stop. There was no clear interpretation here. Paradoxically he moved his arms significantly less in the Development Section (DEVL) when there was a greater element of the unexpected. This correlation probably indicated that he was listening more, paying attention to the music. He also appeared to be focusing on the music when the therapist mirrored Christopher (MIRRC), in that there was a negative correlation between MIRRC and Barnaby’s arm movements (A).

There was a very strong correlation between the therapist being away from the piano and by the children (X), and Barnaby having his head turned towards her (HTH). This suggests he was interested in what she was doing. There were two strong negative correlations involving Barnaby having his mouth open (MO), firstly when the therapist addressed Aaron (ADDRA), and secondly during her improvisation on the Context Music (IMCX). Barnaby tended to have his mouth open when he was mouthing his beater or when he gave the impression of wondering about something. That MO should occur less at these times suggests he was possibly more self-contained and quiet during them.

A high correlation existed between Barnaby’s unpitched vocalisations (VOCU) and the time when the therapist was by the children, away from the piano (X). The code X denotes that she was in the middle of the group of children rather than next to one particular child, and it was likely that Barnaby vocalised because he wanted the
therapist next to him, and was trying to interact with her. There was a negative correlation between non Basic Structure musical material that had been introduced before (REP) and Barnaby smiling (SM). The main REP was ‘Let’s play Listening’. The correlation suggested that Barnaby was following the song’s suggestion.

Another negative correlation existed between the therapist singing (SO) and Barnaby’s VOCPXNT (an approximately pitched vocalisation that formed a triad with the therapist’s current or last notes). This suggested that Barnaby usually made his VOCPXNT after the therapist had stopped singing, which was often the case, his notes echoing her recent harmonies. There was possibly less of an incentive to vocalise so tunefully when the therapist provided ongoing vocal lines.

A correlation existed between the therapist singing the name of Aaron (NAMEA) and Barnaby vocalising out of pitch (VOCU). This was an unexpected correlation. It could be, once again, that Barnaby wanted attention. The therapist focusing on Aaron meant that Barnaby could not interact with her as he wanted. The need that many of the children had for attention suggested that individual music therapy might have been a preferred intervention.

There was a correlation between ends of sections (END) and Barnaby moving his head (H). This suggested that Barnaby might have been held by the music to some extent, but once it was over, looked around him as people do after concentrating on something.

There was a negative correlation between Barnaby making mouth movements (MM) and the therapist singing (SO). When mouth movements were made (they only occurred in Session Twenty-three when Barnaby was without his beater) they gave the impression of Barnaby cogitating and being pensive, and often occurred when the therapist was speaking. Apparently when the therapist was singing there was less to reflect and more simply to experience in a trouble free way.

A correlation occurred between the Hello Song Section (HSONG) and Barnaby presenting S (sound elicited from the solo instrument without the child beating). This indicated that he became more involved with his drum during HSONG. Possibly the emphasis on the tambourine during it inspired him to handle his own tambourine, (held in the snare-drum stand and referred to as his drum). The Hello Song was about greeting another and about affirming contact with the therapist.
There were three correlations in which Barnaby’s smile (SM) figured. The first was a negative correlation between the Development Section of the Basic Structure (DEVL) and SM. The reason for this is not clear. This is consistent with the writer’s observations that he looked serious, as if concentrating on something, during the song ‘Let’s Play Listening’ and the improvisation on the glockenspiel, which largely figured in DEVL. In both cases high notes were used by the therapist, and perhaps these did not convey sufficient emotion for Barnaby. The second was a positive correlation between passing V7-I shifts (CADD). This simply suggested Barnaby enjoyed diatonic music containing CADD. The third correlation was between the Hello Song Section (HSONG) and SM. Again Barnaby enjoyed the HSONG.

There was a significant reduction in pitched vocalisations that matched the current or recent notes of the therapist (VOCP) when she was singing (SO) and playing the piano (PI). There was also a reduction in approximately pitched vocalisations in the therapist’s tonality (VOCX) while the therapist was playing the piano (PI). He responded to being addressed (ADDRB) by smiling and laughing (SM and LAU), a sign of pleasure. He also responded to the therapist’s mirroring him (MIRRB) by moving his feet (F) less and mouthing (HM) less. This suggested he was taking notice of her output, was more focused and shifted to a different state while connecting with her.

Lastly there was a very strong correlation between the therapist changing the time-signature of her music to 7/4 (TS74) and Barnaby moving his head (H). Since TS74 occurred only once this was probably due to chance.

### 16.3.1.5 Correlations: Darren of School B

Darren had 17 significant correlations. A correlation existed between the Context Section (CTEXT) and Darren beating against himself in time with the therapist’s music (!M). This showed a general awareness of the CTEXT, and a possible enthusiasm for it, and indicated that Darren connected with the therapist. There was a correlation between Darren beating against himself without beating in time with the music (!) and CTEXT. This suggested that the opening part of the session might have been exciting and motivating for him since his beating movements were lively.
An interesting correlation existed between the therapist addressing Joe (ADDRJ) and Darren having his mouth open (MO). ADDRJ often entailed the melismatic theme of Joe (see Example 15 Joe’s theme (CJ) in Appendix H on page 299) and it was thought this made Darren wonder at the sound the therapist was making, the open mouth being a sign of interest. The way Joe’s name was set differed greatly from how it would be normally spoken. This may well have contributed to Darren’s interest.

There was a negative correlation between the therapist being by the children (X) and Darren moving his arms (A). This suggested that he was focusing on the therapist, since her being by the group was an infrequent event. There was a strong positive correlation between the therapist improvising on the Context Music (IMCX) and Darren beating against himself (!). Again this was probably connected to the newness of the session and a degree of excitement because of it.

Darren had several beating behaviours that correlated with different aspects of the therapist’s music. He presented D (beats on surface other than solo instrument or self) more frequently during CTEXT (the Context Section) than elsewhere. It has been suggested that he was excited during the first part of the session and presenting D tied in with this. There was also a correlation between the therapist playing the piano (PI) and Darren beating against himself in time with the music (!M). This tied in with the therapist’s observation that most of the major interactions between Darren and herself involved his beating in time with the therapist’s piano music. It seemed likely that the sound of the piano motivated Darren to beat. In some ways it was less important whether he beat against himself or on his drum, the important issue being his sense of rhythm. His beating on the tambourine in time with the music (BTM) correlated with the therapist improvising (IM). IM occurred on the piano and followed Darren’s beating. This he initiated after his turn in the Hello Song when he appeared more motivated to beat. There were three more beating correlations. In one Darren beat more against himself (!) when the therapist was playing the piano (PI). It seemed that he was aroused by her piano music. This could have been due to one of many reasons including excitement at the sound of the instrument, and the fact she was communicating forcefully in a non-verbal way. This was a language that he appeared to understand, and with which he had an affinity. There was a correlation between Darren beating a clacker against himself in time with the music (SHM!) and the
therapist playing repertoire (REP). This refers to his beating in ‘Once Upon a Chime-Bar’ (see Appendix A, Example 4 on page 287) when once again he appeared excited. He had an unusual instrument to play, and the therapist was telling a story. There was a correlation between Darren beating on his drum (B) and the therapist improvising (IM). Possibly Darren noticed the new material and became motivated to make sounds of his own. Beating on his solo instrument also correlated with the therapist playing the piano (PI). She had the impression that Darren was stimulated by the sound of the piano, but was also encouraged to use his own instrument after seeing and hearing the way that she used hers. It also probably indicated that Darren wanted to connect with the therapist and was using his drum to do so, despite not playing in tempo. It was rather a sharing of activity at such moments, like the parallel play of small children.

An unexpected correlation occurred between the therapist improvising on Rosanna’s theme (IMCR) and Darren moving his head (H). This was difficult to explain. A strong correlation existed between the therapist addressing Rosanna (ADDR) and Darren putting his hand to his mouth (HM). It was not clear why HM should occur here. Possibly Rosanna’s theme was forceful, the melody employing wide intervals, causing Darren to stop in his tracks and ponder. Probably he was aware that the therapist was focusing on Rosanna and may have wished she was focusing on him.

There was a negative correlation between the therapist improvising on Darren’s theme (IMCD) and his moving his beater (SI). This suggested that he was paying attention to the therapist’s music and may have recognised his theme within it. Another correlation occurred between Repertoire (REP) and Darren having his mouth open (MO). This tied in with Darren’s apparent interest in ‘Once Upon a Chime-Bar’ (see Appendix A, Example 4 on page 287) during which he gazed at the other children as each took their turn. The open mouth suggested a state of receptivity and concentration, and was of a similar kind to MO in respect of Joe’s theme being played.

The last correlation was between Joe being addressed by the therapist (ADDRJ) and Darren keeping his head turned towards the piano (HP). Fragments of Joe’s theme were often present during ADDRJ and it was also played in the high register of the piano. Both facts possibly help to explain why Darren looked towards the piano. The high notes of the piano probably attracted him because of their pitch and because they
were unusual. The quality of the therapist’s voice was unusual being particularly clear when she sung Joe’s melismatic theme; so too Joe’s first name lasting an entire 4/4 bar.

16.3.1.6 Correlations: Rosanna of School B

There were 13 significant correlations in respect of Rosanna. There was a correlation between the therapist’s pauses in the music (PAU) and Rosanna moving her arms (A). Observation suggested that she sometimes did this to release tension caused by not knowing when the therapist would resume playing, and at other times to move or beat her cymbals. There was a negative correlation between the Development Section (DEVL) and A, probably because Rosanna was focusing on the potentially interesting events in DEVL, namely the Chime-Bar Song and, in the late session, the activities surrounding Mahmoud being upset. Lastly, there was a positive correlation between the therapist’s improvisation on Mahmoud’s Context Theme, (IMCM) and A. Generally Rosanna moved her arms when she was beating her cymbals, or nudging them with her elbow. As often a momentum built up during improvisatory passages after the straightforward version of a theme, Rosanna may have felt this and increasingly played her cymbals out of sheer enthusiasm.

There was a correlation between the therapist naming Joe (NAMEJ) and addressing him (ADDRJ) and Rosanna having her head turned towards the piano (HP). The reason for this was uncertain. There was a strong correlation between the therapist presenting Mahmoud’s Context Theme (CM) and Rosanna moving her solo instrument (SI). Similarly there was a correlation between CM and Rosanna beating her solo instrument (B). CM was a leisurely theme with no obvious outstanding features. The correlation relates to the fact that Rosanna appeared to like joining in with the music even when it was not her turn. A further correlation between the therapist addressing Mahmoud (ADDRM) and Rosanna tensing her body (T) was particularly striking. T seemed to express critical moments of intense excitement and a desire to communicate. That T should have occurred during ADDRM possibly denoted that Rosanna longed to be heard during that time.

Mahmoud sat next to the piano, near the therapist, and had more than his fair share of attention, as is shown by the total time that each child was addressed (see Table 8).
Table 8 Total duration of ADDR-s, School B

<table>
<thead>
<tr>
<th>Observable</th>
<th>Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRD</td>
<td>361.2</td>
</tr>
<tr>
<td>ADDRR</td>
<td>397.2</td>
</tr>
<tr>
<td>ADDRJ</td>
<td>282.4</td>
</tr>
<tr>
<td>ADDRM</td>
<td>630.3</td>
</tr>
</tbody>
</table>

It can be seen that Rosanna had the next highest total time of being addressed. Possibly, therefore, she was trying to compete for attention with Mahmoud when tensing her body, going some way towards shouting and verbalising.

A correlation existed between the therapist improvising on the Context Music (IMCX) and Rosanna moving her head (H). Rosanna was generally active in the Context Section, and H often occurred in conjunction with her beating, turning her head to one side after placing a beat. She might also have been affected by the new material just as she appeared to have been by the improvisation on Mahmoud’s theme.

There was a strong correlation between the therapist playing the piano (PI) and Rosanna beating her cymbals in time with the therapist’s music (BM). This suggested that Rosanna was interacting with the therapist, and was able to follow her output. Her doing so in this way showed a level of ability which far exceeded that suggested by her developmental age and diagnosis of spastic quadriplegia. The correlation between PI and Rosanna beating on her tray (DM) suggests similar phenomena. A correlation also existed between the therapist presenting the Hello Song (HS) and Rosanna beating on the Hello Tambourine in time with the music (BTM). Rosanna always appeared to enjoy ‘saying hello’. Her BTM was a non verbal form of the greeting and a way of expressing herself.

There was a negative correlation between the therapist presenting the Context Section (CTEXT) and Rosanna moving her legs (F). This suggested that for Rosanna the dominant activity in CTEXT was channelling her energies into listening to and playing music, since her leg movements were believed to be an expression of excitement and pleasure both by the therapist and the teachers.
16.3.1.7 Correlations: Joe of School B

There were 24 significant correlations related to Joe. Several of these were between different therapist behaviours and Joe moving his arms (A) or keeping them still. There was a strong negative correlation between the therapist addressing Mahmoud (ADDRM) and Joe’s A. The most likely explanation for this is that the therapist varied the quality of her singing voice during ADDRM. Joe was sensitive to such changes and may have stopped moving his arms in order to focus on listening to her. There was also a strong negative correlation between the Hello Song Section (HSONG) and A. This seemed to be largely due to the fact that Joe often appeared to be actively listening to the therapist singing during this, his head turned towards the piano. A negative correlation between his moving his cymbals (SI) and HSONG tied in with this. There was a strong positive correlation between the Context Section (CTXT) and Joe moving his arms. This tied in with another correlation between CTXT and Joe moving his cymbals (SI). A possible explanation for this is that the therapist presented music with few breaks in it in this section, so there were fewer textural changes for him to notice. There was a negative correlation between the therapist addressing Joe (ADDRJ) and A. Most probably Joe was paying attention to the therapist.

There were six correlations in which Joe’s eyes were turned towards the piano (EP). A negative correlation occurred between the Development Section (DEVL) and EP. While this could partly be explained in terms of Joe watching things going on around him at times (watching Darren beat, for example, or the helper with Rosanna in the Chime-Bar Song), the therapist felt his orientation was away from the piano, his head turned much of the time in the opposite direction, even when he was not playing with his cymbals (which were to his right, away from the piano). Possibly he had explored and engaged with the therapist as much as he could, and was taking a rest. Nevertheless there was a particularly strong correlation between the therapist playing the piano (PI) and EP. Clearly PI was meaningful to Joe: he briefly glanced at the piano periodically during DEVL. There was another strong correlation between the therapist singing (SO) and EP. This ties in with PI and EP, the therapist, when at the piano, generally playing it while she sang. A correlation existed between the Hello Song (HS) and EP. Made up of short repeated melodic phrases this song was likely to have been remembered by Joe, and because it was familiar, he may have been
interested in hearing it again. The fact that he looked towards the therapist during it showed that he was interacting with her. There was a correlation between the therapist singing Rosanna’s name (NAMER) and EP for which no definite reason can be given. There was a strong correlation between Rosanna’s theme as a whole (CR) and Joe’s EP. Two elements of CR which could have caused reactions were firstly the emphatic way the melody tended to be sung by the therapist, giving her voice a different quality, and secondly the two accented quavers on the first beat of the second bar.

A correlation existed between the therapist singing Rosanna’s name (NAMER) and Joe’s head being turned towards the piano (HP). This ties in with the correlation described above between NAMER and EP (eyes turned towards the piano). An unexpected negative correlation existed between the therapist making a ritenuto (RIT) and Joe’s HP. Usually Joe was sensitive to change in the music. This finding suggested that tempo change may not have been as important as textural change, or change in the quality of the therapist’s voice. It is more probable, however, that Joe simply took more than two seconds to register the tempo change. A correlation between the Hello Song (HS) and Joe’s head turned towards the piano (HP) also tied in with one described above viz. between HS and EP. There was a high correlation between the therapist singing Joe’s name (NAMEJ) and HP. Apparently Joe responded to his name being sung, and was aware he was being addressed.

There were three correlations involving Joe’s leg movements (F). One was a high negative correlation between the therapist addressing Mahmoud (ADDRM) and Joe’s F. This indicated that Joe was probably paying attention to the therapist and tied in with the negative correlation between ADDRM and Joe moving his arms less, (described above). There was also a negative correlation between the therapist singing Mahmoud’s name (NAMEM) and F. This usually occurred during ADDRM and ties in with the ADDRM and F correlation already described.

Two final correlations emerged. One was between the therapist’s pauses (PAU) and Joe moving his head (H). This suggested an interaction, Joe possibly becoming restless following or during PAU, not knowing what to expect next. There was an extremely high correlation between the therapist singing Joe’s name and Joe laughing. He only laughed four times, on each occasion in a state of hyper-excitability. The therapist sang his name to try to soothe and contain him.
16.3.1.8 Correlations: Mahmoud of School B

There were 12 significant correlations relating to Mahmoud. Three of these involved Mahmoud turning his eyes towards the piano (EP). There was a correlation between the therapist playing the piano (PI) and Mahmoud’s EP. This corroborated the view already expressed that Mahmoud was interested in and affected by PI. Another correlation was between the therapist’s ritenuto (RIT) and EP. Mahmoud gave the impression that he noticed RIT and probably wondered where the therapist’s music was leading to. He possibly anticipated the frequently attendant cadences that followed RIT, and may have felt a degree of suspense. The correlation between RIT and Mahmoud having his head towards the piano (HP) could be understood in a similar way. There was a correlation between the therapist’s repertoire (REP) and EP. The REP part of the session mainly consisted of the song ‘Once Upon a Chime-Bar’ (see Appendix A, Example 4 on page 287) which Mahmoud gave the impression of liking, singing to it at one point. His EP suggested that he was interacting with the story teller, the therapist, focusing on her music, and taking in what she sang and played.

There was an extremely high correlation between the therapist’s improvisation (IM) and Mahmoud moving his arms (A). Mahmoud tended to move both arms upwards when he was considering something or perturbed about something. During IM there was a high factor of the unknown and probably he was apprehensive at times about what the therapist was doing, and what she would do next.

A negative correlation existed between the therapist playing the piano (PI) and Mahmoud vocalising (V). Mahmoud gave the impression of listening carefully to PI, which would entail his being quiet, and the correlation reflected this. There was a correlation between the therapist’s improvisation (IM) and Mahmoud singing an approximately pitched note outside the therapist’s tonality (VOCX). When the therapist improvised it was probably not always possible to follow her, especially if she was playing allegro. Mahmoud may have both not been able to pitch in the tonality and objected to the improvisation, registering this objection by pitching outside the its tonality. Another correlation involving Mahmoud’s voice was between the therapist speaking (SP) and Mahmoud making an unpitched vocalisation (VOCU). This was probably a mixture of Mahmoud responding to her in a conversational way, mainly because he wanted attention, and in one part of each session grizzling slightly, again
wanting attention. A negative correlation existed between the therapist playing the piano (PI) and Mahmoud pitching outside the tonality of what she was playing (VOC). Mahmoud’s general interest and sensitivity towards the piano was such that this correlation was to be expected.

Two correlations involved Mahmoud moving his legs and feet (F). There was a high positive correlation between the therapist’s Development Section (DEVL) and Mahmoud’s leg movement (F). When Mahmoud appeared to have had a satisfactory experience, or indeed an unsatisfactory one, he often lifted his right leg, straightened out. The Chime-Bar Song apparently provided satisfactory experiences and this was in DEVL, hence the correlation. There was an extremely high positive correlation between the therapist addressing Mahmoud (ADDRM) and Mahmoud’s F. This indicated a strong interaction between Mahmoud and the therapist. The video-tape shows this appeared to be a positive experience for Mahmoud, with Mahmoud recognising that the therapist was addressing him and focusing on him, his leg movement indicating a pleasure response.

The last correlation was a negative one between the therapist speaking (SP) and Mahmoud having his mouth open (MO). Mahmoud had poor lip closure so having his mouth open to a lesser extent after or during SP seemed to indicate some kind of shift.

16.3.2 Discussion

These findings primarily indicated that all the children connected with the therapist, in some ways similarly, but mostly in different ways. The number of correlations seemed to reflect their levels of awareness and focused activity, although for some their physical disabilities seemingly interfered with their expressive ability.

With the exception of Nihal, all the children presented basic behaviours such as turning their heads and eyes to the piano at apparently interesting moments in the music, reducing or ceasing activity when focusing on the therapist, and turning their heads towards the therapist when she was away from the piano in the middle of the group. They all seemed to connect using whatever abilities they had, with the exception of Joe who, although able to use his arms, never beat on his cymbals or on the Hello Tambourine. Nihal, who had spastic quadriplegia, made small head and foot
movements in response to the piano being played. It seemed a characteristic of this group of children that they utilised their resources.

The ability of each child varied enormously as did the range of their connecting behaviours. While Darren and Rosanna could beat in time with the music in a highly organised way, it was physically difficult for Christopher to turn his head towards the piano. Nihal, normally still with head lowered, once smiled unexpectedly, a simple but significant communication which was one of her chief interactions. Aaron mainly moved his head and eyes. Mahmoud and Barnaby sang on occasions in the key of the prevailing tonality and Joe could stop playing with his cymbals, turn his head and eyes towards the piano, and focus on the therapist. Both Joe and Christopher smiled on occasions as did the majority of children. The impression was given that Rosanna and Christopher tried to sing.

As in the short-term analysis, a child was deemed to recognise his or her own theme if s/he responded to his or her own theme and no other child’s theme, and similarly for a child being named and addressed. According to these criteria no child recognised his or her own theme, only Mahmoud recognised being addressed and only Christopher recognised being named. Since in a group situation it is normal to react to somebody else being addressed these criteria were relaxed by allowing responses to other children’s themes, their being named and being addressed. In these circumstances still nobody recognised their theme, but Joe, Mahmoud, Barnaby and Nihal recognised being addressed, and Joe and Christopher recognised being named. These results were at variance with those of the short-term analysis because the catchment areas for the children’s responses were different. However, it was thought that negative results should be interpreted as a failure to detect or reveal a response rather than implying that there was no response.

It was important to acknowledge the variety of ways in which the children were able to connect with the therapist. While it was extraordinary that certain children could beat in time with the music, it was equally extraordinary that there was a high correlation ($z = 4.73$) between the therapist presenting a cadence (CAD) and Nihal making mouth movements (MM). The main difference between this and a child beating in time with the music was that the latter was a more overt and organised response than the former, and arguably one made consciously and intentionally. Nevertheless such responses
indicated the potential of music therapy for all types of persons since they demonstrated a susceptibility to music, even in persons with a great number of disabilities.

16.3.2.1 Corroboration of Qualitative Findings

Five different kinds of analysis have been used to shed light on the nature of the connection between the therapist and the children. Two of these were qualitative: analysis of rare events and change events. Three of these were quantitative: analysis of the downbeat, short-term sequential analysis and long-term sequential analysis. It was thought that the findings of the change events could be shown to be more reliable if corroborated by the quantitative findings. These corroborations are now discussed.

16.3.2.2 Corroboration in School A

In the change events it was suggested that Aaron disliked cadential resolutions because he flexed his arms and puckered his face on one. Also he seemed to dislike delayed word-resolutions because he turned his head away from the piano on one. These findings are corroborated by those of the long-term sequential analysis where there was a negative correlation between HP (head to piano) and HSONG (the Hello Song Section), the HSONG being made up of cadential shifts, suspensions and resolutions.

The findings in the change events that Barnaby appeared interested in the therapist (leaning towards her when she was nearby, exploring the glockenspiel she was holding, listening to her clarinet and unusual low sung notes) were corroborated by the long-term sequential analysis which showed a high correlation between ADDRB (therapist addresses Barnaby) and Barnaby smiling. Other correlations corroborated the finding that Barnaby was interested in, and interacted, with the therapist. The negative correlation between HM and MIRRB (vocal/instrumental sound from the therapist mirroring Barnaby’s sound), for example, suggested that Barnaby’s attention was focused on the therapist rather than his beater, just as it appeared to have been in the change events when he cocked his head, apparently listening to the therapist’s clarinet playing, then her unusual low sung notes. The short-term analysis showed that Barnaby made various vocal responses to the end of his own theme, the beginning and end of the therapist’s piano playing and when she returned to the piano after being among the children.
There were only three change events for Nihal. In one of them the therapist was addressing her (ADDRN) while she was being helped to beat her cymbals. During the course of this the cymbals touched Nihal’s nose, the therapist made an exclamatory vocalisation, and Nihal smiled. The long term analysis showed a high correlation between ADDRN and SM (smile), thus corroborating the change event. In another, Nihal moved her head and took a deep breath, apparently in response to changes in the therapist’s music. The long term analysis showed that Nihal made mouth movements in response to the therapist’s cadences, and leg movement in response to the piano. Both correlations corroborate the finding that Nihal was aware of the therapist and responded to her.

The change event in which Christopher moved his arms (A) during the HSONG (Hello Song Section) was corroborated by the long-term correlation between HSONG and A. Christopher also smiled during the change episode indicating interest and pleasure. The corroboration is important because it underpins the finding that Christopher appeared to interact with the therapist and his surroundings. Therefore, several of his apparent responses to observables in the change episodes which were not coded probably indicated a similar interest. These included apparent responses to dissonances, high notes and the quality of the therapist’s voice.

**16.3.2.3 Corroboration in School B**

Darren largely presented beating behaviours and three types of these occurred in the change events: !P (beating in own pulse against body), B (beats solo instrument and makes sound) and BTP (beats tambourine in own pulse). The first !P occurred during IMCX (improvisation on the Context Music) at the start of Session Eight. The short-term analysis showed a high correlation between IMCX and !P, while the long-term analysis showed a correlation between ! and CTEXT (the Context Section) in which IMCX is subsumed. Both corroborate !P and IMCX in the change events. In the first change event in which B occurred the therapist was finishing IMCX, making a cadence and then playing and singing CD (Darren’s Context Theme – see Example 13, page 297 in Appendix A). The short-term analysis showed a correlation between IMCX (improvisation on Context Music) and B (beats solo instrument and makes sound), and between CD and B, thus corroborating the change event finding. The last beating behaviour BPT (beats tambourine in own pulse) occurred just before his Hello Song
turn prior to assisted beating when the therapist presented his own theme (CD) and improvised on it (IMCD). The long-term analysis results did not corroborate this, having no BTP findings at all. In the short-term analysis, however, there were correlations between CD (Darren’s Context theme) and B (beats on solo instrument), and between IMCD (improvisation on Darren’s Context theme) and B, which corroborated the relationship BTP and CD/IMCD.

None of the other change events of Darren could be directly corroborated. This was partly due to certain observables not having been coded: for example, lowering of the head, the unusual length of some of the therapist’s notes, the quality of her voice, her quiet speech and the introduction of the tambourine, all of which apparently affected Darren.

The observables of Rosanna in the long-term sequential analysis largely centred round her moving or playing her solo instrument, the cymbals, but also included HP (head towards piano), F (moves one or both legs/feet) and T (body tenses). The change events, however, once again included observables that had not been coded: the quality of the therapist’s voice, Rosanna’s upward head-tilt and head-tilt to one side. Only two types of observables appeared in the short-term analysis: beating of various sorts and leg/foot movement. There was a greater number of observables in the long-term analysis but none that coincided with those in the change events, although it is possible to say that in all the episodes the therapist played the piano and/or sang.

Joe’s repertoire of observables (as per the long-term sequential analysis) centred round A (arm movements), F (feet and leg movements) and EP/HP (eyes/head towards piano). There were only two further observables, LAU (laughs) and SI (moves solo instrument). These showed a different profile of Joe to that in the change events where uncoded observables were, once again, referred to. Those for the therapist were the quality of her singing, textural changes in her music, tempo change and vocal glissandi. Joe had two uncoded observables: head down, and the therapist’s beat on the tambourine which made him start. Nevertheless the correlation between Joe E/HP (head/eyes towards the piano) and PI (therapist plays the piano) broadly corroborated Joe EP/HP during the first change episode when the therapist was playing the piano and singing, just as it did in the later episode when Joe presented EP/HP in conjunction with his being still.
Lastly, Mahmoud’s repertoire of behaviours (as per both sequential analyses) was wide-ranging although he did not beat. He moved his arms (A) and legs (F), turned his head/eyes towards the piano (H/EP) and made four types of vocalisation. As with the other children’s change events, observables were included that had not been coded. The apparent responses of Mahmoud in this category were his suddenly becoming quiet and, in another change episode, being still. The uncoded stimuli from the therapist were dissonance, hectic music, high vocalisations, low vocalisations, different voice quality and out of attunement. In all but one of the change events the therapist was singing and/or playing the piano. In a general way, however, the long-term sequential analysis corroborated the relationship between Mahmoud’s EP response to the therapist’s non-attuned music, which was in fact IMCX (improvisation on Context Music) since she was playing the piano and there was a significant correlation between EP (eyes turned towards the piano) and PI (therapist plays the piano).

16.3.3 Discussion

It was difficult to link the findings of the change events with those of the quantitative analyses because so many behaviours were not coded, in spite of the fact that 204 observables had been coded. Nevertheless, as shown in the preceding section, where common links were found there was also corroboration.

16.4 Analysis of Observables on the Downbeat

A test for activity on the observable BAR (the downbeat) was made. BAR occurred at each point where there was a bar line during music with a discernible rhythm. A histogram of inter-BAR times shows the distribution of bar lengths in tenths of a second. It was judged that bar lengths of less than 0.5 s could be errors, and therefore excluded, and that if a bar length exceeded 5.5 s the rhythm may have stopped. Therefore all bars of lengths from 0.5 to 5.5 s were considered to be valid bars containing rhythmic music. These limits were based on subjective judgement rather than experimental evidence. In retrospect it would have been helpful to have an observable to indicate rhythmic music.
Each valid bar was divided arbitrarily into eight equal time periods corresponding to quavers in a 4/4 bar. Anything that occurred during the first or last of these was deemed to be on BAR (the downbeat). This allowed a total margin of error from one quaver time before BAR to one quaver time after BAR. If event timings were random, one quarter of events would be expected to occur on BAR. In this analysis the onset times of each observable were tested to find what proportion of them occurred on BAR. Onset times indicated an instantaneous activity or the start of a continuous activity. Whenever an observable was found to occur more on the downbeat than the expected amount by chance, (one quarter of the time), a $p$-value was calculated as the probability of getting this result, or more, by chance. Similarly when the measured amount was less than the expected amount, $p$ was calculated as the probability of getting this result, or less, by chance. The calculation procedure is set out in the appendix section N.4 ‘Downbeat’ Analysis on page 481.

All of the observables which gave a $p$-value better than 0.05 for at least one child were extracted and cross-tabulated by observable and by child. There were 28 observables, of which 10 were expected to be on the list since they were defined as occurring on the downbeat. The fact that these did occur confirmed both the accuracy of the coding and the performance of this analysis. The remaining 18 observables indicated the actual responses of the children. These are shown in Table 9 and Table 10 on pages 251 and 252.

There were more significant results in School B, but none of them involved vocalisations. In School A where vocalisations did figure, they actually occurred less
than expected on the downbeat. This might have indicated that the children were listening out for the downbeat, an idea supported by the fact that they generally moved less than the children in School B, (partly owing to the severity of their disabilities), and were therefore concentrating.

The observables on BAR (the downbeat) were considered in categories of head, arms, legs and vocalisations. Five children (D, J, M, R and A) presented HP (head turns towards the piano) or EP (eyes towards the piano). This suggested they may have anticipated the downbeat. All the children except Joe and Barnaby presented H (head movement), and three children presented MO (mouth open). Only Mahmoud presented MM (mouth movements). Again there was the sense that he was responding to the therapist’s beat. Since his head was mainly turned towards the piano, this may have been a way of physically manifesting a release of tension.

Only one child in each school, Mahmoud and Christopher, presented A (moves arms or hands). The remaining three children in School B, Darren, Joe and Rosanna, all presented beating behaviours or movements of their solo instrument, neither of which were presented by the children in School A. Possibly the arm movements for Mahmoud and Christopher were rudimentary beating behaviours. Certainly they suggested a response to the therapist’s music. One child in each school, Darren and Barnaby, presented F (moves one or both legs). Vocalisations were only presented in School A, by Barnaby, Nihal and Christopher. These, as has been mentioned, occurred significantly less than expected on the downbeat.

The results of the test for activity on the observable BAR strongly suggested that some of the children’s movements were a response to the therapist’s beat. The view of Fraisse that ‘rhythm perception … is closely tied up with motor functioning’ seemed apt here.

To aid comparison between children, the tables below contain the same set of observables for all the children. Wherever an observable occurs for a child, the corresponding cells in the table contain figures. The smaller type size indicates results that are not significant ($p > 0.05$). The columns headed $d$ contain numbers ranging

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from -1.00 to +3.00, representing the deviation from the expected chance result of 25% of occurrences on the beat. (-1 represents 0% on the beat, +3 represents 100% on the beat.)
### Table 9 Results of downbeat analysis, School A

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<th>Observable</th>
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<th>Christopher</th>
<th>Barnaby</th>
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<td>d</td>
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<td>d</td>
<td>p</td>
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</tr>
<tr>
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<td></td>
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Table 10 Results of downbeat analysis, School B

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16.4.1 Comparison of School B and School A

Any comparison of the children is confounded by their different abilities. Those in School A had a greater number of disabilities than those in School B. Christopher and Nihal had spastic quadriplegia and could move very little, and Aaron had no purposeful voluntary movement. Barnaby, the only child able to move his arms and legs to some extent, appeared unable to beat his drum. His beating was limited to tapping against his beater, often in his own pulse, when he was mouthing one end of it. The children’s ability to respond was severely limited. Christopher’s repertoire of observable
responsive behaviour was smiling, turning his head towards the piano, leaning forwards away from chair and making vocalisations, most of which were unpitched. Nihal could smile and vocalise a little, and was able to lift her head (which she did very occasionally). Aaron’s ability to respond was limited to eye and head movement, looking towards or away from the piano and turning his head towards or away from it. Occasionally he puckered his face and flexed his arms. Barnaby had the ability to do all of the above things but was also able to sing and pitch his vocalisations in the therapist’s tonality. Being relatively able, he was the odd one out in the group.

The children in School B had less severe disabilities, although Mahmoud had spastic quadriplegia and impaired vision. He nevertheless had an ability to respond to the therapist in a wide range of ways. He presented varied vocalisations including singing and grizzling, turned his head and eyes towards the piano, and raised his arms slightly when some aspect of the music appeared to intrigue or disturb him. He extended his leg when seemingly pleased, or registering something, and, in the late session, smiled. The other children in the group were able to use their arms but did not pitch in the way that Mahmoud was able to. Both Darren and Rosanna could beat in time with the therapist’s music, a way of connecting with the therapist that none of the children in School A experienced. Joe, though able to use his hands and arms purposefully, did not beat, and used his cymbals as toys with which to play, often mouthing them. He was sensitive to changes in the music, his main response being to turn his head and eyes towards the piano when textural or pitch changes occurred.

It can be seen that each child had different abilities to respond, and a different repertoire of behaviours. This made it difficult to compare the two groups, and, indeed, to compare each group member. Comparisons could be made between measures of their responsiveness quantified in terms of the observables. A simple result, $R$, was obtained by counting the number of different significant types of response per child in the short-term sequential analysis as shown in Table 11.
According to this measure the children in School B were about twice as responsive as those in School A. The ratings of the various children concur with the writer’s subjective observations.

### 16.5 The Basic Structure and Child-Therapist Relationship

#### 16.5.1 The Context Music

The Context Music (see Appendix A: Example 5, page 289; Example 12, page 296) was intended to provide an indication to each group of children that they were in the music therapy space, one shared by the therapist and children alike. This was thought to be similar to the ‘potential space’ shared by mothers and babies as described by Winnicott.\(^5\) The children’s musical themes alternated with the group theme. The child was there as an individual person but also part of the group.

The children’s themes were gradually composed as the therapist got to know each child, with the idea of helping him or her know that s/he was being addressed. They could also provide a mirroring in sound of aspects of each child so that s/he could ‘find him or herself’ in the therapist’s music in much the same way as children find themselves in their mother’s eyes. Sequential analysis was inconclusive about the helpfulness of this approach. Thus far only Barnaby has been shown to recognise his theme (see Appendix A, Example 10, page 294). Therapist observation suggested that the children appeared to respond more to how melodies were articulated. The quality of the therapist’s voice was important, therefore, as were its prosodic features. Stern points out that what is striking about infant-mother vocal interaction is how the mother

speaks to her infant rather than what she says and this seems relevant here, to the child-therapist relationship. It was also found that the children responded to the tonal language in that some of the children sang in the tonality of the therapist, recognised cadences and ends of phrases, and were sensitive to dissonance. Joe, Mahmoud, Rosanna and Christopher recognised their own names and Joe, Mahmoud, Rosanna, Barnaby and Nihal recognised being addressed.

16.5.2 The Hello Song

The Hello Song (see Example 1, page 284 of Appendix A), built upon a triad, formed a special part of the session. It was distinctive because a helper assisted each child to beat, an attempt was made to draw the children’s attention to the downbeat and the tonic, and the subject of the song itself concerned a way of making contact. Many music therapists have Hello and Goodbye Songs in their sessions. Heal Hughes suggests these form part of a musical framework, part of the boundaries of music therapy. Certainly it was very much part of the Basic Structure, an extended framework, and one of the most enjoyed parts for the children. The word ‘hello’ is used a great deal generally. Familiarity with it, and recognition of it must, therefore, have been pleasing to the children who tended to be motivated by the song. After the assisted beating two of the more able children, Darren and Rosanna, beat by themselves, and vocalised too, as did some of the less able children, who also smiled.

By stressing the tonic and the downbeat, the entire Hello Song prepared for its final note, giving ample time for anticipation of it. It also conformed to the ‘law of good continuation’ which may have made it more acceptable to the children. It was thought that stressing the tonic and the downbeat would enable the children to feel unequivocally in contact with the therapist, and that secondly, the experience of this would motivate them to communicate further. It was also to teach the children about music, or to awaken that which was already within them. If they knew about it

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consciously they would know how to assert themselves. This seemed to be the case when Darren and Rosanna beat in Session Eight of School B after their respective turns in the song.

The role of the helpers was important. They not only assisted the children to beat in time with the music; their physical presence in itself may have indicated that the Hello Song was a special event, one in which each child in turn was the focus of attention.

The Hello Song provided the children with an opportunity for successful experiences since it made copious use of anticipation. It appeared to absorb them, facilitated child-therapist contact, and prompted further interaction initiated by the children, most notably by Darren and Rosanna. Its importance can be judged by the amount of time it occupied in the sessions: in School A, 7:22.8 minutes in Session Eight and 11:45.6 in Session Twenty-three; in School B 7:38.6 in Session Eight and 13:44.3 in Session Twenty-five. The lengthier sections in the late sessions reflected increased participation by the children and more improvisation before and after the actual song itself by the therapist.

16.5.3 The Development Section

The therapist intended to meet the children’s responses in an improvisatory way in the Development, taking the lead from the children rather than initiating music herself. This did not happen. Each time the therapist felt it necessary to introduce music the germ of which did not come from the children themselves, although in Session Eight, School A, she introduced some improvised clarinet music following a breathy vocalisation of Barnaby. She followed this with a song, ‘Let’s play Listening’ (see Example 3, page 286 of Appendix A), possibly chosen unconsciously because the title reflected her problem of hearing the children, and being heard by them. At some level the children’s restricted repertoire of behaviours made the therapist feel she must give the children something in a structured way. Also the level of the children’s disabilities was too difficult to acknowledge at times. Nevertheless there were advantages to introducing structured music. Some of the children joined in vocally and instrumentally and it stirred interest in the others. It was thought that if the children had had no connection with the therapist these responses would not have occurred.
16.5.4 The Context Reprise and Bye-Bye Song

During the Context Reprise emphasis was placed on reflecting back to the children what had happened during the session. The section was also intended to signal that the session was moving towards its final stages. The Bye-Bye Song was a ritualised way of concluding the session but appeared not to have a significant effect on most of the children. A co-occurrence analysis of the children’s behaviour in the Context Reprise and Bye-Bye sections showed that all the children had different responses to these sections and there was no marked trend of behaviour.

There was a slight tendency for the therapist to play the Context Reprise in a perfunctory fashion if the children were passive. This was similar to her playing inauthentically and was one of the pitfalls of working with an extended structure with a group of children who had severe disabilities: it was hard to judge at times when to keep going and when to stop; when to present familiar music and when to freely improvise.

