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Mission

The commission on Music in Special Education, Music Therapy and Music Medicine was established in 1974. The Commission was established in order to contribute to the progressive development of music therapy and music in special education. The commission seeks to emphasis the importance of communication between the related disciplines which are involved.

The commission aims to:

- gather and present detailed information from each specific profession;
- exchange information regarding training of the three professions;
- share information and research through an informal email discussion group and through biannual seminar meetings; and
- present the outcomes of these meetings in publications.

Commissioners

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30 years of the ISME Commission of Music in Special Education, Music Therapy, and Music Medicine: History and Aims

By Manuela Prause-Weber, Commission Chair 2006

In 1974, the Commission of Music in Special Education, Music Therapy, and Music Medicine, then entitled the Commission on Music Therapy and Music in Special Education was founded as one of six new commissions at the 11th World Conference of the International Society for Music Education in Perth, Australia. The major tasks and objectives of this commission were, according to its first chair Violeta Hemsey de Gainza were to (a.) lend expertise to the executive committee and membership, calling attention to the results and implications of ongoing and past studies and projects; (b.) establish international and interdisciplinary cooperation; and (c.)provide and exchange information about current practices and research (Hemsey de Gainza, 1989: 6.) While in the beginning of the commission's existence the similarities and differences between the two fields, social music education and music therapy were central themes (seminars in Paris 1982 and 1985; Lisbon, 1984; Bad Honnef, Germany, 1986; Provo, Utah 1987; Melbourne, Australia, 1988), the field of music medicine became increasingly important since the second decade of its foundation. "Discussions at the Melbourne conference led to the suggestion that music relates to education therapy and medicine and that this perspective should rightfully be part of the commissions responsibility" (Pratt, 1989b. 3). As a result, in1988 during the world conference in Canberra, Australia, the term music medicine was added. Rosalie Rebollo Pratt commission chair from 1988-1992 states "Professionals in all three areas were already collaborating in research and practice on the effects of music on human behavior but the moment had finally come to recognize formally that the vision and wok of the commission had earned us the title of Commission for Special Music Education, Music Therapy, and Music Medicine (Pratt 2004, 203).

The following biannual conferences of this interdisciplinary commission took place in Talli, Estonia, 1990; Bad Honnef, Germany 1992, Boulder, Colorado, USA 1994; Rennes, France, 1996; Capetown, South Africa, 1998; Regina, Canada 2000; Jyvaskyla, Finland 2002; and Vitoria, Spain, 2004; Serdang, Selangor D.E., Malaysia, 2006; Bologna, Italy, 2008; A look at the past seminars themes: Evolution in Music Therapy, Music in Special Education, Music Medicine- specialized approaches. Music as a Medium: Application Interventions; Music in Communication, Healing and Cognition; Special Resonations - baselines and connections in Music in Special Education, Music Therapy and Music Medicine; Community, Creativity, and Culture; Connections in Music in Special Education, Music Therapy, and Music Medicine shows that these in general are formulated very broad, showing the Commission's intention to generally give space for a wide range of topics within all three fields

The dissemination and exchange of information about the Commission's meetings has always been considered important for this interdisciplinary working group. As a result, a body of publications has been produced, documenting the presentations at the meetings since 1986. The first publication titled *The First Research Seminar of the ISME Commission on Music Therapy and Music in Special Education* (Pratt & Moog, 1989) documents the presentations held in Bad

Honnef, Germany; the next two publications, *Music Therapy and Music in Special Education: The International State of the Art, Volume I* (Pratt & Hesser, 1989) and *Music Therapy and Music in Special Education: The International State of the Art, Volume II* (Pratt, 1989a), document the conferences in Utah, USA and in Melbourne, Australia. The papers held at the following conference in Bad Honnef are documented in *Musica Movet* (Laufer & Piel, 1994), at the conference in Renner, France in *Music as a Medium: Applications and Interventions* (Laufer & Montgomery, 1998), at the conference in Cape Town, South Africa in *Music as a Human Resource: Drafts and Developments* (Laufer, Chesky, & Ellis, 2000) and at the conference in Regina, Canada in *Resonances with Music in Education, Therapy, and Medicine* (Laufer & Montgomery, 2002). These publications that now document the Commission's work for almost 20 years "provide an opportunity for the Commission to establish its professional identity and to reach audiences that could not otherwise benefit from their exchanges" (McCarthy 2004, 193). "To this day, the 'ISME Commission for Special Education, Music Therapy, and Music Medicine' stands alone in the international arena of music and healing as the one international organization that understands the distinct yet reciprocal roles of education, therapy, and medicine" (Pratt, 2004, 203-204).

The main intention of the Commission's work is and always has been to have a constructive exchange and dialogue between a) the three professional fields, b) research and practice, and c) different countries. In order to help people in need through the medium of music we should not restrict ourselves to our own familiar approaches, but make use of the whole range of possibilities of using music and explore new ways together. The statement which commissioner Barbara Hesser made in 1989 still holds true today: "The international dialogue that takes place in a working symposium is an important and rich opportunity. A meeting like the World Leadership conference in Music Therapy and Music in Special Education helps us to attain a global perspective of our professions. To see and know ourselves and our work in this broader context is like the awesome, life-challenging experience of an astronaut when he views the earth from space. Our perspectives and concerns are quickly seen in a new light" (Hesser 1989, vii). It is the intention of this seminar to contribute to the further exchange and creative dialogue between professionals in order to serve people in need through the art of music.

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2006 ABSTRACTS

Music therapy for asthmatic children

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The number of children with asthma is now increasing in the world. The World Health Organization (WHO) has announced that there are more than 100000,000 asthma patients in the world. Now, childhood asthma has become a worldwide problem. It is said that air pollution and environmental changes are the cause of the asthma attack upon the small young bodies of children. They also trigger mental illnesses. The basic way to cure asthma is the medication for getting rid of tracheal inflammation. The training as therapy has also been said an important cure for it almost 70 years. And one way for the training is to learn abdominal breathing.

Our research began in the 1970's and since then, we have developed approaches including "Music Therapy for Children Suffering from Asthma" to help those afflicted with the disease. We are now leading the practice. This therapy is intended to help children work through asthma attacks via music instead of relying upon medication. Through trial and error, we have continued our research with doctors, allergy specialists, music therapists, and the patients. Since 1983, we have presented the results of our research at international academic meetings and seminars of music therapy. Now, the situation is very different. Asthma patients have improved remarkably as a result of our approaches and have not had to depend solely upon medicine. This workshop will emphasize "Ten Methods of Asthma Music;" the mechanisms of childhood asthma and abdominal breathing; music therapy for asthmatic children; or "asthma music;" as well as the way to learn abdominal breathing to ease the asthma attack pain. I will also discuss prevention measures - how to cope with the asthma attack. The results of "Asthma Music Class" for children will be presented I

2006 PAPERS

Improving well-being and quality of life for the elderly through vibroacoustic sound therapy

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Abstract: A particular use of technology in 'open-ended' contexts lies at the heart of Vibroacoustic Sound Therapy, which has been developed in schools for profound and multiply handicapped children and in homes for the long-term care of the elderly and elderly mentally infirm. The therapy uses examples of digital music technology to improve communication skills, motor control and well-being in a non-invasive approach. Research methodologies used to date capture mainly, but not exclusively, qualitative data. Indications are positive, suggesting that the benefits resulting from this therapy are tangible and significant for various conditions associated with ageing.

Key words: vibroacoustic; sound therapy; ageing; empowerment; aesthetic resonation; music technology; elderly well-being; non-invasive.

Introduction

The focus of this paper is on elderly people within residential settings who have experienced the effects of stroke, depression, confusion and dementia, and of a study into the effectiveness of a new approach within this context - an approach called Vibroacoustic Sound Therapy (VAST).

Throughout the last century, there have been significant advances in medicine and in public health. Coupled with a general improvement in hygiene and diet, there has been a general increase in longevity. As people enter their 60s it is possible for some that the quality of life will not be maintained, and when they reach their 70s and 80s there is a significant increase in the likelihood of stroke, dementia and physical and/or mental or intellectual impairment. The older we become, the more likely we are to depend upon the help and caring of others.

Increase in longevity is reflected in the number of people living in sheltered accommodation, with a concomitant growth in numbers of homes for the long-term care of the elderly. These homes range in quality from the provision of rather basic care to that of high quality surroundings and more stimulating and invigorating environments. Self-contained flats can be provided within a community home, where residents may be as independent as they are able or wish or to be - and as sociable.

Working with the elderly presents particular challenges in with a therapy which depends a great deal on the establishment of both rapport and trust between therapist and resident, and in the acceptance of, and resonation with, a particular therapeutic environment.

Greer, (1994) has clearly identified the potential for 'psychologically motivated endeavours' having a profound effect even on 'the survival chances' of the seriously ill, and also makes a powerful case against the insensitive treatment of illness. The separation of the individual from the disease can be seen to be demotivating and can produce negative emotional and psychological effects, which in turn can decrease or depress (speed of) recovery. There are numerous anecdotal reports of the variety of standards which exist both in hospitals and residential homes. Sylvia Rogers (The Guardian, 26.8.98) gives a graphic account of the carelessness and indifference which can sometimes be experienced in the hospital ward, and makes a powerful plea for every worker to be trained 'to treat every patient as an individual', one of the fundamental tenets of VAST. In the area of 'mind-body' medicine, it has been proved 'with the utmost rigorous of modern science' that we respond 'to every stimuli in global ways', (Watkins, 1997). This research supports the view that 'the health of any individual not only depends on physical health but also on the unique mental, emotional and spiritual aspects of that individual ' (ibid).

An essential feature of the therapy is focus on the individual, her or his needs, and the growing interaction between 'patient' and 'therapist'. Emphasis is placed on the creation of an interactive environment for caring, in which the individual is given control. There are certain fundamental requirements crucial to our emotional and psychological well-being (Griffin & Tyrell, 1999):

- To feel a measure of control over our lives
- To give and receive attention
- To have a sense of community

The first two points are central to the objectives of VAST. There is some observational and anecdotal evidence to suggest that following therapy sessions, some residents are more inclined to socialise and become more involved with the community of the home environment.

The power and effectiveness of sound and music in enabling people to come to terms with, sometimes even overcome, disabilities has been noted by many authors (Boyce-Tillman, 2000, Critchley & Hensen, 1977, Goddard, 1996, Hamel, 1967, Innes & Hatfield, 2001, McClellan, 1991, Sacks, 1973, 1986, Springer & Deutsch, 1998, Storr, 1992, Wigram, Saperston, & West, 1995). Aspects from all these areas provide the grounding for this therapy which is essentially non-invasive. An emphasis is placed on the creation of a highly controlled environment in which individuals are able to autonomously develop a range of skills through aesthetic interaction with sound. The therapy brings together aspects of different worlds which are connected to music but without depending on traditional musical skills or thought processes. A broad view of music is taken, and we move away from particular ways of organising sound towards the view of sound itself as being the most important element. Therefore, although practitioners of VAST will need

to have 'open' ears, traditional musical skills such as the ability to read music notation or play an instrument are not prerequisites.

Background

Since 1992, I have been developing the techniques of VAST through a research and development project for children with severe learning difficulties (SLD), and profound and multiple learning difficulties (PMLD). This approach brings together aspects of sound (music), aesthetics, technology and creativity. (Ellis, 1994, 1995a&b, 1997, Ellis & van Leeuwen 2002).

Subsequently, the therapy was introduced to a home for the long-term care of the elderly for a 30 week-long pilot study. The results were such that a follow-up project, funded by the Linbury Trust, was established in three homes for the elderly, one a residential home, and the other two homes for the elderly mentally infirm (EMI). To date more than 35 people have been involved for periods from 20 weeks to more than three years.

Research Methods

1. Exploratory methods – grounded theory

As the research was carried out in the environment of day-care centres, homes for the long-term care of the elderly and for the elderly mentally infirm, aspects of ethnographic research methods were a natural choice and participant observation, case study and video analysis of behaviour were the main tools employed in a programme of grounded theory. The application of methods to analyse the efficiency of the therapy for specific conditions focused on discovery,

> 'a kind of research in which order is not very immediately attained, a messy, puzzling and intriguing kind of research in which the conclusions are not known before the investigations are carried out', (Richardson, 1996).

For the work with both handicapped children and the elderly, I devised a longitudinal video-based methodology called Layered Analysis (Ellis, 1996). In this methodology, every session of Sound Therapy is completely recorded. Subsequently, for each individual, significant moments are copied on to separate 'master tapes'. Periodically, every example of one aspect from a master tape, a particular arm movement for example, can be copied onto another tape – a 'layers tape' – and an extremely detailed chronological account of behaviour significant to an individual can be assembled for detailed scrutiny. For the purposes of reviews, 'summary tapes' can be assembled. These are limited to around 10 minutes in length and so draw perhaps on one example every three months. Rather in the manner of time-lapse photography where we can view a flower opening in a short space of time, so it is possible to see significant, and frequently very moving, behaviours developing over a period of weeks, months or years.

2. Methods for measuring the effectiveness of the therapy.

Three methods of data collection and evaluation are being used at present:

i). Observational analysis of the video tapes produced through Layered Analysis can reveal changes in behaviour and response, which in turn can indicate progression and development.

ii). A small group of EMI residents have been involved in a 10 week study using the Bradford Dementia Group Profiling Scales: Well-being and Ill Being (WAIBS), which form an on-going planning and dementia mapping approach for individuals in residential settings.

iii). Nurse Observation Scales together with a mood monitoring data collection are being used for settings in which the therapy is performed by staff of a home after completing a training period. This is complemented by observation records kept by the therapist, who is also a full-time activities manager within the home.

Further details appear in 'Results' below.

Technology

Three items of (music) technology are central to this therapy, and they help define the activities of the three divisions of sound therapy sessions:

1. Interactive Communication Skills.

Sound processor and microphone to (re)develop and/or improve:

- vocal inflection (expression);
- enunciation; range of phonemes (vowels, consonants, etc.);
- expressive use of voice;
- listening skills.

A basic sound processor with microphone is used to create (mainly) three basic effects: long reverberation as in a large cathedral or cave; multiple echo patterns from a single sound; creating 'chords' from a single vocal sound. These effects often encourage vocal activity, responsiveness and active listening, including people who have lost speech through stroke. This part of the therapy gives emphasis to vocal interaction, with eye-contact and responsiveness being a focus, encouraging use of the voice and the development of enunciation and expression. The focus given here is on expressive communication through changes in pitch, volume and vocal timbre - non-verbal communication.

2. Independent physical movement and control.

The Soundbeam (www.soundbeam.co.uk) is a device which converts physical movement into sound. It emits an invisible ultrasonic beam. By moving a leg, arm or hand, for example, in this beam, the movement directly generates and gives expressive control over sound. The created sounds are produced digitally and so can range from traditional musical instrument sounds (flute, trombone, piano etc.) to environmental sounds, or any electronically synthesized sound. Accordingly, it is possible to have sounds available which each individual responds to. Using the Soundbeam can:

- help (re)develop physical control;
- extend/re-energise listening range (quiet/loud; high/low);
- awaken curiosity through exploration;
- enable self-expression.

All the sounds created in these first two parts of the therapy are heard via loudspeaker and/or headphones and additionally felt as vibration via a Soundchair, which provides an extra stimulus, reinforcing cause and effect (Skille & Wigram, 1995).

3. Relaxation.

The Soundchair has three acoustic areas designed to transmit the vibration of sound to the thorax, abdomen and legs. It is used in this final part of a therapy session to promote a general feeling of physical and mental well-being, and to provide a possible trigger for recollection and reminiscence.

Playing specially recorded tapes which combine gentle classical, 'relaxing', or 'content-free' music with low frequency sine tones can induce deep relaxation. This in turn can help ameliorate anxiety, stress and depression, as well as muscular aches and pains (Wigram, & Dileo, 1997). Much research has been undertaken concerning vibroacoustic techniques, (Skille, 1991, Williams, 1997). I have adopted a slightly different approach to others in the production of tapes used in the therapy, mixing sine tones of between 20 – 75Hz with the music, but allowing the music to determine the pitch of the sine tone as well as the timing of its pulsing.

Client Group

Every resident involved in VAST is treated individually, and responses to a similar stimulus can vary enormously between people. Accordingly it is not possible to say that stimulus X will inevitably result in response Y. Some residents use the microphone with enthusiasm and to significant effect whilst others may reject this aspect of the therapy. However, the Soundchair with the vibroacoustic music tapes seems to be most effective, and this part of the session is looked forward to almost without exception.

The conditions which have been encountered during the project to date include:

- Disaffection
- Anxiety
- Paranoia
- Depression — *Mild*, *Severe*
- Terminal Cancer
- nCJD
- Senility
- Dementia
- Alzheimer's
- Stroke — *Loss of speech*, *Loss of movement*, *Cognitive impairment*

Case Studies

The following descriptions are indicators of the kind of responses and effects which have been noted over a period of months, during which the residents experienced weekly VAST sessions of between 20 – 40 minutes duration.

E, aged 82, had been in a residential home for the long-term care of the elderly for a few years following a mild stroke. Her speech was not impaired, but the left side of her body was weakened and she would not use her left arm. I understood her to be very disaffected with her life in the home, and she was described as somewhat depressed and generally uncooperative.

This study lasted 30 weeks. It reveals a developing change in behaviour, interaction, receptiveness and smiling, positive responses. There are moments of fun, delight and energetic interchange with the microphone. When using the Soundbeam we see an increasing ability to interact expressively with sound, and the spontaneous and increasingly frequent use of her left arm which, prior to the therapy, had been rarely used. The final part of each session, during which she would listen to the relaxation music tapes, reveals a lady fully involved in listening and often being deeply moved. During the 30 weeks she received VAST, her behaviour in the home gradually changed and she became a member of a small group, with a more positive and out-going demeanour than at the start of the sessions.

Located in a home for the long-term care of the Elderly Mentally Infirm, **N** had been in care for some years and was 57 at the start of this study. Prior to living in the home he was leading a normal and healthy life, but he suddenly started to become forgetful. Deterioration was rapid and within a few months he needed institutional caring, having lost the ability of physical control and

apparent cognition. He had lost most, if not all, self-help skills and was unable to walk. The diagnosis was either Alzheimer's or vCJD, but this is not confirmed.