16.5.5 Is the Music Therapist like the ‘Good-Enough Mother’?

Mention has been made throughout this study of the idea that the role of the therapist is like that of the ‘good-enough mother’, a term used by Winnicott.\(^{514}\) He felt that much therapeutic change could be accomplished by enabling the child to develop mastery through a relationship with a significant other, usually the mother. This study showed that the music therapist had the potential of being like a ‘good-enough mother’. She was in a unique position to communicate with the children in a way that transcended their disabilities and facilitated their development, and she used a language that the children appeared to understand, and could use themselves. She gave them the opportunity to play games, give and take, and even dance with joy. While none of the children could run, through the music they could have the experience of a running game.

For Winnicott, psychological growth required visual mirroring by the mother or significant other. For Sabbadini ‘holding auditory reflection’ is another aspect of mirroring when the child’s sounds are echoed in some way so that the child learns to

\(^{514}\) Donald W. Winnicott, *Playing and Reality*, op. cit.
‘enjoy them and recognise them as his own’.\footnote{Andrea Sabbadini, ‘On Sounds, Children, Identity and a “Quite Unmusical” Man’, \textit{British Journal of Psychotherapy}, 14(2), 1997, p. 194.} This is particularly relevant to music therapy. During the music therapy undertaken for this study, however, it was often difficult for the therapist to ‘hear’ the children being in the world, and to some extent to see them, since many initiated very little. It was thus difficult to be a good-enough mother. She had to intuit what the children were like and present the resultant music to them, a process which required patience and attention to detail, and involved trying to make sense of unable children. This led at times to the children making the therapist feel unable in the counter-transference. Yet she did react to the children, and her response to them in the Basic Structure was a sonic reflection of their personalities, as perceived by her, as well as a literal mirroring, at times, of their vocalisations.

Two major ways in which the therapist endeavoured to be like a ‘good-enough mother’ were by offering the Basic Structure together with her own personal way of relating to the children. The latter entailed the articulation of the Basic Structure, and spontaneous improvisation, and involved judgements about the timing and quality of the music she presented to them according to the children’s needs as she perceived them. At times this process appeared to be intersubjective\footnote{The use of the word ‘intersubjective’ in this sense is attributed to Colwyn Trevarthen by Mercédès Pavlicevic, \textit{Music Therapy in Context: Music, Meaning and Relationship}, (London and Philadelphia: Jessica Kingsley, 1997), pp. 108-109.} so that the therapist went through processes similar to those of a mother with her infant. An example of this occurred when Christopher smiled and the therapist expressed an understanding of his smile through the quality of her vocalisation. Christopher then broadened his smile.

The therapist altered her music slightly, and so their communication developed.

It was hoped that certain changes in the children over time would be detected, particularly increased levels of activity, vocalisation and responsiveness. These could demonstrate development attributable to the good-enough mother. Due to insufficient data this was not possible, only two sessions in each school being transcribed. Nevertheless, the apparent levels of responsiveness of the children at times strongly suggested that the Basic Structure and its articulation by the therapist provided a way of adapting to the children’s needs that was like the good-enough mother. There were many instances of interaction, of the children moving from passivity to activity, then
assertiveness, and sharing concordant musical moments of a pulse or key. There were occasions when certain children presented reciprocal behaviour, either vocally or instrumentally. Clearly the children responded to the music but the therapist facilitated their processing of it.

The clinical work in this study showed that the therapist frequently behaved like the good-enough mother, but did not consistently fulfil this role. This was partly due to the difficulty in reaching the children, but also due to the therapist’s lack of experience. Ultimately the music therapist could only be good enough within the boundaries presented by the children’s disabilities, and was essentially Winnicottian in the dynamic of her approach.

16.6 The Three Research Questions

16.6.1 Did the Children Take More Part in the Sessions over a Period of Time?

Originally it had been the intention to see if the children took more part in the sessions over time. If a larger number of sessions had been transcribed it would have been possible to answer this, but two sessions alone would not yield statistically reliable results and could not indicate a trend. Nevertheless, a comparison was made between the early session of each school and the late session, assessing the extent to which the children took part. The concept of ‘taking part’ was quantified by (1) the extent to which the children connected vocally with the therapist’s output, as indicated by pitching in the therapist’s tonality, (2) the amount the children beat in time with the therapist’s music, (3) the number of times the children moved or beat on the therapist’s downbeat, (4) how much of the time the children had their heads and/or eyes turned towards the piano and (5) unpitched vocalisations, which were finally considered since they were thought to reflect either enthusiasm or dissatisfaction which the children might have felt for the session. Such vocalisations may also have been made as part of an effort to sing. The results are shown in Table 12. The observable codes which constitute the above five categories are shown in the left-hand column. The second column shows whether a row of figures represents a number of occurrences (n) or a percentage of the total time (t). Code definitions can be found in Table 14 on page 307 of Appendix D.
The vocalisations were considered first. In School B there was a reduction in the number of all vocalisations directly connected with the therapist’s output. Whereas, for example, Mahmoud made 13 VOCPN (pitched vocalisation that matched the therapist’s current or last note) taking 0.6% of the time in Session Eight, he made only 1 in Session Twenty-five which took 0.0% of the session time. Whereas Joe made 6 VOCP (pitched vocalisation that matched therapist’s current or recent note), which took 0.1% of the session time, he made none in Session Twenty-three. The same trend was seen in School A. The most notable change was in Barnaby. In Session Eight he made 54 VOCPXN (pitched vocalisation that approximately matched therapist’s current or last note) which occupied 0.8% of session time, but only 5 in Session Twenty-three, occupying taking 0.1% of session time.

Most of the beating observables indicated a similar fall in levels of participation. Durations are not given as beats were deemed to have zero duration. Rosanna in
Session Eight School B, for example, beat her cymbals on 24 occasions in time with the music while in Session Twenty-five she only beat on 14 occasions in time. She beat on her tray in time with the music on 19 occasions in Session Eight, but did not beat at all on her tray in Session Twenty-five. The children in School A did not generally beat in either early or late sessions.

The difference in level of participation between the two sessions was not so marked in the case of beating on the downbeat (-BEAT). Darren and Rosanna, for example, presented BBEAT 12 and 24 times respectively in Session Eight. Darren presented BBEAT 12 and 14 times respectively in Session Twenty-five. Interestingly, Darren beat the tambourine on the downbeat (BTBEAT) 7 times in Session Twenty-five, having not presented BTBEAT at all in Session Eight. He presented DBEAT (beating on downbeat on a surface other than instrument or self) nil times in the early session but 5 times in the later one. Barnaby in School A, the only child to beat, presented 1 BBEAT in the early session and none in the late session.

The percentage of time the children had their heads turned towards the piano (HP) was less in the late sessions, except in the case of Joe in School B. He presented HP 58 times in Session Eight, filling 15.4% of session time, while in Session Twenty-five, although presenting HP 53 times (slightly less) the observable filled 44.5% of session time, a significantly greater percentage than in the early session.

Interestingly, four children had their eyes turned towards the piano (EP) for more time in the late session than the early one. They were Darren, Joe, and Mahmoud, School B, and Barnaby, School A. Darren only presented EP once in Session Eight filling 0.2% of session time, but looked towards the piano 26 times in the late session, filling 3.3% of session time. Joe and Mahmoud presented EP in Session Eight 59 and 233 times respectively, filling in turn 12.0% and 28.6% of session time. In the late session they presented EP 66 and 262 times respectively, filling 21.4% and 32.5% of session time, a significant increase. Barnaby, School A, presented EP 4 times in the early session, and 5 times in the late session, a very slight increase with a marginal differential in percentages of time filled.

Finally, unpitched vocalisations (VOCU) were considered. Mahmoud was the only child in School B to present VOCU more in the late session. He presented it 68 times
in the early session with 4.5% of session time filled, and 77 times on the late session with 20.6% of session time filled, a significant increase. In School A Nihal presented VOCU 3 times in Session Eight with 0.0% of session time filled, but presented it 102 times in Session Twenty-three, filling 1.1% of session time, again a significant increase.

16.6.1.1 Discussion

Following this analysis it was realised that it had been foolish to have one of the concepts of ‘taking part’ in the session quantified in terms of beating in time with the music primarily because Aaron, Christopher, Nihal and Mahmoud were physically unable to beat. Furthermore Barnaby rarely beat in time with the music and Joe did not beat at all. It was interesting that this error occurred. At some level it was hard to imagine children being unable to beat and make music, and seemed to indicate that the therapist subconsciously related to them as whole and intact.

Overall the children in both schools participated less in their respective late sessions, although half the children, 3 in School B and 1 in School A, presented EP (eyes towards piano) more in the later session, suggesting greater interest in the therapist. Possibly they were expecting something from the therapist which was not forthcoming. The increase in VOCU (unpitched vocalisation) presented by Mahmoud in Session Twenty-five was due to his dissatisfaction rather than enthusiasm for the session. His grizzling only abated when the therapist took him out of his chair, held him in her arms and carried him over to the piano, where he sat quietly on her knee. Barnaby’s reduced number of VOCU (unpitched vocalisations) in Session Twenty-three was possibly due to the fact that he had not been given his beater as it was thought to be a distraction. Consequently he had appeared less excited than usual.

One can only speculate on the reasons for the overall reduction in the level of participation. It may have been reduced in both late sessions by chance, and the criteria for categorising participatory behaviour were rough and omitted many factors that were difficult to quantify. Nevertheless it is possible to obtain some ideas about it by drawing on the memories and thoughts of the therapist as she reviewed the video-
In Session Twenty-five, School B, she felt that she played and sang too much, leaving insufficient space for the children to express themselves or communicate. She also felt that her music could sometimes be described as ‘inauthentic’ when she played mechanically, for the sake of it, without being attuned to the children, and without relating to them. This is comparable to the way the depressed mother relates to her infant.

In this situation the Basic Structure was arguably unhelpful, being too easy to fall back on and sterile if not articulated with the children in mind. Pavlicevic points out that it is music and emotion that together ‘form the root of fundamental human contact’. In the ‘inauthentic’ music of this therapist, music and emotion were not flowing together, nor did they combine to meet the being of the children. This may well have been sensed by them and resulted in their cutting off from the therapist and becoming passive. The therapist failing to leave sufficient space for the children may have brought about a similar effect.

A speculative point was that many of the musical phrases presented by the therapist were too long for the children. Probably their memories were shorter than those of normal children so that they could not easily remember what she played. Their liking of the Hello Song may partly have been due to their recognising the short melodic phrase which was repeated eight times within the course of the song.

In Session Twenty-three, School A, the therapist felt more comfortable with her output. The children gave the impression of listening more and this may have been one reason for the apparent reduction in their level of participation. Only Barnaby could really beat, which lessened the group’s potential rating, but he did not seem to understand that

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517 A possible precedent for this procedure was made by Chris Barker in ‘Interpersonal Process Recall on Clinical Training and Research’, in F. N. Watts (ed.), *New Developments in Clinical Psychology*, (Leicester: British Psychological Society, 1985).


he could beat his drum with his hand. His main beating activity occurred when he mouthed the end of his beater, and beat against it with his fist.

It was important to remember that although participation levels dropped, the children from both Schools nevertheless did participate in both early and late sessions.

16.6.2 When did the Major Child-Therapist Interactions Occur?

It was not possible to generalise about what constituted major child-therapist interactions since each child had different abilities and a different range of responses. A child turning his eyes towards the therapist could be a major child-therapist interaction, whereas for another beating in time with the music was such an interaction. For this reason each child was considered individually.

16.6.2.1 Aaron-Therapist Interactions, School A

Aaron’s major interactions involved movement of his head and/or eyes. He often looked at the therapist when she was away from the piano in the middle of the group of children, and often turned his head to the piano as she returned there as if to see what she would do next. Her singing very low or high notes seemed to affect him as, for example, when he averted his head and eyes from the piano when she sang c’’ and f’’ sharp at 13:02 in Session Eight, or when in Session Twenty-three at 23:32 he faced her, and grimaced, when she sang quietly below c’ with an unusual sounding voice.

16.6.2.2 Nihal-Therapist Interactions, School A

Nihal had the least skills of all the children, with a limited behavioural repertoire. When apparently responding to the therapist she usually made small movements. Since these were also infrequent, all her responses were arguably major interactions.

Nihal’s foot movement seemed be an important indicator of how she reacted to the session. She moved her feet at different times, at the end of a musical phrase for example, as at 25:13, Session Eight, or between melodic segments, as at 12:42.3, Session Eight.

She apparently responded to pauses in the therapist’s musical ‘conversations’ with another child, and to contrasts in dynamics. Unexpected sounds also appeared to affect
her: the clattering of a dropped tambourine, high notes sung by the therapist, a piano chord breaking the silence. Her foot movement was particularly important in that it seemed to mean that she was following events, and indicated what she found significant in the music, showing at the same time a sensitivity to this.

Two marked interactions occurred at 19:43.6 in Session Eight and 21:14.5 in Session Twenty-three. In the former (which was described in Chapter 8 at 8.2.10) there was a tempo change to slow, the introduction of thirds on the piano and a shift to the flattened submediant. Nihal moved her head, feet and arms in apparent response to this, possibly reacting to all the different ingredients of this musical moment. In the latter interaction, the therapist was next to Barnaby, singing his theme then placing a beat on his drum. Nihal raised her head slightly and made an ambiguous unpitched vocalisation after this beat which prompted the therapist to turn towards her, and sing her theme and address her. Barnaby looked at her too, smiling. Nihal responded later to her theme being sung by laughing at 30:25 so it is possible her earlier vocalisation was a little laugh possibly in response to the therapist playing Barnaby’s solo instrument.

Nihal’s most prominent interaction with the therapist appeared to be a smiling response to the latter’s exclamatory vocalisation following the cymbals accidentally touching Nihal’s nose. This happened during her turn in the Hello Song at 28:30.1 Session Eight, and had apparently more effect on her than the song itself. It was a moment of humour that child and therapist shared, and it was in contrast to the majority of other apparent responses throughout the sessions in which Nihal made very small movements.

16.6.2.3 Christopher-Therapist Interactions, School A

During the major interactions with the therapist, Christopher did one or more of the following: made pitched or unpitched vocalisations, leant forwards out of his chair, turned his head partly or completely towards the therapist, raised his legs and smiled.

Certain major child-therapist interactions occurred when Christopher was being addressed. For example the therapist played his theme at 11:54 in Session Eight, then improvised and sang his name. Christopher firstly made an unpitched vocalisation then pitched three notes over an 18-second period, a vocal dialogue ensuing. He
showed great awareness of each piano note the therapist played and seemed eager to respond, to let the therapist know he was there. He smiled at 40:50.5 in Session Eight when the therapist played a variation on his theme and sang to him.

The sung word ‘hello’ of the therapist seemed to prompt Christopher to smile and vocalise, whoever she was addressing. Examples of this occurred at 14:48 and 17:53.3, Session Eight and notably at 28:41 in Session Twenty-three when Christopher sang three notes approximately pitched in the therapist’s tonality. He also initiated an interaction at 18:23 in Session Eight by smiling, apparently pleased with himself because he moved his cymbal, which constituted a rare event. The therapist responded by describing Christopher’s playing to Aaron whom she was addressing. Shortly afterwards she addressed Christopher, improvising on his theme in a vigorous way.

Christopher appeared to respond to a variety of situations. He showed interest in the other children when they interacted with the therapist as at 29:21.8 Session Twenty-three, for example, appearing intrigued by the sound of the clarinet at 33:54.0 Session Eight and smiling with apparent pleasure during the song ‘Let’s Play Listening’ at 35:32.5, Session Eight. Occasionally he appeared curious about what was going to happen next, turning his head towards the piano, for example, at 16:52 in Session Eight when the therapist had returned to it after being with Nihal.

16.6.2.4 Barnaby-Therapist Interactions, School A

While Barnaby frequently beat against his beater in Session Eight, none of his beating behaviours formed major interactions with the therapist. These largely occurred when he pitched or sang in her key, or when he explored an instrument she was holding when by his side.

One example of his singing in the therapist’s tonality occurred at 13:24 near the beginning of Session Eight, towards the end of the therapist addressing Christopher and presenting his G major theme. Barnaby started singing when the piano accompaniment had temporarily stopped and the therapist’s vocal line was full of pauses as she neared a cadence. He firstly sung a’ three times, following the therapist’s second inversion D7 chord, then d’ seven times, as the therapist sang d’ three times, then, as she played a D11 chord, he sang e’ once then g’ three times and finally b’ three times following the therapist’s vocal line. He then switched from
singing to vocalising an unpitched drone. The first ten notes had been set to the consonant ‘g’, while the latter notes were set to ‘loo loo loo’.

Barnaby seemed to have a natural feeling for melody. About 20 seconds after the above example, when the therapist was still addressing Christopher, he once again echoed her sung notes, firstly singing a´ six times, the dominant of the current chord, and then adding the mediant and tonic notes in a pause she left. The last major interaction in the same section at 14:13.5 contained a passage in which the therapist had come to the end of the section, had just made a cadence and was sustaining the root position of a G chord on the piano. During this Barnaby sang b´, a´, g´, e´ and d´ in a fluid and even way.

Barnaby sang most in the first part of Session Eight. He tended to sing when the therapist was either not singing, or singing very little in relation to her piano playing, Barnaby possibly feeling there was more room for him at such times. His singing could be understood in several ways. It may have given him the feeling of being close to the therapist even though she was addressing another, it may have been enjoyable to make the sounds, but possibly it may have been a way of drawing attention to his presence in the group and asking the therapist to address him next. This appeared to be the case at 19:25.5 in Session Eight when he sang a short tune in G major.

There were instances of Barnaby singing in the prevailing key when his theme was being played or improvised upon, or it was his turn in the Hello Song. In these cases he had direct communication with the therapist and often took part in short turn taking interactions with her. When she was next to him, he looked at her, touched her arm and the instrument she was holding. There was every indication he wanted to make contact.

16.6.2.5 Darren-Therapist Interactions, School B

The major Darren-therapist interactions took the form of Darren beating in time with the therapist’s music. The two main interactions of this kind occurred when the therapist was addressing Mahmoud. In the first of these, at 29:31 in Session Eight, the therapist came to the end of a phrase in her music and was silent for two seconds. Darren picked up her 4/4 tempo during the silence and began rhythmically beating on his drum for three and half bars. The therapist supported him pianistically for four
bars but resumed singing to Mahmoud again at the start of the third bar, trying to acknowledge both children simultaneously. The second interaction followed about 23 seconds later, the therapist still addressing Mahmoud who was making protesting vocalisations. She paused in her 6/8 music, then sang that Mahmoud was ‘playing now’. At this point it was Darren who played, exactly taking up the therapist’s time signature. The therapist responded to Darren by offering the same music in 4/4 that had accompanied his beating previously. Darren took up the crotchet beat, gradually accelerating as he proceeded.

The impression was that Darren wanted attention and was frustrated by the therapist attending to a grumpy Mahmoud. Interestingly, he played on both occasions at the ends of sections or phrases, as he did at the onset of some of the other beating interactions, possibly intuiting an opening for him. This was the case at the end of Mahmoud’s Hello Song turn when the tambourine was given to Darren at 28:43, Session Twenty-five, and he began beating on it followed by the therapist on the piano. However, he also joined in with the therapist’s music at the beginning or middle of sections, when she was playing his theme, 11:50.9 in Session Eight for example, and during an improvisation on the Context Music at 20:46.5 in Session Twenty-five. He also initiated beating episodes at the end of both of his own Hello Song turns (25:21 in the early session, 29:53.8 in the late one) appearing focused in his playing, giving the impression of having been stimulated by the assisted beating and wanting to show what he could do on his own. A brief turn-taking interaction at the end of Darren’s Hello Song turn at 29:53.5 in Session Twenty-five led on to an allegro passage which Darren joined in with, beating in time with the therapist’s music with remarkable precision at 30:9.6. It was interesting that he played like this in a session where he tended to present as bored and disinterested. The Hello Song appeared to be a catalyst of some kind.

**16.6.2.6 Rosanna-Therapist Interactions, School B**

Rosanna also beat in time with the therapist’s music but tended to place isolated beats on her cymbals rather than generate a pulse because she was constrained by her physical disabilities. Her in-tempo beats occurred sporadically throughout the sessions and were not limited to those periods when the therapist was focusing on her. The most noticeable beating interactions occurred at the end of both her Hello Song turns, at
23:01.8 in Session Eight and 24:20.4 in Session Twenty-five, when she played on the Hello Tambourine by herself presenting, in the early session, a string of 13 beats intermittently in time with the music, and, in the late session, following the melodic logic of the music as offered by the therapist, a passage with many pauses and delayed resolutions. Like Darren she appeared focused in her playing at these times. There was every indication that she was inspired in some way by the assisted beating and music of the Hello Song itself.

16.6.2.7 Joe-Therapist Interactions, School B

The usual way that Joe interacted with the therapist was to turn his head to the piano and look at it when she was playing and/or singing something that interested him, often letting go of the cymbals he was mouthing when something caught his attention. An example of this was described in appendix section I.3.17: Joe Stopped his Mouthing Activity 19:47.1, page 391. The majority of these interactions occurred when there was some textural, pitch, dynamic or similar change in the therapist’s music and often entailed a cessation of movement in Joe, giving the impression he was focusing on the therapist and wondering what she would do next.

The main interactions with Joe occurred when he was in a state of hyper-excitability and the therapist played and sang some music to calm him down. An example of this occurred at 10:57 in Session Eight.

16.6.2.8 Mahmoud-Therapist Interactions, School B

There were several major interactions between Mahmoud and the therapist although Mahmoud did not beat. Most notably Mahmoud vocalised, often making unpitched vocalisations but also clearly singing in the same key as the therapist, and sometimes oscillating between the two kinds of vocalisations. This was the case at 16:38 in Session Eight, near the end of a section of music which had lasted over five minutes and in which Mahmoud had only fleetingly been addressed near its start. Mahmoud snuffled, then exclaimed ‘oi’ and then loudly sang the dominant note of the cadence. It sounded as if he were saying ‘what about me?’ This was how the therapist interpreted it as she began playing Mahmoud’s theme. Mahmoud appeared to pay great attention to everything she played and sang in the ensuing minutes, and he was first to play the Hello Song. Clearly he had vocalised to gain her attention and had achieved his goal.
A second interaction in which Mahmoud wanted the therapist’s attention occurred in Session Twenty-five. It was apparently in response to the therapist concentrating too long on the other children without specifically including Mahmoud. He began a series of unpitched vocalisations at 34:42 Session Eight which finally turned into pre-crying sounds at 39:55 despite all efforts to calm him. It seemed to the therapist that he wanted to be picked up and this is what she did, carrying Mahmoud to the piano and keeping him on her knees as she played. He stopped fretting.

A different kind of Mahmoud-Therapist interaction occurred during and after the final verse of ‘Once Upon a Chime-Bar’ (see Example 4, page 287 of Appendix A) which began at 39:28 in Session Eight. In the fifth bar of this Mahmoud sang ‘Aah’ on the tonic for two beats, beginning on the downbeat. He had a look of contentment on his face and it appeared he was taking delight in the music. The interaction continued with Mahmoud making gurgling sounds and snorts until the end of the verse. The therapist finished by singing ‘that was everyone making it go’, and singing the usual e’ flat at the cadence. As she finished, Mahmoud made a vocal glissando up to the e’ flat just sung and echoed the word ‘go’ by singing a long, firm and clear ‘oh’. It seemed he wanted the song to continue. There ensued a further interaction with the therapist in which she set Mahmoud’s repeated e’ flats to music, improvising. There was every indication that Mahmoud had found a note meaningful to him, wanted to sing it and enjoyed doing so.

16.6.3 Discussion

It was possible to answer the question ‘when did the major child-therapist interactions occur?’ primarily from the child’s point of view, or in terms of the external structural elements of the session, though both categories were interdependent.

16.6.3.1 The Child’s Point of View

It seemed that there were four main circumstances in which major interactions occurred: when a child (1) wanted something specific from the therapist (2) was curious about what the therapist would do next, (3) wanted to share music with the therapist and engage with her (4) wanted to sing or play because s/he took delight in the music. The last two were difficult to differentiate.
Wanting something could entail making vocalisations of dissatisfaction as Mahmoud did at 39:55 in Session Twenty-five, School B when he wanted to be picked up, or acting out as Barnaby did at 29:10 in Session Twenty-three, School A, when he wanted the therapist’s attention and physical proximity. Their actions resulted in the therapist responding in both cases to the children’s needs. Additionally, ‘wanting something’ could relate to a specific activity when the child appeared to signal to the therapist that he wanted a turn in the Hello Song or the Chime-Bar Song. The signal could be made vocally, instrumentally, by a child turning their head towards the therapist or with a smile.

In the second category, there were many instances of children turning their heads towards the piano and sometimes clearly looking at it shortly after the therapist had come to the end of a section in the music, paused, or delayed the resolution of a cadence. The children also turned their heads towards the therapist if she began speaking, the implication again being that they were curious about what she would do next.

In the third category a child seemed to want to share some aspect of the therapist’s music, singing in her tonality for example, echoing her sung words, following the contour of her melody. Darren joined in with the therapist’s music by beating his drum in the same pulse as the therapist on occasions. Such concordance also entailed the therapist following the children in some way. A simple example of this was the therapist playing the piano in a pulse initiated by Darren on his drum.

In the fourth category a child seemed, at times, to sing or play for the pleasure of making music, and not primarily to communicate with the therapist. An excellent example of this was Mahmoud singing E flat on the downbeat in the Chime-Bar Song at 39:41 in Session Eight.

### 16.6.3.2 The Structural Elements of the Session

The major child-therapist interactions linked with the input of the therapist occurred during ‘Let’s Play Listening’ (see Example 3, page 286 of Appendix A), when the word ‘hello’ was sung, when a child was being addressed, when the therapist’s voice sounded unusual, after the Hello Song, at ends of sections, during pauses, when there
were textural and other changes in the music and when the therapist returned to the piano after being among the children.

16.6.4 When the Music Therapist Focused on an Individual Child How did one Know the Child was Aware of this?

There were two ways of approaching this question: drawing on the subjective experience of the therapist and on the data gathered.

The therapist found that when she focused on a child it was possible to tell s/he was aware of this when s/he gradually engaged with her in some manner. The engagement did not necessarily entail the child looking at the therapist, although this did happen sometimes. More often the child used what the therapist offered in music. If she sang and played a phrase on the piano, for example, addressing the passage to a certain child then pausing, s/he might use the pause as a place to make a vocalisation, or smile. If the therapist then resumed playing and continued to address the same child, his or her smile might increase and his or her arms move, and s/he might vocalise again. Christopher made these sort of responses, and when the therapist’s singing voice reflected the sense of laughter in his unpitched vocalisations on one occasion, his smile became enormous. There was no doubt that he knew the therapist was focusing on him.

By engaging with the therapist, the child tended to change. When Rosanna, for example, was aware she was the object of the therapist’s attention, her playing of the cymbals became more measured. She appeared to be listening and judging when the therapist would play so that she could be in synchrony with her, managing to place a beat which completed a phrase, or beating in time with the music. The change might involve an increased amount of beating interspersed with pauses, the latter allowing for turn-taking. This was the case for Darren when the therapist focused on him.

It was possible for the child to use what the therapist offered when she was away from the piano as well. This often involved reaching out to the instrument she was holding and exploring it, as well as gazing into her face as Barnaby did on many occasions. For Darren an extended tambourine was there to beat, and even if he had been still before the therapist approached him, he would often start beating the instrument she offered him.
Sometimes the therapist would ask a certain child whether s/he wanted to be next in the Hello Song, for example. When a child knew s/he was being addressed in this way s/he would often make some response, smiling, making a vocalisation, or in the case of Rosanna beating her cymbals, then looking at the therapist. Occasionally Aaron would avert his eyes, apparently signalling that he did not want the therapist’s attention. By averting his eyes he was still responding to the therapist but in a negative way.

Drawing on the data, when a child appeared to respond to being addressed, or focused on, and did not respond to the other children being addressed, that was the surest indication of all that s/he was aware of the therapist’s attention.

16.7 Music Therapy Guidelines

The findings in this study led to the emergence of guidelines in respect of music therapy. It was found, to begin with, that the Basic Structure provided a useful framework but could also be unhelpful in that at times it provided ready musical material when different music may have been more appropriate. This could lead to the therapist playing in an inauthentic way, one in which she was not attuned to the children. One guideline of music therapy, therefore, is that the therapist should be flexible enough to switch from following a structure to improvising freely in a way that meets the children’s current moods and needs. Another guideline following on from this is that the therapist should avoid playing just for the sake of it, that is using musical material which has no relevance to the children.

It was also found that there was a tendency for the therapist to play the piano without pauses or breaks, not leaving the children enough time to gather and make their responses. The fact that Barnaby tended to sing when the therapist had reduced her output (either by stopping singing and just playing the piano, or by leaving pauses) supported this. The guideline here is not to overreact to children who do not initiate very much by presenting them with an incessant stream of notes. Playing the piano and singing can be a potent facilitating medium, and it is important to allow children time to respond to it.

The children were very responsive to the Hello Song, the word ‘hello’ itself often causing a child to vocalise or smile. One lesson learned from this was that saying
‘hello’ is important to children and that a ‘hello song’ is more than just a structural element in a music therapy session.

In this study it was found that there was merit in drawing children’s attention to the downbeat in the Hello Song through the design of the song and assisted beating, certain children being motivated to beat by themselves immediately after it. There was a strong sense of the children communicatively ‘playing hello’ having had the experience of it in assisted beating. A guideline, therefore, is that it is beneficial to help children with severe disabilities beat. This has the advantage of enabling the children to experience music making first hand, is stimulating and has the additional benefit of there being physical contact with the helper. For the child with spastic quadriplegia it can be better to help a child beat on something that is light and yields easily to the touch like the Chinese cymbals. It may be uncomfortable for a child’s clenched hand to beat on a tambourine or drum.

The Hello Song had much in common with the music introduced by the therapist during the rest of the sessions. This was strongly tonal, melodic, containing suspensions and resolutions, making use of anticipation, and containing V7-I shifts at the ends of phrases. It was found that the children were able to follow this music extremely well and join in with it, pitching or singing in the tonality of what the therapist sang or played, as well as beating in time. A guideline therefore is to use tonal music with children who have severe disabilities because it is accessible, and will in turn facilitate child-therapist interaction and communication.

16.8 Ways in which the Research could have been Improved

The use of video was appropriate for this study, making it possible to review and transcribe data over time. It would have been better, however, to have had more than one video-camera since often the children were obscured by the helper and/or therapist, and data were lost. In addition it was not possible to see a child’s face when his or her head was turned away from the camera.

An acoustic piano with a MIDI output would have facilitated music transcription, and saved time. Ideally an electronic system was needed that recorded the times of visible and audible events in synchrony, and allowed coded observables or other text to be attached at specific points in time. The transcription method used in this study was not
100% accurate and it was difficult to ascertain exactly when, for example, children vocalised.

It would have been helpful to have had the use of a room dedicated to music therapy. Not only would it have been unnecessary to push a piano into the room prior to the start of each session (far from an ideal prelude to running a music therapy group), but the equipment needed could have been set up prior to the children’s arrival, preventing the children from waiting around and enabling the therapist to work with the children’s initial responses.

It would have been better to have used a ten-second window when describing rare events and to have found these by looking through the video tapes rather than the event list on the computer. This was discussed at the end of section 9.3 Discussion of Rare Events, page 171.

The first set of change events suffered from a similar lack of forethought. While they were gathered by looking at the video tape they were not checked against the event list on the computer. This meant it was not certain that all change events were identified. Also a summary of change events was not given. This was rectified when describing those in School B but ideally the format of the description of change events should have been identical.

It was felt that the quality of the music therapy would have been enhanced if the therapist had had a supervisor for her clinical work. This would, of course, have been helpful to the children, but may also have enabled the writer to make a more forceful case that the therapist is like the Winnicottian good-enough mother. Undertaking the music therapy in Reading was stressful and on reflection needed the objective input and support of another music therapist as a supervisor.521

Finally, the quality of the equipment used to suspend the children’s cymbals was not sufficiently sturdy. It frequently needed readjusting if the children pulled hard on their solo instruments and this interfered with the flow of the session.

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521 The work was stressful for the writer partly because she was an inexperienced music therapist, but also because of the practical aspects of the work. After approximately one and a half hours drive to work, setting up equipment in a short space of time, and moving a heavy piano, it was demanding to ‘be there’ for the children. Furthermore she felt exposed, knowing that every detail of her clinical work was being recorded.
16.9 Conclusions

16.9.1 Summary

It was found that children with cerebral palsy and severe and multiple disabilities who were in interactive music therapy had the capacity to follow Western tonal music and respond to it. Some could sing in the therapist’s tonality and beat in time with her music, and they all demonstrated, with gaze, movement, facial expressions and/or use of musical instruments that they connected with her. The study did not show a steady developmental progression from being unable to being more able due to a lack of data. Rather it demonstrated the potential of music therapy to reach children with severe and multiple disabilities and help them communicate, assert themselves and experience being in an interactive relationship.

The fact that the children were not so damaged that they could not interact is an important finding because children with severe disabilities are often considered to be beyond the scope of therapy, and the extent of their ability to respond is not appreciated.

The Basic Structure approach was found to be excellent when used well, but difficult to use well consistently. If the children were passive, it was easy to play and sing the pre-composed material automatically rather than responsively. However, when the therapist was able to articulate the structure in a way that was sensitive to the children’s needs, she could facilitate interaction with them. At these times the therapist’s music was fluent and flexible, and she was attuned to the children. They in turn tended to be alert, active, and aware of her, sensitive to the constituents of music, and to its underlying logic.

No method was devised for ‘asking’ the data whether or not the therapist was like the good-enough mother.

The results of this study indicate that it is worthwhile doing music therapy with children with severe disabilities in that they show a capability to respond to the therapist.
16.9.2 Threats to the Validity of this Research

The quantitative results should be taken as strong indications rather than proven facts because (1) the data were ultimately subjective, (2) observables were not consistently coded in all cases (see 7.5 Reliability Test, page 147), (3) some of the statistical analysis procedures lacked the rigour that might be required in ‘hard science’(see Appendix N, page 474), and (4) no reliability check was done on the transcription of the music itself. This final point was not deemed serious since the music was mainly simple and straightforward with only the time signatures occasionally open to interpretation.

16.9.3 Suggestions for Further Research

Since this study has touched on a variety of aspects of music therapy which could not be corroborated, it is suggested that further research be done looking at the effect of vocal and instrumental high pitches in music therapy, the effect of different qualities in the therapist’s singing voice and the effects of dynamic and textural changes in the therapist’s music. The use of silence and its qualities would also be important to look at, aspects of music therapy which this study brought into focus.

Further consideration of infancy research would be valuable. This would enable a comparison to be made between normal interaction and that of children with disabilities, and could shed light on the motivating forces behind the latter’s movements, vocalisations and use of musical instruments. Infancy research has brought to our attention, for example, the innate musicality within infants, their tendency to move in synchrony with the speech of their caretakers and their ability at a very young age to beat in time. It has shown that ‘Our bodies express the impulses of our minds’ and that ‘musical elements…develop…as part of global

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behaviors in the context of social interaction…’

A fuller exploration of these themes could help define the so-called ‘music child’.

One general finding was that group music therapy with children who have cerebral palsy and severe and multiple disabilities was difficult at times to undertake. The children had different capabilities and some were slow to respond. It often appeared that individual music therapy would have been more appropriate and made it easier to give each child adequate attention. This could be an area for further research. There were indications in this study that given more attention each child would have developed to a greater degree, and it would be important to establish this as a fact. It would also be helpful to see whether children took more part in the sessions over time.

Both sequential analyses yielded significant relationships between certain pairs of child and therapist observables but the times when they occurred in sequence were not extracted. These would be worth investigating with a view to finding common factors or antecedents.

There is potential for transforming and examining the existing data of this study in many different ways. For example (1) codes could be merged to form a smaller set of more general behaviour categories (2) codes could be compounded to give qualified or more specific categories e.g. therapist singing while addressing a particular child. This would allow the use of more of the information which has already been collected. There are many ways of analysing these data, limited only by the imagination of the researcher.

The writer recommends her transcription method with certain provisos: the number of observables should be limited in order to meet the constraints of time, the definitions of the observables should be simple and clear cut and a pilot study should be done before finalising the set of observables and their definitions. It is difficult to apply a coding system consistently if it changes during the study, requiring modification to earlier work.

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Finally, when there is a need for group music therapy with children who have severe and multiple disabilities, it is suggested the Basic Structure be used again. The writer and other therapists might be able to refine and improve this approach, in particular taking more account of the children’s responses and leaving more time for them. It was the writer’s impression that given these amendments the approach could provide a useful starting point. Of importance, in the end, is how we move away from the structure.
The University of Reading

Department of Music

MUSIC THERAPY PROCESS WITH YOUNG PEOPLE WHO HAVE SEVERE AND MULTIPLE DISABILITIES

 Appendices and References

Ph.D. Thesis

Susan Judith Van Colle

January 2003
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Appendix A

Themes of the Basic Structure

This appendix contains the music for the children’s themes and pre-composed material used in the Basic Structure (see section 5.4 The Basic Structure, page 113).

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"Hello" Song

(c) 1985 Sue Van Colle

** Key is F for School B, D for School H  ** The child's name is sung in place of "... - ..."
Example 2 How Shall we Play Now? (REP)

How Shall we Play Now?

\( \frac{j}{= 96} \)

(c) 1988 Sue Van Colle

Voice

Piano

How shall we play now? How shall we play now,

how shall we play? How shall we play today?
Let's Play Listening

\( \text{Let's play listening listening listening with Sue.} \)

(c) 1988 Sue Van Colle
Once Upon a Chime-Bar

(c) 1985 Sue Van Colle

Voice

Piano

Once upon a time, you know, Liv'd a chime bar thus: and so, Ting ting ting ting it would go! Ting ting ting ting ting!

That was ... ... making it go! That was ... ...

* The child's name is sung in place of "... ..."
Various instruments can be used in place of the chime-bar, and the words altered accordingly.
Example 5  Context Music, School A (CX)

Context Music, School A

\( \text{\textcopyright 1988 Sue Van Colle} \)

Voice

Here we are to-day

Here we are to-day

Piano

Here we are to-day for music, here we are to-day.
Example 6  Aaron’s theme (CA)

Aaron, School A

(c) 1988 Sue Van Colle

Voice

Piano
Example 7 Nihal’s theme (CN)

Nihal, School A

\( \text{\(J = 90\)} \)

\text{(c) 1988 Sue Van Colle}

Voice

\text{Ni - hal} \quad \text{Ha - sham} \quad \text{Ni - hal}

Piano

\text{Ha - sham, Ni - hal} \quad \text{has come here with Sue}
Example 8 Nihal’s second theme (CN2)

Nihal (2nd theme), School A

\( \textit{J} = 112 \)

(c) 1988 Sue Van Colle

Voice

Nihal Hasham, Nihal Hasham

Piano

Hasham Nihal Hasham is here with Sue.
Example 9 Christopher’s theme (CC)

Christopher, School A

\[ \text{Voice} \]
\[ \text{Piano} \]

\( q = 72 \)

(c) 1988 Sue Van Colle

Christopher Taylor is here

Christopher Taylor is here

Christopher Taylor is here

Christopher Taylor is here.
Example 10 Barnaby’s theme (CB)

Barnaby, School A

(c) 1988 Sue Van Colle

Voice

Piano
Example 11  Bye Bye Song, School A (BBS)

Bye-Bye Song, School A

\( \text{\textcopyright 1988 Sue Van Colle} \)

\( j = 60 \)

**Voice**

Bye bye bye  Let's sing Bye bye  Bye bye bye  un - til next time.

**Piano**

Bye bye bye  Let's sing Bye bye  Bye bye bye  un - til next time.
Example 12  Context Music, School B (CX)

Context Music, School B

\( \text{\( \downarrow \)} = 110 \)

\[ \begin{align*}
\text{Voice} & : \quad \text{Here we are for music Oh Oh here we are} \\
\text{Piano} & : \quad \text{Here we are for music Oh Oh music with Sue.}
\end{align*} \]
Example 13 Darren’s theme (CD)

Darren, School B

\( j = 192 \)

(c) 1988 Sue Van Colle

Voice

Piano

(Campbell)

Darren

is here today.