N experienced Sound Therapy initially for a six month period. He had cerebral irritation which made him fidgety. He could not sit still and was constantly pulling at himself, never being 'at rest'. During this time, the therapist found that he liked a 'droning' sensation produced using the Soundbeam, with some occasional positive responses (vocal, verbal and facially expressive indicators) to his experiences in the therapy.

After six months, there was a gap in the therapy, and it was during this that N suddenly started to walk again. Both his wife and staff at the home feel there was a direct link with the Sound Therapy and this change in behaviour. He has subsequently been receiving the therapy for the past ten months and now he is walking independently around the home and is able to feed himself. According to the therapist he will frequently be somewhat agitated and non-communicative before a session. During sessions he is very responsive to the relaxation tapes. For example, the therapist often records that having put headphones on him he will gradually relax, often smile at her, and become totally still for the next 30 – 40 minutes. On return to the lounge he can often be talkative and smile. His facial expression is often very positive.

The following brief summaries are of residents in a home for elderly mentally infirm (EMI) and extend over a nine-month period.

S was 65 years of age and had dementia of the Alzheimer's type (DAT) for the previous five years. When the project started, he was withdrawn, non-responsive, completely 'locked away' – a shadow of his former self. His normal posture was to keep his head tucked into his chest, and he was only ambulant with support.

After two months, S was beginning to give brief, clear responses into the microphone and occasionally sitting up with his head raised; eye contact was made and smiles exchanged. From then on it has been recorded that S has initiated touch, responded to his name, replied positively to the open enquiries at the end of the sessions, and also, equally importantly, made it quite clear when he *hasn't* enjoyed something.

The transformation in his condition is significant. He is now independently mobile, 'chatty' at times and regularly engages eye contact and is quite upright in posture. The nature of the sessions has altered over time and he is now more restless. Consequently, passive listening is considered to be the most appropriate approach to encourage him to remain seated to experience the benefits of sound and vibration.

Some of the change can be assigned to medication. However discussions with the Matron of the home have led to the view that Sound Therapy has promoted feelings of well being, which have had positive effects beyond the VAST sessions themselves.

M was 75 years old at the start of therapy sessions. She had dementia and little coherent speech, although she did make murmuring sounds. She was independently mobile, wandering about for much of the day.

Over the course of some months, M demonstrated quite clearly her occasional uneasiness both with the microphone and Soundbeam. Because of this the sessions were limited to listening to the relaxation tapes. M gradually moved away from a seemingly protective pose (arms to chest) to one of relaxation. Her face, which had been frequently 'busy' with various expressions, often became still and restful, and she tended to fall silent once the music started.

E was 81 years of age, and had experienced several strokes which affected her speech, comprehension and physical strength. When she first came to the sessions, she would respond predominantly by blowing into the microphone, and occasionally would copy sounds. This developed into E initiating song, continuing conversations, and imitating quite complex musical phrases. It appeared that what speech she did have was becoming clearer and without doubt her self-confidence increased.

Although there was no independent playing of the beam, nevertheless it has inspired her to burst into song (and in tune with the Soundbeam tones) and also provoked laughter.

A was 96 years old, and had low mood and depression. She was mobile with a Zimmer frame, quite hard of hearing and maintained as much independence as possible. It is quite extraordinary to see the transformation in her during the sessions. There were numerous episodes of infectious laughter, smiles and real appreciation of the music – both from the beam and the pre-recorded music. These sessions also caused her to reminisce - the remembrance of family and the war being very precious to her - and she obviously enjoyed the opportunity to speak about them. Many residents with a variety of conditions have reacted in a similar way following, or during, listening to the music tapes, often talking about family and experiences from their past.

D was 76 years old, with manic depression and independent mobility. She had short-term memory and obviously experienced extreme highs and lows. Her mood affected her decision whether or not to come to the sessions. She would frequently talk obsessively and until recently it would appear that she was paying little attention to the sound or music, and had no interest in playing the beam at all. However, she really enjoyed singing with the microphone.

Towards the end of her programme of VAST she demonstrated enjoyment of both the music tapes and the vibration. She has been eager to attend the sessions, and most recently has sat quietly, albeit fidgeting, for several minutes. She frequently made positive comments about her feelings at the end of the sessions.

M was 80 years of age with dementia and very little in terms of quality of life – limited sight, quite deaf, totally dependent, with swallowing difficulties, being physically 'rigid' and often awkward with the staff.

It was established quite early on that M would only benefit from the effects of the relaxation tape and vibroacoustic chair, and so this was his experience each week. Anecdotal evidence suggested that on occasions his lunch time meal was more easily accepted, and that he became relatively more alert and amenable following VAST.

Results

After therapy sessions, all involved would often seem happier and would smile more, with greater awareness of other people. This affect could last overnight and sometimes for some days. When talking with residents at the conclusion of therapy sessions they would often make positive comments, saying that they felt better, happier, generally more comfortable, and that physical aches and pains were reduced.

Careful observation of the video recordings of individual's VAST experiences extending over several months, and in some cases in excess of two years, indicates improvement in:

- mood
- level of distress
- level of depression
- level of aggression
- level of anxiety
- level of relaxation

and also has been seen to:

- encourage eye-to-eye contact;
- develop vocal communication, both verbal and through inflection;
- improve hearing ability, sometimes beyond the immediate Sound Therapy environment;
- develop listening skills;
- encourage and develop physical movement;
- provide opportunities for individual exploration and control;
- enable deep relaxation and pleasure;
- provide opportunities for cathartic recollection and happy reminiscence;
- promote a general feeling of physical and mental well-being;
- re-energise and motivate;
- develop positive self-esteem;
- produce smiles, happiness, and a positive outlook which can permeate other aspects of experience.

It is possible to mark progression over time. From the tapes produced through Layered Analysis, there are often gradual changes in behaviour and response revealed, and there may be a change from *dependency*, to becoming *responsive*, leading to a more *independent* form of behaviour

where the resident takes some control and initiates activity. We can trace changes over time illustrating this gradual process:

Progression Observed

Dependent	Responsive	Independent
isolated	aware	contributing
indifferent	reactive	expressive
frowning	smiling	laughing
crying	laughing	expressing
silent	content	receptive
withdrawn	thoughtful	communicative
inward	poised	interactive

These data are of course qualitative. By contrast, a recent short study of five residents over the final ten weeks of a series of VAST sessions was conducted by Stephen Dennet of ATH Consultancy Ltd. This study was based on the Well and Ill Being Scales (WAIBS) devised by the Bradford Dementia Group. It was a very small-scale project, partly designed to see whether this data collection methodology would further validate the therapy, and consequently the results can only be seen as indicative, although they certainly support the evidence from video analysis and day-to-day observation.

Table 1: Summarized WAIBS well-and ill being scores for five participants (average age 82) over 10 weeks in which VAST was provided.

Stage ONE (Sessions Running)
Well-being Scores Summary Table

	Participant Number	Period 1 Mon	Period 2 Wed Pre	Period 3 Wed Po	Period 4 Wed En	Period 5 Frid
	1	51	59	64	38	68
	2	30	53	81	82	69
	3	21	15	25	26	27
	4	29	38	71	72	66
	5	17	24	68	72	59
Total		**148**	**189**	**309**	**290**	**289**

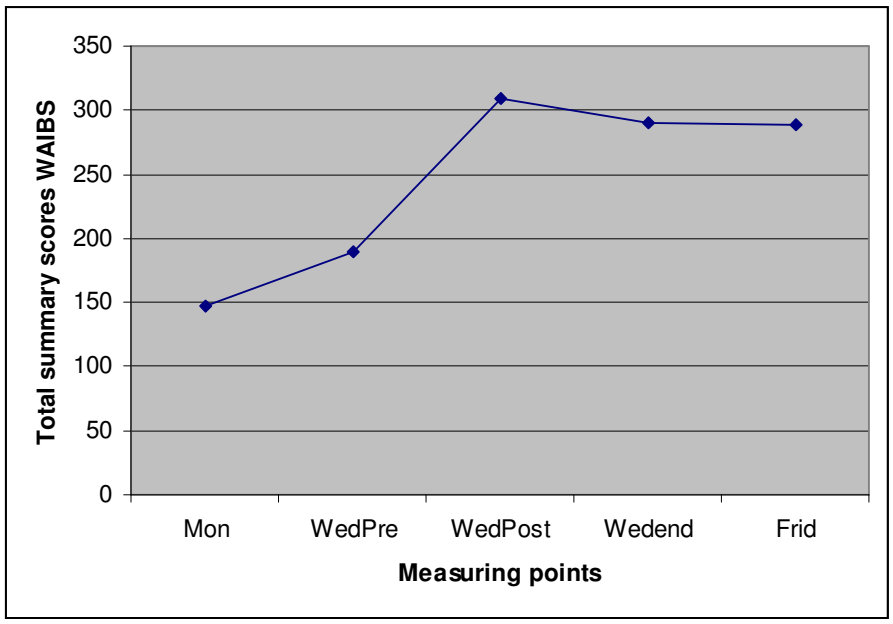

Figure1: Total of summarized well- and ill being scores for five participants (average age 82) over 10 weeks in which sound therapy was provided.

From this we can see that there was an overall increase in well-being in the hour after the sessions for all participants. There was also an unexpected indication of expectation. A reading of the total scores over the ten weeks reveals that this positive change effect remained high and only dropped off over the following days.