Darren

Play!
Example 14 Rosanna’s theme (CR)

Rosanna, School B

\( \text{\textcopyright 1988 Sue Van Colle} \)

\( j = 110 \)

Voice

\( \text{Rosanna Bee-kett is here today Ros-} \)

Piano

\( \text{Rosanna Bee-kett has come to play. Ro-} \)

\( \text{\textcopyright 1988 Sue Van Colle} \)
Example 15  Joe’s theme (CJ)

Joe, School B

(c) 1988 Sue Van Colle
Example 16 Mahmoud’s theme (CM)

Mahmoud, School B

\[ \text{\( \text{\( \text{\( \text{j} = 132 \)} \)}} \]

(c) 1988 Sue Van Colle

Mahmoud, School B

Mahmoud, School B

Mahmoud, School B

Mahmoud, School B

Mahmoud, School B

Mahmoud, School B

Mahmoud, School B

Mahmoud, School B

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Mahmoud, School B

Mahmoud, School B

Mahmoud, School B
Example 17  Bye Bye Song, School B (BBS)

Bye-Bye Song, School B

\( \text{\textcopyright 1988 Sue Van Colle} \)

Bye bye Bye bye See you again next time

Bye bye Bye bye See you again next time
Appendix B

Consent Form

This appendix contains copies of the introduction, letter and consent form sent to the parents of each child involved in this research (see section 6.6.4 Implementation of Research Plan, page 130).

**Music Therapy and the Young Handicapped Child**

Music Therapy with the young handicapped child is based on the idea that all children, however handicapped, respond to music. Often children are motivated to sing, move and/or play an instrument while listening to someone making music. The Music Therapist can use his skills to build on these responses to help a child develop self-awareness, the ability to communicate and to gain greater control over his physical movements. Through making music with the Music Therapist, a child may experience more keenly being in a relationship and discover new ways of using that relationship, becoming more aware that he has a part to play in the world and that he can enjoy himself. By having Music Therapy with other children in a group situation a child may benefit from the experience of sharing.

This information and the following letter concerns your child

[name of child]
from Sue Van Colle B.A. (Hons) Dip M.T. (Roehampton)  
Postgraduate student at The Department of Music,  
University of Reading

Dear [name of parent]

I am a Music Therapist who is conducting a Music Therapy Research  
Project involving a series of Music Therapy sessions. I am writing  
to ask you if you would be interested in allowing your child to  
participate.

The aims of Music Therapy include promoting self confidence, self-  
awareness and communication within a relationship. I will sit the  
children in chairs, give each child a musical instrument and sit  
myself at the piano. Helpers will be present to look after the  
children and assist them with their playing. The group sessions  
will last up to 40 minutes and be on a weekly basis. 22 sessions  
are planned over a one-year period.

The sessions will be recorded on audio and video tape for the  
purpose of later analysis. Recordings will be confidential and  
will be maintained securely in my personal keeping. No confidential  
information will be disclosed about your child except within the  
team responsible for your child's treatment.

The Music Therapy offered will in no way differ from normal Music  
Therapy in which the therapy is for the benefit of the child and  
aims to help his development. Participation in the project would  
in no way affect the care and the treatment of your child which  
would otherwise be available. Hopefully the project will offer  
your child an extra benefit.

You have the right to withdraw your child at any time. I would  
advise parents that before doing so they would consult with  
their child's teacher and myself. An effort will be made to arrange  
alternative Music Therapy at a later date if you so wish.

When my research is finished, recordings will either be destroyed,  
given to parents and/or possibly kept for professional reference  
purposes but only with the written consent of ALL relevant parents.  
Parents will have the right to know the results of my project  
should they wish.

There is still limited understanding of what Music Therapy is and  
how it works. Not much detailed written work exists on the  
processes which occur in Music Therapy where the Therapist desires  
a two-way communication with the child and offers rhythm and melody  
as the common language. One purpose of this project is to make  
available written information which will shed light on how and when  
music is used by the children. Video recordings are vitally  
important for this task because they provide a full record of events  
some of which, but for the recordings, would pass unnoticed although  
of significance, and they provide a record to which one can  
repeatedly refer for detailed observation. This is important  
when it comes to writing out music and studying the children's  
responses as they listen and play.
My previous work has shown me that nearly all severely handicapped Cerebral Palsied children respond to music. The further purpose therefore of this project is to help make Music Therapy more widely accepted. This will increase the opportunities for Music Therapists to work in this field in order to help Cerebral Palsied and other handicapped children experience themselves in new and satisfying ways.

I will be in close contact with professional workers associated with your child’s care and will be guided by their advice and recommendations regarding your child’s participation in the project.

I would like to know how parents feel about my project. I will be pleased to meet all parents individually to discuss any queries they may have before they complete the Consent Form enclosed. Please feel free to contact me by 'phone at any time.

I will also be available to talk individually to parents who have decided they would like their child to participate in the project and they will be able to contact me throughout the year, as and when they need. A meeting for all parents to attend may be arranged if appropriate.

I would be grateful if you would consider the above and return to me, when you are ready, one of the enclosed Consent Forms.

Many thanks for your attention,

Yours sincerely,

Sue Van Colle
Music Therapist
Music Therapy Research Project

Consent Form

I/We_____________________________________________________________
being the parents of_____________________________________________
wish/do not wish my/our child to participate in the research project to be conducted my Miss Van Colle.

I/We understand that the therapy sessions will be video-taped but that the video-tapes will only be seen by researchers associated with this study.

I/We understand that my/our child can be withdrawn at any time and if my/our child is withdrawn alternative Music Therapy may be made available as desired outside the group concerned with the project.

I/We understand that my/our identity and the identity of my/our child will not be disclosed in written and verbal reports of the research.

I/We consent/do not consent to the keeping of the research video-tapes at the conclusion of the project for purposes of future professional purposes only.

SIGNED___________________________________________________________

Date______________________________

*N.B. Video-tapes will only be kept if ALL the participating parents agree.*
Appendix C

Register of Attendance

This appendix records the attendance of the subjects of this study at the music therapy sessions held at their respective schools. Reference is made to this table in section 7.2 Choice of Sessions on page 145.

Table 13 Register of Attendance

<table>
<thead>
<tr>
<th>Session</th>
<th>School A</th>
<th>School B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A  N  C  B</td>
<td>D  R  J  M</td>
</tr>
<tr>
<td>1</td>
<td>a / / / a</td>
<td>/ / a /</td>
</tr>
<tr>
<td>2</td>
<td>/ / / / / a</td>
<td>/ / / /</td>
</tr>
<tr>
<td>3</td>
<td>a / / / / a a</td>
<td>a a /</td>
</tr>
<tr>
<td>4</td>
<td>a / / / / / / /</td>
<td>/ / / /</td>
</tr>
<tr>
<td>5</td>
<td>a / a / / / / /</td>
<td>/ / / /</td>
</tr>
<tr>
<td>6</td>
<td>a / / / / / / /</td>
<td>/ / / /</td>
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<tr>
<td>7</td>
<td>/ / / / / / / /</td>
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<tr>
<td>8</td>
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<tr>
<td>9</td>
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</tr>
<tr>
<td>10</td>
<td>/ / / / / / a /</td>
<td>/ / a /</td>
</tr>
<tr>
<td>11</td>
<td>/ / / / / / a /</td>
<td>a / a</td>
</tr>
<tr>
<td>12</td>
<td>/ / / / / / / /</td>
<td>/ / a /</td>
</tr>
<tr>
<td>13</td>
<td>/ / / / / / / /</td>
<td>/ / a /</td>
</tr>
<tr>
<td>14</td>
<td>/ / / / / / / a</td>
<td>/ / a /</td>
</tr>
<tr>
<td>15</td>
<td>/ / / / a / / /</td>
<td>a / /</td>
</tr>
<tr>
<td>16</td>
<td>/ / / / / / / /</td>
<td>a / /</td>
</tr>
<tr>
<td>17</td>
<td>/ / / a / / / a</td>
<td>a / /</td>
</tr>
<tr>
<td>18</td>
<td>/ a / / / / / /</td>
<td>a / /</td>
</tr>
<tr>
<td>19</td>
<td>/ / / / / / / /</td>
<td>a / /</td>
</tr>
<tr>
<td>20</td>
<td>/ / / a a a a /</td>
<td>/ / a</td>
</tr>
<tr>
<td>21</td>
<td>/ / / / / / / a</td>
<td>/ / a</td>
</tr>
<tr>
<td>22</td>
<td>/ / / a / / / a</td>
<td>/ / a</td>
</tr>
<tr>
<td>23</td>
<td>/ / / / / / / /</td>
<td>/ / a</td>
</tr>
<tr>
<td>24</td>
<td>/ a / / / a / /</td>
<td>/ a /</td>
</tr>
<tr>
<td>25</td>
<td>/ / / / / / / /</td>
<td>a / /</td>
</tr>
</tbody>
</table>

/ present
a absent

A Aaron Seale
N Nihal Hasham
C Christopher Taylor
B Barnaby King
D Darren Campbell
R Rosanna Beckett
J Joe Wilson
M Mahmoud Jamall
Appendix D
Detailed Definitions of Observable Codes

This appendix may be used to look up the meaning of any given observable code, since codes are presented in alphabetical order. Most other tables of observables present them in order of their Reference Number, causing codes to be grouped together according to their function. This appendix may also be used to look up a code’s Reference Number, in order to locate it in another table.

Table 14 Definitions of observable codes in alphabetical order

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Ref. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>Beats on self.</td>
<td>C 34</td>
</tr>
<tr>
<td>!BEAT</td>
<td>! on downbeat of therapist’s music.</td>
<td>C 35</td>
</tr>
<tr>
<td>!M</td>
<td>! in time with therapist’s music.</td>
<td>C 36</td>
</tr>
<tr>
<td>!P</td>
<td>! in own pulse, with a minimum of three beats.</td>
<td>C 37</td>
</tr>
<tr>
<td>!SH</td>
<td>Shakes instrument, beating against self.</td>
<td>C 42</td>
</tr>
<tr>
<td>!SHBEAT</td>
<td>!SH on downbeat of therapist’s music.</td>
<td>C 43</td>
</tr>
<tr>
<td>!SHM</td>
<td>!SH in time with therapist’s music.</td>
<td>C 44</td>
</tr>
<tr>
<td>!SHP</td>
<td>!SH in own pulse, with a minimum of three beats.</td>
<td>C 45</td>
</tr>
<tr>
<td>A</td>
<td>Moves arm/s, hand/s or finger/s. Slightest finger movement is included.</td>
<td>C 18</td>
</tr>
<tr>
<td>AB</td>
<td>Child is helped to beat/shake solo instrument.</td>
<td>C 56</td>
</tr>
<tr>
<td>ABB</td>
<td>Child is helped to beat or shake instrument other than solo instrument or Hello Tambourine.</td>
<td>C 57</td>
</tr>
<tr>
<td>ABPIM</td>
<td>Therapist assists Child M (Mahmoud) to play the piano.</td>
<td>T 13</td>
</tr>
<tr>
<td>ABT</td>
<td>Child is helped to beat on the tambourine, as in the Hello Song.</td>
<td>C 58</td>
</tr>
<tr>
<td>ADDR—</td>
<td>Therapist addresses Child —, the dash being replaced by the initial letter of the child’s name. Used when the therapist’s singing or playing addresses, names or refers to a particular child, when the child’s theme is being played, in child’s turn in the Hello Song, or other song, when reflecting a child’s pulse, when mirroring a child’s vocalisation.</td>
<td>T 81-88</td>
</tr>
<tr>
<td>AI</td>
<td>Child is helped to move or stroke instrument other than solo instrument or Hello Tambourine.</td>
<td>C 59</td>
</tr>
<tr>
<td>AN/V</td>
<td>Arms not visible. Either the arms are both totally obscured or the observer cannot be sure whether there is arm movement or not. For example, if one arm is still and the other is obscured, AN/V applies because it cannot be determined whether or not the concealed arm is moving.</td>
<td>C 19</td>
</tr>
<tr>
<td>B</td>
<td>Beats solo instrument and makes sound.</td>
<td>C 21</td>
</tr>
<tr>
<td>BAR</td>
<td>Downbeat of therapist’s music (first beat in a bar).</td>
<td>T 65</td>
</tr>
<tr>
<td>Symbol</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>BB</td>
<td>Beats non-solo instrument or beats against beater.</td>
<td>C 30</td>
</tr>
<tr>
<td>BBBEAT</td>
<td>BB on downbeat of the therapist’s music.</td>
<td>C 31</td>
</tr>
<tr>
<td>BBEAT</td>
<td>B on downbeat of the therapist’s music.</td>
<td>C 23</td>
</tr>
<tr>
<td>BBM</td>
<td>BB in time with the therapist’s music.</td>
<td>C 32</td>
</tr>
<tr>
<td>BBP</td>
<td>BB in own pulse, with a minimum of three beats.</td>
<td>C 33</td>
</tr>
<tr>
<td>BBS</td>
<td>Bye-Bye Song composed specifically for each school. (See Appendix A: Example 11, page 295; Example 17, page 301.)</td>
<td>T 42</td>
</tr>
<tr>
<td>BM</td>
<td>B in time with the therapist’s music.</td>
<td>C 24</td>
</tr>
<tr>
<td>BNOS</td>
<td>Beats without a sound on solo instrument.</td>
<td>C 22</td>
</tr>
<tr>
<td>BP</td>
<td>B in own pulse, with a minimum of three beats.</td>
<td>C 25</td>
</tr>
<tr>
<td>BSH</td>
<td>Beats on instrument with shaker/clacker.</td>
<td>C 50</td>
</tr>
<tr>
<td>BT</td>
<td>Beats tambourine.</td>
<td>C 26</td>
</tr>
<tr>
<td>BTBEAT</td>
<td>BT on downbeat of the therapist’s music.</td>
<td>C 27</td>
</tr>
<tr>
<td>BTM</td>
<td>BT in time with the therapist’s music.</td>
<td>C 28</td>
</tr>
<tr>
<td>BTP</td>
<td>BT in own pulse, with a minimum of three beats.</td>
<td>C 29</td>
</tr>
<tr>
<td>BYE</td>
<td>Bye-Bye section of the basic structure.</td>
<td>T 80</td>
</tr>
<tr>
<td>C—</td>
<td>Child’s (“—’s) theme, specifically composed for each child. The dash is replaced by the initial letter of the child’s name, for example Aaron’s theme is CA. (See Appendix A page 283.)</td>
<td>T 32-40</td>
</tr>
<tr>
<td>CAD</td>
<td>Cadence: a root position V7-I or IV-I shift of the kind that usually occurs at end of an eight-bar phrase in Western classical music.</td>
<td>T 58</td>
</tr>
<tr>
<td>CADD</td>
<td>Transient cadence: a root position V7-I or IV-I shift that does not occur at the end of an eight-bar phrase but during the ongoing music.</td>
<td>T 59</td>
</tr>
<tr>
<td>CH</td>
<td>Child being physically held or touched by helper or therapist.</td>
<td>C 64</td>
</tr>
<tr>
<td>CHN/V</td>
<td>It is unclear whether or not the child is being held or touched by helper or therapist.</td>
<td>C 65</td>
</tr>
<tr>
<td>CHR—</td>
<td>Child — touches or holds therapist or helper.</td>
<td>T 1-8</td>
</tr>
<tr>
<td>CHV</td>
<td>Child being physically held or touched by visitor.</td>
<td>C 66</td>
</tr>
<tr>
<td>CHVN/V</td>
<td>It is unclear whether or not CHV.</td>
<td>C 67</td>
</tr>
<tr>
<td>CL</td>
<td>Therapist plays the clarinet.</td>
<td>T 19</td>
</tr>
<tr>
<td>COF</td>
<td>Cough.</td>
<td>C 71</td>
</tr>
<tr>
<td>CONXR</td>
<td>Recapitulation, with variation, of CX in the Context Reprise section of the basic structure.</td>
<td>T 41</td>
</tr>
<tr>
<td>CTEXT</td>
<td>Context section of the basic structure.</td>
<td>T 76</td>
</tr>
<tr>
<td>CTEXTR</td>
<td>Context Reprise section of the basic structure.</td>
<td>T 79</td>
</tr>
<tr>
<td>CUP</td>
<td>Hiccough.</td>
<td>C 72</td>
</tr>
<tr>
<td>CUPN/V</td>
<td>It is unclear whether or not CUP.</td>
<td>C 73</td>
</tr>
<tr>
<td>CX</td>
<td>Context Music composed specifically for each school. (See Appendix A: Example 5, page 289; Example 12, page 296.)</td>
<td>T 30</td>
</tr>
</tbody>
</table>
D Beats on surface other than instrument or self, for example on tray or side of wheelchair.  

DBEAT D on downbeat of therapist’s music.  

DEVL Development section of the basic structure.  

DM D in time with the therapist’s music.  

DP D in own pulse, with a minimum of three beats.  

E Eye moves during EP.  

EN/V Eyes not visible. Either the eyes are totally obscured or the observer cannot be sure whether the eyes are looking in the direction of the piano or not.  

END End of section where you would put a double bar line. In this study, however, when a silence (with or without speech) follows the end of a passage, the double bar is moved to the point where the therapist’s next instrumental/vocal section begins. Where a section is abortive and therapist stops playing and/or singing before the point where a double bar would normally be placed, END occurs at the point of resumption of the therapist’s music. END can occur at a point where there is very little time between sections. END usually occurs at the point where a new category of music starts.  

EP Eyes towards piano.  

ERR Therapist makes a mistake in pre-composed music (which might be recognisable by the children).  

ETH Eyes towards therapist when she is away from the piano.  

F Moves one or both legs/feet.  

FBEAT F on downbeat of therapist’s music.  

FN/V Feet/legs not visible. Either both feet and legs totally obscured or the observer cannot be sure whether there is foot/leg movement or not. For example, if one leg is still and the other is obscured, FN/V applies because it cannot be determined whether or not the concealed leg is moving.  

GAB General assisted beating/movement {AB, ABB, ABT, AI}  

GADDR— Generally addressing Child — {ADDR—, NAME—, MIRR—, THB—, C—, IMC—, CHR—}  

GATT General attention (head/eyes) to therapist {HP, HTH, EP, ETH}  

GB General beating {!, !SH, B, BB, BT, D, BSH}  

GBBEAT General beating on the downbeat {!, !SH, B, BB, BT, D}BEAT  

GBM General beating in time with music {!, !SH, B, BB, BT, D}M  

GBP General beating in own pulse {!, !SH, B, BB, BT, D}P  

GBREG General regular beating {!, !SH, B, BB, BT, D}BEAT, M, P}  

GCAD General cadence (final/passing) {CAD, CADD}  

GFM General facial movement {P, SM, Y, E, MM}  

GIV General involuntary vocalisation {COF, CUP, LAU}  

GLOCK Therapist plays the glockenspiel.
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM</td>
<td>General movement (unaided) {H, A, !, !SH, B, BB, BT, D, BSH, I, SH, SI, F}</td>
</tr>
<tr>
<td>GMCH</td>
<td>General musical change (cadence/tempo) {CAD, CADD, DY, TS14, TS24, TS34, TS38, TS44, TS64, TS68, TS74, END, PAU, RIT, RUB, SUS}</td>
</tr>
<tr>
<td>GRUB</td>
<td>General rubato or tempo variation {PAU, RIT, RUB, SUS}</td>
</tr>
<tr>
<td>GTPLAY</td>
<td>General playing by therapist {PI, VCB, VCBB, VCBD, VCBJ, VCBM, VCBN, VCBR, VCBT, VCSH, CL, GLOCK, ABPIM}</td>
</tr>
<tr>
<td>GTS</td>
<td>General tempo change/punctuation point {TS14, TS24, TS34, TS38, TS44, TS54, TS64, TS68, TS74, END}</td>
</tr>
<tr>
<td>GTSOUND</td>
<td>General sound from therapist {GTVOG, GTPLAY}</td>
</tr>
<tr>
<td>GTVOG</td>
<td>General vocalisation by therapist {SO, SP, VOCUT}</td>
</tr>
<tr>
<td>GV</td>
<td>General vocalisation {VOC, VOCP, VOCPN, VOCPNT, VOCX, VOCPX, VOCPXN, VOCPXNT, V, VOCU}</td>
</tr>
<tr>
<td>GVP</td>
<td>General vocalisation, pitched {VOC, VOCP, VOCPN, VOCPNT, VOCPX, VOCPXN, VOCPXNT, V}</td>
</tr>
<tr>
<td>GVPS</td>
<td>General vocalisation, pitched, in tonality {VOC, VOCP, VOCPN, VOCPNT, VOCPX, VOCPXN, VOCPXNT}</td>
</tr>
<tr>
<td>GVPSI</td>
<td>General vocalisation, pitched, in tonality, in tune {VOC, VOCP, VOCPN, VOCPNT}</td>
</tr>
<tr>
<td>H</td>
<td>Moves head. Decisive head movement rather than passive one due to movement of other parts of the body e.g. jaw movement or beating on the beater when it’s in the mouth.</td>
</tr>
<tr>
<td>HBEAT</td>
<td>H on therapist’s downbeat.</td>
</tr>
<tr>
<td>HLP</td>
<td>Helper visible within the group, but not intervening with a particular child.</td>
</tr>
<tr>
<td>HLPX</td>
<td>Child is subject of helper’s intervention, other than assisted beating. Includes standing or kneeling close to the child or extending an instrument to the child.</td>
</tr>
<tr>
<td>HM</td>
<td>Hand or instrument placed against or in mouth.</td>
</tr>
<tr>
<td>HN/V</td>
<td>Head not visible.</td>
</tr>
<tr>
<td>HP</td>
<td>Head turned towards piano.</td>
</tr>
<tr>
<td>HS</td>
<td>Hello Song. (See Example 1, page 284 of Appendix A.)</td>
</tr>
<tr>
<td>HSH</td>
<td>Shakes head.</td>
</tr>
<tr>
<td>HSONG</td>
<td>Hello Song section of the basic structure.</td>
</tr>
<tr>
<td>HTH</td>
<td>Head turned towards the therapist when she is away from the piano.</td>
</tr>
<tr>
<td>I</td>
<td>Child, unaided, moves an instrument which is not his solo instrument.</td>
</tr>
<tr>
<td>IM</td>
<td>Musical improvisation not linked to the music of the basic structure, the children’s themes or to REP.</td>
</tr>
<tr>
<td>IMBBS</td>
<td>Improvisation on Bye Bye Song.</td>
</tr>
</tbody>
</table>
IMC— Improvisation on child’s theme. The dash in the code is replaced by the initial letter of the child’s name, for example IMCA for Improvisation on Aaron’s theme.

IMCX Improvisation on Context Music.

IMHS Improvisation on Hello Song.

IMREP Improvisation on ‘repertoire’ (REP).

IN/V Non-solo instrument not visible.

LAU Laugh.

MIRRX— Vocal and/or instrumental sound from therapist imitating or ‘mirroring’ Child —’s vocal and/or instrumental sound, the dash being replaced by the child’s letter.

MM Mouth movements other than smile (SM) or mouth open (MO). Examples of this could be chewing movements or quasi ‘tasting’ movements.

MN/V Mouth not visible. Either the mouth is totally obscured or the observer cannot be sure whether the mouth is open or not.

MO Mouth open. Lips apart, jaws relaxed. Ranges from almost closed to wide open.

NAME— Therapist names Child —, the dash being replaced by the child’s letter, or L (a helper) or S (therapist).

NAMEL Therapist names Helper L.

NAMES Therapist names herself.

P Face pucker. There is some marked distortion of the usual appearance of the child’s face and this is not due to smiling. For example, wrinkling round the mouth, screwing up of the nose, or frowning.

PAU Pause in music. This code is used when there is a break in the rhythmic flow of the music, for example a fermata or a comma.

PI Therapist plays the piano.

REP ‘Repertoire’ of the therapist. Material composed specifically for the two schools, but not part of the basic structure. (See Appendix A: Example 2, page 285; Example 3, page 286; Example 4, page 287.)

RIT Ritenuto.

RUB Tempo rubato.

S Sound elicited from solo instrument without the child beating it.

SBB As S, but from non-solo instrument.

SBBMU SBB in time with the therapist’s music.

SBEAT S on downbeat of therapist’s music.

SH Shakes instrument.

SHBEAT SH on downbeat of therapist’s music.

SHM SH in time with therapist’s music.

SHP SH in own pulse, with a minimum of three beats.

SI Moves solo instrument by him/herself.
SIBEAT  SI on downbeat of therapist’s music.  C 52
SILENT  Therapist is silent (inverse of GSOUND)  T 114
SIN/V  Solo instrument not visible  C 53
SM  Child smiles.  Broad range of different types of smile included, from subtle upward turn of closed mouth and cheeks to more marked version where mouth is open wide.  C 8
SMBEAT  SM on the downbeat of the therapist’s music.  C 9
SMU  S in time with the therapist’s music.  C 96
SO  Therapist sings.  T 14
SP  Speech, from therapist or helper/s.  T 15
STILL  Stillness (inverse of GM)  C 107
SUS  Delayed presentation of downbeat or resolution of cadence.  T 62
T  Body tenses.  The torso and some or all of the limbs become rigid, or just one limb is rigid.  C 60
THB  Therapist beats on non solo instrument.  T 20
THB— Therapist beats on Child —’s solo instrument or other instrument that s/he is using at that time.  The dash is replaced by the child’s letter.  T 21-28
THSH  Therapist shakes shaker.  T 29
TO  Total obscure.  Applies when therapist or helper stands in front of a child and s/he cannot be seen.  T 67-75
TS— Used every time there is a change of time signature.  The code’s dash is replaced by the numbers of the time signature, for example TS24 for 2/4.  C 70
UV  Unexpected visitor within the group, but not intervening with a particular child.  T 10
UVJ  Unexpected visitor by Child J (Joe).  T 11
V  Pitched vocalisation outside the scale denoted by the key signature belonging to the current or most recent key.  For example, if a child sings C# when the therapist is or has been playing in the key of G major, this would be coded as V.  C 79
VM  Unspecified pitched vocalisation in time with the music.  C 80
VMIRR  Two or more consecutive notes imitating part (or all) of the therapist’s played or sung melody in the current or preceding bar, or the two bars preceding an intervening silence of unspecified duration.  This is a broad category which includes octave transpositions, approximate inversions and retrogrades and elaborations.  Both VOCP and VOCPX notes are included.  C 93
VOC  Pitched vocalisation which cannot be classified as VOCP (see below) but is a note of the home scale of the current or most recent key.  C 82
VOCP  Pitched vocalisation which (1) forms a unison or an interval of some number of octaves with a note sung or played by the therapist in the current or preceding bar or (2) matches (in the way described above) a note sung or played by the therapist in her last two bars preceding an unspecified length of silence.  C 84
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 85</td>
<td>A note which forms a unison or an interval of some number of octaves with one of the therapist’s vocal or instrumental notes which are concurrent with it or immediately precede it (with or without an intervening silence).</td>
</tr>
<tr>
<td>C 86</td>
<td>VOCPN on downbeat of therapist’s music.</td>
</tr>
<tr>
<td>C 87</td>
<td>A pitched vocalisation which forms part of the implied triad (using the most obvious harmonisation) derived from the last note or chord of the therapist’s vocal or instrumental output. For example, if the therapist plays a G and sings C simultaneously, and the child sings an E, then VOCPNT would apply.</td>
</tr>
<tr>
<td>C 88</td>
<td>As VOCP but approximately pitched only.</td>
</tr>
<tr>
<td>C 89</td>
<td>As VOCPN but approximately pitched only.</td>
</tr>
<tr>
<td>C 90</td>
<td>As VOCPNT but approximately pitched only.</td>
</tr>
<tr>
<td>C 75</td>
<td>Unpitched vocalisation, for example a gurgle, snort, or glissando.</td>
</tr>
<tr>
<td>C 76</td>
<td>VOCU on downbeat of therapist’s music.</td>
</tr>
<tr>
<td>C 77</td>
<td>VOCU in time with the therapist’s music.</td>
</tr>
<tr>
<td>C 78</td>
<td>VOCU in own pulse, with a minimum of three beats.</td>
</tr>
<tr>
<td>T 16</td>
<td>Unpitched vocalisation of therapist.</td>
</tr>
<tr>
<td>C 83</td>
<td>As VOC but approximately pitched only.</td>
</tr>
<tr>
<td>C 81</td>
<td>Series of vocalisations in own pulse. This covers the whole phrase of individual vocalisations, each of which has its own code also.</td>
</tr>
<tr>
<td>C 91</td>
<td>A scale or melody or fragment thereof, having three or more notes of three different pitch classes relating to the key of the current or preceding bar, or the two bars preceding an intervening silence of unspecified duration. VSC must span VOC/P/X/N notes and may include rests of a similar length to the notes.</td>
</tr>
<tr>
<td>C 92</td>
<td>Word or sound that is the same or similar to that sung by the therapist. This includes vowel rhymes where consonants differ.</td>
</tr>
<tr>
<td>T 12</td>
<td>Therapist visible within the group, but not intervening with a particular child.</td>
</tr>
<tr>
<td>C 69</td>
<td>Child is subject of therapist’s intervention, other than assisted beating. Includes standing or kneeling close to the child or extending an instrument to the child.</td>
</tr>
<tr>
<td>C 10</td>
<td>Yawn.</td>
</tr>
</tbody>
</table>
Appendix E

The Event List: Format and Sample

The event list was first mentioned at the end of section 6.6.6 Research Protocol, page 133. This appendix explains what the event list is and how it was created, finally giving as an example an excerpt that may be examined in conjunction with the corresponding transcription.

E.1 Event List Format

The event list is a time-based record of all the coded observables that occurred in the four music therapy sessions that were transcribed for this study. It exists in digital form as a plain text file in which each line is an event consisting of 6 fields: (1) school and session number, (2) start time, (3) end time, (4) agent, (5) action performed, (6) optional notes. For example:

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>A08 15:28.2 16:51.5 M HLPX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:30.0 15:30.4 J VOCU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:30.5 * R B</td>
<td>Ai</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:30.9 * R B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:31.0 16:45.3 S HS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:31.0 15:32.0 S CADD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:31.2 15:41.3 J A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:31.3 * R B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:31.4 15:43.3 J Mn/v</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A08 15:32.0 * M AB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The first field is one of “A08”, “A25”, “B08” or “B25” to identify the session. The second field is the event’s starting time as shown by the digital clock recorded on the videotape, in minutes, seconds and tenths. The third field has the same form except for an instantaneous event, whose end time is indicated by “*” representing “not applicable” or “the same as the start time”. The fourth field is one of “A”, “N”, “C”, “B”, “D”, “R”, “J”, “M”, “S”, or “H”, representing one of the eight children (see section 6.6.9 The Children, page 134, and Table 1, page 136), Sue (the therapist) or the Helper, respectively. The fifth field is one of the observable codes listed in Table 3 on page 152 or Table 14 on page 307. The optional sixth field contains any additional information that could be of use. Events are sorted into order so that they form four blocks, one per session, and in each block events appear in chronological order.

The event list was originally created on a PC by typing data into a series of spreadsheets, one per person per session. These were subsequently converted to plain text and merged into a single file. Programs were created to perform various validity and ‘sanity’ checks on the data to locate errors, ensuring that each field conforms to the specification above, fields within each event are compatible (e.g.: a child must belong to the school; the agent of a child’s observable code must be a child and not the therapist/helper; inherently instantaneous observable codes must have “*” as the end time), start and end times are within the session limits, and impossible combinations of
events do not occur simultaneously. Appropriate corrections were made after re-examining the transcription and/or video recording.

Additional artificial observable codes were created by merging together groups of existing codes, giving wider categories of behaviour (for example, GM, general movement). These codes are identified by reference numbers at the top of the ranges for children’s and therapist’s observables, viz. C99-113 and T107-122, in Table 14 on page 307, Appendix D. They are not shown in Table 3 on page 152 because they were not used to directly describe observed behaviours, and were only introduced at a late stage in the study, after most of the analyses were performed.

The entire event list, covering four music therapy sessions, contains approximately 32,000 events which would fill several hundred pages if printed. The full list is not shown here because it is neither practical nor useful in printed form. It can be made available to other researchers via email, floppy disk or other suitable digital medium.

### E.2 Sample Excerpt

The following excerpt from the event list corresponds to Transcript 1 on page 413.

<table>
<thead>
<tr>
<th>Event Time</th>
<th>Action/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A08 13:17.6 *</td>
<td>S BAR</td>
</tr>
<tr>
<td>A08 13:17.6 13:18.0</td>
<td>S NAMEC</td>
</tr>
<tr>
<td>A08 13:17.6 13:21.0</td>
<td>B HM</td>
</tr>
<tr>
<td>A08 13:18.6 13:56.8</td>
<td>A HP</td>
</tr>
<tr>
<td>A08 13:19.4 *</td>
<td>C H</td>
</tr>
<tr>
<td>A08 13:20.5 *</td>
<td>S BAR</td>
</tr>
<tr>
<td>A08 13:21.3 13:24.7</td>
<td>B A</td>
</tr>
<tr>
<td>A08 13:21.3 13:41.0</td>
<td>B SI</td>
</tr>
<tr>
<td>A08 13:21.8 13:22.9</td>
<td>N H</td>
</tr>
<tr>
<td>A08 13:21.8 13:26.0</td>
<td>C P</td>
</tr>
<tr>
<td>A08 13:21.9 13:23.6</td>
<td>B LAU</td>
</tr>
<tr>
<td>A08 13:21.9 13:24.7</td>
<td>B SM</td>
</tr>
<tr>
<td>A08 13:22.3 *</td>
<td>B H</td>
</tr>
<tr>
<td>A08 13:22.3 13:22.9</td>
<td>A H</td>
</tr>
<tr>
<td>A08 13:22.4 13:25.4</td>
<td>B F</td>
</tr>
<tr>
<td>A08 13:23.0 13:50.4</td>
<td>A EN/V</td>
</tr>
<tr>
<td>A08 13:23.3 *</td>
<td>B H</td>
</tr>
<tr>
<td>A08 13:23.4 *</td>
<td>S BAR</td>
</tr>
<tr>
<td>A08 13:23.7 *</td>
<td>B VOCPNT</td>
</tr>
<tr>
<td>A08 13:23.7 13:30.0</td>
<td>B VSC</td>
</tr>
<tr>
<td>A08 13:24.0 *</td>
<td>B VOCPNT</td>
</tr>
<tr>
<td>A08 13:24.4 *</td>
<td>B VOCPNT</td>
</tr>
<tr>
<td>A08 13:24.9 *</td>
<td>B VOCPN</td>
</tr>
<tr>
<td>A08 13:25.0 13:27.2</td>
<td>B MN/V</td>
</tr>
<tr>
<td>A08 13:25.3 *</td>
<td>B VOCPN</td>
</tr>
<tr>
<td>A08 13:25.3 13:26.9</td>
<td>B HM</td>
</tr>
<tr>
<td>A08 13:25.5 *</td>
<td>B VOCPN</td>
</tr>
<tr>
<td>A08 13:25.5 *</td>
<td>S BAR</td>
</tr>
<tr>
<td>A08 13:25.7 *</td>
<td>B VOCPN</td>
</tr>
<tr>
<td>A08 13:26.0 13:27.0</td>
<td>S PAU</td>
</tr>
<tr>
<td>A08 13:26.2 *</td>
<td>B VOCPN</td>
</tr>
<tr>
<td>A08 13:26.4 *</td>
<td>B VOCPN</td>
</tr>
<tr>
<td>A08 13:26.8 *</td>
<td>B VOCPN</td>
</tr>
<tr>
<td>A08 13:26.9 13:32.9</td>
<td>B A</td>
</tr>
<tr>
<td>A08 13:27.4 *</td>
<td>B H</td>
</tr>
<tr>
<td>A08 13:27.4 *</td>
<td>S BAR</td>
</tr>
<tr>
<td>A08 13:27.4 *</td>
<td>C A</td>
</tr>
</tbody>
</table>

...g, g, g, etc
A08 13:27.4 13:28.6 B MO
A08 13:27.4 13:29.0 B SM
A08 13:27.4 13:29.1 B F
A08 13:27.4 13:39.5 S PI
A08 13:27.5 * B VOCPN after melody
A08 13:27.7 * B VOCPN
A08 13:27.9 * B VOCPN
A08 13:28.2 * B VOCPN
A08 13:28.4 13:31.0 S CAD
A08 13:28.9 13:33.7 C H
A08 13:29.0 * B VOCPN loo,loo,loo,
A08 13:29.0 13:37.0 B MN/V
A08 13:29.5 * B VOCPN
A08 13:29.5 13:41.2 B HM
A08 13:30.0 * B VOCPN
A08 13:30.0 13:31.0 S PAU
A08 13:30.4 14:26.4 C MN/V leans forward until 44.5
A08 13:31.0 * S BAR
A08 13:31.0 * C A
A08 13:32.7 13:36.4 B VOCU
A08 13:33.6 * S BAR

[End of excerpt]
Appendix F
Reliability Test Results (Kappa)

The reliability test is outlined in section 7.5 Reliability Test, page 147. The calculation procedure is detailed in appendix section N.1 Reliability Test (Kappa) on page 474.

Table 15 Reliability test results (kappa)

<table>
<thead>
<tr>
<th>Number</th>
<th>Code</th>
<th>$T_{AB}$</th>
<th>$T_{AB}$</th>
<th>$T_{A\beta}$</th>
<th>$T_{A\beta}$</th>
<th>$\kappa$</th>
<th>$z$</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 1</td>
<td>H</td>
<td>17113</td>
<td>2583</td>
<td>5463</td>
<td>23241</td>
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<td>147.00</td>
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<tr>
<td>C 2</td>
<td>HBEAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 3</td>
<td>HSH</td>
<td>304</td>
<td>48</td>
<td>383</td>
<td>47665</td>
<td>0.581</td>
<td>135.22</td>
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<tr>
<td>C 4</td>
<td>HP</td>
<td>11080</td>
<td>1019</td>
<td>3122</td>
<td>33179</td>
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<td>173.60</td>
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<tr>
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<td>HTH</td>
<td>998</td>
<td>625</td>
<td>3366</td>
<td>43411</td>
<td>0.299</td>
<td>75.08</td>
</tr>
<tr>
<td>C 6</td>
<td>HN/V</td>
<td>2418</td>
<td>323</td>
<td>847</td>
<td>44812</td>
<td>0.792</td>
<td>175.09</td>
</tr>
<tr>
<td>C 7</td>
<td>P</td>
<td>0</td>
<td>0</td>
<td>480</td>
<td>47920</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>C 8</td>
<td>SM</td>
<td>4581</td>
<td>323</td>
<td>1430</td>
<td>42066</td>
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<td>181.41</td>
</tr>
<tr>
<td>C 9</td>
<td>SMBEAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 10</td>
<td>Y</td>
<td>111</td>
<td>16</td>
<td>48</td>
<td>48225</td>
<td>0.776</td>
<td>171.71</td>
</tr>
<tr>
<td>C 11</td>
<td>E</td>
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<td></td>
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</tr>
<tr>
<td>C 12</td>
<td>EP</td>
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<td>1617</td>
<td>1956</td>
<td>38612</td>
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<td>C 13</td>
<td>ETH</td>
<td>649</td>
<td>474</td>
<td>1054</td>
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<td>99.88</td>
</tr>
<tr>
<td>C 14</td>
<td>EN/V</td>
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<td>2674</td>
<td>5582</td>
<td>35127</td>
<td>0.447</td>
<td>100.20</td>
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<td>MM</td>
<td>634</td>
<td>363</td>
<td>1331</td>
<td>46072</td>
<td>0.412</td>
<td>96.24</td>
</tr>
<tr>
<td>C 16</td>
<td>MO</td>
<td>18068</td>
<td>4290</td>
<td>6101</td>
<td>18738</td>
<td>0.571</td>
<td>126.01</td>
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<tr>
<td>C 17</td>
<td>MN/V</td>
<td>19271</td>
<td>4800</td>
<td>1525</td>
<td>43954</td>
<td>0.909</td>
<td>200.36</td>
</tr>
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<td>C 18</td>
<td>A</td>
<td>20264</td>
<td>1467</td>
<td>3763</td>
<td>22906</td>
<td>0.784</td>
<td>173.20</td>
</tr>
<tr>
<td>C 19</td>
<td>AN/V</td>
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<td>1525</td>
<td>4832</td>
<td>37243</td>
<td>0.527</td>
<td>119.62</td>
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<tr>
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<td>HM</td>
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<td>480</td>
<td>47023</td>
<td>0.668</td>
<td>147.19</td>
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<tr>
<td>C 21</td>
<td>B</td>
<td>701</td>
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<td>271</td>
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<tr>
<td>C 22</td>
<td>BNOS</td>
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<tr>
<td>C 23</td>
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<tr>
<td>C 24</td>
<td>BM</td>
<td>110</td>
<td>161</td>
<td>43</td>
<td>48086</td>
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<td>118.44</td>
</tr>
<tr>
<td>C 25</td>
<td>BP</td>
<td>97</td>
<td>0</td>
<td>55</td>
<td>48248</td>
<td>0.779</td>
<td>175.65</td>
</tr>
<tr>
<td>C 26</td>
<td>BT</td>
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<td></td>
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</tr>
<tr>
<td>C 27</td>
<td>BTBEAT</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C 28</td>
<td>BTM</td>
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</tr>
<tr>
<td>C 29</td>
<td>BTP</td>
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<tr>
<td>C 30</td>
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<td>102</td>
<td>9</td>
<td>43</td>
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<tr>
<td>C 31</td>
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<tr>
<td>C 33</td>
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<td>!BEAT</td>
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<td>78.99</td>
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<td>50.15</td>
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<td>!P</td>
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<td>172</td>
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<td>0.503</td>
<td>110.83</td>
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<tr>
<td>C 38</td>
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<tr>
<td>C 40</td>
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<td>153</td>
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<tr>
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Appendix G
Observable Occurrence Totals

The information in this appendix relates to Chapter 8
Descriptive Analysis of Observables starting on page 157.