Further Research

From the research activity since 2000, it is clear that there are benefits resulting from a programme of VAST for elderly people with a variety of conditions. A new two-year project – iMUSE – (Interactive Multi-Sensory Environments for the Elderly) has just commenced, supported again with funds from the Linbury Trust. The target group will present a range of conditions which may include anxiety, depression, general ageing, senility, stroke, and Parkinson's Disease. Through expanding the range and scope of VAST, we aim to provide a stimulating, multi-sensory environment, so enabling greater self-expression and communication on the one hand, and also the possibility for a more receptive response to the relaxation aspect of the therapy.

1. We now have the possibility of broadening the available sound palette, so allowing for a more personal, customised, aural experience for the individual. This will be achieved by using a computer controlled sound sampler and synthesizer. It will be possible to customise sound

patches for individual users and the results of the new and vastly expanded sound palette will be compared to the rather limited range of sounds used to date.

2. Software packages which produce visuals from sound input are being explored and compared. Different ways of generating visual results from audio inputs are also being investigated. This may involve the mapping of aspects of sound (pitch, volume, timbre) onto aspects of visual stimuli (colour, density, size/shape). The effects of different mappings will be carefully monitored.

3. The addition of visual stimuli to the existing therapy may well increase motivation, physical activity and personal expression and communication. By having a computer as central controller, we aim to create an easy-to-use facility. This will further enhance the fundamental nature of VAST – the empowerment of the individual through independent and autonomous expressive interaction within an interactive environment.

4. Additional research methodologies are to be developed for monitoring and evaluating, and these will be trialled and compared with current practice.

This new project will have the potential to reach beyond the elderly client group. The prototype iMUSE environment suggests that it will have a significant beneficial affect for children with a variety of special needs, and trials of iMUSE in a number of special schools will be an added source of information. At the conclusion of the project we aim to have a system which can be of use in this domain as well as with the elderly.

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The role of rhythm and pitch in an adult cochlear implant user's musical listening skills

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Abstract

The purpose of this paper is to outline and expand upon results specifically related to rhythm and pitch from a case study of a postlingually deafened adult cochlear implant recipient, "C." The listening strategies and experiences of musical enjoyment will also be described. Training procedures were comprised of three parts. Part I involved formal meetings during which musical concepts and listening activities were introduced. Part II, a listening component, was comprised of melodies composed to reinforce the music and speech elements introduced. Part III was comprised of a description of C's daily listening experiences maintained in an audiolog. Data were gathered from baseline testing, pretest-posttest scores; rehabilitative training sessions; instructional cycle assessments; and audiolog entries. The results of the pretest-posttest revealed no substantial improvement in C's musical listening skills, however session transcripts and Level assessments revealed that she was able to perceive the elements of rhythm and pitch, as well as listening strategies she employed. Additionally, audiolog entries revealed C's ability to experience musical enjoyment. Findings from this study, in addition to the materials developed, may be used as a rehabilitative starting point for the development of music listening methods, and materials for school music classrooms and therapy programs.

Keywords: cochlear implant, hearing loss, rehabilitation, perception, listening

Background

The sense of hearing plays a critical role in the way we perceive our world. Affected are our interactions with individuals close to us, daily routines, and our ability to distinguish the myriad of incoming sound stimuli which enhance our quality of life. Individuals diagnosed with a hearing loss later in life, are often traumatized by the sudden changes to their world - alterations which subsequently affect their social and emotional faculties, and vocational placement. The cochlear implant, a biomedical electronic device, is designed to aid in the auditory rehabilitation of children and adults diagnosed with severe or profound hearing losses who are unable to hear and/or comprehend speech with conventional hearing aids (Beiter & Brimacombe 1993, 417). Cochlear implants convert sound into electrical currents which directly stimulate remaining auditory nerve fibers (Dorman 1998, 5). All cochlear implant devices are composed of an implanted internal component, an external microphone, and a speech processor. The internal component is placed behind the ear, underneath the skin. A microphone and a radio-frequency

transmitter comprise a headpiece worn externally behind the ear. The microphone collects acoustical signals from the environment and the radio-frequency transmitter sends the signals through the implant system. The acoustical signals gathered by the microphone are then electrically transduced and travel by cable to the speech processor for analysis. The resulting electrical output travels back by cable to the transmitter which, in turn, sends the signals through the skin via radio-type waves to the receiver and subsequently to the electrodes implanted within or in proximity to the cochlea. The concentration of electrical currents at the electrode site results in the direct stimulation of the remaining neural fibers within the cochlea. The ensuing electrical discharge of the auditory neurons advances through the central auditory system to the auditory cortex and is interpreted as meaningful sound (Dorman 1998, 6).

Research Involving Cochlear Implants and Music Perception

Research focusing upon the musical perception and enjoyment of cochlear implant users has revealed that the transmission of certain musical features varies with the device. For example, the studies of Gfeller and Lansing, (1991, 1992) and Pijl, (1997) have revealed that implant users are more successful with the rhythmic aspects of music and substantially less accurate than normal hearing adults in tasks involving the perception of simple melodic patterns. However, Dorman, Basham, McCandless, and Dove (1991) found that pitch perception varies considerably from one recipient to another in tasks involving melody and instrument recognition as well those involving the differences between ascending and descending patterns. Gfeller, Woodworth, Witt, and Knutson (1997) found, while investigating adult implant recipients' rhythmic perception, that implanted individuals are less accurate than normal hearing adults on temporal perception tasks but do demonstrate better discrimination skills when simple rhythmic patterns are presented at a moderate tempo. Gfeller, Christ, Knutson, Witt, Murray, and Tyler (2000), examined the length of profound hearing loss, age, pre- and post implant listening habits, and the sound processing strategies employed by cochlear implant users as possible influences upon the perception of musical elements and musical enjoyment. They concluded that musical enjoyment varied for each cochlear implant user and discovered intraindividual differences resulting from factors such as listening situation, the use of quality sound equipment, as well as structural features of music including interval size and clear rhythmic patterns.

Purpose

Variations in the quality and accessibility of musical elements to cochlear implant users as well as the need for the formulation of procedures and materials to aid in the development of their musical listening skills have been revealed in limited formal studies. Furthermore, the interests in the rehabilitation of musical listening skills and the need for training materials and strategies have also been reinforced in the numerous anecdotal accounts of adult cochlear implant users (Fox, 2000; Gfeller et al., 1996, 1998). The purpose of this paper is to outline and expand upon results specifically related to rhythm and pitch from a case study of a postlingually deafened adult cochlear implant recipient (Schraer-Joiner, 2003). The listening strategies employed by the subject in addition to experiences of musical enjoyment will also be described.

Methods

The Subject

The subject for the study, C, a 54 year old postlingually deafened woman, was implanted with the CLARION® S-Series Multi-Strategy cochlear implant (Advanced Bionics Corporation) in her weaker left ear. According to C, her hearing loss was the result of a gradual deterioration of the hair cells of her inner ear. She was unclear as to the cause of this deterioration or the age at which the onset of her hearing loss occurred.

C's childhood memories are comprised of the musical experiences she shared with her family. Her parents were both musicians and C took music lessons as a child. Her musical listening interests included big band, classical, and church hymns. C's musical tastes expanded between the ages of 15 and 16 years to include Smoky Robinson and groups such as The Beatles. Her musical memories fade during the 1970s, a change she attributes to musical taste rather than hearing loss. C was a senior in high school when she realized that others were hearing sounds that she was not. However, she expressed the belief that, although slight, her hearing loss was present throughout childhood. C remembers, for example, missing verbal instructions for class assignments while in middle school, specifically at the age of 12.

During her first professional audiometric evaluation, C, at the age of 24, was diagnosed with a mild loss. At that time, she was informed by her audiologist that the condition would not progress. Over the next 25 years, however, her hearing loss deteriorated substantially. In 1996, at the age of 49 years, C was diagnosed with a profound loss in her left ear and a severe to profound loss in her right ear. As C's hearing loss progressed, her audiologist encouraged her to consider the cochlear implant. C stated of this time period that "it took every fiber and tactile sense" to comprehend her surroundings. She stated also that it took a year to make the "agonizing decision" to have the surgery and an additional six months to schedule the procedure. C was implanted on July 13, 1998 in her weaker left ear.

Training Model Development

Stainsby, McDermott, McKay, and Clark (1997) found that among individuals receiving cochlear implants music appreciation is the second most commonly expressed desire after the achievement of speech perception. However, due to the limited numbers of cochlear implant user music training models and materials, those involving hard of hearing and deaf children were studied for the current research. Darrow (1989), for example, suggested Sander's (1977) hierarchy of auditory processing as a means for developing sequential musical listening objectives for all children regardless of hearing acuity status. Hagedorn (1992) also acknowledged the similarities between the components of speech and music, suggesting that Sander's hierarchy is congruent with musical listening expectations. Hagedorn stated that although the hierarchy was designed for the development of speech discrimination, there may be

important implications for music education, hence meriting the need for further study in this area. The approaches of Boothroyd (1986) and Erber (1982) were also reviewed.
A model developed by Erber (1982) and later adapted by Estabrooks (1994, 1998) titled *Learning to Listen with a Cochlear Implant: A Model for Children*, emphasizing the development of spoken language through listening and recommended for children with cochlear implants served as the speech and language framework for the current study (Estabrooks 2000, 231). The *Performance Standards for Music* of the National Standards (Lehman, Asmus, Boyle, Colwell, & Shuler, 1996) with emphasis placed upon the elements of rhythm and pitch, category of Listening/Describing grades Kindergarten - grade 4, served as a foundation for the music lessons developed (Lehman, Asmus, Boyle, Colwell, & Shuler, 1996). These materials were deemed suitable for providing C with a rhythmic and melodic (pitch) foundation, a decision-based primarily upon her musical experiences pre- and postimplantation. The *Performance Standards for Music* were selected instead of a general music basal textbook series as the standards have "rapidly become accepted as the basis for most state and local music standards and frameworks," subsequently "providing a common foundation for music curricula throughout the nation" (Lehman et al. 1996, 1).

Procedures

Baseline Testing Materials

Baseline testing was administered to establish a pretreatment understanding of the auditory stimuli perceptible to C and to provide a foundation for the listening materials developed. Included were the *Minimum Speech Test Battery for Adult Cochlear Implant Users* (Nilsson, McCaw, & Soli, 1996) comprised of the *Consonant/Nucleus/Consonant* (*CNC*) *Test* (Peterson & Lehiste, 1962) and the *Hearing in Noise Test (HINT*) (Nilsson, Soli, & Sullivan, 1994). Baseline testing measures also included the *Test of Auditory Perceptual Skills-Upper Level* (*TAPS-UL*) (Gardner, 1996); Audiometric Testing; *Duration Pattern Sequence tests (DPS)* (Musiek, Baran, & Pinheiro, 1990); *Pitch Pattern Sequence tests (PPS)* (Pinheiro, 1979); and the *Primary Measures of Music Audiation* (*PMMA*) (Gordon, 1979).
Rehabilitative Training

Rehabilitative training was comprised of three parts. Part I, involved formal meetings of C and the researcher at C's home during which musical concepts, materials, and listening activities were introduced. These biweekly sessions emphasized four training levels based upon the four levels of auditory development specifically detection, discrimination, identification, comprehension. Each level was followed by an assessment to ascertain C's success with the elements introduced, to determine areas in need of further reinforcement, and C's readiness for the subsequent level. This paper will focus primarily upon Levels 1 (detection) and 2 (discrimination) of training as the initial activities introduced required that C first concentrate upon rhythm and pitch individually.

Part II was comprised of an additional musical listening component, specifically companion compact discs consisting of melodies composed to reinforce the music (elements of pitch and

rhythm) and speech elements introduced in each instructional cycle (Part I) of rehabilitative treatment. C was instructed to listen to these melodies daily particularly on the days when she and the researcher did not meet.

Part III of rehabilitative treatment was comprised of audiotaped accounts of C's daily listening experiences which she maintained in an audiolog format. C was instructed to provide narrative description of the important auditory events she experienced in listening environments such as her home, church, shopping centers, and car radio (Cranton, 1989; Dean, 1994; Knowles, 1951; Knowles, 1978). She was asked to document melody recognition, especially those emphasizing pitch or rhythmic patterns focused upon during her rehabilitative treatment. An overview of the testing and training procedures described in the current chapter is presented in Table 1.

Table 1:

Overview of Testing/Treatment Structure

Components of Testing and Training	Description	Level	Elements
Baseline Testing	Baseline for comparisons	----	Speech testing; pure tone testing; pitch and rhythm sequence; auditory perceptual skills
Pretest	Representative of all levels of training	1-4	Pitch, Rhythm, Dynamics, Meter, Tempo
Part I: Formal training	Detection	1	Pitch, Rhythm
Part I: Formal training	Discrimination	2	Pitch, Rhythm
Part I: Formal training	Identification	3	Pitch, Rhythm, Dynamics, Meter, Tempo
Part I: Formal training	Identification and Comprehension	4	Pitch, Rhythm, Dynamics, Meter, Tempo

Table 1 continues on next page

Table 1, continued:

Overview of Testing/Treatment Structure

Components of Testing and Training	Description	Level	Elements
Part II: Companion CD's	Melodies composed to reinforce elements of each level	1-4	Pitch, Rhythm, Dynamics, Meter, Tempo
Part III: Audiolog	Log of C's every day listening experiences	1-4	----------
Posttest	Pretest re-administered	1-4	Pitch, Rhythm, Dynamics, Meter, Tempo

Results

Data for this study were gathered from baseline testing, administered prior to the pretest as a means of establishing foundations for comparisons. Data were also gathered from pretest-posttest scores, rehabilitative training session transcripts (a written account of rehabilitative sessions by the researcher), instructional cycle assessments, and audiolog entries.

The Role of Rhythm and Pitch in C's Musical Listening Experiences

Although the results of the pretest-posttest revealed no substantial improvement in C's musical listening skills, a review of rehabilitative training session transcripts, Level assessments, and audiologs revealed that C was able to perceive the elements of pitch and rhythm in activities emphasizing each music element independently, as well as in activities combining both. See Table 2 for C's pretest and posttest scores.

Table 2
C's Pretest and Posttest Scores

	Part I Detection Pre /Post	Part II Discrimination Pre /Post	Part III Identification Pre /Post	Part IV Comprehension Pre /Post
Subtest 1 (Trial 1)	10/10	10/8	4/4	2/2
Subtest 2 (Trial 2)	9/10	10/10	4/5	1/3
Subtest 3 (Trial 3)	10/9	10/9	3/4	2/2
Subtest 4 (Trial 4)	9/10	10/10	4/3	3/2
Total	38/39	40/37	15/16	8/9

Note. Part I of the pretest/posttest was comprised of a maximum of 40 points; Part II, 40 points; Part III, 20 points; and Part IV, 12 points.

Instructional Cycle 1, Level 1

Results of Level 1 rhythm assessments revealed strengths in the detection of shorter note values; the detection of repeated rhythmic patterns; specific rhythmic patterns; target patterns shorter, longer, or the same as the given comparison patterns; as well as items requiring C to choose either the shortest or longest note value of a given series. Although C did well on activities involving the detection of notes of shorter duration, she, on two separate occasions, indicated that shorter durations were in fact more difficult for her to discern. See Table 3 for C's Instructional Cycle 1, Level 1 Rhythm, Pitch, and Rhythm/Pitch Assessments.

Table 3
C's Instructional Cycle 1, Level 1 Rhythm, Pitch, and Rhythm/Pitch Assessments

Element	**Activity**	**Score/Maximum Score**
Rhythm	detection of short note values	3/3
Rhythm	detection of longer note values	2/3
Rhythm	detection of repeated rhythmic patterns	3/3
Rhythm	detection of specific rhythmic patterns	3/3
Rhythm	is the target shorter, longer, or same as comparison patterns	3/3
Rhythm	detection of the shortest or longest note value in a given item	3/3
Pitch	detection of high-low pitch patterns	3/3
Pitch	detection of low-high pitch patterns	1/3
Pitch	detection of low-high-high pitch patterns	3/3
Pitch	detection of high-low-low pitch patterns	3/3
Pitch	detection of low-high-low pitch patterns	3/3
Pitch	detection of high-low-high pitch patterns	3/3
Rhythm and pitch	detection of high-low patterns of longer duration	3/3
Rhythm and pitch	detection of high-low patterns of shorter duration	3/3
Rhythm and pitch	detection of low-high patterns of longer duration	3/3
Rhythm and pitch	detection of low-high patterns of shorter duration	3/3
Rhythm and pitch	detection of repeated notes of longer duration	3/3
Rhythm and pitch	detection of repeated notes of shorter duration	3/3

Results of the Level 1 pitch assessments revealed strengths in the detection of high-low pitch patterns, the detection of low-high-high, high-low-low, low-high-low, and high-low-high pitch patterns as shown in Table 3. A weakness was revealed on items involving the detection of low-high pitch patterns, as C answered only one of the three items correctly. C's scores on the items involving combined elements of rhythm and pitch specifically high-low patterns of longer or shorter duration, low-high patterns of longer or shorter duration, and repeated notes of longer of shorter duration, revealed no weaknesses, as C answered only one of the three items correctly.

Although C was able to determine the target matches on the rhythm assessment items, her additional verbal descriptions indicated that she had difficulty distinguishing between note values closer in length such as quarter notes and half notes or dotted half notes and whole notes. Such inconsistencies were also noted during Level 1 activities, as well. As a result, the researcher determined that such differences would be closely observed in Level 2 in order to further develop, refine, and maintain her rhythm skills and subsequently her general musical listening skills. C's pitch assessment scores were also high, with the exception of low-high pitch patterns. However, due to some of the inconsistencies noted during Level 1 activities, as well as C's requests for an in depth focus on pitch, the patterns introduced in Level 1 were reviewed and new pitch patterns were introduced during Level 2 activities. Combined elements were also reviewed as a means of maintaining those skills and modifications made to incorporate the newer rhythm and pitch patterns introduced in Level 2.

Musical Enjoyment Documented During Instructional Cycle 1, Level 1

C's Level 1 audiolog entries also revealed that she was experiencing musical enjoyment with the Clarion® implant. The following entry which described her experience was significant not as a result of the musical elements involved, although she did indicate that she perceived harmony parts, but because of her excitement and appreciation of music she perceived.