Table 16 Observable occurrences by number and time

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<td>C 24</td>
<td>BM</td>
<td>Beats SI in time with music</td>
<td>216</td>
<td>0.00</td>
</tr>
<tr>
<td>C 25</td>
<td>BP</td>
<td>Beats in own pulse</td>
<td>155</td>
<td>0.00</td>
</tr>
<tr>
<td>C 26</td>
<td>BT</td>
<td>Beats tambourine</td>
<td>274</td>
<td>0.00</td>
</tr>
<tr>
<td>C 27</td>
<td>BTBEAT</td>
<td>Beats tambourine on downbeat</td>
<td>13</td>
<td>0.00</td>
</tr>
<tr>
<td>C 28</td>
<td>BTM</td>
<td>Beats tambourine in time with music</td>
<td>95</td>
<td>0.00</td>
</tr>
<tr>
<td>C 29</td>
<td>BTP</td>
<td>Beats tambourine in own pulse</td>
<td>138</td>
<td>0.00</td>
</tr>
<tr>
<td>C 30</td>
<td>BB</td>
<td>Beats non-solo instr. or beats against beater</td>
<td>195</td>
<td>0.00</td>
</tr>
<tr>
<td>C 31</td>
<td>BBBEAT</td>
<td>Beats non-SI on downbeat</td>
<td>2</td>
<td>0.00</td>
</tr>
<tr>
<td>C 32</td>
<td>BBM</td>
<td>Beats non-SI in time with music</td>
<td>44</td>
<td>0.00</td>
</tr>
<tr>
<td>C 33</td>
<td>BBP</td>
<td>Beats non-SI in own pulse</td>
<td>129</td>
<td>0.00</td>
</tr>
<tr>
<td>C 34</td>
<td>!</td>
<td>Beats on self</td>
<td>912</td>
<td>0.00</td>
</tr>
<tr>
<td>C 35</td>
<td>!BEAT</td>
<td>Beats on self on downbeat</td>
<td>26</td>
<td>0.00</td>
</tr>
<tr>
<td>C 36</td>
<td>!M</td>
<td>Beats on self in time with music</td>
<td>142</td>
<td>0.00</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Count</td>
<td>Percentage</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>C 37</td>
<td>!P Beats on self in own pulse</td>
<td>428</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 38</td>
<td>SH Shakes instrument</td>
<td>73</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>C 39</td>
<td>SHBEAT Shakes instr. on downbeat</td>
<td>1</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 40</td>
<td>SHM Shakes instr. in time with music</td>
<td>14</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 41</td>
<td>SHP Shakes instr. in own pulse</td>
<td>18</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 42</td>
<td>!SH Shakes instr., beating on self</td>
<td>155</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 43</td>
<td>!SHBEAT Shakes instr., beating on self on downbeat</td>
<td>7</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 44</td>
<td>!SHM Shakes instr., beating on self in time with music</td>
<td>33</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 45</td>
<td>!SHP Shakes instr., beating on self in his/her own pulse</td>
<td>97</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 46</td>
<td>D Beats on surface other than instrument or self</td>
<td>340</td>
<td>0.00</td>
<td></td>
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<tr>
<td>C 47</td>
<td>DBEAT D on the downbeat</td>
<td>25</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 48</td>
<td>DM D in time with music</td>
<td>72</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 49</td>
<td>DP D in own pulse</td>
<td>15</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 50</td>
<td>BSH Beats with shaker</td>
<td>1</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 51</td>
<td>SI Moves solo instrument unaided</td>
<td>1580</td>
<td>13.30</td>
<td></td>
</tr>
<tr>
<td>C 52</td>
<td>SIBEAT Moves solo instrument on the downbeat</td>
<td>3</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 53</td>
<td>SIN/V Solo instrument not visible</td>
<td>13</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>C 54</td>
<td>I Moves non-SI unaided</td>
<td>174</td>
<td>1.35</td>
<td></td>
</tr>
<tr>
<td>C 55</td>
<td>IN/V Not clear whether or not I</td>
<td>14</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>C 56</td>
<td>AB Child assisted by helper to beat/shake SI</td>
<td>142</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 57</td>
<td>ABB Assisted beating on non-solo instrument</td>
<td>67</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>C 58</td>
<td>ABT Assisted beating on the tambourine</td>
<td>133</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 59</td>
<td>AI Assisted moving/stroking of non-SI</td>
<td>3</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>C 60</td>
<td>T Body tenses</td>
<td>49</td>
<td>0.27</td>
<td></td>
</tr>
<tr>
<td>C 61</td>
<td>F Moves one or both legs/feet</td>
<td>2081</td>
<td>13.32</td>
<td></td>
</tr>
<tr>
<td>C 62</td>
<td>FBEAT F on the downbeat</td>
<td>1</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 63</td>
<td>FN/V Feet/legs not visible</td>
<td>287</td>
<td>4.96</td>
<td></td>
</tr>
<tr>
<td>C 64</td>
<td>CH Child being physically held/touched by hlpr./th.</td>
<td>130</td>
<td>4.41</td>
<td></td>
</tr>
<tr>
<td>C 65</td>
<td>CHN/V Not clear whether or not CH</td>
<td>10</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>C 66</td>
<td>CHV Child being physically held/touched by visitor</td>
<td>2</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>C 67</td>
<td>CHVN/V Not clear whether or not CHV</td>
<td>1</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>C 68</td>
<td>HLPX Child assisted by helper</td>
<td>51</td>
<td>7.36</td>
<td></td>
</tr>
<tr>
<td>C 69</td>
<td>XX Child assisted by therapist</td>
<td>69</td>
<td>3.83</td>
<td></td>
</tr>
<tr>
<td>C 70</td>
<td>TO Child totally obscured by therapist</td>
<td>251</td>
<td>1.69</td>
<td></td>
</tr>
<tr>
<td>C 71</td>
<td>COF Cough</td>
<td>14</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>C 72</td>
<td>CUP Hiccup</td>
<td>284</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 73</td>
<td>CUPN/V Not clear whether or not CUP</td>
<td>3</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 74</td>
<td>LAU Laugh</td>
<td>68</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>C 75</td>
<td>VOCU Unpitched vocalisation</td>
<td>821</td>
<td>3.26</td>
<td></td>
</tr>
<tr>
<td>C 76</td>
<td>VOCUBEAT Unpitched vocalisation occurring on downbeat</td>
<td>3</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 77</td>
<td>VOCUM Unpitched vocalisation in time with music</td>
<td>2</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 78</td>
<td>VOCUP Unpitched vocalisation reoccurring in own pulse</td>
<td>1</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>C 79</td>
<td>V Pitched vocalisation outside scale of current key</td>
<td>23</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>C 80</td>
<td>VM Vocal note/phrase in time with the music</td>
<td>3</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>C 81</td>
<td>VP Vocal note/phrase in own pulse</td>
<td>2</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>C 82</td>
<td>VOC Pitched sung note outside tonality</td>
<td>33</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>C 83</td>
<td>VOCX As VOC but out of tune</td>
<td>32</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Value 1</td>
<td>Value 2</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>C 84</td>
<td>VOCP Pitched vocalisation matching th.’s current/recent note</td>
<td>79</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>C 85</td>
<td>VOCPN Pitched vocalisation matching th.’s current/last note</td>
<td>86</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>C 86</td>
<td>VOCPNBEAT Pitched vocn. forming triad with th.’s current/last note</td>
<td>1</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 87</td>
<td>VOCPNT As VOCP but out of tune</td>
<td>27</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>C 88</td>
<td>VOCPX As VOCP but out of tune</td>
<td>41</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>C 89</td>
<td>VOCPXN As VOCPN but out of tune</td>
<td>103</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>C 90</td>
<td>VOCPXNT As VOCPNT but out of tune</td>
<td>44</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>C 91</td>
<td>VSC Scale/melodic phrase of 3 or more notes</td>
<td>19</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>C 92</td>
<td>VWMIRR Word/sound mirroring therapist’s syllable</td>
<td>3</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>C 93</td>
<td>VMIRR Vocalisation (2 or more notes) mirroring th.’s melody</td>
<td>3</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>C 94</td>
<td>S Sound elicited from SI without child beating</td>
<td>447</td>
<td>1.49</td>
<td></td>
</tr>
<tr>
<td>C 95</td>
<td>SBEAT S on the downbeat</td>
<td>11</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 96</td>
<td>SMU S in time with the music</td>
<td>8</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>C 97</td>
<td>SBB Sound elicited from non-SI without child beating</td>
<td>20</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>C 98</td>
<td>SBBMU SBB in time with music</td>
<td>1</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>C 99</td>
<td>GATT General attention (head/eyes) to therapist {HP, HTH, EP, ETH}</td>
<td>846</td>
<td>27.52</td>
<td></td>
</tr>
<tr>
<td>C 100</td>
<td>GB General beating {!, !SH, B, BB, BT, D, BSH}</td>
<td>836</td>
<td>2.12</td>
<td></td>
</tr>
<tr>
<td>C 101</td>
<td>GBBEAT General beating on the downbeat {!, !SH, B, BB, BT, D}BEAT</td>
<td>139</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>C 102</td>
<td>GBM General beating in time with music {!, !SH, B, BB, BT, D}M</td>
<td>265</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>C 103</td>
<td>GBP General beating in own pulse {!, !SH, B, BB, BT, D}P</td>
<td>159</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>C 104</td>
<td>GBREG General regular beating {!, !SH, B, BB, BT, D} {BEAT, M, P}</td>
<td>443</td>
<td>1.43</td>
<td></td>
</tr>
<tr>
<td>C 105</td>
<td>GAB General assisted beating/movement {AB, ABB, ABT, AI}</td>
<td>258</td>
<td>0.27</td>
<td></td>
</tr>
<tr>
<td>C 106</td>
<td>GM General movement (unaided) {H, A,!, !SH, B, BB, BT, D, BSH, I, SH, SI, F}</td>
<td>2849</td>
<td>44.05</td>
<td></td>
</tr>
<tr>
<td>C 107</td>
<td>STILL Stillness (inverse of GM)</td>
<td>2839</td>
<td>55.36</td>
<td></td>
</tr>
<tr>
<td>C 108</td>
<td>GFM General facial movement {P, SM, Y, E, MM}</td>
<td>607</td>
<td>7.75</td>
<td></td>
</tr>
<tr>
<td>C 109</td>
<td>GIV General involuntary vocalisation {COF, CUP, LAU}</td>
<td>357</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>C 110</td>
<td>GVPS General vocalisation, pitched, in tonality, in tune {VOC, VOCP, VOCPN}</td>
<td>93</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>C 111</td>
<td>GVPS General vocalisation, pitched, in tonality {VOC, VOCP, VOCPN, VOCPNT}</td>
<td>198</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>C 112</td>
<td>GVP General vocalisation, pitched {VOC, VOCP, VOCPN, VOCPNT, VOCPX, VOCPXN, VOCPXNT}</td>
<td>202</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>C 113</td>
<td>GV General vocalisation {VOC, VOCP, VOCPN, VOCPNT, VOCPX, VOCPXN, VOCPXNT, V}</td>
<td>713</td>
<td>4.31</td>
<td></td>
</tr>
<tr>
<td>T 1</td>
<td>CHRA (Therapist/helper) touched by Aaron</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>T 2</td>
<td>CHRN (Therapist/helper) touched by Nihal</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>T 3</td>
<td>CHRC (Therapist/helper) touched by Christopher</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>T 4</td>
<td>CHRB (Therapist/helper) touched by Barnaby</td>
<td>2</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>T 5</td>
<td>CHRD (Therapist/helper) touched by Darren</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>T 6</td>
<td>CHRR (Therapist/helper) touched by Rosanna</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>T 7</td>
<td>CHRJ (Therapist/helper) touched by Joe</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>T 8</td>
<td>CHRM (Therapist/helper) touched by Mahmoud</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>T 9</td>
<td>HLP Helper in group, not by specific child</td>
<td>49</td>
<td>4.09</td>
<td></td>
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</tbody>
</table>
Unexpected visitor with group 3 0.35
Unexpected visitor by Joe 1 0.30
Therapist with group, not by specific child 51 6.10
Therapist helps Mahmoud play piano 1 0.02
Therapist singing 223 58.79
Therapist speaking 160 4.43
Therapist’s unpitched vocalisation (VOCU) 12 0.11
Therapist plays piano 128 61.25
Therapist plays glockenspiel 10 1.64
Therapist plays clarinet 2 0.43
Therapist beats on non-solo instrument 28 0.00
Therapist beats on Aaron’s instrument 7 0.00
Therapist beats on Nihal’s instrument 9 0.00
Therapist beats on Christopher’s instrument 1 0.00
Therapist beats on Barnaby’s instrument 3 0.00
Therapist beats on Darren’s instrument 8 0.00
Therapist beats on Rosanna’s instrument — —
Therapist beats on Joe’s instrument — —
Therapist beats on Mahmoud’s instrument 34 0.00
Therapist shakes shaker 4 0.13
Context Music 48 5.92
Hello Song 23 8.85
Aaron’s theme 16 2.77
Nihal’s theme 14 1.77
Nihal’s second theme 2 0.43
Christopher’s theme 10 1.05
Barnaby’s theme 15 1.21
Darren’s theme 7 2.06
Rosanna’s theme 5 1.73
Mahmoud’s theme 8 2.90
Joe’s theme 11 2.31
Context Music reprise — —
Bye-Bye Song 5 1.60
Repertoire (non-B.S. material already known to children) 23 6.72
Improvisation on Context Music 28 3.30
Improvisation on Hello Song 3 0.17
Improvisation on Aaron’s theme 7 0.99
Improvisation on Nihal’s theme 6 0.59
Improvisation on Nihal’s 2nd theme 1 0.03
Improvisation on Christopher’s theme 14 3.14
Improvisation on Barnaby’s theme 7 0.79
Improvisation on Darren’s theme 10 1.39
Improvisation on Rosanna’s theme 5 1.09
Improvisation on Joe’s theme 6 0.84
Improvisation on Mahmoud’s theme 5 1.05
Improvisation on Bye-Bye Song 6 0.86
Improvisation on repertoire (REP) 4 0.28
Improvisation not linked to B.S.

Root position V7-I or IV-I shift ending a phrase

Transient root posn. V7-I/IV-I shift not ending phrase

Ritenuto

Pause in music

Delayed downbeat or resolution of cadence

Tempo rubato

Therapist make an error

Downbeat of therapist’s music

End of section

Time signature changes to 1/4

Time signature changes to 2/4

Time signature changes to 3/4

Time signature changes to 3/8

Time signature changes to 4/4

Time signature changes to 5/4

Time signature changes to 6/4

Time signature changes to 6/8

Time signature changes to 7/4

Context Music section

Hello Song section

Development section

Context Reprise section

Bye-Bye section

Therapist addressing Aaron

Therapist addressing Nihal

Therapist addressing Christopher

Therapist addressing Barnaby

Therapist addressing Darren

Therapist addressing Rosanna

Therapist addressing Joe

Therapist addressing Mahmoud

Therapist names Aaron

Therapist names Nihal

Therapist names Christopher

Therapist names Barnaby

Therapist names Darren

Therapist names Rosanna

Therapist names Joe

Therapist names Mahmoud

Therapist names Helper L

Therapist names herself (Sue)

Therapist mirrors Aaron’s sound

Therapist mirrors Nihal’s sound

Therapist mirrors Christopher’s sound

Therapist mirrors Barnaby’s sound

Therapist mirrors Darren’s sound
| T 104 MIRRR | Therapist mirrors Rosanna’s sound | 2 | 0.01 |
| T 105 MIRRJ | Therapist mirrors Joe’s sound | — | — |
| T 106 MIRRM | Therapist mirrors Mahmoud’s sound | 3 | 0.04 |
| T 107 GCAD | General cadence (final/passing) \{CAD, CADD\} | 190 | 4.14 |
| T 108 GTS | General tempo change/punctuation point \{TS14, TS24, TS34, TS38, TS44, TS54, TS64, TS68, TS74, END\} | 311 | 0.12 |
| T 109 GRUB | General rubato or tempo variation \{PAU, RIT, RUB, SUS\} | 338 | 16.71 |
| T 110 GMCH | General musical change (cadence/tempo) \{CAD, CADD, DY, TS14, TS24, TS34, TS38, TS44, TS54, TS64, TS68, TS74, END, PAU, RIT, RUB, SUS\} | 651 | 19.63 |
| T 111 GTVOC | General vocalisation by therapist \{SO, SP, VOCUT\} | 339 | 63.67 |
| T 112 GTPLAY | General playing by therapist \{PI, VCB, VCBB, VCBD, VCBJ, VCBM, VCBN, VCBR, VCBT, VCBA, VCSH, CL, GLOCK, ABPIM\} | 189 | 63.63 |
| T 113 GTSOUND | General sound from therapist \{GTVOCC, GTPLAY\} | 263 | 83.59 |
| T 114 SILENT | Therapist is silent (inverse of GSOUND) | 262 | 16.41 |
| T 115 GADDRA | Generally addressing Aaron \{ADDRA, NAMEA, MIRRA, THBA, CA, IMCA, CHRA\} | 29 | 6.88 |
| T 116 GADDRN | Generally addressing Nihal \{ADDRN, NAMEN, MIRRN, THBN, CN, CN2, IMCN, IMCN2, CHRN\} | 40 | 6.55 |
| T 117 GADDRC | Generally addressing Christopher \{ADDRC, NAMEC, MIRRC, THBC, CC, IMCC, CHRC\} | 45 | 8.60 |
| T 118 GADDRB | Generally addressing Barnaby \{ADDRB, NAMEB, MIRRB, THBB, CB, IMCB, CHRB\} | 42 | 8.08 |
| T 119 GADDRD | Generally addressing Darren \{ADDRD, NAMED, MIRRD, THBD, CD, IMCD, CHRD\} | 34 | 6.58 |
| T 120 GADDRR | Generally addressing Rosanna \{ADDRR, NAMER, MIRRR, THBR, CR, IMCR, CHRR\} | 23 | 6.91 |
| T 121 GADDRJ | Generally addressing Joe \{ADDRJ, NAMEJ, MIRRJ, THBJ, CJ, IMCJ, CHRJ, UVJ\} | 22 | 6.08 |
| T 122 GADDRM | Generally addressing Mahmoud \{ADDRM, NAMEM, MIRRM, THBM, CM, IMCM, CHRM, ABPIM\} | 42 | 10.84 |
Appendix H

Descriptions of Rare Events

This appendix relates to section 9.2 Rare Events starting on page 169. The majority of rare events of the children and therapist are now described, grouped in order of rarity, starting with the most rare. Within each group observables are categorised as presented in Table 5 on page 170: head visibles, arms and torso visibles, audibles, and finally miscellaneous observables, all presented in alphabetical order within each category. The onset time of each rare event is given.

There were 12 observables that occurred only once, of which 8 were children’s observables.

H.1 Children’s Single-Occurrence Observables

There were 5 visibles, 5 audibles and 1 miscellaneous.

H.1.1 Head, Arm and Foot Single-Occurrence Visibles

The observable SMBEAT (smiles on the downbeat of therapist’s music) was the rarest head observable and occurred near the end of School A Session Twenty-three at 42:41.2. It belonged to Barnaby, who moved his head on the downbeat as well as smiling and it coincided with the onset of the Bye-Bye music. This song was prepared for verbally by the therapist who addressed some of her comments to Barnaby.

The observable SHBEAT (shakes instrument on downbeat of therapist’s music) was presented by Darren in the second half of School B Session Eight at 38:55.2. Darren had not had access to his beater for a short while and had been active shaking the clacker during an action song. The clacker was not usually introduced into the session so SHBEAT was doubly rare. Darren also presented a unique observable in School B Session Twenty-five: BSH (beating with the shaker) at 35:26.7. Here Darren treated his shaker like a beater, and beat with it on his drum. Prior to this Darren had been beating against his body while holding the shaker.

Rosanna presented the fourth children’s single observable BNOS (beats without a sound on solo instrument) in Session Eight, School B at 20:14.0. It occurred shortly
before the start of the Hello Song during a quiet period in which the therapist was readjusting the position of Mahmoud’s Chinese cymbals. A few seconds after tentatively playing her solo instrument, Rosanna looked up at the therapist.

The observable FBEAT (moves feet/legs on downbeat) occurred in Session Eight, School B and was presented by Joe at 12:37. The therapist, at the piano, sang and played the Context Music in B flat and, as she did so, Joe continuously moved his arms and feet. She then began improvising on the Context Music at the fourth bar, and Joe began playing with his cymbals in the fifth. The therapist acknowledged this by freely improvising and singing about his cymbals, playing an ascending quaver scale with staccato thirds on c’ and e’ flat, which lasted for two bars, the second of which was piano only. One bar after the end of this scale of which g’’’’ was the top note, the therapist resumed singing, presenting a vocal line around c’ and accompanying it with a minimum of chords. During this Joe started smiling and stopped moving his arms and feet. While he swiftly resumed moving his arms, his feet remained still for seven seconds with the exception of two instantaneous movements, one of which was on the downbeat.

**H.1.2 Children’s Single-Occurrence Audibles**

There were 4 children’s single occurrence audibles of which 2 were instrumental and 2 were vocal. The first instrumental one was ABPIM (therapist assists Mahmoud to play piano) which occurred during the final part of Session Twenty-five, School B at 40:53.0. Mahmoud had appeared distressed and the therapist decided to take him out of his wheelchair and carry him to the piano where she sat him on her lap. Once at the piano, Mahmoud became calm and was quiet. The therapist asked him if he could feel the piano keys. She then took his hand and made it play four white notes, each one twice, starting on e. This was the only time an event of this kind occurred in any of the sessions.

The second single-occurrence children’s instrumental audible was SBBMU (sound from a non-solo instrument that is in time with music and does not arise as the result of beating). This was an instantaneous audible presented by Joe in Session Twenty-five of School B at 33:19.2. It occurred during his turn in the Hello Song. Joe had been unusually quiet and limp prior to his turn, his arms dangling over the edge of his wheel-
chair and his chest touching the attached tray. As the helper assisted him to beat with his right arm, he became more alert and his left arm began moving slightly. His head was towards the piano throughout the song but he looked elsewhere when it finished. The helper let go of Joe’s hand and held the tambourine in front of him so he could play it by himself. The therapist began improvising on the piano around Joe’s theme, changing from 4/4 to 6/8. From this point Joe’s arms were moving continuously. In the second bar of the improvisation Joe flicked his left hand upwards across the side of the tambourine, making the discs sound. This coincided exactly with the second dotted crotchet beat of the therapist’s 6/8 bar of music.

The first single-occurrence children’s vocal audible was VOCUP (unpitched vocalisation that re-occurs in its own pulse) presented by Barnaby, the most vocal child, in Session Eight of School A at 16:19.2. The therapist was playing the piano and singing, directing her music to Nihal. This she did by repeatedly naming her and improvising on her theme. Barnaby turned his head towards the piano where the therapist was seated and mouthed his beater. He then leant forwards out of his chair towards his solo instrument (something he did only occasionally) smiled, then vocalised a series of b´ flats through closed lips. Nihal lifted her head slightly and watched him.

This was an interesting reiterated vocalisation, particularly from the point of view of its pitch, b´ flat. The therapist’s music was in the key of G so that Barnaby’s notes did not match it. This may not be thought a curious fact except that Barnaby had been frequently pitching in the therapist’s tonality earlier in the session.

Mahmoud in Session Eight, School B, presented the second single-occurrence vocal audible at 39:41.0. This was VOCPNBEAT (pitched vocalisation matching therapist’s current or last note and occurring on the downbeat of the therapist’s music). The therapist was playing a specially composed song in E flat ‘Once Upon a Chime-Bar’ (see Example 4, page 287 of Appendix A) during which each child was helped to play a different instrument. Mahmoud had been alert since this started and appeared to be gradually working towards his vocalisation. His head was constantly turned towards the piano and he made slow mouth movements. Eventually his mouth was open all the time and his eyes moved to and from the piano, on which they were originally fixed. The helper took Mahmoud’s hand as the therapist sat at the piano again having briefly
left it to rearrange Mahmoud’s instrument. The song resumed. Mahmoud vocalised an approximately pitched sub-dominant, and he was helped to beat the chime-bar. The therapist played and sung a dominant seventh in the fourth bar of the song and Mahmoud, on the downbeat of the next bar sang ‘Aah’ on e flat for the length of a slow dotted minim.527

H.1.3 Unexpected Visitor Intervened with Joe

This observable occurred near the end of Session Twenty-five, School B at 40:19.0. Teacher L unexpectedly entered the room in which the music therapy took place. Joe briefly moved his head so the top of it was towards her. He was still for a moment but as she approached he turned his head away from her. Teacher L held a surprise card and present, a bottle of wine, for the therapist as a token of thanks from the children. Joe was nearest to her so she placed the present and card on the tray attached to his wheelchair, took hold of his right hand, which she wrapped round the bottle of wine, and said to him ‘say thank you’. Joe slightly moved his feet and arms and lowered his head so much that it touched the card. The teacher then gently pulled his head up with her left hand, still holding his hand with her right arm, and told him to look up. He did not. Teacher L was forced to admit defeat and let Joe’s head resume its bowed position on the tray. She lingered by Joe a moment or two more, adjusting his cymbals which were dangling by the side of his chair and uniting them with Joe’s left hand. His head remained lowered. As she moved away from Joe his hand was still wrapped around the bottle of wine. Teacher L withdrew, saying ‘thank you’ several times.

H.2 Therapist’s Single-Occurrence Observables

There were four therapist single-occurrence observables, three of which were audibles, a similar number to that of the corresponding children’s audibles. It will be seen that the rest of the therapist rare observables were predominantly audible, a fact commensurate with the amount of time the therapist spent at the piano, out of view of the camera.

527 See Chapter 11 starting on page 183, and Transcript 3 on page 418.
H.2.1 Therapist’s Single-Occurrence Audibles

TS74 (time signature changes to 7/4) occurred for one bar only during the Context Section of Session Twenty-three, School A, at 21:58.8. Everyone in the group had been mentioned in unaccompanied song by the therapist, using each child’s theme, here in the same key. The therapist played Aaron’s theme in 3/4 instead of its original 4/4 time signature as if trying to rock him out of his passivity, but Barnaby was the one who vocalised. The therapist vocally mirrored his vocalisation (which was in 4/4) while still referring to Aaron so that she divided her attention between the two children. It was at this point that the therapist launched into 7/4, possibly trying to reconcile the 3/4 of Aaron with the suggested 4/4 of Barnaby. Aaron, Nihal and Christopher were all completely still during TS74 while Barnaby moved his head and feet throughout it, the onset of this movement already established before TS74.

The second single-occurrence event of the therapist was IMCN2 (improvisation on Nihal’s second theme). This occurred in Session Eight of School A at 28:50.2. It came after Nihal’s turn in the Hello Song in which she smiled a rare smile during assisted beating. The therapist, encouraged by this, played a 6/8 variation of CN2 on the high register of the piano during which Nihal moved her head slightly. The slightness of the head movement elicited one and a half bars’ play, on the piano, of cadential shifts which finished with a cadence on the relative minor. This constituted the variation on CN2. It acknowledged the inconclusive response from Nihal. Apart from this she did not move. Aaron was still before and during IMCN2, his mouth open. Christopher, also open mouthed, was mostly still before IMCN2, but moved his arms very slightly during the therapist’s ‘hellos’ in IMCN2 and made mouth movements after the cadence on the relative minor. Barnaby was vocal and smiling before IMCN2, briefly non-smiling during and one-bar post IMCN2, and immediately after it looked towards the piano where the therapist was seated, mouthing his beater.

It is worth mentioning here the reason why Nihal was given two themes. The therapist felt the first one was inadequate, did not reflect Nihal and seemed not to reach her. The fact that she was very hunched up, her face bowed, played a large part in this. She only very gradually became ‘apparent’.
The next therapist single-occurrence, TS14 (time signature changes to 1/4), occurred in Session Twenty-five of School B at 19:40.6; it was simply a way of describing the downbeat of an aborted 3/4 bar which quickly turned into a 6/8 passage. Joe had elicited a passage of piano triplets and sustained vocal tones from the therapist, (about a minute before TS14), which was mainly intended to contain Joe who vocalised repeatedly in a very excited fashion. After a while he became calmer, and the therapist sang and played his theme, pausing many times in this as a way of inviting Joe to respond. He eventually turned his head towards the piano. At this point the therapist stopped playing her slow 3/4 and changed to a steady 6/8 pulse, playing in the high register of the piano, and responding to Joe’s changed head position by giving him different music which was meant to be gentle and nurturing.

During the pre-TS14 (time signature change to 1/4) Darren who was periodically active beating was completely quiet and still, only resuming beating five seconds later. Mahmoud, having the hiccoughs, mainly had his head and eyes towards the piano. He averted his eyes for a moment while he hiccupped again then resumed looking towards the therapist, still during the pause. Lastly, during TS14, Rosanna who also had her head towards the therapist for long periods, kicked her feet and smiled several times during the passage addressed to Joe. She was momentarily still during the pause prior to TS14 resuming her foot movements four seconds later.

**H.2.2 Therapist’s Single-Occurrence Visible**

The observable THBC (therapist places beat on Christopher’s cymbals) occurred at 17:48.7 in Session Eight, School A. The therapist was silent as she sat at the piano. Christopher leant forwards from his wheelchair and turned his head towards her, keeping it like this as she played and sang the first four bars of Aaron’s G major theme. He then turned his head away, making an unpitched vocalisation, while the therapist began improvising on the theme in C major. During this, Christopher was mostly still with his mouth open. At the end of the passage he vocalised the dominant and mediant of the therapist’s cadential note, an unaccompanied c’ which lasted about five seconds. The therapist then resumed Aaron’s theme in G major. Christopher began globally moving and turned his head once more towards the piano, vocalising again. The therapist broke off from a subdominant chord and left the piano, crouching by Christopher and asking him if he wanted to ‘say hello’ to Aaron. She placed a beat on
his cymbals as if to demonstrate what Christopher might do, going on to assist him to do the same.

H.3 Children’s Observables Occurring Twice

There were three children’s observables that each occurred twice, one of these in the category of audibles, VP (vocal note/phrase that re-occurs in child’s own pulse), and two visibles, HBEAT (moves head on therapist’s downbeat) and CHRB (Barnaby touches therapist).

H.3.1 Children’s Audible Occurring Twice

Both occurrences of VP (vocal note/phrase that re-occurs in child’s own pulse) were presented by Joe near the beginning of Session Eight at School B, first at 11:02.0 then at 11:19.4. Joe had been moving his arms and head since the start of the session, his head turned towards the piano for half the time. The therapist had been quietly improvising in B flat with a time signature that varied slightly but was mainly 4/4. She sang and played the piano, and continued to do so when Joe was suddenly still. Six seconds later he turned his head and eyes towards the piano as the therapist sang f and played f’ and repeated the unison three times. She then played a chord comprising g, b flat and c’. At this moment Joe tensed his body, extended his arms and, without changing the direction of his gaze, vocalised a rhythmic series of approximately pitched notes, mostly on f’, smiling all the time. Each vocalisation was followed by a little glissando. He paused momentarily then continued his repeated vocalisations, which were this time unpitched. During the course of these Joe relaxed his body. He appeared cheerful. None of the other children paid any attention to him.

H.3.2 Children’s Visibles Occurring Twice

The second event in this category, HBEAT (moves head on therapist’s downbeat) was presented by Barnaby in the Context Reprise of Session Twenty-three, School A at 41:42.1. It occurred during a passage in G major in which the therapist was singing and playing on the piano to Nihal. The latter had made her cymbals sound and this had elicited fast moving and surging music from the therapist. Barnaby’s head was slightly tilted on one side and his fist hovered near his face without actually touching his mouth. At the fifth bar of the theme he began smiling, for no apparent reason, then tilted his
head further with a precise movement on the downbeat of the sixth. This was also a point at which the second syllable of Nihal’s name was sung.

Barnaby presented HBEAT (moves head on therapist’s downbeat) once again in Session Twenty-three, School A, at 42:41.2. The therapist asked the children in turn if they were ready for the Bye-Bye Song. Barnaby, momentarily still, became unfocused, flexing his left arm, holding it near his head, and moving his arms and feet most of the time. The therapist finally addressed the question to Nihal, speaking her name. After two seconds Barnaby made an unpitched vocalisation, ‘Ba’, then smiled and moved his head one second later at the same time the therapist played and sang the first notes of the Bye-Bye Song.

The observable CHRB (Barnaby touches therapist) occurred half-way through Session Twenty-three of School A, first at 23:18.5 then at 29:24.0. In the first instance the therapist had just begun the Hello Song and was, unusually, away from the piano, in front of all the children, holding and beating the Hello Tambourine and singing the Hello Song in the key of D. Barnaby’s head was tilted upwards towards the ceiling. Towards the end of the song the therapist approached Barnaby who immediately looked at her, smiled and leant forwards out of his wheelchair. The therapist extended the tambourine to him and he immediately touched it, and placed a beat in time with the third beat of the therapist’s song. The therapist withdrew the tambourine, beat the next beat and then quickly extended the tambourine once again, structuring a turn taking interaction. This time she helped Barnaby to play on the beat. As the therapist brought the tambourine near to Barnaby’s hand, he touched her hand. His head was tilted towards her face as she leant over him. Aaron watched Barnaby and the therapist, and Christopher’s head pointed in their direction.

Barnaby was often unfocused, shaking his head frequently and looking away from the piano. When the therapist or the helper was close by he was more likely to engage. Interestingly, when he did engage his singing very often matched the therapist’s music in some way.

The second instance of CHRB (Barnaby touches or holds therapist) occurred after Barnaby had grabbed Aaron’s cymbals, and pulled the boom from which they hung towards him, laughing. The helper, who had been assisting Nihal to beat in the Hello
Song, was holding out the Hello Tambourine for her as this happened. The therapist was at the piano playing Nihal’s second theme in the high register of the piano, singing as well. Both therapist and helper went over to Barnaby to disentangle the boom and cymbals, the therapist in front of him, the helper behind. As the therapist leant over Barnaby, he briefly held her arm, smiling as he did so. The therapist told him he was ‘very naughty’, in a mild fashion. Aaron and Christopher watched the therapist and helper.

**H.4 Therapist’s Observables Occurring Twice**

There were four therapist observables which occurred twice. Each one was an audible. They were CL (therapist plays clarinet), CN2 (Nihal’s second theme), MIRRR (therapist mirrors Rosanna’s sound) and TS38 (time signature changes to 3/8). They are now described in alphabetical order.

CL (therapist plays clarinet) first occurred in the Development Section of Session Eight, School A at 33:40.3. Aaron, head towards the piano, had had the last Hello Song turn which ended with slow and quiet piano and vocal music from the therapist with lots of pauses. The children became quiet and still and the therapist sang ‘What shall we play now?’ Barnaby vocalised twice. He gave one pitched and key related vocalisation and one unpitched vocalisation. The therapist picked up on the idea of exploring different sounds and vocalised a lingering ‘ph’ sound followed by repeated glissandi at the piano. She then improvised a song incorporating the ‘ph’ sound. After this she introduced the clarinet, another type of sound, but this time pitched. The therapist played the tune from her improvisation on the clarinet and while she did this Christopher leant forwards out his chair towards the therapist and Barnaby sang the note that could be heard on the clarinet. Nihal did not move and Aaron turned his head away from the therapist towards the piano. All the children presented different behaviours.

A few bars of therapist vocalisation separated the first and second CL (therapist plays clarinet), the latter occurring at 34:06.4 when the new tune was repeated. Once more Christopher leant forwards, his mouth wide open. Barnaby leant out of his chair too and vocally mirrored the sound of the clarinet, approximately pitching d’ and c’’, notes
from the clarinet melody. Aaron had his head and eyes towards the piano but did not avert his head when the therapist faced him. Again Nihal remained still.

CN2 (Nihal’s second theme) was introduced vocally and pianistically during the Context Section of Session Eight, School A at 14:18.4. The therapist had been focusing on Christopher, and Nihal had been mostly still, her head and feet moving slightly only on a few occasions. CN2 was presented vocally and on the piano in variation form, the tempo in 4/4 instead of 3/4, and stylistically it grew out of the last bars of walking crotchets played for Christopher, the music’s texture being very similar. Nihal’s head moved twice, very slightly, when the therapist sang the second syllable of her surname.

Aaron was motionless during CN2 (Nihal’s second theme) until near its end when the therapist paused the music just before its two closing bars. She left the piano and approached Nihal singing a long unaccompanied and out of tempo note, a contrast to the piano walking crotchets. Aaron turned his head towards her during this, seemingly registering both change of music and the therapist’s location. Christopher presented differently. He was alert throughout CN2. He leant forwards out his chair, smiled several times and presented unpitched vocalisations immediately after the therapist had sung ‘hello’, which she did twice as she addressed Nihal. Christopher had in fact been alluded to by name, the therapist pointing out to Nihal that she was sitting next to Christopher. Barnaby was generally active in an unfocused and smiling way. While most of his vocalisations were unpitched during CN2 he presented a surprising scale of approximately pitched notes from the subdominant down to the tonic of the therapist’s key. He initiated this a few seconds after the final notes of CN2 had been sung by the therapist. Mention of the second occurrence of CN2 (Nihal’s second theme) which occurred at 28:39.5 in the same session has already been made. It had been Nihal’s turn in the Hello Song with the customary assisted beating. Nihal made one fleeting arm movement and a similar leg movement which occurred around the fourth downbeat. During the penultimate bar of the Hello Song, however, Nihal lifted her head, moved her foot and unexpectedly broke into a big smile. The song concluded and the therapist began CN2 (Nihal’s second theme) first on piano only, then with singing. It was presented in its original sparse form but an octave higher, and played *delicato*. In this way the therapist tried to match Nihal’s apparent fragility: her sudden
smile, her sudden withdrawal and her minute movements. This was possibly a misguided view since it was during the robust motions of assisted beating that Nihal emerged from her ‘hiding’. The outgoing gesture of a smile was not repeated again by Nihal during the five-bar CN2 postlude to the Hello Song, but she did move her head slightly at the mention of her name. Aaron and Christopher were motionless during CN2. In common with Barnaby their mouths were open.