An entry logged during week 4 of training (Tuesday, September 3, 2002, 8:15 p.m.) was comprised of listening experiences C had while watching a television program titled "The Billy Graham Crusade." Her specific experiences centered on a group, The Bill Gaither Quartet, performing the *Star Spangled Banner.* Although C indicated that she perceived harmony, she stated: "It wasn't so much what they sang, which was the *Star Spangled Banner,* however, those men just ministered to my spirit. I mean they just touched my spirit in such a way that I had chill bumps. I mean major from the top of my head to the tip of my toes. Oh, it was just remarkable and amazing. I am just so grateful for that wonderful experience. That was truly an "ah-ha" experience."

Instructional Cycle 2, Level 2

Throughout Level 2, C, as a result of her requests for additional listening opportunities, was given a series of rhythm and pitch listening and discussion-based activities prior to the same/different activities. In some instances, the listening activities were presented in a comparison like fashion, subsequently providing C with the opportunity to describe how the patterns sounded to her. At other times, patterns were presented in order to broaden her experience base with certain interval and rhythm types. During session 18, C began to "test" herself on the listening activities by listening to and subsequently attempting to describe the specific pitch patterns presented. C explained to the researcher that she wanted to determine if the patterns she perceived were correct. For example, C was able to determine that one of the listening activities presented was a high-high-low pattern (G_5 to G_5 to G_4) comprised of an

octave. C was also able to detect and accurately label a low-medium-high, a high-medium-low, and high-low-medium patterns, as well as ascending and descending patterns, specifically. Level 2 assessments were developed with an emphasis placed primarily upon the combined elements of pitch and rhythm and individual pitch activities as a result of C's requests for such a focus. Results of the combined rhythm and pitch assessments, as shown in Table 4, revealed strengths in the discrimination of those items emphasizing whole notes and dotted half notes (pitch: A_4), dotted half notes and half notes (pitch range: F_4 to E_5), half notes and quarter notes (pitches: A_4 and F_5), dotted quarter notes and quarter notes (pitches: A_4, G_5), and repeated versus varied patterns (pitches A_4 , E_5). C correctly labeled only two of the items requiring her to discriminate between quarter notes and eighth notes (pitches A_4, C_5). For example, on item two (pattern one: A_4, quarter notes; pattern two, C_5, quarter notes) was labeled incorrectly with regard to pitch but correctly in terms of rhythm. C was also able to determine that both patterns were comprised of a quarter note and quarter rest. C also correctly labeled only two of the items requiring that she discriminate between eighth and sixteenth notes (pitches: A_4, C_6). For example, on item one (pattern one: A_4, eighth note; pattern two: A_4, sixteenth note), C incorrectly labeled both the rhythm and pitch.

Table 4
C's Instructional Cycle 2, Level 2 Rhythm/Pitch and Isolated Pitch Assessments

Element	**Activity**	**Score/Maximum Score**
Rhythm and pitch	discrimination of whole notes/ dotted half notes/ pitch: A_4	3/3
Rhythm and pitch	discrimination of quarter notes/ eighth notes/ pitches: A_4, C_5	2/3
Rhythm and pitch	discrimination of dotted half notes/ half notes/ pitches: F_4, A_4, E_5	3/3
Rhythm and pitch	discrimination of half notes/ quarter notes/ pitches: A_4, F_5	3/3
Rhythm and pitch	discrimination of dotted quarter notes/ quarter notes pitches: A_4, G_5	3/3
Rhythm and pitch	discrimination of eighth notes/ sixteenth notes/pitches: A_4, C_6	2/3

Table 4 continues on next page

Table 4
C's Instructional Cycle 2, Level 2 Rhythm/Pitch and Isolated Pitch Assessments (concluded)

Element	Activity	Score/Maximum Score
Rhythm and pitch	discrimination of repeated patterns/ varied patterns/ pitches: A_4, E_5	3/3
Pitch	discrimination of high-low-high patterns	2/3
Pitch	discrimination of low-high-low patterns	2/3
Pitch	discrimination of low-low-high patterns	3/3
Pitch	discrimination of high-high-low patterns	2/3
Pitch	discrimination of low-medium-high patterns	3/3
Pitch	discrimination of high-medium-low patterns	3/3
Pitch	discrimination of low-high-medium patterns	2/3
Pitch	discrimination of high-low-medium patterns	3/3
Pitch	discrimination of medium-low-high patterns	3/3
Pitch	discrimination of medium-high-low patterns	3/3
Pitch	discrimination of ascending patterns	2/3
Pitch	discrimination of descending patterns	3/3

Results of the individual pitch assessments revealed strengths in the discrimination of low-low-high, low-medium-high, high-medium-low, high-low-medium, medium-low-high, and medium-high-low, and descending patterns as C answered all items correctly as shown in Table 4. Although items involving the discrimination of high-low-high patterns, low-high-low, high-high-low, low-high-medium and ascending patterns were not as consistently answered by C, she was able to provide additional information regarding the pitches and rhythms comprising each item.

For example, C was able to recall and subsequently label the rhythmic patterns of high-low-high item 3, specifically a quarter note-quarter note-half note pattern. She was also able to determine that the highest notes in both patterns (pattern one: D_6 to F_5 to D_6; pattern two: D_6 to E_5 to D_6) were the same. Additional information was provided by C on item 1 of the low-high-medium patterns (pattern one: F_4 to F_6 to D_5; pattern two: F_4 to C_6 to D_5). C was able to specifically label the low-high-medium patterns, and also was able to determine that the distance between the lowest and highest pitches extended beyond an octave. Although C's assessment scores revealed no significant weaknesses in her performance on either the combined elements of rhythm and pitch or the isolated pitch skills as shown in Table 4, minor inconsistencies were revealed in combined element activities emphasizing the continued presence of discrimination problems between quarter notes and eighth notes, as well as eighth notes and sixteenth notes.

Musical Enjoyment Documented During Instructional Cycle 2, Level 2

Listening experiences logged during Level 2 of training also revealed C's abilities to experience musical enjoyment. One entry, which occurred between the 12th and 14th week of training, emphasized for C an emotional musical moment. C stated: "This was not so much a musical "ah-hah" moment as it was a music emotional moment as you [the researcher] and I have talked about several times in the past. So often, music stirs emotions and brings back memories like nothing else really can. Well, this was *My Girl* and it just gave me such a vivid mental picture of one special moment when I was in high school. As we have said before only music can do that so that was a really special time."

Listening Strategies Employed by C While Listening to Musical Activities

Session transcripts and level assessments, revealed some of the listening strategies C employed while engaged in musical listening activities. For example, during a Level 2 training session, C began to "test" herself on listening activities by attempting to describe the specific pitch patterns presented. C explained to the researcher that she wanted to determine if the patterns she perceived were correct. Additionally, Level 1 and Level 2 assessments revealed another listening strategy specifically that C most consistently provided answers by indicating a target match, first, followed by a description of subsequent measures in the order in which they were presented. In subsequent three and four measure activities emphasizing multiple elements, C often requested that each measure be presented individually in order to decrease the number of pitches upon which she was asked to focus at a single time.

Musical Listening Enjoyment

As a result of the extensive audiolog descriptions provided by C, her ability to perceive and subsequently enjoy music was documented. One entry logged during week 10 of training described C's ability to correctly identify a melody playing on the television in the family den

located two rooms away. C stated that she "heard and recognized" the theme song from the Andy Griffith's Show. C was able to identify the whistling and even described the scene from memory, specifically Andy and Opie walking to the fishing hole. C stated "that was really exciting for me."

The results of this study, in compliance with previous research, indicated that musical enjoyment does vary among individual implant users (Gfeller, Christ, Knutson, Witt, Murray, & Tyler, 2000). For example, C was able to experience musical enjoyment in a variety of environments including her home (radio, television); shopping centers, church services, and sporting events indicating that her aural environment was of less influence in her musical listening success than reported in previous research (Dorman, Basham, McCandless, & Dove, 1991; Fox, 2000; Gfeller, Christ, Knutson, Witt, Murray, & Tyler, 2000). C's musical experiences were often varied, sometimes spontaneous, as her perceptual awareness was aroused at unexpected times, for example, when not specifically seeking musical activities. The latter experiential phenomena, incidental musical awareness, and spontaneous musical enjoyment occurred primarily at the end of structured training period in the current study.

Conclusions

C's significant musical listening as a child and adolescent may have been an influential factor in her postimplantation musical listening success (Gfeller, Knutson, Woodworth, Witt, & Debus, 1998). C's ability to perceive rhythm was in compliance with previous studies indicating that sensory elements not exclusively associated with music, such as rhythm, are transmitted with a cochlear prosthesis (Gfeller & Lansing, 1991, 1992; Pijl, 1997).

The variation in C's ability to perceive pitch patterns verified compliance with previous research which indicated that pitch perception, specifically tasks emphasizing the differences between ascending and descending patterns, as well as melody and instrument recognition, varies for cochlear implant users (Dorman, Basham, McCandless, & Dove, 1991). The findings of the current study reinforce previous research findings indicating that cochlear implants are more effective in transmitting and subsequently facilitating the perception of rhythm in a musical context (Gfeller & Lansing, 1991, 1992).