The third therapist audible occurring twice was MIRRR (therapist mirrors Rosanna’s sound). MIRRR is used broadly, so that a response does not always have to reflect exactly the sounds it mirrors, MIRRR denoting, rather, a discrete response to a specific sound or series of sounds. MIRRR occurred once in Session Eight, School B at 42:33.6, and once in Session Twenty-five, School B, at 21:53.5.

Before the first instance of MIRRR, the therapist re-introduced Rosanna’s theme, in 4/4 instead of 3/4, as part of the Context Reprise near the end of the session. Rosanna was active during this. She frequently beat on her solo instrument, the Chinese cymbals, moved her legs and repeatedly looked towards the piano where the therapist was seated. The therapist’s music changed from 3/4 to 6/4 as she emphasised that Rosanna had been ‘playing in music today’. Rosanna placed a beat on the resolution of a A7-D cadential shift in the therapist’s second 6/4 bar. There ensued a dialogue. The therapist paused, Rosanna tensed her body and opened her mouth wide. The therapist sang ‘Hello, Rosanna’ with D major 7 harmony. Rosanna beat twice on her cymbals. The therapist in response played an empathetic MIRRR on an open chord comprising fourths, singing ‘Huh’ on a´, which was followed by two crotchet rests. Rosanna turned her head towards the piano again, the therapist played an A7 chord and paused again before presenting Rosanna’s Context Theme in full, in tempo.

The second instance of MIRRR (therapist mirrors Rosanna’s sound).took place after the Hello Song was first presented by the therapist. It was addressed to the whole group, the therapist singing and playing the piano as usual. Rosanna smiled during its opening bar and kicked her legs with apparent pleasure, her head already turned towards the piano. The therapist paused slightly in the fifth bar, then continued at a slightly slower tempo, but did not sing. Near the end of the sixth bar Rosanna opened her mouth wide, kicked her legs, extending the right one, and loudly vocalised ‘Aah’. The therapist responded by singing ‘Hello’, the MIRRR, on the last quaver beat of bar
6 and the downbeat of bar 7, thereafter not singing until the last note of the song. The quality of her vocalisation was similar to that of Rosanna.

TS38 (time signature changes to 3/8) occurred exclusively in the sessions at School A, the first occurring near the end of Session Eight at 38:29:2. The therapist, at the piano, had begun singing and playing the Context Reprise, partly improvising on it, partly playing it as a variation. Immediately she started singing ‘Here we were today’ Barnaby, who had recently been quiet, smiled and then began chuckling in such a way as to elicit a specific response from her, a change from 4/4 to 3/4 (see Chapter 10 page 176). This felt more gentle to the therapist, and empathetic with the chuckle. She sang Barnaby’s name and vocally improvised over a piano pedal on D11, constantly addressing him. After two bars of 3/4 she paused then resumed more slowly than before, modifying the tempo and time signature. This has been transcribed as a change to 3/8 in order to accommodate a certain lilt and ambiguity in the stresses of the therapist’s music. TS38 occurred at the start of a new 13-second rubato passage, over the same sustained pedal, in which the therapist once again sang Barnaby’s name, then two glissandi resembling the cooing of a mother to her baby. Barnaby became still for about three seconds after the first glissando then smiled and laughed, beating on his beater in his own pulse. Christopher leant forwards out of his chair during the first glissando, and Nihal’s head moved slightly. Only Aaron remained still.528

TS38 (time signature changes to 3/8) occurred in Session Eight, School A, a few minutes later at 41:19:0. The therapist had been reflecting back some of the events of the session, acknowledging the children through her improvised singing and piano playing. She had focused on Barnaby and Christopher and now focused on Nihal, who, although physically hunched up as usual, was moving her head slightly. The onset of TS38 occurred at the start of the second bar of the section in which Nihal was addressed. The first bar was 4/4 but the therapist quickly slipped into 3/8, the time signature for Nihal’s second theme which the therapist now played and improvised on. The therapist felt that particular care had to be taken with Nihal because she was so tense and withdrawn. By singing and playing music which resembled a lullaby, the therapist hoped to calm and reassure her. Again there was a slight ambiguity attached to the time signature when transcribing the music since it could be have been construed

528 See Chapter 10 starting on page 176, and Transcript 2, page 415.
as 6/8. It is uncertain whether the therapist’s notation of 3/8 reflected a misinterpretation of the time signature or an unconscious desire to make a musical statement of lightness and delicacy which she associates with 3/8.

H.5 Children’s Observables Occurring Three Times

There were five children’s observables that each occurred three times and they arose in every category. They were E (moves eyes), AI (assisted moving/stroking of non-solo instrument), SIBEAT (moves solo instrument on downbeat), VWMIRR (word/sound mirroring therapist), and UV (unexpected visitor). These are considered in the above order, viz. head region, arms and torso, audibles and miscellany.

H.5.1 Head Observables Occurring Three Times

The observable E (moves eye) applied when a child was already looking towards the piano and shifted the direction of his or her gaze though still looking towards the piano. E occurred three times in Session Twenty-five, School B, and was presented by Mahmoud on each occasion. Mahmoud was thought to be visually impaired but the extent of this condition was not known.

The first occurrence of E (eyes move during eyes toward the piano) at 28:42.3 followed a lengthy turn of Mahmoud in the Hello Song. This included a preamble containing Mahmoud’s theme and a long improvisatory postlude during which the therapist tapped Mahmoud’s tambourine. Mahmoud smiled during the preamble and repeatedly turning his eyes towards the piano. The therapist then sang to Mahmoud, over a ten-bar C pedal, ‘Who shall we give [the tambourine] to now?’ She ended with a sustained C7 chord containing fourths, and held it for several seconds without resolving it. She briefly spoke and as she did so Mahmoud could clearly be seen looking at the piano after a period of EN/V (eyes not visible). The therapist’s paused chord shortly ended, giving way to a monophonic piano improvisation which addressed a different child. Immediately Mahmoud glanced up to the therapist’s head.

The second E (eyes move during eyes towards piano) occurred at 29:18.6 near the end of a piano and drum improvisation which used Darren’s theme and was played by Darren and the therapist. This improvisation began slowly two octaves below c’ and, in fits and starts, made its way to three octaves above c’. It had a precarious quality,
stopping and starting several times and gradually accelerating. Mahmoud’s mouth was continuously open during this and his head was turned towards the piano. His eyes were either towards the piano or not visible. The music became sequential and Mahmoud moved his arm slightly at the third repetition of Darren’s theme. This jumped an octave, slowed down and loudly repeated itself. Mahmoud, his eyes to the piano, momentarily shifted his eye position as the therapist’s music hit the highest C-note yet, c’’’.

The last occurrence of E (moves eyes during eyes towards piano) came near the end of Session Twenty-five, School B, at 44:33.2. Mahmoud, having been upset, had been taken by the therapist to the piano, and had been sitting on her lap while she sang and played, an exceptional turn of events. The therapist eventually returned Mahmoud to his wheelchair in a calmer state, and then sang to him that he ‘can play bye-bye’ on his cymbals. Mahmoud’s head and eyes were towards the piano which was immediately behind the therapist, and by inference towards the therapist. (Only the therapist’s hands were intermittently visible). His mouth opened as she took his hand after which he made little mouth movements as she helped him strike his cymbals on the downbeat of her vocal music. His legs moved for a short while after the downbeat had sounded as though Mahmoud was physically energised by it. The therapist continued with assisted beating and just before the fifth downbeat Mahmoud turned his eyes upwards towards the therapist’s face presenting the last occurrence of E (moves eyes during eyes towards piano).

H.5.2 Observables of the Arms Occurring Three Times

There were two observables which occurred three times in this category, AI (assisted moving or stroking of non-solo instrument) and SIBEAT (moves solo instrument on downbeat). AI occurred once with Mahmoud in Session Twenty-five, School B, and twice with Aaron in Session Twenty-three, School A. SIBEAT was presented each time by Joe in Session Eight of School B.

AI (assisted moving or stroking of non-solo instrument) in the case of Mahmoud meant stroking of the tambourine, rubbing its surface. When AI first occurred at 28:00.2, Mahmoud had just had his turn in the Hello Song in which he verged on a smile throughout and had his eyes mostly turned towards the piano. As usual the helper had
assisted him to beat and the therapist had played the piano and sung. What had been
unusual was the therapist beating on Mahmoud’s tambourine by herself before the start
of the Hello Song and then assisting him to beat on the final note of her singing.

The moment for the Hello Song’s cadence arrived. Mahmoud’s hand was placed once
again on the tambourine by the helper and it remained there. The therapist improvised
three bars on the piano using Mahmoud’s theme and then sang, accompanying her
voice with a single contrapuntal line on the piano. As she sang she simultaneously
tapped on Mahmoud’s tambourine with soft staccato beats, partly to encourage him to
play by reminding him of what he might do, but also so that he could feel the vibrations
from her beats. This could have made Mahmoud feel physically connected with the
therapist through the music. Her beats echoed Mahmoud’s hiccoughs which had
quietly punctuated the session. The music, which remained in F major, the same key
as the Hello Song, was heavily pedalled. The therapist sang g’’, which was outside her
usual range. Mahmoud presented mouth movements. Unless his eyes were not
visible, Mahmoud was constantly looking at the piano. The therapist played a C7
pedal, paused, took Mahmoud’s hand and rubbed it across the surface of the
tambourine. His mouth, which had been mainly open, closed for the duration of this.

The second and third instances of AI (assisted moving or stroking of non-solo
instrument) followed in quick succession at 31:26.4 and 31:29.2 in Session Twenty-
three. They occurred when the helper was next to Aaron some moments before the
start of his turn in the Hello Song. Aaron, who moved very little, had briefly had his
head turned towards the therapist as she intervened with Nihal, but had turned his head
away from the therapist and was still again. The helper came up to Aaron and stood
behind him, leaning over the back of his chair as she put his cymbals on one side and
introduced the tambourine for the Hello Song. Aaron moved his head slightly and
looked up into her face. A quick succession of events interrupted Aaron’s turn.
Barnaby in the adjacent chair on the right stretched over and touched Aaron’s
tambourine. The helper took hold of his arm and steered him away. Christopher, who
was next to Aaron on his left, made a loud unpitched vocalisation to which the therapist
responded verbally. The helper rolled up Aaron’s right sleeve as far as his elbow and
proceeded to lead his hand in small jerky movements over the surface of the
tambourine while the therapist finished talking to Christopher. The helper then
paused. The therapist began an improvisatory preamble to the Hello Song on the piano and the helper resumed AI again, this time with large arhythmic circles over the tambourine head.

The AI (assisted moving or stroking of a non-solo instrument) in this case was particularly deliberate and physical. The helper usually pushed up the sleeve of a child with whom she was doing assisted beating, but only just above the wrists to allow the child to have a fair amount of skin contact with the tambourine. With Aaron the helper felt the need to push up the sleeve more than usual. By rolling the sleeve all the way up to the elbow the child might be empowered to do a better ‘job’. It also said something about how hard it was to reach Aaron. Something extra was always needed and even then Aaron did not appear to respond.

The other observable of the arm and torso region which occurred three times was SIBEAT (moves solo instrument on the downbeat of therapist’s music) This occurred three times in Session Eight, School B, and was presented by Joe on each occasion. SIBEAT first occurred at 13:49 during the Context Music for Joe near the beginning of the session. After the first four bars of the Context Music Joe frequently moved his solo instrument, the Chinese cymbals, as the therapist played and sung his theme. His feet were moving too as he engaged with the cymbals. SIBEAT occurred on the twelfth bar of the Context Music for Joe. The therapist played a chord on the dominant in the eleventh bar which resolved onto a submediant chord and the SIBEAT coincided with this resolution.

The second occurrence of SIBEAT (moves solo instrument on the downbeat of therapist’s music) came shortly after the first at 14:00. The therapist momentarily broke off playing Joe’s theme and presented two bars of quasi recitative addressed to him. Joe held on to the cymbals during this and was still during the therapist’s sung words. These were particularly clear as there was very little accompanying piano and they were sung in an emphatic, narrative way. As the pulse was re-introduced with two dominant seventh piano chords, a crotchet followed by a dotted minim, Joe let the cymbals go. The therapist sang the last crotchet of the bar and as she sang the first crotchet of the next bar Joe pushed the cymbals on the downbeat.
The third occurrence of SIBEAT (moves solo instrument on therapist’s downbeat) was at 15:25.0 during Rosanna’s theme music in the key of D which followed that of Joe. His head was turned in the opposite direction to the piano (it had been towards the piano during the latter part of his theme music) and he made no attempt to play his cymbals. The therapist began a repeat of Rosanna’s theme. Joe turned his head once more to the piano, his arms moving slightly. This movement coincided with a D7-G passing shift so that the onset of HP (head towards piano) occurred on a downbeat. Joe looked at the cymbals and moved them finally on the downbeat of the third bar of the repeat of Rosanna’s theme. It was interesting that each of the other three children in the group presented some new behaviour on the downbeat at this point.

H.5.3 Children’s Audibles Occurring Three Times

There were four children’s audibles which occurred three times: VM (vocal note or phrase occurring in time with therapist’s music), VMIRR (two or more notes mirroring therapist’s recent material), VOCUBEAT (unpitched children’s vocalisation occurring on downbeat) and VWMIRR (word/sound mirroring the therapist).

The first instance of VM was at 11:19.4 in Session Eight, School B, and was presented by Joe. It consisted of one unpitched vocalisation that occurred on the downbeat of the therapist’s music and was part of a series of reoccurring vocalisations which the writer has already described above in H.3.1 Children’s Audible Occurring Twice. At the moment of Joe’s vocalisation the therapist resolved a V7-I shift, and switched from improvising to playing Context Music. Rosanna beat approximately half a second after the resolution. Mahmoud cast his eyes towards the piano at the same moment. Darren had his head towards the piano but did not move or vocalise on the downbeat, though two seconds later he closed his mouth which he had opened when the therapist presented V7.

The second instance of VM (vocal note or phrase occurring in time with therapist’s music) occurred at 42:00.9 in Session Eight, School B. The therapist was playing the piano and singing an improvisation on Mahmoud’s theme in E flat. She left a crotchet rest on the fourth beat of the fourth bar and then played piano only, though continuing the theme. All the children moved their heads on the downbeat of the first piano-only bar. Joe vocalised 0.1 s before the downbeat of the second piano-only bar, having
briefly looked towards the piano, making three unpitched vocalisations. These coincided exactly with the downbeat, a crotchet beat and one quaver beat. His second VM occurred one crotchet beat after the cadential resolution at the end of the improvisation for Mahmoud. Both Darren and Rosanna moved their heads on the downbeat. Mahmoud and Rosanna had their heads towards the piano during Joe’s vocalisations. Darren turned his head in Joe’s direction just before Joe vocalised, when he was making a clattering sound with his cymbals, but then turned his head away.

The last occurrence of VM (a note or phrase in time with therapist’s music) occurred in Session Eight of School A at 13:52.0. The therapist improvised in the key of G major on Christopher’s theme, Christopher leaning forward in his chair as she did this. She played staccato notes in the high register of the piano, presenting short sections of the theme then pausing. As she paused on the dominant, Barnaby began singing a´ six times, then sang a´, f´# and d´, fitting in with the harmony of the therapist. VM occurred when the therapist played the next part of Christopher’s theme and Barnaby vocalised note a on the downbeat.

The first occurrence of VMIRR (two or more notes mirroring therapist’s recent material) was vocalised by Barnaby in Session Eight, School A, at 20:45.2. The audible in question consisted of two notes, e´ and d´ which echoed the therapist’s vocal notes of the previous bar, an octave lower.

Barnaby’s vocalisation came during a passage in the key of G in which the therapist had been playing and singing variations on his theme and frequently vocalising his name. Barnaby’s initially laughed and smiled, and fleetingly pitched in the therapist’s tonality. The therapist left the piano, and stood close to Barnaby, singing his first name twice. Barnaby turned his head towards her. She paused and then sung his surname on the tonic, simultaneously beating once on Barnaby’s drum. She paused again having completed her interrupted melodic line. During the pause Barnaby loudly sang five pitched notes, four b´s and one d’´, fitting in with the therapist’s tonality. He sang ‘gull gill gulli goo’, which the therapist then mirrored vocally creating a new variation of Barnaby’s theme. After this response Barnaby leant forwards towards his

529 See Chapter 10 starting on page 176, and Transcript 1, page 413.
drum and imitated the last two pitch classes the therapist had sung. There had been a short period of turn-taking marked by the concordant singing of Barnaby.

There were not many instances where the therapist had been physically close to Barnaby. After the therapist had returned to the piano, which she did almost immediately after the vocal interaction with Barnaby, he did not make an in-tune concordant vocalisation for a minute and a quarter. When he did the therapist was obliged to leave the piano and go to him because he was physically interfering with Christopher and she needed to give some support to the helper.

The observable VOCUBEAT (unpitched vocalisation occurring on the downbeat) occurred twice in Session Eight School B, at 24:53.4 and 41:51.9, and once in Session Twenty-three, School A at 17:29.7. In the first instance the therapist had been singing and playing the piano for about 23 s, improvising on Darren’s Context Theme and presenting an introduction to his turn in the Hello Song in the form of a syncopated pedal on C7 in 4/4. Joe made pitched vocalisations two seconds before this introduction, in a silence, and unpitched vocalisations in bars 5-7 of it. He was silent for the first bar of the song, his VOCUBEAT coming on the downbeat of the second bar. It was followed within a second by two more unpitched vocalisations. He was then silent again for about nearly six minutes with the exception of one vocalisation that lasted one second in the seventh bar of the Hello Song.

The second VOCUBEAT, also presented by Joe later in the same session, occurred nine seconds before the second instance of VM (vocal note or phrase in time with therapist’s music), described above. It can be considered as the first of two vocalisations in time with the therapist.

The third VOCUBEAT (unpitched vocalisation on the downbeat) was made by Barnaby. The therapist was addressing Nihal, singing her first Context Theme in the key of C and playing it on the piano. Halfway through the first bar, Barnaby tilted his face upwards, his arms and body still and his mouth open. Near the end of the third bar however he started moving again, then began smiling. A fraction of a second later he presented his VOCUBEAT as the therapist played a Dm7 chord and sung the note a. Barnaby made one further unpitched vocalisation in the same bar then was silent for about 16 seconds.
VWMIRR was first presented by Darren in Session Eight, School B at 23:04.8. It had been Rosanna’s turn in the Hello Song, which the therapist played on the piano and sang. During the preamble to this Darren had looked towards the piano but the moment the song started, he turned his head away, repeatedly putting his hand to his mouth. He looked briefly towards the piano just before the song finished. The song ended and the therapist played a postlude with quaver consecutive sixths in the treble. She then reflected back to Rosanna that she had sung ‘hello’, the last syllable of ‘hello’ falling on the third beat of the bar. Darren, who had been tapping his hand against his body loudly exclaimed ‘oh’ on the fourth beat of the same bar, echoing the therapist’s last vowel.

The second occurrence of VWMIRR (word/sound mirroring therapist) was also in Session Eight, School B, but this time was presented by Mahmoud, late in the session at 40:25.5. The therapist was at the piano playing and singing the last verse of an action song in E flat, ‘Once Upon a Chime-Bar’ (see Appendix A, Example 4 on page 287), which called for different instruments to be played in turn by the children. It was Mahmoud’s turn and he was assisted to beat an e’ flat chime-bar. He vocalised several times during the song, pitching within the therapist’s tonality as well as making some unpitched vocalisations. His head was mostly turned towards the piano. He presented VWMIRR immediately after the Chime-Bar Song had closed with the sequence IV-V7-I. The therapist sang the word ‘go’ on e’ flat, the final note of the song, Mahmoud vocalised with a similar ‘o’ sound, touching briefly on the same note, and initiating a turn-taking interaction. The e’ flat was repeatedly presented with different harmonisations around it so nearly all the e’ flats played by Mahmoud were part of any given chord played by the therapist.

The last VWMIRR (word/sound mirroring therapist) came from Barnaby in Session Twenty-three, School A at 32:35.5. It was Aaron’s turn in the Hello Song but Barnaby, who was sitting next to him, reached out to touch the former’s tambourine. The helper gently restrained him. He had a slight frown on his face which eventually gave way to a smile as the therapist played a sub-dominant pedal leading to the upbeat before the start of the Hello Song. Barnaby reached out again, touching the helper just before the first downbeat. She smiled but did not try to restrain him. As if beginning

530 See Chapter 11 starting on page 183, and Transcript 3, page 418.
to realise he was interrupting Aaron, he removed his arm but a few moments later touched the helper again. Finally he was relatively self-contained, his head turned away from both the helper and the therapist, again looking thoughtful. During the postlude the therapist sang ‘(Aaron) played Hello’. One bar later Barnaby exclaimed the word ‘play’.\footnote{See Chapter 13 starting on page 204, and Transcript 8, page 440.}

**H.6 Therapist’s Audibles Occurring Three Times**

There were two therapist audibles which occurred three times and these were IMHS (improvisation on Hello Song) and THBB (therapist beats on Barnaby’s solo or non-solo instrument). The Hello Song was usually played straight through on the piano by the therapist without improvisation, so that the children could get to know it very well, hopefully following the rhythm, the path of the tonic and the chord changes and resolutions. IMHS (improvisation on Hello Song) was therefore significant. Similarly since the therapist mainly played the piano, her playing Barnaby’s drum was unusual.

The first occurrence of IMHS (improvisation on Hello Song) in Session Twenty-five School B came at 22:00.7, after the Hello Song. When this started the children all moved slightly. Darren beat, Joe moved his feet and his cymbals, and Mahmoud hiccuped, then looked at the therapist. Rosanna smiled, moved her feet, turned her head towards the piano and in the sixth bar of the song cried ‘aah’ in an excited fashion, her mouth wide open. The therapist mirrored her vocally then paused in the penultimate bar on C7, before the cadence, wondering whether Rosanna would vocalise again. Rosanna decided to smile instead and look at the therapist. The latter resolved the cadence therefore, but altered the final note of the song, singing c’’ instead of the tonic, f’. The IMHS started here and lasted six seconds, essentially a response to Rosanna. The therapist’s vocal c’’ lasted about four seconds, for one and a half bars, with tonic, dominant then tonic piano chords moving underneath it. On the upbeat at the end of the IMHS bar, she introduced two semiquavers, the first notes of the Hello Song tune. Darren was still for the duration of the unusually long sung note, Joe’s head was towards the piano as it had been during the song and Mahmoud moved his feet. Like Joe, his head was towards the piano. Rosanna continued smiling and
looking at the piano, her mouth open. IMHS was followed by simple, free improvisation.

The forcefulness of Rosanna’s vocalisation had prompted the therapist to change course in her rendition of the song. By singing the long c’’ on the last note of it, she tried to reflect back the spirit of Rosanna, the feelings she gave of enthusiasm and boldness. The c’’ was a surprise just as Rosanna’s vocalisation had been. It also reduced the feeling of finality about the cadence, possibly signalling that the interaction with Rosanna need not be over.

The second IMHS (improvisation on Hello Song) occurred in Session Twenty-three, School A at 26:11.4. The therapist, who was by the children, spoke to them asking who wanted to play ‘Hello’ next. Christopher immediately pitched an F#, the last note the therapist had sung. He smiled too and made a further unpitched vocalisation giving the impression that he wanted his turn. About 20 s later the therapist, improvising at the piano in the key of D, asked if Christopher was ready. Here the IMHS occurred. It was slight, four seconds long and a borderline variation on the Hello Song. The therapist simply replaced the usual quavers, which she sang on the upbeat of the introductory chord, with two minims and a crotchet as she sang ‘Well He-llo’ with piano accompaniment. Usually if these notes were elongated they sounded like paused quavers. Here a downbeat was given to ‘well’ and there was the feeling of a 4/4 pulse. The bar was therefore categorised as IMHS. It sought to reflect the decisive and robust aspect of Christopher through the elongated and emphasised introductory notes, and these traits were further expressed by the staccato way the song was presented. Barnaby who had been smiling since the end of his turn continued smiling until just before the end of IMHS. Aaron and Nihal remained somewhat hidden away: the former’s eyes were not visible and Nihal’s posture made it impossible to see her face. Neither moved their arms or feet.

IMHS (improvisation on Hello Song) occurred for a third time later on in the same session at 33:06.5 and arose in complex circumstances. Again it was short, lasting about six seconds, and followed Aaron’s turn in the Hello Song, the final one of the session. Aaron was largely passive during this, only occasionally moving his head or looking at the therapist. Barnaby, seated next to him, presented contrasting behaviour, reaching out twice to touch the helper, then making three distinctive vocalisations in the
postlude. The other children were still and quiet. Christopher’s head was turned
towards the piano. The therapist decided that Barnaby’s second vocalisation, ‘play’,
which mirrored her own, called for some response even though it was Aaron’s turn.
This was a dilemma. She therefore improvised in such a way as to continue the flow
of music she was offering to Aaron but including the word ‘play’ in her singing. Then
she resumed Aaron’s theme, singing his name. Barnaby once again vocalised, this
time a series of unpitched notes. The therapist responded to these, again trying to
maintain the integrity of the music while acknowledging Barnaby. She amplified what
Barnaby vocalised and directed this to Aaron. The therapist felt tense while she did
this which led her to use the time signature of 5/4 for two bars, one she did not use very
often. IMHS occurred after the second 5/4 bar when the therapist felt she had
adequately responded to Barnaby and should address Aaron more directly, then close
the section. She improvised briefly in 3/4 introducing the downwards triadic part of
the Hello melody on the third and last beat of the bar, thereafter improvising a coda
based on Aaron’s theme.

The other observable to occur three times was THBB (therapist beats on Barnaby’s solo
or non-solo instrument). THBB occurred first in Session Eight, School A at 20:37.8.
The therapist had addressed the three other children at length in the Context Section of
the session but for some reason, despite the numerous smiles and vocalisations of
Barnaby, had left him until last. She had fleetingly sung ‘hello’ to him and sung his
name but only as one of the group of children, not in a special space of his own.
Barnaby’s actions and expressions were very labile and he constantly beat and mouthed
his beater at the same time. As the session progressed, however, his vocalisations
become more focused until, for example, he shadowed or mirrored the notes the
therapist was singing or made up little tunes in the therapist’s key.532 The therapist
decided to follow the Basic Structure rather than improvise with Barnaby until finally,
as though she could not keep this up, she began to engage with him directly, playing
motifs from his theme and singing his name repeatedly. Barnaby laughed twice. The
therapist went up to him, sang the last part of his theme and beat once on his drum as
she sang his surname, a smile on her face. She was trying to demonstrate how
Barnaby could use his drum instead of chewing his beater (in hindsight it could have
been more helpful if the therapist had removed the latter), and her proximity seemed to
emphasise that she was at last giving Barnaby the attention he may have been wanting. Barnaby, his head towards the therapist, immediately smiled after her beat and offered a bright vocal fragment which used notes of the triad of her key. For a few minutes after this he did not noticeably engage with the therapist, who continued to sing to him.

Christopher vocalised, a fraction of a second after the THBB, on an approximately pitched sub-mediant. Nihal, who so far had hardly moved at all, moved her head very slightly. Only Aaron did not move.

The second occurrence of THBB (therapist beats on Barnaby’s solo or non-solo instrument) was in Session Twenty-three, School A at 21:12.0. It occurred during a section in which the therapist was focusing on Aaron who, throughout the sessions had been presenting as a fragile and far away child with no energy, perpetually subdued and almost always motionless. The therapist had played Aaron’s theme music, acknowledging the odd vocalisation from Barnaby as she went along. This she did by either briefly taking time out from Aaron or incorporating the timbre of Barnaby’s vocalisation within the theme music of the former child. Aaron stirred when the therapist made three mistakes on the piano\textsuperscript{533} twice moving his head, then turning it towards the therapist who came up to him and adjusted his cymbals. The therapist started talking to Aaron in a chatty and friendly way as she did this, taking his hand at one point, and asking him if he knew who was sitting next to him. Aaron moved his head a fraction but made no sound. The therapist provided the answer herself by first singing the opening notes of Christopher’s tune then those of Barnaby. She paused before the second downbeat of the latter and then placed a beat on Barnaby’s drum as she sang the final note. Barnaby leaned towards her now, smiling, as she leaned towards him. Nihal made a rare vocalisation.

THBB (therapist beats on Barnaby’s solo or non-solo instrument) occurred for a third time during the Development of Session Twenty-three, School A at 37:37.7. The therapist was improvising on the black notes of a glockenspiel and lightly singing to the group as a whole. The children were very still. The children were very still. Christopher and Barnaby had their

\textsuperscript{532} See Chapter 13 starting on page 204, and Transcript 7, page 437.

\textsuperscript{533} Two of the mistakes involved the disruption of a melodic sequence by incorporating a note which did not belong to it. The third mistake involved dissonant chords comprising a cluster of notes which the writer was unable to decipher.
heads tilted slightly and their mouths open for some minutes. The therapist sang and played a stream of phrases, mainly reflecting to the children what they had done thus far in the session. Hiccoughs from Nihal, and soft vocalisations from Barnaby, the pitched ones matching her notes, beautifully augmented her music. The therapist paused. Barnaby turned his head away from her and became slightly restless, swinging his legs gently, vocalising softly and smiling for no apparent reason. The therapist addressed Aaron. As she did so Barnaby covered his face with both his hands, something he had not done before, and stayed like this for about a quarter of a minute until the therapist had finished playing to Aaron. The therapist came over to him and knelt by his side enabling Barnaby, who was leaning out of his chair, to explore the glockenspiel with his hand, which he did. The therapist sang that Barnaby ‘[said] hello on his drum’, tapping Barnaby’s solo instrument just once on the word drum. While this was not entirely accurate, Barnaby continued to look happy and explored the glockenspiel for a while longer. The therapist tried to come to terms with the fact that not all children will use their solo instrument in the way she hoped.

H.7 Therapist’s Observables which Occur Four Times

There was only one observable in this category, the audible NAMEL (therapist names Helper Lucy). The occurrences of NAMEL were in both early and late sessions of School A. Here Lucy was the only helper in music therapy and the therapist found her support sensitive and intelligent. NAMEL occurred twice at the very beginning of Session Eight at 9:12.0 and 9:18.2 when Lucy had just finished setting up the children’s instruments. The therapist suggested beginning the session and Lucy brightly replied ‘okay’ in a musical voice which travelled through various pitches. The therapist sat down at the piano and, over sustained D13 chords sang ‘okay… okay said Lucy’ then, after a pause sang ‘okay said Lucy’ again, this time over a B minor first inversion chord.

As the therapist started the session, Barnaby sang some of the therapist’s piano notes, Christopher opened his mouth wide, Aaron, whose head and eyes had been turned towards the piano before the session started, looked away from it for a few seconds. Unusually his mouth was open. Nihal was very still but slightly moved her head on the downbeat of the therapist’s second bar and again on the downbeat of the third bar.
Barnaby sang some of the therapist’s piano notes, Christopher opened his mouth wide and Aaron, whose head and eyes had been turned towards the piano before the session started, looked away from her for a few seconds after she started playing and singing. Unusually his mouth was open. Nihal was very still but slightly moved her head on the downbeat of the therapist’s second bar and again on the downbeat of the third bar.

NAMEL (therapist names Helper Lucy) occurred for a third time in Session Twenty-three, School A at 26:56.6. It had been Christopher’s turn to play Hello and Lucy, standing behind him, had assisted him to beat the tambourine as she generally did. All the children were relatively still and quiet during this, Barnaby, who was often very active, only moving near the end of the song. Lucy remained behind Christopher after this, continuing to hold out the tambourine as the therapist addressed Christopher, improvising on his theme, singing his name and singing about what he was doing: ‘Christopher is playing Hello with Sue and Lucy’. On the fourth bar of her music Christopher began moving his head, trying to turn his head round to the left, in the direction of the piano but shortly after this he was still. This was the point where the therapist sang ‘and Lucy’.

The last time NAMEL (therapist names Helper Lucy) occurred was in the Development of Session Twenty-three, School A at 38:11.2. The therapist was improvising vocally and instrumentally, playing on the five black notes of a portable glockenspiel. She initially addressed the group as a whole then approached and addressed each child in turn, particularly reflecting the fact that they had played ‘Hello’. Helper Lucy had been part of that ‘Hello’, as usual, but she was not next to the group at this point. Christopher managed to turn his head towards the therapist. Barnaby sang some extremely high notes which imitated the quality of the therapist’s notes and fitted in with the delicate sound of the glockenspiel. On several occasions Aaron had his head and eyes towards the therapist. She finally sang ‘we all said hello’, and went on to name herself, each of the children except for Christopher, (for reasons which are unclear) and Helper Lucy. Barnaby smiled and shook his head as NAMEL occurred, Aaron appeared to be watching the therapist, Christopher and Nihal did not move and their heads were turned away from the therapist. The latter had had hiccoughs throughout most of the session, and she seemed to offer one to the therapist as the latter paused.
Helper Lucy was quite a presence in the group, and the therapist wanted to acknowledge this and draw the children’s attention to their relationship with her. She had a musical voice, and a caring way with the children.

**H.8 Therapist’s Observables which Occurred Five Times**

There were three therapist observables which occurred five times. These were CR (Rosanna’s theme), IMCM (improvisation on Mahmoud’s theme) and IMCR (improvisation on Rosanna’s theme).

CR (Rosanna’s theme) occurred three times in Session Eight, School B and twice in Session Twenty-five of School B. The first time it occurred was at 15:00 when the therapist was addressing Rosanna in the Context Section. The timing of Rosanna’s turn had largely been determined by Rosanna herself as a result of her looking towards the piano. She appeared to respond to her theme, (which was sung by the therapist with glissandi), turning her head towards the piano, beating on her cymbals, tensing her body, smiling and opening her mouth wide. Mahmoud turned his eyes towards the piano several times during this.

CR (Rosanna’s theme) occurred a second time at 42:02.3, near the end of the session when the therapist reflected back to the children what had happened in it, again a usual practice. Both at the beginning and end of the session CR was presented in the key of D major, the key of the mediant of the group’s key. This was the key in which the therapist originally improvised Rosanna’s theme, and it felt too strong to the therapist to transpose. Also it would have been out of range to sing in the key of B flat. Rosanna was very active beating her cymbals and kicking her feet while her theme was being played. Mahmoud once again kept his eyes turned to the piano during CR while Joe turned his head towards it from the fourth bar onwards. Darren beat quavers in tempo during one bar, then did not play anything else.

CR occurred for a third time at 42:38.7, a resumption of the previous CR following an improvisatory break of about 14 seconds. Rosanna looked at the piano almost continuously through it. This time Mahmoud did not turn his eyes towards the piano, except for one instant. Darren only looked towards the piano in the middle of it while Joe looked through most of it, only averting his head and eyes after the cadential resolution.
The fourth time CR (Rosanna’s theme) occurred was in Session Twenty-five at 15:12.5. Like the other instances of CR it was played and sung at the piano in the key of D major. Rosanna only had her head towards the piano for about the first two bars. Mahmoud had his eyes towards the piano during the first eight bars while Joe had his head and eyes towards the piano most of CR. Rosanna went on to beat in time with the therapist’s music immediately after the end of CR.

CR (Rosanna’s theme) occurred for the fifth time in Session Twenty-five at 38:42.7, part of the Context Reprise. Unusually it was played in 6/8. Rosanna was initially still, but from the fourth bar onwards, when the therapist syncopated the first V7-I shift and sung a glissando, she kicked her legs during all the remaining bars of her theme. Mahmoud also moved his legs in bars 5-8 and turned his eyes towards the piano during the glissando. Darren was playing with a loose pair of Chinese cymbals on a long thread and paid no attention to the CR while Joe had his head towards the piano throughout CR, and held on to his cymbals.

The first occurrence of IMCM (improvisation on Mahmoud’s theme) was in Session Eight, School B at 19:21.0 after Mahmoud had presented several ambivalent vocalisations, poised between singing and crying. The therapist was at the piano. After a long vocalisation of Mahmoud (a downward glissando beginning on the dominant of her last chord) she played and sang his theme and assisted him to beat his Chinese cymbals. She then presented the group’s Context Music, addressing him. Mahmoud repeatedly turned his eyes towards her. The therapist made a cadence at the end of Mahmoud’s theme but sustained the tonic vocally throughout the bar on the word ‘play’, emphasising the fact that Mahmoud ‘can play’. Mahmoud looked at her, keeping his eyes fixed longer this time. She went on to improvise another cadential passage of four bars based on the Context Music, then, in an effort to acknowledge and affirm Mahmoud’s presence, she improvised four bars on Mahmoud’s theme, (the IMCM). This had a jaunty aspect. Despite Mahmoud’s open mouth and apprehension, the therapist viewed him as a sturdy fellow with a strong capacity for play. Mahmoud fleetingly turned his eyes towards her during the third bar of IMCM, but did not turn his eyes towards the piano again until two bars later when the therapist was singing an unusually high note, f’. 
Rosanna looked at the piano during most of IMCM. Darren presented seven beats on his drum, four of which were in time with the therapist’s music. Joe mouthed his cymbals, appeared calm but did not look at the piano until the final note of IMCM.

The second occurrence of IMCM (improvisation on Mahmoud’s theme) was in the Context Reprise of Session Eight, School B at 41:40.0. Mahmoud had been vocalising again, for the first time singing long, firm and clear pitched notes which matched those presented by the therapist and led to a brief improvised interaction with her. In order to acknowledge this, and stress the significance of Mahmoud’s responses, the therapist addressed him first in the beginning of the Context Reprise. She played IMCM here during which Mahmoud made several mouth movements. As in the earlier IMCM the therapist changed the note values of Mahmoud’s original theme. Mahmoud made a large arm movement when the therapist first sang it, moved his arm twice on the downbeat and kept his eyes turned towards the piano.

Darren looked away from the piano to begin with during Mahmoud’s music. Rosanna, who had already been looking at the piano, made a decisive head movement away from it after two bars of IMCM, but was drawn back to looking towards the piano in the second part of IMCM when the therapist stopped singing and presented piano music only. Joe who had been playing with his cymbals during IMCM and had not been looking towards the piano also looked towards it, albeit briefly, at the same point in the music.

The basic plan of the session was to have the children’s themes after each section of the Context Reprise so it was significant that the therapist was playing an improvisation on Mahmoud’s theme rather than playing it in its original form. This was a response on the part of the therapist to Mahmoud’s unusual level of activity and assertiveness during the session, in particular his singing.

The last three occurrences of IMCM (improvisation on Mahmoud’s theme) came in quick succession in Session Twenty-five, School B. The first, at 26:53.5, came after Mahmoud’s turn in the Hello Song. His turn was unusual in that before it started the therapist sang an unaccompanied variation of Mahmoud’s theme to him, tapping each downbeat on the tambourine on his lap. Mahmoud could feel this beat because his hand was resting on the tambourine, and he smiled. His eyes were towards the piano.
much of the time during his Hello Turn. At the end of the song the therapist played a few bars of slow improvisation on the first five notes of Mahmoud’s theme, the part of his music which she usually sang his name to. This constituted the third IMCM. When Mahmoud’s eyes were visible they were turned towards the piano during this. He also hiccupped on the downbeat of the third bar of the IMCM.

Joe only briefly looked at the piano during the third IMCM (improvisation on Mahmoud’s theme) although he had been looking at it most of the time during the Hello Song. Darren beat rapidly, mainly in his own pulse or erratically. He did, however, beat in time with the therapist on three occasions, once on a downbeat. Rosanna, who had been smiling throughout the entire Hello Song, kicked her feet during nearly all of the IMCM. The onset of her foot movement occurred just after the final chord of this song.

The therapist broke off momentarily from the third IMCM (improvisation on Mahmoud’s theme) to vocally improvise over a long, sustained Gm7 piano chord, addressing Mahmoud and emphasising that he had ‘played Hello’. This was intended to affirm what he had done. Then, after a brief C7 chord, she presented the fourth IMCM at 27:15.1. This was in the key of F major, (the key of the Hello Song and the third IMCM) and in 2/4. It consisted of the therapist playing a single contrapuntal bass line on the piano with her left hand and lightly tapping Mahmoud’s tambourine with her right, as she did earlier. The therapist presented the first four notes of Mahmoud’s theme in various ways. Mahmoud, when his eyes were visible, was clearly looking at the piano. He also hiccupped on the downbeat of the fifth bar. Just before the end of the fourth IMCM, the therapist slowed the pulse slightly and pedalled heavily over a downward vocal arpeggio. Mahmoud started making mouth movements.

Darren was very active during the fourth IMCM (improvisation on Mahmoud’s theme), beating eight times on the quaver beats of the therapist’s music. The therapist had already felt he was following this. He had stopped beating when she had presented a tempo rubato after the third IMCM, and resumed when she had reinstated a pulse. The speed of the therapist’s music (crotchet = 69) may have also been a factor. Rosanna beat three times during the fourth IMCM, once a fraction of a second later than the therapist’s downbeat and once on the next quaver beat. Her mouth was open
throughout and verged on a smile. Joe kept fairly still during the fourth IMCM, his hands round the edge of his tray, and his head and torso leaning over it slightly.

The fifth and final IMCM (improvisation on Mahmoud’s theme) occurred at 28:11.4. It formed a transitional passage at the end of Mahmoud’s Hello Turn when the therapist was quiet for a moment, then addressed Mahmoud with song and piano, asking him who he wanted to ‘give the Hello Tambourine to now’. Her doing this partly reflected the fact Mahmoud had seemed very sensitive to her music and she did not want to cut off from him too abruptly. It was also to explain why Helper Lucy was removing the Hello Tambourine away and returning Mahmoud’s Chinese cymbals. The therapist drew on his theme to emphasise she was communicating especially with him. Mahmoud was very still during this but raised his arms slightly as the cymbals chinked together and his name was sung.

Darren tilted his face towards the ceiling just before the onset of the last IMCM (improvisation on Mahmoud’s theme). When the therapist sang ‘who shall we give the tambourine to?’ Darren beat twice vigorously in time with the music, once on the downbeat. Rosanna, whose face had also been tilted to the ceiling, beat once on her cymbals a moment later, smiling. Joe looked towards the piano but did not otherwise move. It is important to remember that the children may well have been getting something out of a session at those times when they did not obviously appear to be doing so, and it was not always possible to judge exactly how they were feeling.

IMCR (improvisation on Rosanna’s theme) occurred three times in Session Eight of School B, and twice in Session Twenty-five of the same School. The first IMCR at 15:37.2, Session Eight, arose during the Context Section after Rosanna’s theme had been played in its near original form. Rosanna beat each time after the therapist sang her name, her mouth wide open. She turned her head towards the piano. The therapist paused, then sang her name again. Rosanna placed a beat in time with the music for the second syllable of her name. At this point the therapist moved into a thematic improvisation. She paused again, on ‘he-’ and Rosanna beat again for ‘-llo’, her beat being accompanied vocally and pianistically by the therapist. Rosanna’s body

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534 See Chapter 12 starting on page 194, and Transcript 6, page 432.
tensed after this. She beat again, smiled and then rested. The IMCR here matched the creative aspect of Rosanna, which was largely responsible for it.

Darren mainly looked towards the piano and was still during IMCR (improvisation on Rosanna’s theme). Joe intermittently looked in the same direction, otherwise fingering his cymbals. Mahmoud was mainly still, but from time to time slightly raised his arms slightly and turned his eyes towards the piano in the pauses.

The second IMCR (improvisation on Rosanna’s theme) formed the closing five bars of Rosanna’s Hello Song turn in Session Eight, School B, at 23:45.4. Rosanna was active during the Hello Song and its postlude (which included music addressed to other children). During the assisted beating she continuously moved her right leg from side to side which, according to staff at her school, was a sign of pleasure. When the helper moved away she quickly started beating the tambourine by herself with enormous energy and determination, placing beats in time with the music and beating as many as five beats in succession.535 Rosanna beat on the downbeat at the cadence, her body tense before the preparatory, paused V7. She beat again with the music in the next bar, this time beating with her whole arm which she had stiffened and outstretched. The therapist felt the need to play extra music to affirm and accommodate Rosanna and she drew on Rosanna’s theme for this as she improvised. As she did so the helper removed the Hello Tambourine. Undaunted, Rosanna beat on her tray, then on her cymbals when Helper Peta returned them, and then in the ensuing silence prior to the next child’s Hello Turn, and beyond.

The other children were quiet during this IMCR (improvisation on Rosanna’s theme). Darren had his head bowed and rubbed his mouth with the back of his hand. Joe, about to mouth his cymbals, paused then forgot about them as he slowly turned his head towards the piano. Mahmoud was still, then sang therapist’s tonic at the final cadence.

The third IMCR (improvisation on Rosanna’s theme) occurred at 26:10.4 and was in response to Rosanna. It followed a silence after Darren’s turn in the Hello Song. Rosanna, who had played her cymbals in time with the therapist’s cadential music for Darren, then beat a few more times when the therapist had stopped playing. The

535 See Chapter 12 starting on page 194, and Transcript 5, page 428.
therapist embarked on an IMCR not wishing Rosanna to feel unnoticed. This had several time signatures probably because the therapist was not totally convinced she should be addressing Rosanna just before Joe’s turn in the Hello Song, and she felt torn between the children. Even Mahmoud, mouth wide open, wailed and looked at the piano at the same time as Rosanna beat. The IMCR started in 5/4, moved to 6/4 after one bar, moved to 4/4 after five bars and changed to 3/4 one bar later. Rosanna looked towards the piano during the first three bars when the therapist was playing piano only. She then looked away. The therapist sang softly, alluding to Rosanna and her cymbals, and went on to conclude the IMCR by dovetailing Joe’s theme with the last note of it. Mahmoud moved his arms very slightly during the start of the IMCR and then was during it, only moving his head once on the last downbeat of the IMCR. Joe’s head was turned towards the piano until the fourth bar of the IMCR after which he was involved with Helper Peta who was preparing for Joe’s Hello Song turn.

IMCR (improvisation on Rosanna’s theme) occurred for a fourth time in Session Twenty-five, School B, at 23:25.3, the preamble to Rosanna’s turn in the Hello Song. The therapist had been playing ‘Hello to Everyone’, the first airing of the Hello Song. Rosanna smiled during this and jiggled her legs in a lively fashion at its onset, and towards its end. Her last movements on both occasions were to straighten her right leg and stretch it out in the air. The therapist, after the song finished sang to the children ‘Let’s play Hello now, shall we?’. Rosanna kicked her legs. The therapist sang ‘Yes?’ and paused. Rosanna kicked her legs again then gathered herself together and beat just once on her solo instrument. This felt like a ‘yes’ to the therapist. She left the piano to introduce the Hello Tambourine to the children, and see who wanted to play first, perhaps needlessly since Rosanna had already indicated she was keen. Joe started as the therapist beat the tambourine, becoming extremely excited, possibly having a slight fit, and repeatedly vocalising in his own pulse. The therapist attended him, singing his theme then playing some quiet music on the piano. Joe gradually calmed down. The therapist asked Rosanna if she was going to play first. Rosanna clinked her cymbals in a seemingly affirmative response. The IMCR (improvisation on Rosanna’s theme) occurred here. It was a five-bar passage in 6/4, then 4/4, which provided an introductory V7 to the Hello Song and intended to provide an undemanding background as the helper removed Rosanna’s cymbals and gave the tambourine to her. The therapist used Rosanna’s theme with the intention of helping
Rosanna understood she was being addressed. Rosanna kicked her legs and opened her mouth wide as the tambourine came towards her. Once the IMCR started she became still, possibly concentrating on Helper Peta at whom she periodically glanced as her hand was guided over the skin of the tambourine.

Mahmoud looked towards the piano for the most part during the IMCR (improvisation on Rosanna’s theme) and apart from hiccupping twice did not move. Darren who was initially quiet, suddenly, in the second bar of the IMCR, beat against his body in time with the music, twice on the downbeat. Joe, arms outstretched and wobbly, had his head turned away from the piano until the end of the IMCR when he looked towards it. This shift occurred around the downbeat of the last bar of the passage when the therapist played an arpeggiated V7 chord in the high register of the piano, then made a ritenuto and paused, before playing the upbeat of the Hello Song. It struck the therapist how useful it is that music can provide a framework for different activities occurring simultaneously.

The last IMCR (improvisation on Rosanna’s theme) occurred at 25:13.0. It formed a short postlude to the Hello Song for which the IMCR above formed an introduction. Rosanna had played the tambourine in the Hello Song looking partly at the therapist and partly towards the helper. At the end of the song the helper stopped holding Rosanna’s arm and stepped back (though still extending the tambourine) and the therapist, unusually, recapitulated the second half of the song. Rosanna hesitantly played a few beats to this by herself, two of which were in time with the music. Her hesitation prompted the therapist to wait for her just before the downbeat, pausing on the last quaver of the bar (in a rather unmusical way) so Rosanna could gather her responses. This she did all the way through to the end of the song, her leg stretched right out, as before, at the cadence. The therapist reflected on Rosanna’s activities, largely improvising for six bars. Rosanna was still but suddenly tensed and stretched her arms out, her head towards the piano. She stayed like this for about ten seconds while Helper Peta stroked her right arm. She then relaxed, her head still towards the piano and her arm resting on the tambourine.

The therapist introduced the IMCR (improvisation on Rosanna’s theme) which comprised piano alone and was played in a straightforward and simple manner to avoid taxing Rosanna. It finished the whole section while still acknowledging Rosanna.
She remained still though during the IMCR but jiggled her leg as per usual when her cymbals were returned. Darren had his head bowed during the IMCR and was playing with his beater, mouthing it at one point, a contrast to his more extrovert behaviour when, in the Hello recapitulation, he beat rapidly against his body, smiling. Joe kept his eyes fixed on the piano nearly the whole duration of the Hello Song, improvisation and postlude, only looking away for a short period.
Appendix I
Descriptions of Change Events

This appendix relates to section 9.4  Change Events starting on page 172.  A description of change events is given for each School, looking at one example of each type that occurred.  A summary of additional change events in each category is given for those in School B.  Each change event is described under a separate numbered sub-heading.  Finally an inter-session comparison of change events is made.

I.1 Change Events in Session Eight, School A

I.1.1 Start of the Session 9:05.0

A change was anticipated in the children’s behaviour at the start of the session when the therapist sat down at the piano and began to sing and play.  It was thought her presence would probably make a difference to the children and they might connect with her.  Christopher, who had been opening and closing his mouth and making mouth movements prior to the start of the session, opened his mouth wide, and kept it open like this for nine seconds.  Aaron who had been looking at the piano, averted his eyes from it.  Barnaby presented no change of behaviour at the start of the session but pitched into the therapist’s tonality.  There was no change in Nihal who presented as the most withdrawn of the children sitting, with her head bowed down.

I.1.2 Aaron Turned his Head towards the Piano 9:26.0

Aaron was motionless during the lead-in to this change episode, his head in midline, a serious expression on his face and his arms resting on his lap.  The therapist sang and played the piano in a leisurely way, improvising a 6/4 passage in G major.  She sang ‘And now it’s Sue at the piano’, accompanying this with a sustained chord on the dominant made up of fourths.  The word ‘Sue’ was set to an upward scale of crotchets beginning on b and ending on e´ and this was tied to a minim e´ in the next bar when the time signature changed to 3/4.  The therapist sang to the sound ‘oo’ as she climbed the scale.  It was at the moment of the passive downbeat of the 3/4 bar that Aaron suddenly turned his head to the piano.  About a second later he looked at the therapist and continued to do so throughout the rest of the episode.  He made no other
movement. During the lead-out the therapist repeated the D chord, singing a´ above it, after briefly touching on a first inversion B minor chord.

**I.1.3 Christopher Moved his Arms and Feet 9:37.5**

During the lead-in of this episode Christopher was completely still while the therapist improvised at the piano and sang. She played chordal quaver configurations in 3/4 time, the quavers tracing an underlying A minor 7 chord which was underpinned by a D 7/9 pedal. Just before the moment of change the therapist played two quaver dissonances made up of the semitones c’’ and b’. Immediately after the first one Christopher stretched out his arms in front of him and then slowly raised them, simultaneously moving his feet. During the lead-out the therapist addressed Christopher, responding to his gestures, and sang his name. As she did so he puckered his face, still moving his arms and feet.

**I.1.4 Aaron Flexed his Arms 11:35.8**

During the lead-in of this change episode, Aaron was motionless, a serious expression on his face once again. The therapist was at the piano playing and singing in 4/4. She presented two improvisatory bars, V and V7 in G major, the first with a crescendo, the second forte. She resolved the V7 onto the tonic in the next bar and as she did so Aaron turned his head towards the piano and flexed both his arms, briefly puckering his face. In the lead-out the therapist played the third bar of the Context Music then made an arpeggiaic improvisation on I, singing an a´ semibreve. During this Aaron opened his mouth wide and protruded his tongue.

**I.1.5 Christopher Puckered his Face 11:39.0**

During the lead-in of this change episode Christopher had his mouth open and both arms extended in front of him. Apart from his tongue intermittently protruding he was motionless. The therapist improvised on the piano in G major, playing two loud D7 crotchet chords at the end of a 4/4 bar. She then played and sang the third bar of the Context Music in G major, replacing the D7 chord that usually followed it on the downbeat of the next bar with a G major upward arpeggio. Over this she sang ‘mu-[-sic]’ on a semibreve a´, thus presenting the interval of a ninth. Christopher slightly puckered his face at this point, the moment of change, then moved his foot as the
therapist’s arpeggio unfolded. The therapist briefly paused before the next bar during which Christopher moved his arms a fraction. She then presented an upward C major arpeggio over which she sang a quiet d’’, another ninth interval. Christopher began raising his arms during this.

I.1.6 Christopher Leant Forwards 13:30.0

During the lead-in of this episode the therapist addressed Christopher, singing a temporally elongated variation of the penultimate bar of the G major Context Music in 4/4. She did this initially without piano accompaniment and in tempo rubato. Christopher had his eyes towards the piano at the start of the lead-in and was open mouthed. His flexed arms were slightly outstretched and his face slightly puckered. The therapist reached the last two notes of the Context tune, e’ and b’, before the cadence and introduced a piano accompaniment, playing two D7 minim chords with added tones and pausing before the cadential resolution. Christopher made an instantaneous arm movement on the downbeat of the first of the piano chords, then moved his head away from its position against the back of his chair as the therapist paused after the D7 chords. He moved his arms briefly again on the next downbeat of the therapist’s music, then began to lean forwards, the moment of change. During the lead-out the therapist pianistically improvised on Christopher’s Context theme without singing, presenting his tune two octaves higher than usual. Christopher continued to move his head until it was in mid-line.

I.1.7 Christopher Lifted his Legs up in the Air and Smiled 14:56.0

The lead-into this change episode began with a moment of silence when the therapist had paused in her music. Christopher made an approximately pitched vocalisation on f’ during this pause and smiled for about two seconds. He then repeated his vocalisation and made an instantaneous arm movement. The therapist began playing the piano in G major with a 4/4 time signature. She played a simple contrapuntal staccato improvisation in a walking tempo based on Nihal’s theme. After the first note of this Christopher began smiling again, and when, on the second beat of the bar the therapist played an octave unison on d’ and d’’ he moved globally for an instant, lifting up both his legs and opening his mouth wide as he smiled. This was the moment of change. The therapist continued with her contrapuntal music in the lead-out and
Christopher slowly began lowering his legs but only put them down again after the end of the episode. The therapist finished by singing Nihal’s name.

I.1.8 Christopher Moved his Arms 16:41.4

During the lead-in of this episode Christopher sat back in his chair, his head turned to the right, his face tilted slightly upwards and his mouth wide open. He was still. His arms were extended in front of him. The therapist was playing the last two bars of a G major improvisation in 4/4 based on Nihal’s theme. She played the first of these bars in the high register of the piano, then, leaving the piano and approaching Nihal, whose tambourine had slipped off her lap, sang a repetition of the melody two octaves lower, tapping each crotchet beat on Nihal’s tambourine. She crouched by Nihal for the rest of the episode in silence. Approximately 1.5 s after she finished singing, Christopher began moving his arms, the moment of change. About two seconds later he made a loud unpitched vocalisation lasting one second. At the end of this he moved his foot and began moving his head in the direction of the therapist.

I.1.9 Christopher Smiled 17:53.3

The therapist was crouching next to Christopher during the lead-in of this episode. She had just started singing Aaron’s theme in G major and beat on Christopher’s cymbals on the third beat of the 4/4 bar. Christopher was initially still, his arms extended forwards and his head turned away from the therapist to the right. It was tilted upwards and his mouth was open. The therapist moved away from him as she sang the second bar of Aaron’s theme, but reached out and played Christopher’s cymbals once more on the third beat of the bar. His arms moved very slightly. At the start of the third bar she took hold of his left arm and made it nudge the cymbals. Almost immediately Christopher began smiling broadly, the moment of change. During the lead-out the therapist moved away from Christopher and crouched by Aaron. The quality of her voice changed slightly, sounding excited and enthusiastic. She paused on the penultimate note of the theme, leaning forward to take Christopher’s arm once more. He made an instantaneous unpitched vocalisation.
I.1.10 Nihal Moved her Head 19:43.6

Nihal was immobile during the lead-in of this change episode, her lowered head turned away from the piano. Her hands were touching each other and her arms were flexed. A large tambourine rested on her lap. The therapist, at the piano, played an in tempo improvisation in G major on the Context Music, addressing Aaron. She then suddenly halved the speed of her music and began playing legato thirds over a first inversion B flat chord, vocally sustaining b’ flat over a period of three bars to the word ‘music’. Nihal began moving her head as the therapist began playing the thirds, the moment of change. About one second later she began moving her feet, continuing to do so right through the lead-out. After another second she began moving her arms for about two seconds. Four seconds after the moment of change Nihal lifted her head up and took a deep breath.

I.1.11 Christopher Turned his Head towards Piano 21:04.5

The lead-in of this change episode began with Christopher moving his head and arms slightly and looking upwards, his mouth open. After about two seconds he moved his legs and feet as well. The therapist sang and played a variation in 4/4 of Barnaby’s E flat theme, transposed to G major, in which she juxtaposed quiet instrumental dynamics with loud vocal ones, the quality of her voice being robust, bright and insistent. She sang ‘Hello Barnaby’ and paused. During this pause Christopher, who had been slowly turning his head for some time, managed to reach a point when his head was turned directly towards the piano, the moment of change. Immediately after this, during the lead-out, the therapist sang and played a cadential version of Barnaby’s theme finishing with half a bar of dotted quaver and semiquaver consecutive fifths, the notes of the third and fourth beats being difficult to discern. Christopher pushed the small tambourine on his lap onto the floor at exactly the same time as the downbeat of the therapist’s music in the last bar of the episode. He continued to move his legs and feet until about one second before the end of the episode.

I.1.12 Nihal Lifted her Head and Smiled Broadly 28:30.1

At the start of this change episode, the therapist, at the piano, was playing and singing the sixth bar of the Hello Song in D major, addressing it to Nihal. She was being assisted to play the cymbals rather than the tambourine on this occasion, the helper
crouching behind her and holding her left hand. The tempo of the song was slower than usual. As it proceeded Nihal kept her lowered face hidden behind her fist. During the second beat of the seventh bar, the cymbals accidentally swung against her nose. The therapist made an exclamatory vocalisation in recognition of this and Nihal lifted her head and smiled broadly, the moment of change. During the lead-out the therapist paused heavily on the last two chords of the penultimate bar of the song, E7 and A7, and the helper assisted Nihal to beat on the second of these. This again was unusual. After raising her head, Nihal was still during the rest of the episode.

It was clear that Nihal enjoyed the feel of the cymbals against her nose and saw the incident as a joke. This may have been enhanced by the therapist’s exclamation since Nihal probably felt the therapist was sharing the joke with her. The incident revealed a rough and tumble side of Nihal which had not hitherto been in evidence.

I.1.13 Barnaby Cocked his Head 34:29.0

The therapist was playing the last three notes of a melody in B flat on the clarinet at the start of the lead-in. Unusually she ended the melody on the dominant. As she was playing, Barnaby mouthed the head of his beater, then the wooden stick. Two seconds later he cocked his head, the moment of change, and fluttered his eye lids, eventually looking up. He continually mouthed his beater during the lead-out holding it with both hands horizontally. As he paused in this way the therapist waited for a moment in the centre of the group then made her way to the piano. As she approached it, Barnaby lowered his eyes and kept them like this right through the lead-out, his mouth wide open and his head still.

I.1.14 Barnaby Faced the Ceiling 34:53.0

At the start of the lead-in of this change episode the therapist quietly sang to the group from the piano ‘How shall we play?’ She was on the third bar of the D major song in 2/4. While the theme of this had been played and sung before, the arrangement was slightly different in that she doubled the sung tune an octave higher on the piano and introduced six two-note chords separated by the interval of a second. Barnaby mouthed his beater as she played and sang, making a continuous unpitched vocalisation like a drone. He leant back in his chair and fleetingly smiled, then continued mouthing his beater with a great deal of concentration. The therapist had just begun the sixth bar
of the song when Barnaby suddenly tilted his head back so that he faced the ceiling, the moment of change. A fraction of a second later he was still and apart from two instantaneous arm moments, remained so for the rest of the episode. After playing two cadential chords, V7 and I (which were divided by a pause), the therapist was silent during the lead-out as well.

I.1.15 Nihal Held her Head Up 35:12.0

During the lead-in of this change episode the therapist was playing a piano only version of the song ‘Let’s Play Listening’ in D major (see Example 3, page 286 of Appendix A). She played this slowly, just beginning the second bar when the episode began. Nihal sat with her head down and turned away from the piano. She was still for the first second and a half of the lead-in but immediately after the therapist played a’’, very slowly began raising her head, then her arms and finally moved her feet a little. She held up her head, the moment of change, faced Barnaby and remained with her head up throughout the rest of the episode. The therapist continued playing the song, but began singing as well after the fourth bar, presenting the tune from the beginning again.

I.1.16 Barnaby’s Head was Still 39:45.0

There was silence during the lead-in to Barnaby’s change event. The therapist stood up after kneeling by Christopher and Barnaby and walked back to the piano. Barnaby first remained still, his mouth wide open, then he moved his head slightly as he followed the therapist’s movements, his left hand gripping the back of Christopher’s chair which was next to his. After a few seconds he made one instantaneous unpitched vocalisation, raising his eyebrows while doing so. He then repositioned his hand on Christopher’s chair, where he left it during the lead-out. A fraction of a second later Barnaby’s head became still, the moment of change. The rest of his body was motionless for four seconds after which Barnaby began moving his hand and arm over the head-rest of Christopher’s chair.
I.2 Change Events in Session Twenty-Three, School A

I.2.1 The Start of the Session 9:25.0

The beginning of the session was of interest once again. Barnaby was looking towards the piano, his left hand near his mouth. When the first piano chord sounded he covered his mouth with his hand and kept it like this for 3.5 s. Aaron had been looking towards the piano before the start of the session and there was no noticeable shift in him as the therapist began playing. Christopher made a loud unpitched vocalisation as the therapist sat down at the piano, turning his head towards it and opening his mouth wide. When the therapist began to play, he slightly closed his mouth then immediately opened it wide again. Nihal was still before the session began but raised both her feet, and her hands, after about 3 s. Barnaby was not given his beater in this session as it was thought to be too much of a distraction. The therapist hoped its absence would encourage Barnaby to play his drum.

I.2.2 Barnaby had his Head Still and Looked Puzzled 9:41.8

Barnaby tapped his head with his left arm during the lead-in of this change episode, his head tilted back and a smile on his face. His mouth was open, and remained so throughout the episode. He slightly swung his right leg. The therapist improvised vocally over a first inversion B minor chord on the piano in a 4/4 tempo rubato singing ‘Ah… Here we are’. Barnaby stopped tapping his head and sat up, reverting his head to its normal position. He clasped his hands together and played with them. On the word ‘are’ he suddenly stopped moving his head, the moment of change, and looked puzzled, a slight frown on his face. During the lead-out he continued to play with his hands and made one brief movement with his right foot. The therapist, repeating the phrase ‘here we are’, paused on the word ‘are’ which was set to a dotted minim.

I.2.3 Barnaby Handled his Drum and put his Head on it 10.01.0

At the start of the lead-in Barnaby’s head was turned away from the piano and was still. The therapist had reached the second half of a 4/4 bar in G major which consisted of rests. Two seconds later she began playing and singing the Context Music in the same key. Barnaby turned his head towards his drum on the downbeat of this and then towards the piano on the third beat of the therapist’s bar. A fraction of a second later
he put his left hand on the head of the drum, the moment of change, briefly smiled and then turned his head once more towards his solo instrument. During the lead-out Barnaby clasped it with both hands, and after three seconds appeared to rest his head on it; (it was not clear if he was actually touching it with his head or not). He looked as though he was hugging it, and he stayed in this position for the rest of the lead-out. The therapist continued with the second and third bars of the Context Music.

1.2.4 Aaron Turned his Head away from the Piano 10:37.7

During the lead-in of this change episode Aaron sat impassively with his head turned towards the therapist who was playing and singing the penultimate bar of a 4/4 section of music in G major related to the Context Music. As she improvised the cadence she altered the original melody by playing and singing an a´ instead of a b´ on the fourth beat of the bar, but accompanied it with the usual D7 chord. She then added a further bar in which she shifted to b´ in the melody on the second beat, still maintaining the D7 harmony. As part of the element of anticipation she lingered on the first syllable of the word ‘today’ and did not complete it till the end of the episode. Aaron lowered his eyes when the therapist sang ‘to–’ then changed the position of his head during the paused chord, turning it in the opposite direction to the piano, the moment of change. He opened his mouth 0.5 s later. After this he remained motionless except for one slight and instantaneous movement of the head when the therapist ended the pause. She did this by singing ‘–day’ on d´ over a second inversion C major chord. Aaron’s mouth remained open for the duration of the lead-out.

1.2.5 Barnaby Covered his Eyes with his Fists 11:20.6

This change episode began with the therapist improvising in 4/4 time on the piano in G major and singing about how Barnaby had been on holiday. Barnaby smiled during the first part of this and shook his head rapidly. He then became still after the word ‘holiday’ had been sung and stopped smiling. The therapist changed to 3/4 time in the next bar, played a first inversion B minor chord and went on to sing that Aaron had been on holiday too. This she did over two bars. As she alluded to Aaron, Barnaby brought his head forwards, screwed up his eyes and completely covered them with both his fists. This was the moment of change. He remained fairly still in the lead-out, but towards the end of the period stretched and slightly jiggled his legs.
Christopher was open-mouthed, motionless and silent during the lead-in of this change episode, his head turned away from the piano, his right arm extended in front of him, resting on his cymbals. The therapist addressed Nihal for one bar in an improvised piano and voice 4/4 passage on V in G major. She then made a variation on the first bar of the Context Music. This led to her singing an a´ quaver on the downbeat of the next bar accompanied by a B minor 7 quaver chord on the piano. She rested for three beats. Barnaby sang ‘yeah’ on an accurately pitched a´ on the second beat of the bar, seemingly echoing the therapist. She cut the bar short (making it a 3/4 bar) and responded to Barnaby by singing ‘uh’ on a crotchet g´ accompanied by an A minor 7 crotchet chord. She turned this into the downbeat of a new 4/4 bar. Christopher began moving both of his arms at this point, the moment of change, bringing them up towards him and moving his cymbals which made a sound. During the lead-out the therapist sang ‘uh’ to an f´# and accompanied it with a G major 7 chord on the downbeat of the next bar. About one second after this Christopher made an unpitched vocalisation with the sound ‘nngh’ and after making a short downward glissando approximately pitched d´. The therapist echoed this d´ vocally on the last beat of the bar and then paused on the next bar with a pedalled D7 chord over which she sang a minim g´ and c´ joining them with a glissando after Christopher.

There were several occasions when Christopher responded with smiles, or movement of arms and legs, when the therapist was mirroring one of the children or engaged in some sort of dialogue with a particular child. His own vocalisation may have been part of a desire to join in, to engage with the therapist himself, if not simply to draw attention to the fact that he was there.

Barnaby Looked Serious 13:58.3

The lead-in here began as the therapist was starting a new section of music, addressed to Christopher. She presented the opening of Christopher’s theme in G major, voice and piano in unison, making a pianistic slip in the second bar of this when she played d´´ and e´´ together instead of d´ by itself. She then paused on b´ singing ‘i[s]’ for about four seconds. Barnaby was smiling broadly, his face tilted upwards and his mouth open. He was moving a lot as the therapist started Christopher’s theme, but
became relatively still and started frowning (the moment of change) a fraction of a second after the therapist had presented the dissonance on the piano. During the lead-out he kept his face tilted upwards and slightly kicked his outstretched legs.

**I.2.8 Barnaby Cocked his Head 14:33.3**

During the lead-in here Barnaby seemed unfocused. He was shaking his head, smiling, moving his feet and apparently looking at something on the ceiling. The therapist sang to Christopher, describing him ‘with his cymbals’ in a quasi recitative fashion, hovering around middle C then shifting onto the d’ above. She played a sustained D9 chord on the piano. The therapist repeated the phrase ‘with his cymbals’ and emphasised the last word by singing it on d’ twice with two crotchets supported by two spread D9 chords. After this she paused briefly. It was at this moment that Barnaby cocked his head, the change event. He stopped moving. In the lead-out Barnaby remained still with the exception of opening his mouth.

**I.2.9 Christopher Turned his Head towards the Piano 17:31.5**

The therapist was focusing on Nihal, singing her theme (CN) in C major, 4/4 time, and playing it on the piano. The lead-in began just after the therapist had sung Nihal’s name on g supported by a G7 chord on the piano. Christopher began moving his head slightly, turning it to his left in the direction of the piano. The therapist, keeping her voice around c’, played the tune in octaves on the piano an octave higher than she sang it with the accompaniment around c’. Christopher stopped moving his head momentarily then turned it decisively towards the piano, the moment of change, and kept it like this during the lead-out and beyond.

**I.2.10 Aaron Turned his Head towards the Piano 20:23.4**

During the lead-in Aaron was motionless except for two instantaneous head movements. Each of these occurred after the therapist had ‘gone wrong’ at the piano which she played without singing. She first played a dissonant interval where there should have been a single note and secondly she doubled a chord with a dissonant interval instead of the octave. Following these ‘mistakes’ the therapist resumed singing, addressing Aaron and beginning to ask him in song if he could hear what she played. Aaron appeared to respond to this by turning his head towards the piano,
movement which marked the moment of change. At the same moment the therapist omitted the piano accompaniment and sang an arpeggio of F minor 7, completing her question asking whether Aaron had heard what she had played. Aaron turned his eyes to the piano as if registering the therapist’s question. The therapist then got up from the piano and stood next to Aaron, repeatedly asking him in song whether he had heard what she played. Aaron kept his head and eyes in the direction of the piano even after the therapist had left it.

I.2.11 Barnaby reached over to Aaron 22:04.0

This change episode has been described in Description of Rare Events, section H.2.1 Therapist’s Single-Occurrence Audibles on page 332 of Appendix H, when the time signature of 7/4 was discussed. A more detailed description is given here touching on issues not mentioned before.

In the lead-in to this change episode, the therapist was contriving to sing ‘Hello’ to Aaron while simultaneously responding to Barnaby, a rather muddled endeavour. Although it was Aaron’s turn to be focused on, the impetus for the improvisation during the lead-in came from Barnaby’s unpitched vocalisations which the therapist mirrored. As she did so Barnaby smiled continuously and moved his head, arms and legs while Aaron remained motionless, completely passive. The time signature at the start of the lead-in was 7/4. After the improvisation the therapist played Aaron’s theme and sang his name, and Barnaby, who had made an exclamatory vocalisation during this leant over and touched Aaron’s chest and legs, and finally took hold of his cymbals stand. Barnaby stopped smiling halfway through the lead-out but continued to move a lot.

I.2.12 Barnaby Leant towards the Therapist 23:13.0

During the lead-in Barnaby was sitting back in his chair with his head tilted upwards and his mouth open. The therapist was in the middle of the group singing the Hello Song to the children and highlighting the downbeats on the large ‘Hello Tambourine’. She stood up, still singing, and approached Barnaby. As she did so Barnaby lowered his head and turned it towards her, leaning towards her once she stood right by him, the moment of change. He was smiling. During the lead-out Barnaby immediately touched the extended tambourine and beat once on it on the downbeat. The therapist
momentarily withdrew it to take her turn in playing, with the intention of swiftly offering it again to Barnaby, for his turn. During this Barnaby leant at a greater angle towards her as though trying to reach her, and made little exclamatory vocalisations, his tongue protruding from between his lips. He smiled throughout the change episode and touched the therapist at the end of the episode.

I.2.13 Christopher Smiled 28:48.1

This change episode took place during Nihal’s Hello Turn, the start of the lead-in occurring just before the last beat of the fourth bar of the song (see Chapter 14, page 210, and Transcript 13, page 453). The therapist varied the song by playing the tune on the piano an octave higher than it was sung. Christopher, initially still, had his mouth open during the lead-in and made instantaneous movements of his head and feet a fraction of a second after the downbeat of the fifth bar. He went on to move his arms very slightly in the same bar and then started to smile, the moment of change. The onset of his smile coincided with the last quaver beat of the bar. Christopher remained smiling during the rest of the lead-out and made an unpitched vocalisation ‘uh’, from about the second beat of the sixth bar. It lasted right through the lead-out. He moved his arms again from the fourth second of the lead-out and made a further discrete movement of his head. The therapist continued with the song as per usual, continuing too with the octave doubling on the piano.

I.2.14 Christopher Turned his Head towards the Therapist 29:21.8

During the lead-in the therapist suddenly had to break off singing and playing the piano to Nihal after her Hello Turn since Barnaby had grabbed Aaron’s cymbals and she needed to restore the situation. As the therapist left the piano she made a stream of comments: ‘Oh… B’s got… A’s cymbal… ooh my goodness that’s very… that’s very naughty’. As she said the word ‘cymbal’ Christopher looked at her, having moved his head and arms soon after she left the piano. Two seconds after this he turned his head towards her, the moment of change. During the comment ‘that’s very naughty’ Christopher broke into a smile (see Chapter 14, page 210, and Transcript 13, page 453).
I.2.15 Christopher Leant Forwards 31:42.0

During the lead-in Christopher was sitting still, his mouth wide open and his bent arms held out in front of him, making him appear alert and receptive. The therapist was at the piano playing and singing an introduction to Aaron’s Hello Turn in D major. This was a sub-dominant pedal made up of an ascending series of reiterated quaver chords leading up to a V7 chord. At first it was in 2/4 time, then it changed first to 3/4 and finally settled in 4/4 when the therapist sang ‘I’m about to play Hello’. Halfway through this bar the therapist made a ritenuto beginning on the word ‘play’, projecting her voice more strongly and more emphatically than before and articulating the words sung more clearly. A fraction of a second after this Christopher moved his head away from the back of his chair and leant forwards slightly, bringing his outstretched arms nearer together. This was the moment of change. During the lead-out he was still for three seconds then moved his head once again just after the V7 chord on the paused upbeat before the start of the song, turning his head towards the helper and Aaron. The head movement Christopher made towards the helper and Aaron must have involved considerable effort, so he must have been very motivated to see what they were doing.

I.2.16 Barnaby Looked away from the Group 36:28.3

At the start of the lead-in Barnaby was smiling, his mouth was open and he was moving his legs. He did not look at the therapist who was on the edge of the group of children, holding a glockenspiel. The therapist sang an unaccompanied phrase in G flat with the whimsical words ‘Let’s sing a song, a song, song’ and then was silent. The quality of her voice was warm. Just before she had finished singing Barnaby closed his mouth and stopped smiling. After a few seconds he started smiling again, once more opened his mouth but then turned his head in the exact opposite direction to the therapist, twisting his torso a little as he did so, his eyes and mouth no longer visible. This was the moment of change. During the lead-out Barnaby turned his body even further away from the therapist. The profile of his face suggested he was smiling but this was not certain. The therapist responded vocally to Nihal with an exclamation after she pitched a note when hiccupping. Barnaby laughed. The therapist repeated her whimsical vocal phrase, this time playing the glockenspiel in unison with it.
I.2.17 Barnaby touched the Glockenspiel 37:25.3

This change episode occurred just under a minute after that described immediately above. During the lead-in Barnaby began moving his legs, head and arms after a period of being still and covering his face with both hands. His moving coincided with the therapist approaching him with the glockenspiel, and singing, as she crouched beside him, ‘Who else played Hello?’ Barnaby turned his head towards her and immediately reached out with his right hand to touch and explore the glockenspiel, the moment of change. During the lead-out he sang b flat, one of the notes the therapist had sung and played to Aaron immediately before she approached Barnaby twelve seconds earlier. The therapist began singing to Barnaby, reminding him that he had ‘played Hello’ earlier in the session.

I.2.18 Christopher Moved his Arms after Being Still 39:32.7

The therapist, crouching on the floor by the children, was singing to them about the session and once again reflecting on how each of them had ‘played Hello’. At the beginning of the lead-in, she addressed Aaron, taking his right arm and helping him beat the tambourine on the ‘-llo’ of ‘Hello’. This she sang on the tonic, on the downbeat, after delaying its presentation. Christopher had been motionless, his head tilted upwards a little and his mouth open, but the second after the therapist helped Aaron place a beat, Christopher’s outstretched arms slowly moved upwards until they were near each other and on a level with his face. This movement lasted the duration of the lead-out just before the end of which the therapist began singing the Hello Song, this time in G major and with different words, ones appropriate to the end of the session.

It seemed that Christopher was responding to the resolution of a delayed cadence which the percussive sound of the beat on the tambourine emphasised. This view is supported by similar incidents which occurred after the lead-out. In one Christopher vocalised during the Hello Song melody, just after the downbeat of ‘played He-llo’, and again at the end of the song. Here the therapist sang ‘played Hello to –’ and paused. Christopher provided an unpitched vocalisation seemingly to complete the phrase and indeed the song, which he did.
I.3 Change Events in Session Eight, School B

I.3.1 Start of the Session 10:27.0

When the therapist began playing the piano at the start of the session, she improvised on the Context Music, alternating between 4/4 and 3/4 time signatures. The therapist was feeling her way into the session and did not want to present a settled pulse, a definitive statement, at the outset of the session when assessing the mood of the group.

Darren had his head down while beating against his body prior to the start of the session. When the therapist first played he looked in the opposite direction to the piano, possibly towards the helper, then four seconds later turned his head towards it and looked at it for about seven seconds. He also made an approximately pitched vocalisation which matched one of the therapist’s notes and was in temporal proximity to it.

Joe was already looking at the piano when the therapist started playing and continued to do so, holding the cord from which his cymbals were suspended with his right hand.

Mahmoud had been moving his arms while the therapist settled herself at the piano but by the time she started playing they were still, and he did not move them when the first notes were played. Nevertheless he turned his eyes towards the piano when the first note had been sounded, again 3 s later and yet again after another 3 s. His head was towards the piano.

Rosanna’s head was towards the piano prior to the start of the session and remained like this as it proceeded. Almost immediately after the therapist began playing she began beating, first her tray then her cymbals. She had given the impression that she was waiting for the therapist to start before playing her solo instrument.

Each child had his head turned towards the piano and in some cases clearly looked towards it.

I.3.2 Darren Beat against his Body 10:39.5

Darren had three beating behaviours which formed change events, of which beating against his body occurred first. The others, beating his drum and beating a non-solo
instrument or other surface, are considered below in the order in which they arose. The beating behaviours are considered separately as they seemed to have different qualities.

There was only one change episode in which Darren beat against his body and this occurred near the beginning of the session. During the lead-in, the therapist improvised vocally and pianistically in 4/4 on the B flat Context Music singing ‘Ah, ah, here we are’ on an f’ monotone consisting of two minims, two crotchets and a tied minim. She accompanied this with two minim chords in the treble clef, the first a tonic inversion, the second an E flat 6 chord, tied over 12 crotchet beats. Darren had his head towards the piano and his mouth was open during the lead-in. He smiled, briefly turned his head towards Joe and Rosanna, then began moving his right arm on the fifth of the crotchet beats. Holding the beater he began beating in his own pulse against his left arm with his fist, lowering his head on the third of his beats and keeping it down throughout the lead-out. The therapist, without singing, played three more chords during the lead-out, two tonic crotchet ones with added fourths and one sustained semibreve, built of fourths on the tonic.