The minor inconsistencies experienced by C may be attributed to the limitations imposed by the cochlear prosthesis. C's physical and psychological condition on a specific rehabilitative training day must also be considered as possible factors affecting her performance on musical listening activities. "Life space," according to Lewin, who applied Gestalt theory to individual and social behavior, includes every psychological fact that is influential in the life of an individual at a given time (Marrow, 1969). Therefore, inconsistencies in C's performance during pitch and rhythm-based activities, while partly a result of the need for further rehabilitative training, may also have been the result of positive or negative events in C's daily experience.

Music educators who teach children and adults with cochlear implants should not assume that musical enjoyment and the development of pitch and rhythm skills are impossible, rather that such skills will vary for each student. Increased aural demands with regard to the number of elements in focus should be monitored as this may influence the number of times the student needs to listen to the activity. Music educators should first consider introducing musical elements individually, combining them only when the student is comfortable and has exhibited success with individual music element activities.

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Music therapy enhances attention span and promotes language ability in young special needs children

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Abstract

Usually young special needs children have one or more disabilities which cause multiple learning difficulties, and often their language ability and attention span are compromised. Concentration is an important key for learning and language ability is a basic communication tool. Therefore, the main goal of the study was, through theory analysis and experimental teaching, to explore the possibility of using music therapy to enhance attention span and promote the language ability of young special needs children.

The methodology of the study used a multiple-baseline across individuals design model. Three 4-5 year-old subjects enrolled in a private kindergarten in Taichung, Taiwan, were selected by purposive sampling to participate. The duration, including the baseline, was 20 weeks in length with one hour instructional sessions once per week.

There was a quantitative analysis to measure validity based on assessment scales used in the observation forms by three observers. There was also a qualitative study using interviews with parents and classroom teachers. The results were the following:

1. Considering quantitative research, based on the comparison of pre- and post-test and observation forms, the scores for the attention span and language ability of young special needs children were clearly enhanced.
2. Considering qualitative research, based on the observation by parents and teachers, the attention span and language ability of young special needs children were improved.

Keywords: Music Therapy, Young Special Needs Children, Attention Span, Language Ability, Multiple-baseline Across Individuals

Introduction

Background

Research documents reveal that many children with special needs exhibit a high level of preference for music and show processing capabilities for musical stimuli that can support deficits in related non-music areas. As a result, music can be used as a motivator and alternate learning avenue for select skills that may be more difficult for the individual to achieve using typical non-music instructional approaches.

While special needs children manifest a wide range of developmental and socialization difficulties, it is clear from the literature and the researchers' own work that a pervasive dysfunction is the inability to

communicate effectively. There has been compelling evidence that the use of musical instrument play can be an effective means for enhancing the verbal communication development among a diverse population of special needs children.

Because singing and speech share many similarities, yet are accessed differently by the brain, music strategies can be used as a means for functional communication. Vocal imitation, initiation of verbal language, increasing length of verbal utterance, and learning of new vocabulary can be approached by embedding desired language responses into song lyrics, followed by fading of the music to spoken language.

Rhythmic structure also provides necessary timing cues to aid in speech intelligibility for certain individuals. Additionally, preferred songs and instruments can be used as motivational tools to elicit eye contact, cause/effect skills, choice-making, and following basic directions. Educational research also supports that our ability to learn and later use new concepts and information is best when we are motivated and the material presented is meaningful to us.

Motivation of the study

Through previous study and instruction, the researcher has observed the positive effects upon developmentally challenged children who have been given the opportunity to interact and experiment with musical instruments, both simple and complex. This group is in great need of encouragement and effective learning activities to help develop language abilities and proper pronunciation skills. Any educational activity that can supplement existing methods for communication development should be explored. The purpose of music in this context is to provide an initial assist and motivation to the individual's learning through music cueing, followed by fading of the music to aid in generalization.

Aims

The aim of this study was to implement and assess a program where musical instrument play could be a.) used to enhance young special needs children's attention span and facilitate verbal development and b.) used as a motivational tool and reward in activities with a special education class as well as throughout the school day. The specific research questions asked were:

1. Can the special needs children enhance their attention span by the music activities?
2. Can the special needs children be motivated to make sounds by the use of musical instruments?
3. Can the special needs children be motivated to say one word by the use of musical instruments?
4. Can the special needs children be motivated to engage in simple conversation by the use of musical instruments?

Link between attention span of special needs children and music

Music therapy procedures can effectively address a number of objectives in auditory training. For example, Robbins and Robbins (1980) found that music, as opposed to speech, is heard and assimilated more easily. Amir and Schuchman (1985) also supported the use of music in auditory training because it provided an added diverse and beneficial learning experience, helping to reinforce subjects' use of auditory functions. Furthermore, Darrow (1989) found that exposure to music and musical activities can

help to train individuals to attend to sounds and differences in sounds, recognize objects and events through hearing their sounds, and to listen to a sound to determine its distance and its location. Researchers such as Morton (1990) discovered that music listening helped to decrease distractibility and increase memory capacity and attention children engaged in cognitive tasks while Lee et al. (2005) found that musical storytelling helps to improve special needs children's attention span (Lee, et al., 2005). Yet another example was that of a music therapy program aimed at early intervention. The preschool children involved in the program demonstrated high rates of appropriate target behavior and a high level of success with language development, cognitive concepts, social and motor skills, and knowledge of music (Standley & Hughes, 1996).

Link between language learning of special needs children and music

As mnemonic devices, songs can act as a memory aid for new or difficult concepts (Chan, Ho, & Cheung, 1998). A song actually organizes information into smaller, repetitive packets that assist in comprehension and retention. Music can also help to establish a positive environment in which to teach people with an affinity for music who find themselves distracted in other instructional settings.

Children enjoy the fun of singing and after they can sing rhythmically, instructors can remove singing from the lesson (Kumin, 1994). Musical cueing can be used effectively in early intervention curricula to improve the identification of logos, recognition of words, prewriting skills and print concepts. Kindergarten students have been shown to have greater text accuracy through shared reading paired with singing, as opposed to spoken text rehearsal (Register, 2001; Standley & Hughes, 1997). Literacy skills have also been demonstrated to benefit from the use of music in the curriculum. Darrow (1989) described the manner in which vocal intonation and quality, speech intelligibility and fluency can be impacted through music therapy. Critical motivation and structure for participants can be provided through what is needed to sing a song: pitch, articulation, breathing processes and attention to rhythm and timing.

Music therapy was also found to be useful in developing rhythmic responsiveness and therefore the rhythm components of speech (Darrow, 1984). The importance of continuous therapist feedback has also been highlighted in the aforementioned research studies. A notational system was developed in a study to help hearing-impaired individuals match phonemes and words that were known or unfamiliar with correct structures of rhythm and inflection. As a result, speech prosody was improved, and there was a high level of generalization and a transfer of learning (Staum, 1987).

As discussed by Gfeller (1990), music therapy's wealth of movement and musical activities can be used together with, initially, spoken words, and then text. Motor and sensory experiences can benefit greatly from music materials and instruments. Music brings exposure across the spectrum of experience and involves multiple senses. As such, it is a critical tool for learning with symbols and mental representations ultimately being connected (Gfeller, 1990).

Language models can be provided via the labeling or description of musical events by a music therapy practitioner. The often lengthy and challenging language rehabilitation process can be enhanced when a music therapist designs activities that are engaging and fun. Several studies have discussed the benefits of integrating musical activities into language education (Darrow, 1989; Gfeller & Darrow, 1987). Motivation of subjects is noticeably improved. Also, the internalization of new words and their meaning can be helped by such multi-sensory learning experiences. Attentive and focused vocal and listening

opportunities are a major component of singing activities. Participating in the learning of songs can promote the practicing of a number of important functions for language development, such as pronunciation, auditory discrimination, and the differentiation and integration of the sounds of letters (Gfeller & Darrow, 1987). Vocabulary can also be developed and sentence structure, can be learned through songs.

Those involved in special education can benefit from musical activities' enhancement of some speech and verbal language skills. For preschool-aged children, whose verbal communication is limited, music can be useful to help prompt and reinforce verbal response. Furthermore, participation in music activities can lead to an increase in desired verbal communication for children with developmental disabilities who have an inclination towards music. Through music, autistic children can increase the inventory of hand gestures they are capable of imitating (Braithwaite & Sigafoos, 1998; Buday, 1995).

Many properties are shared by music and speech. For example, the perception of both requires distinguishing among different sounds and timbres, pitches, intensities, durations and how over time the sounds change. This helps the listener to develop the ability to attach meaning and interpret the sounds. The traditional compliment of techniques for auditory training can be enhanced through the alternative, pleasing tools of music therapy and music activities. The shared aspects of speech and music make this possible (Darrow, 1989).

Methodology

The main goal of the study is to enhance the learning experiences of young special needs children. According to Barlow, Haynes, and Nelson (1986), the multiple baseline is probably one of the best designs available for practitioners. It is relatively simple, withdrawal is not required**,** and applied opportunities for its use abound once systematic measures are being taken (Barlow, et al. 1986). Due to the number of differences among the individuals, a multiple-baseline across individuals design model was employed using both qualitative and quantitative methods to obtain the results.