I.3.3 Joe Turned his Head/Eyes towards the Piano 10:55.6

In the case of Joe it was found that the observable HP (head towards the piano) and EP (eyes towards the piano) frequently occurred together, albeit sometimes with slightly different onset times. Since both observables seemed to indicate interest in the therapist, who was usually at the piano, any discrepancy between the onset times of EP and HP was effectively removed by considering them to be merged into a single observable. Those instances when the onset of EP/HP was also the start of a period of stillness for five seconds or more, however, were considered in a separate category (see below: I.3.19 Joe Turned his Head/Eyes towards the Piano and was Still 21:34.3) because they appeared more dramatic and indicative of a higher degree of attention to the therapist.

The first change episode in which Joe turned his head and eyes towards the piano was mentioned in Chapter 7 in the section on rare events, H.3.1 Children’s Audible Occurring Twice, when Joe turned his head towards the piano just before tensing his body, then made repeated approximately pitched f’ vocalisations in his own pulse, (the
subject of the rare event). The therapist improvised on the piano, playing and singing in B flat major in 6/4. She sang f’ three times before the change event, and went on to sing c’ five times after it with chordal piano accompaniment.

There were 19 change episodes in which Joe turned his eyes and/or head to the piano. He moved his head, feet and arms in the majority of them and moved his cymbals in 13 of them. The therapist played and sang at the piano in every episode in a rhythmically structured way, but made pauses in 12.

1.3.4 Darren Lowered his Head 10:56.0

There were 51 instances of Darren lowering his head in a way that could be deemed a change event. The first one of these is described in detail, then a summary of the rest is given together with a discussion of problems associated with categorising this particular behaviour. Darren’s head was considered to be down if his mouth was not clearly visible when he lowered his head.

At the start of the lead-in of the first change episode in which he lowered his head, Darren looked straight ahead. After a few seconds he briefly turned his head away from the piano, possibly towards one of the helpers (not visible on screen). The therapist had been playing piano solo, improvising on the B flat Context Music and presenting a melodic line in the treble clef over a sustained b flat and e’ flat chord. This accompaniment ceased after one and a half seconds, at which point the therapist resumed singing, presenting four f’ crotchets with the words ‘here we are’ and switching from 4/4 to 6/4. As she sang the first crotchet, Darren simultaneously placed a beat with his fist against his left arm while holding the beater, his head moving back to mid-line. He proceeded to place three more beats in time with the music, lowering his head on the third of these so that his entire face was hidden, the moment of change. He kept his head lowered right through the lead-out and beat eight more times against his body in his own pulse. The therapist improvised a passage in 6/4 addressed to Mahmoud in which she repeatedly sang c’ while playing a chordal accompaniment on the piano in the treble. The passage centred round the dominant.

In certain ways it was difficult to categorise Darren’s head-lowering behaviour. Firstly, the frequency with which it occurred often made it seem a continuous event yet it was clearly in contrast to Darren having his head up, however briefly. Secondly his
head lowering behaviour was often linked to some activity of his right arm so that it was difficult to think of it in isolation. Out of the 51 instances of his lowering his head 20 included beating during the lead-out, mostly against his body. Of the 31 instances when he was not beating during the lead-out, there were 13 instances when he was beating just before it. In 21 instances during the lead-in when Darren did not beat he was moving his right hand, usually rubbing it lightly against his mouth or chest with his fingers spread, or sometimes pulling at his jumper, similarly 30 times during the lead-out. Thus when considering Darren’s lowered head, other behaviours appeared related; also there was sometimes only a marginal temporal difference between a change event that started with lowering of the head and one that began with beating.

There were two other aspects of head-lowering. Darren often lowered his head around a cadence point of the therapist, sometimes actually on the beat of resolution. Six of the episodes had cadences in the lead-in, five in the lead-out. Secondly Darren frequently made excited vocalisations when lowering his head.

1.3.5 Darren Turned his Head towards the Piano 11:09.5

There were 13 change episodes in which Darren turned his head towards the piano. The first of these is described in detail and a summary of the other 12 given. No instances of the observables EP (eyes towards the piano), ETH (head towards therapist when she is away from the piano) or HTH (head towards the therapist) were recorded as lasting five seconds or more.

Darren had his head lowered during the lead-into the first change episode in which he turned his head towards the piano. He was studying the beater which he was handling. The helper stretched her arm a little way in front of him, adjusting Rosanna’s cymbal stand, but he appeared oblivious to this. The therapist, playing the piano in B flat with a 6/4 time signature, began the lead-in by singing a semibreve on c’ which had formed part of an improvisation addressed to Mahmoud. She supported this with an F chord in the treble register. Her attention then shifted to Joe whose name she sung on a paused f¨ dotted semibreve in unison with the piano, maintaining this note for about two seconds. Just before she had finished it Darren suddenly changed his head position and looked up towards the piano. No sooner had he done this than the therapist launched into a new 6/8 passage of arpeggiated quavers on the piano sustaining a g´
vocally over two bars and continuing to sing Joe’s name. Darren kept his head turned towards the piano throughout this, and, after placing two beats on his arm, reduced the extent to which he moved his beater.

The other change episodes in which Darren turned his head to the piano show him apparently responding to a variety of stimuli from the therapist, although there were few consistent patterns. There were, however, two more change episodes in which the therapist sang a paused note immediately before Darren turned his head to the piano. There were also two occasions during a lead-in when the therapist’s voice had an unusual quality. On one she sang emphatically, on the other with a vibrato and Darren turned his head towards the sound source in each case. His name was also sung by the therapist in the second change episode.

On four occasions Darren beat in some way during the lead-in of an episode, looking at the piano afterwards. He tended not to beat or vocalise while his head was turned towards the piano doing this 3 out of the 13 times).

One striking fact is that with the exception of the second change episode, when the therapist sang Darren’s name during the lead-in, the therapist was addressing another child and not Darren when he turned his head towards the piano. It is also notable that he smiled in seven of the episodes.

1.3.6 Darren Became Still 11:19.0

There were five change episodes in which Darren became still. During the lead-in of the first of these the helper stretched above Darren while fixing Rosanna’s cymbal but he appeared not to notice, his head turned towards the piano. The therapist was improvising in B flat at the piano with a 6/8 time signature. She sang the name of Joe on g’ then e’ flat over groups of quavers which traced an F7 chord combined with a subdominant chord and presented a pedal which slightly paused two seconds before the change event. Darren smiled during the initial two seconds of the lead-in, keeping his head turned towards the piano where it remained throughout the episode. He moved his beater around with his right hand up until the moment of change, and opened his mouth, beginning what appeared to be a yawn but did not materialise as such. The change event itself came a fraction of a second prior to the therapist ending the 6/8 passage and changing to a 4/4 passage in which she presented the Context Music...
addressed to the whole group. In so doing she shifted from the dominant seventh to the tonic, but without much change in tempo. The Context Music was played in its original form during the lead-out.

Darren had his head turned towards the piano during the lead-in, his mouth opened a moment after the therapist paused and he was finally still, his head continuing to be turned towards the piano.

A summary of all the change episodes in which Darren became still shows that Helper Peta was present in each, and four out of the five episodes occurred in the Development Section of the Basic Structure. Helper Peta’s input was mainly restricted to the Hello Song. The therapist, who sang and played the piano in three of the change episodes, presented pauses in three of the episodes and spoke in three.

I.3.7 Mahmoud Became Still 11:34.0

Mahmoud was still for a large part of the session, but there was one occasion when his stillness could be deemed a change event. During the lead-in of this Mahmoud continually and almost imperceptibly moved his left arm, holding it outstretched and keeping his fist clenched. His other arm lay still across his chest. His mouth was open. After 1 s he looked towards the piano where the therapist was seated. She played and sang an improvisation on the fourth bar of the Context Music in B flat adding an extra bar in which she sang an upward scale beginning on e´ flat. This she accompanied first with C7 chords, then F7 chords, singing ‘[music] time with Sue today’, and ending with a V7 first inversion chord. This was followed by a ‘comma’ or ‘breath’, a brief break in the music, before the last beat of the bar was presented. During this break Mahmoud stopped moving his arm and became completely still. In the lead-out the therapist resumed the original version of the Context Music, resolving the F7 chord onto a tonic chord. Mahmoud’s mouth remained open. He continued to look at the piano where his gaze had remained with the exception of one micro-second glance elsewhere, and he looked towards it for three seconds of the lead-out.

Mahmoud looked towards the piano during most of the episode. The moment of change, when Mahmoud stopped moving his left arm, occurred when there was a break in the in the temporal flow of the therapist’s music, together with an unresolved V7 chord.
I.3.8 Darren Started to Beat his Drum 11:51.7

Darren beat his drum 195 times but there were only three episodes in which his drum playing constituted change events according to the definition in this study. In the first of these the therapist was playing and singing the Context Music at the piano during the lead-in. She played a V7-I cadence in B flat on the piano, and sang the first letter of the word ‘Sue’ on b flat ahead of the piano resolution as she closed the section. The cadence was presented with a ritenuto and the last note was paused. Darren started to beat during the cadence, before its resolution, beating 10 times against his body with the beater in his own pulse and quickly turning his head towards the piano just before finishing. The therapist responded by introducing his theme vocally and on the piano. The moment of change followed this, after 1.5 s when Darren began beating his drum with his beater. He presented 5 beats to the therapist’s 4 in the first bar of the lead-out, and in the two following bars a steady pulse of 4/4, beating the downbeat of the third bar before stopping.

A summary of the three episodes shows that in each Darren made hand movements prior to beating his drum, either beating against his body, rubbing his hand across his mouth or chest or tugging at his jumper. In the first episode, as we have seen, the therapist closed the Context Section then responded to Darren beating against his body by playing his theme and singing his name. In the second and third episodes, however, Darren’s drum beating was preceded by the therapist playing and singing musical material addressed to another child, and not to Darren. His being addressed therefore was not a prerequisite for his beating.

I.3.9 Rosanna Turned her Head towards the Piano 12:00.4

There were 22 change episodes in which Rosanna turned her head towards the piano. During the lead-in of the first, the therapist, who was at the piano, played and sang Darren’s Context Music in E flat with its 4/4 time signature. She accompanied her singing with marcato crotchet chords. These shadowed the vocal line so that when there was a rest in this there was a rest too in the piano part. Since Darren’s theme was full of rests there were several moments of silence. The therapist sang Darren’s name twice, his surname in the first bar, his full name in the second. Rosanna momentarily turned her head towards the piano at the start of the lead-in but then turned it towards
her cymbals where it remained without moving until the moment of change. She beat five times during the lead-in, twice on her tray, the other times on her solo instrument. Her beating was in time with the therapist’s music on three occasions, her penultimate beat in time with the first of three crotchet rests of the therapist. Just before the change event Rosanna moved her right leg sideways and back, then placed a beat on the cymbals. She finally turned her head towards the piano, and made three small movements in the lead-out. Straight after the change event she moved her leg sideways and back once again, then she looked towards the piano and lastly she placed a beat on her cymbals which coincided with the fourth beat of the therapist’s bar. The therapist continued playing and singing Darren’s Context Music in the lead-out, first presenting a cadential two bars (the seventh and eighth of Darren’s music) with a V7-I sequence. She then played a link passage leading to a repeat of the theme. Looking outside the ten-second window it can be seen that Rosanna had not been focused on since the start of the session. Despite this she beat frequently without turning her head towards the piano.

The therapist was playing the piano in all the episodes, singing in all but one and presenting music with a time signature. It can be seen that in 17 of the episodes Rosanna was moving her cymbals. While she only beat her cymbals in 10 episodes, a figure not statistically significant, she often appeared to nudge them with her elbow.

I.3.10 Joe Put his Head Down 12:01.3

There were six change episodes of this type. In the lead-in of the first, Joe was looking at the piano and playing with the cymbals’ cord with his right hand, his left arm resting on his tray. The therapist was playing Darren’s theme in E flat on the piano and was on the third bar of this, singing Darren’s name and accompanying the 4/4 tune with syncopated crotchet/minim/crotchet B flat chords. After one second, Joe began moving his head, his mouth opening as the therapist sang Darren’s name again. He turned his head away from the piano and slowly lowered it, tilting it slightly to his right. It was not possible to see his mouth at this point. During the lead-out the therapist continued with Darren’s theme, launching into a repeat of it after making a V7-I shift. One second after the moment of change Joe was still for 2.s, then turned his head away from the piano, always keeping his head down. At the start of the repeat of Darren’s theme, the therapist sang a note that deviated from the usual tune. A
fraction of a second later Joe started playing with his cymbals’ cord once again but apart from the movement of his right arm he was still.

Looking at the five change episodes in which the therapist was singing and/or playing an instrument it can be seen that there were two main features to Joe’s head-lowering behaviour. Firstly the therapist’s music in each case was addressed to another child, once to the whole group. Secondly the moment of change often occurred at the end of the therapist’s sung phrases. Both possibilities can be considered in the third episode when the therapist sang ‘It’s D’s turn’ and Joe lowered his head immediately after the word ‘turn’. Finally the second episode was different from the others in that Joe lowered his head in order to get out the way of the therapist who leant over him as she adjusted his cymbals.

1.3.11 Rosanna Became Still 13:21.0

Rosanna became still in six change episodes. At the start of the lead-in of the first she moved her right arm slightly, her head turned towards the piano where the therapist was returning after adjusting Joe’s cymbals’ stand. Rosanna’s head remained turned towards the piano throughout the episode. A fraction of a second before the therapist started playing, Rosanna looked at the piano as well, her arm continuing to move slightly up till the moment of change. Three seconds before this the therapist began singing and playing Joe’s theme. Immediately before Rosanna became still, she briefly looked at the piano once more, the onset of her stillness occurring on the downbeat of the second bar of Joe’s theme on which a passing V7-I transition was resolved. During the lead-out the therapist continued Joe’s theme but paused around the third beat of the second bar, then varied the way she presented the theme by playing the tune an octave higher than usual while holding the first note of it vocally for a minim.

A comparison of all the change episodes in which Rosanna was still shows nine observables occurring in over 50% of the episodes. Three observables occurred in each: Rosanna moved her arm in every lead-in, the therapist sang in every episode (only in the lead-out of two episodes) and she presented a bar-line in each. This latter only occurred in the lead-out of the last three episodes since the therapist was away
from the piano before the moment of change and either silent or vocalising brief melodic fragments.

I.3.12 Rosanna Opened her Mouth 15:20.2

There were seven change episodes that centred around Rosanna opening her mouth. The first of these occurred about five minutes after the beginning of the session when Rosanna’s head was turned away from the piano where the therapist was sitting. The therapist began the episode by playing and singing Rosanna’s D major Context Music in 3/4. As she presented the second downward octave leap in the theme with the words ‘has come to play’, Rosanna smiled and briefly opened her mouth, the onset of these behaviours coinciding exactly with the downbeat of the first complete bar and the low note of the octave leap, d’. A V7-I cadence followed beginning on the third beat of this bar and resolved on the first beat of the next. As it resolved Rosanna began moving her arms, the onset of her movement occurring 0.4 s before the downbeat of the therapist’s music. Rosanna opened her mouth, the moment of change, near the third beat of the same bar, and after this moved her cymbals 0.1s before the next downbeat of the therapist’s music. She went on to beat twice on the wooden tray attached to her wheelchair, presenting beats close to each other and not in time with the music. The therapist began a repeat of Rosanna’s Context theme, elaborating it this time with arpeggios in the left hand, and playing and singing it forte. Rosanna slid her arm across her tray as if getting ready to beat again on it and did just that, beating twice in time with the therapist’s music, once on the third beat of the bar and once on the following quaver. This occurred near the end of the lead-out, at the point where the therapist sang the octave leap in the melody. Here too Rosanna opened her mouth wide, looking as though she could open it no further, and brought her head into mid-line.

There were six other change episodes centred around Rosanna opening her mouth. In all seven episodes Rosanna was physically active. She moved her arms during each lead-in, and in the lead-out of six episodes. She also moved her head in all the episodes, six times during the lead-in and five times in the lead-out. She moved her cymbals at some point in every episode, and apart from the third one beat in some way during each, on four occasions beating in time with the music. Her feet moved in the
lead out of four of the episodes. The therapist was playing the piano, with a time signature, throughout five of the episodes, and singing in the lead-out of three.

I.3.13 Mahmoud Moved his Arm/s 15:21.1

Mahmoud’s arm movements formed the basis of 22 change episodes. Certain slight arm movements were not included since they could have been posturally induced tremors. As before the first change episode is described in detail and a summary of the remaining episodes given.

The first episode in this category occurred about five minutes into the session. At the start of the lead-in the therapist was playing and singing Rosanna’s Context theme in D major with its original time signature of 3/4. She was at the seventh bar of this, at the point of presenting a V7 chord to be resolved on the tonic in the next bar. Mahmoud had his head and eyes towards the piano throughout the lead-in, his mouth generally open during the whole episode. (It should be noted that he had poor lip closure.) As the therapist resolved the V7 chord, he made a brief mouth movement. The therapist began a repeat of Rosanna’s theme. This was arpeggic, louder and more florid. As she sang the first notes, d’ to c”#, which were accompanied by D7 and G major chords respectively, Mahmoud began moving his arms exactly on the downbeat, raising them a little and moving them slightly outwards. His left hand remained clenched while he separated stiffly two fingers on his right hand. In the lead-out he made one more mouth movement on the third beat of the ninth bar, looking away from the piano when he did this. The therapist, who was continuing Rosanna’s Context theme, sang a downward glissando from the upbeat of the tenth bar to the downbeat of the eleventh, also making a slight ritenuto. Mahmoud looked at the piano again for one second at this point.

In five of the episodes Mahmoud moved his arms and vocalised without frowning. One of these was an improvised interaction during which Mahmoud was the focus of the therapist’s attention. In the other four episodes the therapist was presenting the Chime-Bar Song. Here the subtle difference is evident between the therapist interacting directly with a child and the therapist recounting a musical story in which each child can be assisted to play a pre-determined part.
I.3.14 Joe Mouthed his Solo Instrument/Hand 16:21.9

There were seven change episodes in which Joe either put an instrument or his hand to/in his mouth. In the first change episode Joe began putting his solo instrument, the Chinese cymbals, in his mouth, introducing them with his right hand and momentarily withdrawing them before putting them in his mouth again. At the start of the lead-in Joe briefly looked at the piano then focused on his cymbals which he was handling. Next he began moving both his feet, continuing to handle the cymbals but this time trying to hold rather than push them. The therapist was at the piano singing and playing to Rosanna and improvising on the Context Music in B flat. The music she played at this point has already been described in the first change episode involving Mahmoud’s arm movements. Interestingly the moment of change in Mahmoud’s episode occurred at the same point as the start of the lead-in of the episode currently being described. Briefly the therapist, playing the fourth bar of the Context Music, elongated the e’ flat of this bar and turned it in to the first note of a vocal upward scale ending on c’’ in the next bar. Joe’s moment of change came at the beginning of this bar where the upward scale was repeated with different note values, extending into another bar, the therapist continuing to sing about Rosanna.

Joe mouthed his cymbals. Immediately before the lead-in he briefly looked at the therapist after she had sung the ‘la la la’ passage of the Context Music, but quickly resumed his mouthing activities.

There were six other change episodes in which Joe put his hand and/or cymbals to his mouth, with certain common features. Firstly Joe did not vocalise in any of the six remaining change episodes, just as he did not in the first described above. It appears that mouthing was the dominant preoccupation. Secondly the therapist was physically distant from Joe in all the episodes. A third feature common to all seven episodes was that Joe moved his head, arms and feet in each as he made an effort to negotiate his cymbals and/or put his hand in his mouth.

I.3.15 Rosanna Tilted her Head Up 16:45.3

Rosanna tilted her head up several times but only once in a way that constituted a change event. At the start of the lead-in of this episode the therapist, at the piano, presented the penultimate bar of the Context Music, addressed to Rosanna, whose name
she sang. The Context Music was in its original key of B flat major and basically comprised the chord shift Cm7-F7 which resolved, in the final bar, on a tonic chord. The F7-I chord shift was accentuated by a d’ in the therapist’s vocal line over the F7 chord. A fraction of a second after the cadence, Mahmoud sang a loud f’ and exclaimed ‘Aah’. Almost immediately Rosanna moved her cymbals with her elbow and made two brief leg movements. Mahmoud vocalised a downward glissando. A second later Rosanna turned her head upwards, the moment of change and then became still, remaining so for the rest of the episode. She looked upwards. The therapist remained silent after the cadence for a few seconds. Mahmoud, after the change event, grizzled for a second and finally gave one snort. One second later the therapist introduced Mahmoud’s Context theme.

I.3.16 Darren Smiled 18:32.0

There were only three change episodes in which Darren smiled although he smiled 55 times during the session. The first of these began when the therapist was singing her own name to a sustained and unaccompanied cadential E flat. She directed her vocalisation to Mahmoud after having helped him beat his cymbals. It was possible to do this without leaving the piano as Mahmoud sat right next to it. There followed 3 s of silence. Darren, who had been moving his head and arms slightly and looking downwards, turned his head away from the piano and was briefly still. The therapist resumed singing, this time accompanying herself at the piano. She played the Context Music in B flat, once again addressing Mahmoud but this time in tempo. On the second beat of the first bar Darren turned his head right round and looked towards the piano, almost immediately breaking into a smile. At the end of the first bar, he turned his head away from the piano, bringing it into midline, but continued smiling. On the third beat of the second bar he turned his head towards the helper, his smile continuing throughout the lead-out.

The remaining two change episodes have features in common. In both another child, Joe, was about to have a turn at playing with the assistance of the helper. In the second episode this was on the Hello Tambourine in the Hello Song, then, in the third episode, on the small tambourine in the Chime Bar Song. The huge smiles of Darren coincided with Helper Primrose assisting Joe make the tambourine ‘go’. Darren had had a lively turn in the Hello Song and had been very excited during it, vocalising in high
pitches and beating on the tambourine. He had at times initiated stretches of beating which were in time with it.

I.3.17  *Joe Stopped his Mouthing Activity*  19:47.1

There were five change events in this category. During the initial 3 s of the first episode Joe had his head turned to the right, in the opposite direction to the piano. He held a cymbal in his mouth without use of his hands. Both his arms and feet moved. The therapist presented piano sounds alone, sustaining a pedalled F7 sus 4 chord that was part of an improvisation on the B flat Context Music. She then played a three-bar version of the opening two-bar phrase of the Context theme, introducing a bar of 4/4 that was followed by a bar of 2/4, then another bar of 4/4. The accents of these were unclear and could be construed as a bar of 4/4 followed by one of 6/4. Yet the melody was clear, standing out from the simple chordal accompaniment, a juxtaposition of precision with vagueness. Joe began turning his head round to the left after three seconds of the lead-in at the start of the 2/4 bar. A moment later he looked at the piano for one second, then spat out his cymbal, withdrawing his gaze from the piano at the same moment. The change event also coincided with the middle of the third bar of the elongated Context improvisation, a first inversion B flat chord which was followed by a dominant seventh chord. During the lead-out the therapist moved from the third to the fourth bar of the improvisation, presenting an arpeggiacic flourish on B flat in the high register of the piano. Joe turned his head round to the left again on the third second of the lead-out, looking at his cymbal again and moving his cymbals with his right hand.

In summarising the change episodes it can be said that the cymbals figured in every incident of Joe’s mouthing behaviour. In the first episode he mouthed the cymbal on its own and in subsequent episodes he either mouthed the cymbals and his fingers together or held the cymbals close to his mouth while sucking his fingers. He continued to move the cymbals in each lead-out. The therapist played the piano in each episode, singing as well in the three last ones, and the helper was intervening with another child during all but the first episode. Each time Joe withdrew his fingers and/or the cymbals from his mouth there was some change in the texture of sound from the therapist, or some change being heralded. This was so in the first two episodes. In the third Joe there was a ritenuto and cadence. In the fourth a cadence followed by some high notes. In the last episode two unusual sounds immediately preceded his
aborting his mouthing activity. Firstly the therapist sang ‘o’ on a b´ flat minim in a particularly clear voice, and secondly, Mahmoud made unusual gurgling noises. In both cases Joe looked up at the sound source.

I.3.18 Darren Looked at the Helper Intervening with another Child 20:23.0

There was only one episode in this category. At the start of the lead-in Darren, smiling, moved his right arm across the head of his drum, then lowered his head and beat twice against his body. He raised his head again and turned it (the moment of change) in the direction of the helper at whom he looked intently, with open mouth. She was crouching beside Mahmoud in preparation for his turn in the Hello Song, holding his left hand and extending the Hello Tambourine. The therapist was away from the piano throughout the lead-in, removing Mahmoud’s cymbals, and winding them over the boom of his stand. She stood beside the piano until 1 s after the change event and then resumed her place at it, improvising around a C7 chord as an introduction to the F major Hello Song. Darren sat upright during the lead-out, his mouth open. His smile reappeared after the second piano chord of the therapist.

I.3.19 Joe Turned his Head/Eyes towards the Piano and was Still 21:34.3

Joe often became still immediately after turning his head and/or eyes towards the piano. Because the onset of both behaviours was often practically identical, these behaviours are considered here together. There were four change episodes of this type.

In the lead-in of the first change episode the therapist, at the piano, was playing the penultimate bar of Mahmoud’s Context theme transposed to F major, in 4/4, andante. Her music, which included singing, was very clear and light, and differed from the usual version of Mahmoud’s theme in that it slightly varied the closing chords, using quavers and semiquavers instead of crotchets. The therapist paused at the end of the bar having just presented C7. Joe, whose head had been turned towards his cymbals and hence away from the piano, moved it once after both the third and fourth beats of the bar just described, each time nearer the direction of the piano. The moment of change exactly coincided with the therapist’s tonic resolution after the pause. Joe looked at the piano at the same time as turning his head towards it and was completely still in the lead-out. After her tonic resolution, the therapist started a repeat of the penultimate bar that had apparently attracted Joe’s attention.
The change episode described above and the other three have much in common. Firstly the therapist played piano music with a time signature and sang in each. Secondly Joe’s head was turned away from the piano in the lead-in of each suggesting that in all cases something the therapist did particularly caught his attention. Thirdly the helper was intervening with a child in each, in the last episode with Joe himself, and fourthly each change episode occurred when the Hello Song was in progress.

I.3.20 Rosanna Tilted her Head 21:52.0

There were 15 change events of this type. The onset of the first change episode was marked by a leg movement of Rosanna and the fading sounds of an F chord on the piano, played by the therapist. From then on the therapist was silent. Rosanna moved her leg at the start of the silence and cast a momentary glance at the piano. She then forcefully beat once on her cymbals and beat twice on her tray, giving the impression that she had misjudged the position of her cymbals and it was these she was trying to play. After this she tilted her head, the moment of change, beating her cymbals at the same time and making them ring. During the lead-out she placed more beats on her tray then maintained contact with her cymbals, beating them, pulling them and moving them, and making them ring three times. As she did this she continuously made small, non-stop movements with her right leg, from side to side.

Rosanna was very active (in terms of her own repertoire of behaviour) during the change events when she tilted her head. She moved her arm in every single lead-in and in the lead-out of 14 episodes, and she moved her leg in all but two of the episodes, during the lead-in of 12 episodes and the lead-out of ten. She physically connected with her cymbals in 13 of the episodes, either beating them or making them move. The therapist sang and played the piano in 12 and 10 of the episodes respectively while the helper assisted with the children, Mahmoud figuring prominently in eight of the episodes. Rosanna had her head towards the piano in nine of the lead-ins. Half of the episodes occurred in the Development Section of the Basic Structure in which the focus was on the children’s output.

I.3.21 Darren put his Hand to his Mouth 22:43.9

Darren put his hand to his mouth 72 times in Session Eight, either putting the back of his fist against his mouth or spreading his fingers and lightly rubbing them over it.
Seven of these instances constituted a change event. During the lead-in of the first, Rosanna was having her Hello Turn, Helper Primrose assisting her to beat on the Hello Tambourine. The therapist had reached the fifth bar of the song at the piano, and was singing the word ‘hello’, the first of six ‘hellos’. While she presented the full tune of the song on the piano, vocally she omitted the c’’ of the melody and stressed, therefore, the a’ and f’ which were sung in affectionate tones. Darren, had been beating against himself and shaking his lowered head as he did so. A second after the downbeat of the sixth bar of the Hello Song, a point when the therapist sang ‘hello’ for the third time, Darren raised his head and put the back of his hand to his mouth. Almost immediately he looked towards the helper, then towards the piano. The Hello Song proceeded to the end as usual, but the c’’ from the tune was omitted vocally by the therapist throughout.

The therapist sang the word ‘hello’ to Rosanna several times with the same notes, the mediant and tonic, the third most important and first most important notes of the harmonic series (ignoring octaves). The tone of the therapist was warm and encouraging, like that of a mother cooing to her baby, and indeed the musical interval presented, according to Savio,\textsuperscript{536} was that of the mother.

Looking at all the change episodes in which Darren put his hand to his mouth only one salient feature emerges and that is Darren moving his head in all seven episodes. Other features present in all the episodes are implicit consequences of moving hand to mouth, namely Darren’s mouth not being visible in every lead-out and his arm moving. Unremarkable too is that in over 50% of the episodes, the therapist presented bars, piano music and song. It is unremarkable because the therapist was singing and playing the piano for the majority of time in the session. Out of the three episodes where the therapist was not singing, she was talking.

\textbf{I.3.22 Mahmoud was Suddenly Quiet} 32:04.3

This change episode occurred once. During the lead-in the therapist stood by Mahmoud holding his hand (which she did throughout the episode) and talking to the helper about a small tambourine she wanted. As she did this Mahmoud, who was slightly frowning, vocalised an e’ for a fraction of a second, his right arm moving. He

\textsuperscript{536} Carla Savio, ‘Personality Projective Intervals Test’. op. cit.
then grizzled for one second and sang an f’, f# and one unpitched note over a period of one and half seconds. The therapist affectionately shook his left arm a little. Mahmoud sounded as though he was complaining and was communicating he either wanted something or was objecting to something. Then he suddenly stopped vocalising, the moment of change, tensing his body slightly and making one instantaneous leg movement. His mouth which had been wide open slightly closed and two seconds later his arms were still. One second before the end of the lead-out the therapist took the small tambourine from the helper and held it in her left hand. Mahmoud turned his eyes to the therapist as she did this and maintained what seemed like a gaze. He appeared relaxed.

1.3.23 Darren Vocalised 33:45.0

There was only one change episode in which Darren vocalised and in this his vocalisations were screamy, dramatic and intense. During the lead-in the therapist was at the piano playing and singing the Chime-Bar Song in E flat, having reached the second bar. This was a piece she had composed specially for children with Special Needs. When presented it had the flavour of a story being told, one in which the children could play a part on a variety of different instruments, with or without assistance. As the therapist finished singing the phrase ‘Once upon a time you know’ Darren smiled, then lowered his head and beat erratically against his leg, then his arm. After this he raised his head slightly and a smile was visible again. The therapist presented the next part of the song in which the words were ‘lived a chime-bar thus’. At the exact moment when she sang the word ‘thus’, which occurred on the downbeat of the fourth bar, the helper assisted Mahmoud to strike the chime-bar and Darren began to vocalise loudly and excitedly, the moment of change. During the lead-out he fleetingly vocalised three approximately pitched notes that matched the notes of the therapist. The bulk of his output however consisted of two rising and falling glissandi separated only by a fraction of a second. The lowest pitch was an approximate f’. The top note of the second was an approximate d’’. Following the word ‘thus’, the therapist paused slightly and continued the song with the words ‘and so...’ which were accompanied by a dominant chord with a suspended fourth followed by a dominant seventh. Darren beat twice heavily against his arm.
Looking outside the ten-second window it can be seen that Darren started smiling at the beginning of the song while the onset of his vocalisations coincided exactly with the chime-bar note which occurred at its usual point. Darren’s excited vocalisations continued right through Mahmoud’s turn in the song and the contour of his numerous glissandi were often marked by pitched or approximately pitched notes in the tonality of the therapist’s music. The wide range of pitch testified to Darren’s high level of excitement.

**I.3.24 Mahmoud Became Still 41:52.1**

Mahmoud was often still during the session but on one occasion his stillness constituted a change event. At the beginning of the lead-in of this, he had his head turned towards the piano and was slightly moving his arms. The therapist played the piano and sang in E flat making a simple V-I cadence in a bar of 4/4. She sang d’ and e’ flat with a light staccato accompaniment above this, leaving a crotchet rest on the fourth beat of the bar. Mahmoud was still during the crotchet rest. The therapist resumed her music on the next downbeat playing an improvisation which drew thematically on Mahmoud’s theme. She did not sing. Mahmoud moved his arms on the downbeat for a fraction of a second and then was still again. He moved his arms briefly again on the next downbeat and then was still, the moment of change, his eyes turned towards the piano where they remained for 4 s. The therapist continued with her piano improvisation using notes around c’ and playing legato. Mahmoud’s mouth remained open throughout the entire episode.

**I.3.25 Rosanna Looked at the Piano 45:00.0**

Rosanna looked at the piano many times but only one of these times constituted a change episode. When the lead-in of this began Rosanna was quite still and her mouth was open, as it was throughout the rest of the episode. The therapist briefly stood in front of her and Darren and sang ‘[bye] bye’ on V in E flat, addressing Darren. Rosanna had her head turned to the right, away from the therapist. The latter made her way back to the piano and once she had reached it Rosanna slowly brought her head into mid-line so that it was nearer to the piano than before. The moment of change, when she actually looked at the piano, came one second before the therapist started playing and singing the B flat Bye-Bye Song. In this the therapist played the melody
in octaves, doubling the vocal line. Rosanna remained completely still throughout the lead-out, her eyes fixed on the piano.

I.4 Change Events in Session Twenty-Five, School B

I.4.1 Start of the Session 11:31.0

A few moments before the session started the therapist spoke to the children reminding them that this was their last session. Then she began playing the piano, improvising on the Context Music in 6/4 in a slow tempo.

Darren turned his head to the piano and looked in its direction immediately the therapist had finished talking. Then the moment she began playing the piano, he turned his head away into midline, casting a glance at the helper who was by Joe. He held his beater in his right hand and after a few seconds moved it slightly.

Rosanna also turned her head towards the piano when the therapist stopped talking before the start of the session. Once the therapist began playing she turned her face away from her and was still. Her head was tilted in such a way that her ear was in an optimum position for listening to the therapist’s music.

The start of the session seemed to elicit a different response from Joe. His head was turned away from the therapist when she was talking but once she began playing the piano he turned his head and eyes towards her. Mahmoud had his head and eyes to the piano and his mouth open before the session started. He did not move or change in any way or when the therapist started to play the piano.

I.4.2 Darren Leant his Head/Body over Side of Chair 11:55.6

Darren generally sat up without any difficulty so his leaning over the right side of his chair was unusual. Nevertheless it formed the basis for 12 change episodes. It appears significant that Darren leaned over the side of his chair when playing his drum before the session started so that for unknown reasons he was in a leaning mode.

During the lead-in of the first episode the therapist improvised a song in B flat major about it being the last session. It alternated between 4/4 and 3/4 and mostly comprised a vocal melisma over a sustained B flat pedal on the piano. Darren changed from idly
moving his beater to waving it in the air during this. Then, as the therapist sung b’ flat on the last beat of the 3/4 bar, he leaned right over the side of his chair, the moment of change, assuming a position that seemed to be as far away from the piano as he could go. During the lead-out Darren continued to slightly move his beater. The therapist sang that Mahmoud had yawned then went on to sing an e’ flat minim supported with crotchet chords forming a pedal on f. Mahmoud yawned at the beginning of the lead-in and Darren yawned as well, two and a half seconds after the end of the episode, when the melismatic singing continued.

Comparing the 12 different episodes it can be seen that 8 of them occurred during the Context Section. In 50% of the episodes, Darren beat his drum while leaning over his chair and the therapist accompanied his output. The helper was also present 50% of the time, attending to each of the children.

1.4.3 Darren Lowered his Head 12:12.5

There were ten change episodes in which Darren lowered his head, something he did frequently in this session. During the lead-in of the first the therapist improvised vocally and on the piano, playing a moderato passage in B flat major comprising repeated crotchet chords, and a melody in the form of an upward rising scale. At the start of the lead-in she played in 6/4, then changed to 4/4 which she kept for the rest of the episode. She sang about the fact that Mahmoud had just yawned. Darren was leaning slightly over the right side of his chair, with his head tilted in the same direction during the lead in. He wiggled the beater he was holding in his right hand, then pulled himself up so he was sitting upright with his head lowered, the moment of change. His head continually moved slightly as did the arm holding the beater. Half a second before the moment of change the therapist began singing ‘Ah’ to an improvised tune over a pedalled cluster-chord that hinted of V7. This lasted the duration of the lead-out, one in which Darren was only looking down.

A summary of the change episodes shows that Darren moved his arms in each one, and held his beater in the first six episodes and cymbals in each of the remaining ones. Thus in every episode he was playing with an object, and he lowered his head when he looked at it. Nevertheless his head was turned towards the piano in the lead-in of six and he looked towards the piano in the lead-in of five. With the exception of the fifth
episode, when Darren was addressed prior to his Hello Turn, the therapist was addressing other children when Darren looked down.

I.4.4 Joe Smiled 12:32.4

There were four change episodes of this type. When the lead-in of the first started the therapist was playing the third bar of the Context Music on the piano in its original key, B flat. Joe first lowered his head so it was near the cymbals which he held in his left hand, then turned it into midline, and lowered it further, still holding the cymbals. As the therapist played the second part of the fourth bar, Joe flexed his arms slightly and raised his head a little. The therapist, instead of carrying on with the Context Music, lingered on the last chord of the fourth bar, an F7 with added fourths, and improvised an upward scale from e´ flat to b´´´ flat in 6/4. When she played the g´ and a´ of this, Joe started smiling broadly, his mouth open. After two seconds he lifted up his head and turned it towards the piano. He raised his bent right arm in the air while the left pressed the cymbals against his tray. He remained like this right through the lead-out, in which he also maintained an unpitched vocalisation.

A summary of the episodes in which Joe smiled reveals that certain observables occurred in all four. Joe moved his cymbals with his hands throughout each and the therapist sang and played the piano throughout each, making rhythmically structured music. Since Joe elicited sound from his cymbals in the lead-out sections of three of the episodes it can be seen that he was fairly active, also moving his head in three. In two of the episodes the therapist was addressing Rosanna when Joe smiled, in only one did she address him and sing his name.

I.4.5 Joe Looked at the Piano 12:46.1

There were 16 instances when Joe’s looking at the piano constituted a change event. At the start of the lead-in of the first, the therapist improvised rhythmically on the piano in B flat. She presented a pedal of crotchet chords in 4/4 on the dominant over which she played melodic motifs in the piano’s high register. After two and a half seconds she sang ‘Here we are’, pointing the phrase by playing e´´´ flat and b´´ flat. This phrase occupied one and a half bars. Joe had his head towards the piano throughout the episode but was looking down during the lead-in. He had been moving globally during this, playing with his cymbals and smiling, and sustaining an unpitched
vocalisation of excitement for about four seconds. Just before he became silent, the therapist altered the accents of the beat by inserting a 3/4 bar. She then reverted to 4/4, emphasising the metre by playing two minims, c’ and f, in the bass. Joe looked towards the piano 0.1 s after the therapist resumed the original 4/4. During the lead-out he presented as described above except that he did not play with his cymbals since they had swung behind his left arm. The therapist continued to play the piano, without singing, improvising on Joe’s theme which she introduced in a high register (above c’’’), accenting off-beats.

Looking overall at the sixteen change episodes it can be seen that Joe was moving his arms and legs in the majority of these, and moved his head in every one. This was partly due to his intermittent difficulty in maintaining his balance but also partly due the fact that he played with his cymbals in fifty per cent of the episodes. The therapist played the piano in all but one of the episodes, and sang in ten. The episodes occurred nine times during the Hello Song Section, when Joe was particularly exposed to the therapist’s frequent V7-I shifts, pauses, changes in time signature, ritenuto, and delayed resolutions. Individually some of these observables only occurred a few times. Others, like pauses for example, occurred nine times. Merged together, however, these observables occurred in 15 episodes, 14 times in the lead-in of each. The helper was present in eleven of the episodes so there was additional activity during those times.

I.4.6 Rosanna Moved her Leg/s 13:50.8

There were 13 change episodes in this category. During the lead-in of the first Rosanna was still. Her head was back a little and pointing to the right, her left ear turned towards the piano, and her flexed right arm encircled her cymbals. The therapist, at the end of one section of music and the start of a new one, played and sang Mahmoud’s 4/4 Context theme in E flat. During the second quaver beat of the second bar, Rosanna moved her cymbals, then began moving her right leg, the moment of change. She kicked the foot-rest on her chair with her heel and moved her leg from side to side. In the lead-out, the therapist continued with Mahmoud’s theme and Rosanna beat her cymbals twice. Importantly Rosanna’s teachers stated unreservedly that her leg movements indicated pleasure.
Rosanna moved her cymbals with her arm in 11 of the episodes, the majority of times in the lead-out. She also beat her solo instrument in 9 episodes, exclusively in the lead-out of each. The therapist played the piano and sang in 9 of the episodes. It was difficult at times to recognise change events involving Rosanna’s legs because she moved them frequently; there were 37 instances of her legs moving for five seconds or more.

I.4.7 Mahmoud Turned his Eyes towards the Piano 14:16.3

In general a change event was not counted if the observable in question was not clearly visible immediately before the change, its onset time being unknown. The majority of Mahmoud’s change events in which he turned his eyes to the piano were preceded by the observable EN/V (it is not clear whether the eyes are towards the piano or not). Since, however, it was obvious when he did turn his eyes towards the therapist’ head at the piano, his eyeballs markedly turned upwards to his left leaving the whites of his eyes showing, EN/V observables were allowed to precede EP (eyes to the piano) in the case of Mahmoud. Nearly all Mahmoud’s EP observables entailed looking at the therapist’s head as distinct from the piano itself. It is not clear how much he saw since he was visually impaired, but his eyes frequently turned towards the therapist’s head, the sound source.

There were nine change episodes in which Mahmoud turned his eyes towards the piano. During the lead-in of the first of these he moved his outstretched arms slightly then hiccupped. His head was turned towards the piano where the therapist was playing, and it remained like this throughout the episode, with mouth open. His eyes too were turned towards the piano, specifically to the lower part of it. At the start of the lead-in the therapist was at the end of a short improvisation on the Context Music, playing two 4/4 bars of dominant harmony in B flat, then playing a straight allegretto version of the last five bars of the Context Music. Mahmoud lowered his eyes in the first bar of this. Approximately 2 s later he turned his eyes towards the therapist, the moment of change. During the lead-out Mahmoud was still apart from briefly moving as a result of two hiccoughs. The therapist continued with the Context Music in a slightly rushed way, and without any ritenuto or pauses.
One feature of this change episode is that the moment of change occurred when the therapist felt she was just ‘presenting’ the Context Music rather than offering it in a way that could be shared. In a sense she was performing it.

A comparison of all nine change episodes shows that Mahmoud moved his arms in every one. He also hiccupped in eight of the episodes, but then he hiccupped throughout most of Session Twenty-five. The therapist’s music had bar-lines in every change episode, and eight contained her piano music, seven her singing. These observables indicate that the therapist was active musically when Mahmoud turned his eyes towards her but do not describe the quality of her voice. Sometimes it had a markedly different sound from usual during the change episodes, the therapist feeling more gentle or playful than usual, for example. There were two instances when the therapist sang or played high notes and Mahmoud turned his eyes towards the therapist on these occasions.

I.4.8 Joe Turned his Head towards the Piano 15:06.7

There were 18 change episodes in this category. During the lead-in of the first Joe had his head turned away from the piano, then towards the helper who was adjusting the straps round his feet. He oscillated between being floppy and waving his arms around a little. He leant slightly over his tray. The therapist was on the fourth bar of Mahmoud’s 4/4 Context Music in B flat, singing and playing the piano. On the fifth bar she played a piano only version of it, and did not sing in the remaining bars of the Context Music for the rest of the episode. About two seconds after the therapist had stopped singing Joe looked at the piano, then one second later turned his head towards the piano, the moment of change. During the lead-out he sat up straight and was still. One second after the moment of change it was not possible to tell whether Joe was looking at the piano or not.

In the lead-in of the sixteen episodes in which the therapist played and/or sang there were eight pauses, four ritenuto, four delayed resolutions and two instances of tempo rubato. There were two episodes in which the therapist did not play or sing, and several changes in the music that had not been coded. These included the introduction of staccato chords, the therapist’s singing voice becoming clearer and more bell-like, and the therapist’s voice making vocal pyrotechnics.
Rosanna moved her arms in nine change episodes. The lead-in of the first of these began with the therapist singing the first bar of Darren’s Context theme in G major. She accompanied this on the piano with light, rhythmic and brisk staccato chords which alternated between I and second inversion IV. The original key for Darren’s theme was E flat major, and its transposition up a major third caused certain of the higher notes to sound whispery. Rosanna moved her arms slightly for two and a half seconds as the theme continued, briefly turning her head towards the piano as she nudged her cymbals once with the elbow of her right arm, her legs moving as she did this. The onset of her leg movement occurred 0.5 s before the therapist’s downbeat while the sound from her cymbals occurred 0.1 s before it. On the third beat of the fourth bar of Darren’s theme Rosanna began moving her arms again, the moment of change, nudging the cord of the cymbals three times with her right arm. She also began moving her legs, fully stretching out her right leg for one and a half seconds, then bending it back and kicking, her mouth wide open. She gave the impression of wanting to sing, play and dance, a ‘dance of human wellbeing’. The therapist continued with Darren’s theme right through the lead-out, changing the words so that she could acknowledge he had been away from School.

It is not clear whether Rosanna was using her cymbals to communicate with the therapist, and get her attention, or whether she was moving her cymbals and body out of the sheer enjoyment of musical activity. Perhaps she was doing both. She appeared excited, her leg movements suggesting she was enjoying herself and was full of energy and enthusiasm.

The therapist felt that her own whispery voice affected Rosanna. Trevarthen, writing of neonates in relation to their mothers, states that ‘…newborns can show differential awareness of speech sounds that have different vowel formation or different articulation’. In this study it appears this sensitivity applies as well to the singing voice of the therapist. When the therapist is the musical caretaker and is significant to

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a child, it seems s/he will be aware of changes in the sound of the therapist’s voice. In their recent research, Trevarthen and Marwick have pointed to the importance of the singing voice of the mother to convey emotion to her infant and the child’s receptivity to this, a fact which might go towards explaining the responses of some of the children in this study.

A summary of all nine change episodes shows that certain observables were particularly associated with Rosanna moving her arms. Leg movement occurred in every episode, indicating that Rosanna was excited and pleased when she moved her arms, and rhythmically structured music of the therapist was present in each. Rosanna beat her cymbals in eight out of the nine episodes, so much of her arm movement was purposeful and focused. She also had her head turned towards the piano in eight episodes. The Hello Song occurred in seven of the episodes, and the therapist sang in seven episodes and played the piano in six. There were no episodes in which Rosanna changed from one state to another in a silent context. Finally there were four observables which occurred five times: Rosanna’s open mouth, the therapist addressing Darren, the therapist improvising and pauses occurring in the therapist’s music. Pauses intended to allow the children to respond, were sometimes linked with sung questions from the therapist to the group and Rosanna often played her cymbals during these. It felt to the therapist that she was using them to ‘reply’.

I.4.10 Joe Made an Unpitched Vocalisation 18:34.4

There was one change episode in this category. The therapist, at the piano, made an allegretto improvisation on the Context Music in B flat. She was on the second bar of this when the lead-in began. Joe’s head was turned towards the piano and he was smiling broadly, his mouth open. He clutched his cymbals with his left hand, pressing them on his tray and pulling the cord from which they were suspended, making it taut. His body moved slightly all the time. He appeared very excited. The therapist’s piano music changed from 4/4 to 6/8, and introduced the chord of C minor 7. The moment of change came just before the last beat of this first 6/8 bar. Joe loudly vocalised ‘err’ and maintained this vocalisation for 4.5 s, resuming again after a fraction of a second’s break. He banged the cymbals on his tray three times. During

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539 Professor Colwyn Trevarthen and Dr. Helen Marwick, University of Edinburgh. Cited in The Times, 7th August, 2000.
the lead-out the therapist began singing a legato melody comprising dotted crotchets. After two bars she modulated to G major.

There was no obvious reason why Joe began vocalising at the moment he did but his vocalisations were linked to his excited state.

**I.4.11 Mahmoud Yawned 21:16.6**

Mahmoud only gave one yawn that constituted a change event. During the lead-in of the episode in which this occurred the therapist improvised in B-flat major with a 4/4 time-signature, playing the piano and singing. Initially, in the first bar, she played two quaver scales a tenth apart beginning on e’ flat and c. These culminated, in the next bar, in percussive crotchet chords, with a thirteenth in each, which formed an F7 pedal. Mahmoud, his head turned towards the piano, hiccoughed on the downbeat of the first bar of the episode and made his cymbals move slightly, but he was otherwise still. Apart from one brief instance when the object of his gaze was not discernible, he had his eyes turned towards the piano throughout the lead-in. In the third bar the therapist began singing marcato with the jumbled words ‘Oh here are we … Hello’, her melismatic melodic line tracing and ornamenting an F7 chord and ending on a semibreve f’ tied to a minim. She accompanied herself throughout the episode with the F7 pedal, accenting some off-beat chords towards the end of the episode. As the therapist sang the word ‘we’ Mahmoud opened his mouth. By the second syllable of ‘hello’ on an e’’ flat, he was yawning, his mouth open wide. His head, arms and legs and cymbals all moved as he took in the air. The focus of his gaze was not discernible during the lead-out.

**I.4.12 Joe Started then Vocalised 22:35.0**

The therapist walked away from the piano towards the centre of the group of children and beat on a tambourine, which she sang about. She knelt in front of Joe, who was leaning quietly over his tray with his head lowered, and sang ‘well hello!’, delaying the presentation of ‘-llo’ which she finally accompanied with a loud beat on the tambourine. Almost immediately Joe flexed and tensed his left arm, sat upright and, two seconds later, began laughing and smiling in a state of hyper-excitability. His head was turned towards the piano.
I.4.13 Rosanna Stretched out her Arms 24:58.6

It had been Rosanna’s turn for assisted beating in the Hello Song in Session 25 and the helper was now just holding out the tambourine. Rosanna appeared happy, moving her legs all the time and having her mouth wide open. The therapist reprised the second half of the song on the piano, pausing three times as a way of inviting Rosanna to beat by herself on the tambourine and complete a melodic phrase. Rosanna took up the suggestion each time, adding a few extra beats as well. The therapist then played an a tempo postlude and reflected vocally on what Rosanna had done. During the second bar of this Rosanna suddenly turned her head towards the piano and stretched out her arms at right angles to her body. She remained like this for eight seconds and apart from two instantaneous foot movements was still.

I.4.14 Darren Turned his Head/Eyes towards the Piano 25:58.4

There were eight change events in this category. During the lead-in of the first the therapist was by the piano but not playing it. She spoke indistinctly for three seconds, was silent for one and half seconds, then resumed speaking near the end of the lead-in for two seconds, again indistinctly. The helper was next to her, putting Mahmoud’s cymbals temporarily out of the way, and holding the Hello Tambourine. Darren’s head was slightly lowered. He mouthed the end of his beater, shook it, then, as the therapist resumed speaking, suddenly lifted up his head and turned it towards the piano, looking intently in the same direction. This was the moment of change. During the lead-out the helper held the tambourine in front of Mahmoud while the therapist lightly beat on it, on the downbeat, and began singing a 2/4 variation in F major on Mahmoud’s theme as a preamble to the Hello Song. Darren gave a fleeting open-mouthed smile a fraction of a second before the therapist started playing the tambourine and singing near the end of the episode. He looked up when she began talking again very quietly.

Comparing all the episodes it can be seen that Darren looked at the piano and turned his head towards it in each, he also slightly moved his head in every episode, usually to accommodate a shift of focus and he moved his arms in seven of the episodes, playing with a pair of Chinese cymbals in the last five. A salient feature, however, of five of the eight episodes when Darren looked at the piano is that something out of the ordinary was happening. In the fourth episode the therapist was playing Mahmoud’s
cymbals, and playing the piano and singing at the same time. In the fifth episode the quality of the therapist’s singing voice was rougher and more assertive than usual. In the sixth a leaving present was given to the therapist. In the seventh the therapist lifted Mahmoud out of his chair and in the eighth she helped Mahmoud play his cymbals.

I.4.15 Mahmoud made Mouth Movements 27:28.0

There were five change episodes in this category. During the lead-in of the first Mahmoud was still, his head towards the piano and his mouth open. The helper extended the Hello Tambourine so it was just touching his left hand and arm. The therapist improvised vocally on Mahmoud’s theme, softly singing the ‘oo’ sound from ‘Sue’. She sang in F major, with a 2/4 time signature, accompanying her singing with a light contrapuntal piano line in the bass. With her right hand she lightly tapped the Hello Tambourine, first on the downbeats, then following her vocal quavers. Two seconds before the change event she sang a dreamy-sounding set of six quavers, starting on g′′ (a note she did not often sing) which was a downwards arpeggic version of a D minor 13 chord and was supported by a second inversion F6 chord on the piano. After she sang f′ in this sequence, Mahmoud began making mouth movements. The therapist shifted vocally to a, singing ‘he-[llo]’ and pausing on this for the rest of the lead-out. As she sung this note Mahmoud began raising his outstretched arms slightly and moved his left foot until the end of the episode.

The onset of Mahmoud’s mouth movements came about 2 s after the therapist had sung the unusually high note, and the onset of the foot movement occurred about 1 s after the final low note. The mouth movements consisted of Mahmoud opening and shutting his mouth as people do when they are considering or tasting something.

There were four features that occurred in all the episodes: the helper was intervening with either Mahmoud or another child in each, Mahmoud’s eyes were turned towards the piano in the lead-in of four sessions, and in the lead-out of two, suggested he was paying attention to the therapist who was improvising a lot.

I.4.16 Darren Beat in his own Pulse on the Tambourine 28:47.0

This change episode in Session Twenty-five, School B, occurred during Darren’s Hello Song turn, before the start of assisted beating. Mahmoud had finished his Hello Turn
and the therapist, singing and playing the piano, asked who was going to play next, ‘Darren or Joe?’. Darren beat twice on the side of his chair in time with the therapist’s music. The helper, noticing this, moved towards Darren whose head was now turned away from the piano, tilted upwards. She removed his drum and beater, held out the Hello Tambourine for him to play and momentarily took his right hand as she placed it on the tambourine. Darren’s head was mostly lowered during this operation, although he turned his head towards the piano when the therapist quietly spoke for about three seconds. The therapist played the first five melody notes of Darren’s theme in F major, with a 4/4 time signature and briefly paused when the helper took Darren’s hand. She then repeated the five notes in the low register of the piano, going on to play a monophonic improvisation that ascended from two octaves below c´ to c´ itself. Darren began beating unaided in his own erratic pulse on the tambourine from the third bar of the therapist’s monophonic passage, and continued to do so for five seconds. The therapist tried to follow his beat and at the fifth bar she and Darren played in synchrony for about four seconds.

Darren had at first appeared disinterested in the therapist’s music. It was as though he played his initial two beats in time with the therapist in spite of himself. The encouragement from the helper, who placed Darren’s hand on the tambourine, and the pianistic support from the therapist helped him emerge from his withdrawn state.

I.4.17 Mahmoud Moved his Arm/s 30:11.2

Mahmoud moved his arms three times in a way that constituted a change event. During the first of these the therapist was improvising on the piano in a passage addressed to Darren. It was a 4/4 allegretto passage in F major and comprised a melodic line in the high register of the piano over a C pedal of crotchet chords on c´. These were made up of fourths, c´, f´ and b´ flat. The music had a persistent driving quality. During the lead-in Mahmoud had his head and eyes turned to the piano and his mouth open. He hiccoughed, his arms bouncing slightly as he did so. The therapist started a new melodic phrase, in a lower register of the piano (Darren started beating his drum in time with the music at this point) and she then played three f´ crotchets with the crotchet chord accompaniment. The moment of change occurred after this, Mahmoud raising and slightly twisting both arms, the cymbals’ cord in his left hand. The therapist continued her improvisation during the lead-out, reverting
once more to playing in the high register of the piano while still maintaining her
crotchet chords around c’. Additionally in the third bar after the moment of change
she began singing a legato melody line made up mainly of long notes set to the word
‘hello’. Mahmoud kept his eyes towards the piano and his mouth open for the rest of
the episode. He hiccuped once again 1 s before the end of the lead-out.

The change episodes in which Mahmoud moved his arms had features in common.
Mahmoud had his mouth open and moved his head in each. In two out of the three
episodes he moved his feet and solo instrument. The therapist played the piano in
tempo and sang in two of the episodes, and in two episodes the change event occurred
during a Hello Song Section when there was more activity than usual.

1.4.18 Joe Mouthed his Hand 35:26.0

There were two change episodes in this category. At the start of the first, Joe was
leaning over his tray, head down, his right hand holding the cymbals. He began
moving his left arm slightly and turned his head towards it. The therapist was on the
third bar of an improvised song with piano accompaniment, her music, in D major with
a 6/8 time signature addressed in emphatic tone to Mahmoud. She repeated his name
several times and asked him, in song, what was wrong; he had been making an
unpitched complaining vocalisation. The song was part of a sixteen-bar structure in
which the first four bars were exactly repeated and it was played moderato. Joe kept
moving his left arm and appeared to be studying his hand. As the therapist played the
downbeat of the seventh bar, Joe put his hand to his mouth, leaning on his right elbow,
his head turned away from the piano. He moved his left arm at the same time, still
holding the cymbals. During the lead-out Joe moved his legs for two seconds and then
appeared to be concentrating on sucking his thumb. Two and a half seconds after the
moment of change the therapist made a ritenuto on the eighth bar of the improvisation
and then paused for two and a half seconds, in silence.

The other change episode in which Joe mouthed his hand occurred during the eighth
bar of the Bye-Bye Song (at 43:34.3). It had certain features in common with the first
episode: Joe was moving in both and moved his solo instrument in both, there were
pauses in the therapist’s music in both episodes and she was playing the piano and
singing in both. A salient feature of the episodes was that the therapist played
passages of music related to a specific issue: in the first Mahmoud’s upset; in the second the approaching end of the session. It may be that just as there was nothing in it for Joe when the therapist sang and played to Mahmoud, so the Bye-Bye Song did not hold the promise of anything interesting for Joe. This view is supported by events that occurred thirty five seconds before the second change episode. At this time Joe had stopped smiling when the therapist stopped addressing him and shortly afterwards he had turned his head away from the piano the moment the therapist began playing the Bye-Bye Song.

I.5 Summary of Change Events

There were 36 types of change events, a few of which were also rare events. In Session Eight of School B and School A all the children exhibited change events, the most types occurring for Darren and Christopher and least for Aaron, Barnaby, Mahmoud and Nihal. Interestingly Barnaby, who presented 3 types of change events in Session Eight presented 11 in Session Twenty-three, appearing to have been more focused in the later session. His not having a beater in this session may have affected the degree to which he took note of the therapist. In contrast Darren presented considerably fewer types of change events in Session Twenty-five, this fitting in with his apparent lack of interest in the session. There was also a 50% reduction in the number presented by Rosanna. Joe and Mahmoud in School B showed approximately the same number of types of change events, as did Aaron in both sessions, suggesting that overall their response to the therapist was consistent. Nihal was the only child who had no change events in the later session of School B.

Twenty types of change events were uncoded and many of the potential stimuli of the therapist were also uncoded, including the quality of her singing voice, its pitch (in particular if it was low or high), her presenting a dissonance on the piano, and her music being unpurposeful or not attuned to the children. The children appeared to respond to a variety of therapist stimuli with both stimulus and response being difficult to quantify at times. Nevertheless a picture emerged of the children apparently relating to the therapist and being affected by what she did. There were only seven instances in which it was hard to make sense of a child’s change episode.
Appendix J

Transcriptions

This appendix contains transcriptions of the music therapy session excerpts discussed in chapters 10-14. These transcriptions also serve to illustrate the form of the handwritten transcriptions described in section 6.6.6 Research Protocol on page 132. In the interests of clarity, these printed versions omit certain details that exist on the handwritten pages.

Each transcription takes the form of a musical score having 14 staves per system. Each participant (the helper, four children and therapist) has a pair of staves, the upper one for a percussion instrument and the lower one for voice. There is an additional pair of staves for the therapist’s piano music. At the bottom of each page there is a line showing the time in seconds, with the session name and time in minutes at the left. Between each person’s percussion and vocal stave there is space to contain the observable codes for that person. The left-hand edge of the text of each number (seconds) and observable code is positioned horizontally in relation to the music to indicate the time at which it occurs. Most coded events have duration, i.e. are not instantaneous. The duration is indicated by a horizontal line starting just below the code, and extending to the end point of the event. If an event crosses a break between pages, the code is repeated in parentheses at the point of continuation on the new page. Codes are laid out vertically in an order that approximately corresponds to the part of the body being described, feet at the bottom and head at the top. Codes that relate to a child’s beating appear just below the percussion stave.

For comparison, the portion of the event list corresponding to Transcript 1, page 413, is shown in Appendix E, page 314. To conserve space on the page, codes contain some lower-case letters, whereas upper-case is used everywhere else in this thesis. To avoid overloading the reader with detail, certain codes have been omitted from the transcription when they are represented or implied by musical notation. Vocalisations, therapist playing the piano, time signatures and tempo variations are examples of these. Pitched vocalisations are expressed in normal notation on the voice stave. Unpitched vocalisations have note stems without heads, and approximately pitched vocalisations have crosses as noteheads. On percussion staves, conventional and headless notes represent a beating on an instrument and on some other surface respectively. Certain codes connected with a percussion instrument or beating (such as “S” and “!”) are placed on the percussion stave instead of notes.
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Helper

Aaron

Nihal

Christopher

Barnaby

Sue

Helper

Aaron

Nihal

Christopher

Barnaby

Sue

Chris - ty is here to - day, with his dru - ms and his cym - bals
Helper

Aaron

Nihal

Christopher

Barnaby

Sue

Here we were to -

(Mn/v) (EP)

(Mn/v) (MO)

(IM)

(err) Out

CxtoR

(sm) L-S

A08 37: 59 38:0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Here we were to-day Oh Oh Bar-na-by Bar-na-by Bar-na-by
Once upon a time you knew
li'ved a chime bar
Chime bar

thus and so ting ting ting ting it would go ting ting ting ting
That was ev'-ry-one ma-king it go. That was ev'-ry-one
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[mouth snort] that was ev'ry-one
[leaves Mahmoud]
Transcript 3  Mahmoud B08 39:25, page 7 of 7

[Musical notation and text]

[End of document]
Transcript 4  Mahmood B08 27:17

(see Chapter 11)
Re-positions J's instrument
Helper

Darren

Rosanna

Joe

Mahmoud

Sue

B08 22: 54 55 56 57 58 59 23:0 1 2 3 4
Transcript 5  Rosanna B08 22:54, page 3 of 4

H

D

R

J

M

S

B08 23: 15 16 17 18 19 20 21 22 23 24 25 26
Transcript 6 Rosanna B08 14:57 (see Chapter 12)

And Rosanna Bec-kett is here to-day Ro-
tempo rubato
Rosanna has come to play! Rosanna is music arpeggic and florid.
Transcript 6  Rosanna B08 14:57, page 4 of 5
Transcript 7 Barnaby A08 13:44

(see Chapter 13)
Transcript 8  Barnaby A23 32:30  (see Chapter 13)
Transcript 9  Christopher A08 18:17

(see Chapter 14)
Transcript 9  Christopher A08 18:17, page 2 of 5

Ch: Chris·ty play'd  Hel-lo  to  Aa-ron  Seale  on  his  cym  bal  briskly
mo to  rit.
(see Chapter 14)
Transcript 11 Christopher A23 23:26

(see Chapter 14)
Transcript 12  Christopher A23 25:38

(see Chapter 14)

Helper

Aaron

Nihal

Christopher

Barnaby

Sue

"Thank you"

"That's lovely Barnaby"
"Would you like to be next, Christopher?"

"Who's going to play 'Hello' next?"

"Who wants to play 'Hello' next?"

"I think Christopher does"
(see Chapter 14)
Barnaby's, got ... Aaron's cymbal"  "Ooh my goodness that's very-"  "that's very naughty..."  [indecipherable]
Appendix K

Teachers’ Ratings

The following information relates to section 7.6 Rating Scales, page 149, and Chapter 15, page 218.

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### Rating Form

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* T = today (before music therapy)
  W = week (over the past week)

Figure 10 Sample rating form

A separate similar form was used to record the A rating (after music therapy).
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A = absent
N = not recorded
### Table 18: Ratings for Nihal, School A

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A = absent
N = not recorded
Table 19 Ratings for Christopher, School A

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A = absent
N = not recorded

* in pain
### Table 20 Ratings for Barnaby, School A

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A = absent  
N = not recorded
Appendix L

Short Term Sequential Analysis Results

This appendix relates to section 16.2 Short-Term Sequential Analysis, page 224. Table 25 shows the highest z-scores and the corresponding pairs of related observables: the given observable (x) and the target observable (y). The p-values have been calculated from the z-scores (see explanation in Appendix N.3 Short Term Sequential Analysis on page 480). A normal observable code represents an onset (or instantaneous event), and a code with a ‘-’ suffix represents an offset. Results are laid out in order of the child presenting the target observable.

Table 25 Short term sequential analysis results

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</tbody>
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Appendix M

Long Term Sequential Analysis Results

This appendix relates to section 16.3 Long-term Sequential Analysis, page 229. Table 26 shows the highest z-scores and the corresponding pairs of related observables: the given observable (x) and the target observable (y). The p-values result from the Shapiro-Wilk test on the simulated ‘base-line’ distribution (see explanation in Appendix N.2 Co-Occurrence Analysis and Long-Term Sequential Analysis on page 478). Results are laid out in order of the child presenting the target observable.

Table 26  Long term sequential analysis results

<table>
<thead>
<tr>
<th>School</th>
<th>x</th>
<th>y</th>
<th>z</th>
<th>p</th>
</tr>
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</tbody>
</table>
Appendix N

Methods of Data Analysis

This appendix explains the procedures and calculations used to obtain various numerical results.

N.1 Reliability Test (Kappa)

This section outlines the method used in the reliability test. The original data consisted effectively of a log of the observed actions of the participants in each of four music therapy sessions. Two sessions were carried out at each of two schools, with four children and a helper from each school. Each session has six ‘roles’ (the therapist, helper and four children) which are filled by six participants, each denoted by a single letter as follows:

<table>
<thead>
<tr>
<th>Role</th>
<th>School H Session 8</th>
<th>School H Session 23</th>
<th>School B Session 8</th>
<th>School B Session 25</th>
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</thead>
<tbody>
<tr>
<td>Therapist</td>
<td>S</td>
<td>S</td>
<td>S</td>
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</tr>
<tr>
<td>Helper</td>
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<td>L</td>
<td>P</td>
<td>P</td>
</tr>
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<td>Child 1</td>
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<td>D</td>
</tr>
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<td>Child 3</td>
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<td>J</td>
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<tr>
<td>Child 4</td>
<td>B</td>
<td>B</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

The recorded data fell into two types: therapist’s (including the helper’s) observables; and children’s observables. Each therapist’s observable had one ‘track’ running through each session. However, each children’s observable had four tracks corresponding to the four children, and was therefore recorded for a total duration of four times that of each therapist’s observable.

To check the reliability of the coding of observed actions, a second coding exercise was done on four 5-minute segments selected randomly from each of the four sessions. The resulting event list was known as ‘data set B’, and the corresponding segments extracted from the original data as ‘data set A’. Each data set contained \( N_T + 4N_C \) tracks, where \( N_T \) and \( N_C \) are the total number of therapist’s and children’s observables respectively. For each track, the data were compared between set A and set B. At any point in time the combined pair of tracks exhibits one of four states,

---

540 This appendix was written by Clive Jenkins, MA Cantab. (Mathematics), a freelance designer of embedded computer systems and software.
according to whether or not the particular observable is occurring in each of the data sets:

<table>
<thead>
<tr>
<th>Occurring in A</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occurring in B</td>
<td>Yes</td>
<td>$AB$</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>$\overline{A}B$</td>
</tr>
</tbody>
</table>

$AB$ and $A\overline{B}$ denote agreement that the observable is and is not, respectively, occurring in data sets A and B at a particular time. Similarly $A\overline{B}$ and $\overline{A}B$ denote the two possible cases of disagreement. The amounts of time in each of these four states was accumulated in four corresponding totals, $T_{AB}$, $T_{A\overline{B}}$, $T_{\overline{A}B}$ and $T_{\overline{A}\overline{B}}$.

To tolerate errors in the onset and offset times of the observables, a ‘sliding window’ method was used, as illustrated in Figure 11, page 477. The window size ($w$) was 2.5 seconds, and an observable on either track was counted as on (occurring) if the observable was on in any part of the window. The window started just before the start of each session and was slid to just after the end. During the period shown as $t_1$ the observable was off in both tracks (state $A\overline{B}$), so $t_1$ was added into $T_{\overline{A}\overline{B}}$. As the window continued, state $A\overline{B}$ was entered for the duration of $t_2$ which was added into $T_{AB}$. Similarly, $t_3$ was added into $T_{AB}$, $t_4$ into $T_{A\overline{B}}$ and $t_5$ into $T_{\overline{A}\overline{B}}$.

Having accumulated the four totals $T_{AB}$, $T_{A\overline{B}}$, $T_{\overline{A}B}$ and $T_{\overline{A}\overline{B}}$ for each track, those for each children’s observable were aggregated over the four children, thus giving one set of four totals per observable. From these, the observed proportion of agreement, $P_o$, the proportion of agreement expected by chance, $P_c$, and the simple kappa coefficient, were all calculated following the method of Cohen\(^{541}\) as follows:

$$P_o = \frac{T_{AB} + T_{\overline{A}\overline{B}}}{T_{AB} + T_{A\overline{B}} + T_{\overline{A}B} + T_{\overline{A}\overline{B}}}$$

$$P_c = \frac{(T_{AB} + T_{A\overline{B}})(T_{AB} + T_{\overline{A}B}) + (T_{A\overline{B}} + T_{\overline{A}\overline{B}})(T_{AB} + T_{\overline{A}\overline{B}})}{(T_{AB} + T_{A\overline{B}} + T_{\overline{A}B} + T_{\overline{A}\overline{B}})^2}$$

$$\kappa = \frac{P_o - P_c}{1 - P_c}$$

Using the method of Fleiss et al., a standardised test statistic, or z-score, was calculated as:

\[
z = \frac{\kappa}{\sqrt{\text{var}_0(\kappa)}}
\]

where \( \text{var}_0(\kappa) \) is the variance of the kappa coefficient under the null hypothesis that \( \kappa = 0 \).

\[
\text{var}_0(\kappa) = \frac{4(T_{AB} + T_{\pi B})(T_{AB} + T_{\pi B})(T_{AB} + T_{\pi B})(T_{AB} + T_{\pi B})}{(1 - P_e)^2(1 - T_{AB} + T_{\pi B} + T_{\pi B})^5}
\]

The resulting z-score can be compared against a standard normal distribution.

---

Figure 11 Sliding window for kappa test
Co-occurrence analysis attempted to answer to the question ‘To what extent did y happen during the times when x was happening?’, for every pair of observables \((x, y)\). x and y can be thought of as potentially ‘cause’ and ‘effect’, or ‘stimulus’ and ‘response’ respectively, but it is more correct to call x the ‘given’ observable and y the ‘measured’ or ‘target’ observable since causal relationships cannot be assumed (nor indeed, discovered, by this type of analysis alone: the best that can be achieved is to show that there is a lawful connection which is consistent with a hypothesis of cause and effect).

For each \((x, y)\) pair the answer was calculated as a z-score, intended to give a standardised measure of the extent to which y happened more or less than its average for the session, during the specific times when x was happening. The observable x thus defines a ‘catchment area’ for the observable y. To allow for response time, the catchment area was delayed by 2 seconds, giving ‘lagged co-occurrence’ analysis. For convenience, this was called ‘long term sequential analysis’, because it brings out the large-scale co-occurrences.


The time-span of the observations was divided into \(N\) equal intervals, according to the accuracy to which times were recorded: in this case 0.1 second. Each observable was assumed to follow a binomial distribution, having a certain probability of being on during each interval. That probability, \(p(x)\), was calculated as the sum of all the on times of the observable x, divided by the total session time. Furthermore, for every pair of observables \((x, y)\), the conditional probability of y given that x, \(p(y|x)\), was also happening, was calculated as the sum of all the times that both x and y were on, divided by the total session time.

The frequency of observable y, \(f_y = Np(y)\)

The frequency of y given x, \(f_{y|x} = Np(y|x)\)

If y is independent of x, then:

\[ p(y|x) = p(y)p(x) \]

However, if there was a dependency (positive or negative), the ‘strength’ of it can be measured by the z-score:

\[ z = \frac{p(y|x) - p(y)p(x)}{\sqrt{p(y)p(x)[1 - p(x)]}/N} \]
This was derived by considering that the observable $x$ selects a sample of observable $y$. The measured mean relative frequency, $p(y|x)$, was compared with the expected relative frequency, $p(y)p(x)$, and the deviation (difference) was divided by the standard error of the mean of the sample. Thus $z$ indicates the number of standard errors by which the measured mean deviated from the expected mean.

By definition, $z$-scores should to be normally distributed for data containing no dependencies, therefore they can be converted to ‘$p$-values’ by applying the cumulative normal distribution function, e.g. there is a probability $p < 0.05$ that $z$ lies outside the interval $[-1.96,+1.96]$. However, it was found that $z$-scores for the real data were very tightly clustered at zero, most of them within the interval $(-0.01,+0.02)$, very unlike a normal distribution. In the opinion of the writer, this is because the binomial distribution is not really a good model: once an observable is on, it remains on for a relatively large number of intervals of 0.1 second before it goes off, then it stays off for some time. In other words there is a serial dependence in time.

To overcome this problem, a series of 60 simulations was performed to find how $z$ (as calculated above) was distributed under the null hypothesis that there was no dependence between $x$ and $y$. In each simulation, the dependence was removed by creating a new data set as follows: for each observable the on times were extracted and their order randomly permuted; the same was done to the off times; the new sequences of on and off times were interleaved. Thus the simulated data for each observable, $x$, had a similar character to the original, and its frequency, $f_x$, was exactly preserved. From the new data set, a complete matrix of $z$-scores was calculated for all $(x, y)$ pairs. This process was repeated for a total of 60 times, giving a set of 60 $z$-scores for every $(x, y)$ pair. From each set of 60 $z$-scores, the following were calculated:

- the mean, $\mu_0$
- the standard deviation, $\sigma_0$
- the $p$-value of the Shapiro-Wilk test for normality

Then from every old ‘$z$-score’ a new standardised score was calculated by:

$$z' = \frac{z - \mu_0}{\sigma_0}$$

The tabulated results actually contain values of $z'$ as above. Such values were only considered valid if the $p$-value of the Shapiro-Wilk test indicated a distribution not dissimilar from the normal distribution. In this test the null hypothesis, $H_0$, is that the distribution is normal, and a small enough $p$-value would require rejection of $H_0$. The requirement here is that $p$ be large enough to avoid rejecting $H_0$. After studying all the histograms of the simulated distributions against the corresponding $p$-values, it was noted that $p$ had to be well below 0.01 before the distribution was noticeably abnormal. In practice, a more stringent threshold nearer to 0.1 was used, to improve the reliability of results and restrict them to a manageable quantity.
N.3 Short Term Sequential Analysis

This analysis examined the connections between the moments of change in observables by considering onsets and offsets of therapist’s (x) and the children’s (y) observables as potential stimulus-response (or more correctly, given and target) pairs. The catchment area for y consisted of all the 5-second windows starting at all the moments where x occurred. Any overlapping windows were merged into one longer window.

For each (x, y) pair, the following totals were calculated:
- \( t_x \) the total time of windows following each occurrence of x,
- \( T \) the total time of the session,
- \( n_y \) the number of occurrences of y in the session,
- \( n_{xy} \) the number of occurrences of y within windows following x.

If x and y were independent, the expected number of occurrences of y in x’s windows would be:

\[
\frac{n_y t_x}{T}
\]

whereas the actual measured value is \( n_{xy} \), and the deviation from the expected value is:

\[
n_{xy} - \frac{n_y t_x}{T}
\]

To obtain a standard score, the following test was taken from p. 26 of Gopal K Kanji, *100 Statistical Tests*, (London: Sage, 1999). This test measures the significance of a difference between two counts taken over time, where the counted events are assumed to follow a Poisson distribution and the size of each count is large enough that the normal approximation to the Poisson distribution applies. Let \( n_1, n_2 \) be the two counts taken over times \( t_1, t_2 \), and let \( R_1 = n_1/t_1 \) and \( R_2 = n_2/t_2 \) be the corresponding rates. Then the significance of the difference between the two is represented by a z-statistic which is comparable to a standard normal distribution:

\[
z = \frac{R_1 - R_2}{\sqrt{\frac{R_1}{t_1} + \frac{R_2}{t_2}}}
\]
In terms of the totals derived from the data:

\[ t_1 = t_s, \ t_2 = T \]

\[ R_1 = \frac{n_y}{t_s}, \ R_2 = \frac{n_y}{T} \]

\[ z = \frac{n_y - n_y}{\sqrt{\frac{n_y}{t_s} + \frac{n_y}{T^2}}} \]

A histogram of all the resulting z-scores was plotted and found to be reasonably close to a standard normal distribution, but with a higher kurtosis (more peaked). The values of \( z \) were sorted into ascending order and numbered 1 to \( N \). Then corresponding \( p \)-values were calculated as:

\[ p_r = \frac{N - r}{N - 1} \]

The top 1% of the z-scores (with \( p < 0.01 \)) were selected as sufficiently significant.

### N.4 ‘Downbeat’ Analysis

The \( BAR \) observable was recorded in the event list data at the time of every down-beat when there was a musical rhythm, thus dividing the music into bars or measures. Time intervals between consecutive \( BAR \) observables were calculated, and where they ranged from 0.5 s to 5.5 s, it was deemed that rhythmic music was occurring, and these portions were accepted into the next stage of the analysis. Each valid bar was divided into eight equal time periods, and anything that occurred during the first or last of these was deemed to be ‘on the downbeat’. For each child-observable pair (combination) the number of times its onset occurred on the downbeat was counted and compared with the total number of occurrences. If event timings were random, one quarter of events would be expected to occur ‘on the downbeat’.

Let \( n \) be the total number of occurrences of a particular child-observable pair, of which \( k \) occurred on the downbeat. So the actual proportion on the downbeat was \( k/n \), and the proportional deviation from the expected chance result was:

\[ d = \left( \frac{k}{n} - \frac{1}{4} \right) / \frac{1}{4} = 4 \frac{k}{n} - 1 \]

Since \( 0 \leq k \leq n \), \( d \) ranges from -1 to +3, with expected value 0.
In cases when \( d \geq 0 \) the corresponding \( p \)-value was the probability of at least \( k \) successes out of \( n \) trials, where each trial is independent with probability \( p' = 1/4 \) of success. This is the binomial cumulative probability distribution function, given by

\[
P(x \geq k) = \sum_{i=k}^{n} \binom{n}{i} (p')^i (1 - p')^{n-i} = I_{p'}(k, n - k + 1)
\]

where \( I_{x}(a, b) \) is the incomplete beta function.

In cases when \( d < 0 \) the corresponding \( p \)-value was the probability of at most \( k \) successes out of \( n \) trials, given by

\[
P(x \leq k) = 1 - P(x \geq k - 1) = 1 - I_{p'}(k, n - k)
\]

Calculation of the incomplete beta function depended in turn on the log gamma function, \( \ln \Gamma(x) \). The algorithms used for both were those described in chapters 6 and 26 of M. Abramowitz and I. A. Stegun, ‘Handbook of Mathematical Functions’, *Applied Mathematics Series*, Volume 55, 1964, (Washington: National Bureau of Standards; reprinted 1968 by Dover Publications, New York).
References


"This researcher has 98 observables for each child and 106 for the therapist and helper, ..."