Participants and setting

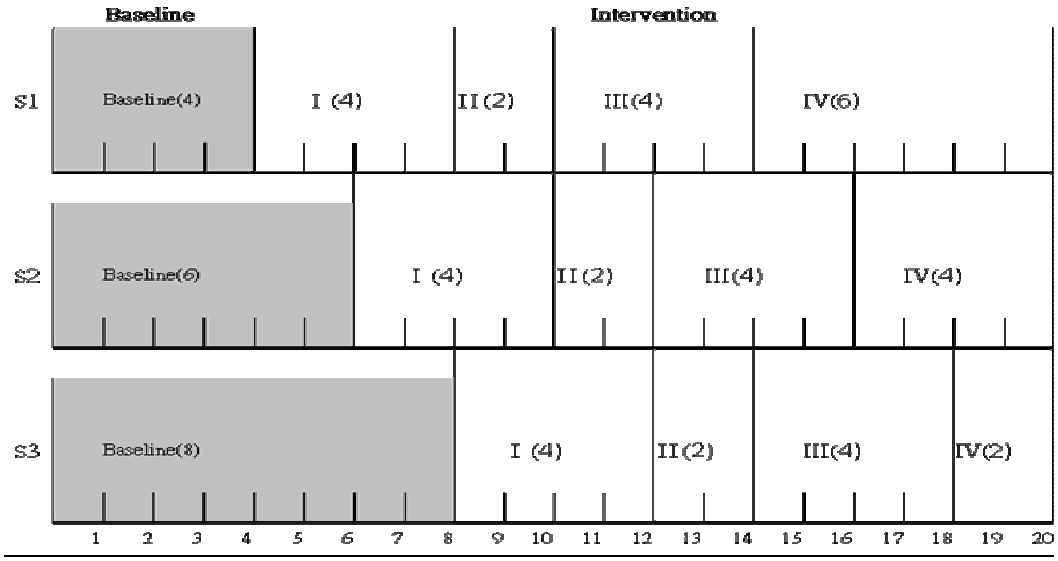
Three 4-5 year-old subjects enrolled in a private kindergarten in Taichung, Taiwan, were selected to take part in the experiment via purposive sampling. These students all had been clinically diagnosed with a range of developmental disabilities.

Duration

This was a 20-week study, with one hour sessions once per week of specific, study-focused music education lessons. The initial four weeks of the study were dedicated to baseline observation.

Research Design

A multiple baseline research design across participants was used in the research. All observations of participants undertaken during baseline and intervention phases were recorded on videotape.



- I (4): Intervention I of Attention Span (4 times)
- II (2): Intervention II of Making Sounds (2 times)
- III (4): Intervention III of Speaking one word (4 times)
- IV (6): Intervention IV of speaking simple sentences (6 times)

Baseline

In assessing the participants' initial behavior, the number of observations for each varied due to the research design. For Participant 1, there were four baseline observations, for Participant 2, six, for Participant 3, eight. Each observation session was 30 minutes in length. Hence, the total amount of observation time varied for each participant, ranging from 2 hours (Participant 1) to 4 hours (Participant 3). During baseline, participants were observed in their regular school-day group activities. The baseline observations concluded in each case when the observers were in agreement about the specific nature of each participant's behavioral and developmental challenges.

Intervention

Prior to the start of the formal curriculum, one free play musical instruments session was held in which each student was given the opportunity to choose unprompted musical instruments that they found attractive for whatever reason (Table 1). Their preferences were used during activities and throughout the program. Mandarin Chinese was used for curriculum materials as well as all target sounds and words.

Table 1. Participants' preferences for musical instruments.

Participant	Participant's Preference Instruments
5-year-old, male, autism along with developmental delay	Hand-bells
4.5 year-old, male, Down Syndrome along with developmental delay	Rattles
4-year-old, female, ADHD along with developmental delay	Drums

Experimental phase 1

The main goal of this stage was to attract children's learning attention by playing different instruments. Curriculum design, as shown in Table 2, included a "Hello Song", "Attendance Song", "Musical Storytelling", "Relaxation Time," and "Goodbye Song".

Table 2. Curriculum design of phase 1

Musical Activities	Instruments used	Target Objectives
Hello Song	Guitar	Hearing the sound of a guitar and becoming familiar with the song to develop children's concept that music class is starting, and focus attention on the instructor.
Attendance Song	Participant's preference instruments	By playing children's preference instruments, children will pay attention to the activity.
Musical Storytelling	Sound effect instruments	By playing different sound effect instruments, children will be more attentive in the class.
Relaxation Time	Recorded music by researcher	By listening to the recorded music, children will calm down after the class activities.
Goodbye Song	Guitar	Develop up children's concept that music class is ending.

Experimental phase 2

The main goal of this stage was to promote children's language ability, specifically in making sounds. Curriculum design, as shown in Table 3, included:

Table 3. Curriculum design of phase 2

Musical Activities	Instruments used	Target Objectives
Hello Song	Guitar	Children would be able to do the sound echo part of the song.
Attendance Song	Participant's preference instruments	By playing children's preference instruments, children would be able to echo sounds of instruments.
Sound Games	String instrument: Nan-Hu Blown instruments: recorder, slide-whistle, etc.	By playing the Nan-Hu, children would imitate, make nonsense sounds and different sounds. By playing the blown instruments, children could form more correct lip shapes
Relaxation Time	Singing soft sound song accompanied by guitar	By listening to the song, children would be able calm down after the class activities.
Goodbye Song	Guitar	Develop children's concept that the music class is coming to an end.

Experimental phase 3

The main goal of this stage was to promote children's language ability in speaking one word. Curriculum design as shown in Table 4 included:

Table 4. Curriculum design of phase 3

Musical Activities	Instruments used	Target Objectives
Hello Song	Guitar	Children would be able to echo one word
Attendance Song	Participant's preference Instruments	By playing children's preference instruments, children would be able to echo one sound related to the sound of the instruments.
Sound Games	String instrument: Nan-Hu	By playing the Nan-Hu, children could make nonsense sounds and imitate the instrument's sound.
Relaxation Time	Singing lullaby accompanied by guitar	By listening to the lullaby, children would calm down after the class activities.
Goodbye Song	Guitar	Children would be able to sing one word

Experimental phase 4: The main goal of this stage was to promote children's language ability, and be able to have a simple conversation. Curriculum design as shown in table 5 included:

Table 5. Curriculum design of phase 4

Musical Activities	Instruments used	Target Objectives
Hello Song	Guitar	Children would be able to sing a simple greeting sentence.
Attendance Song	Participant's preference instruments	Children respond to prompts by saying "Here I am" and playing their preference instruments.
Singing Activities, Movement & Musical Storytelling	Pitched & unpitched instruments, i.e. sound effect Instruments, castanets, bells, xylophone	By participating in different activities, children would be able to imitate and learn simple sentences.
Relaxation Time	Listening to recorded soft music	By listening to the recorded music, children would calm down after the class activities.
Goodbye Song	Guitar	Learning a simple greeting sentence, such as "See you next time, goodbye," etc.

Assessment

The assessment instruments included a pre and post-test, semi-structured observation forms implemented to gather data on attention span and language ability; and interview reports. All intervention sessions were recorded on video and reviewed and scored by three observers**.**

The pre-test and post-test were conducted by a pediatric physician at a local hospital. The observation session was conducted by three observers including one trained undergraduate student and two trained graduate students. Interview reports were conducted by the three participants' as well as by parents and teachers. At the end of the study**,** three social reliability assessment reports were completed by a parent, a teacher, and the school's principal.

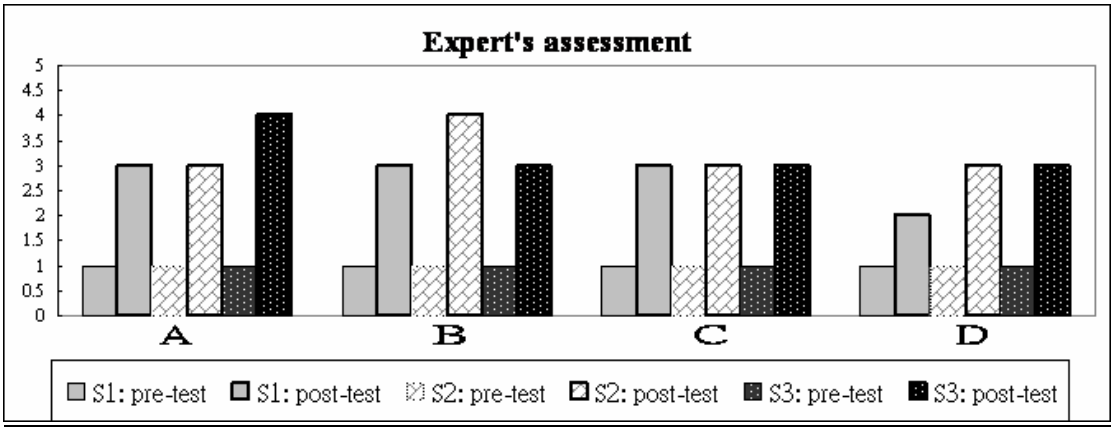
Results

Pre-test and post-test expert assessment

The comparison of pre-test and post-test is shown in Figure 1. Participants were scored on a "1-5" scale on a range of aspects related to attention span and language ability. For attention span, a score of "1" indicated the participant was able to pay attention less than 40% of the time across 10 categories. A score of "5" indicated the participant paid full attention 100% of the time. For language ability, a score of "1" indicated the participant had less than 40% proficiency across 10 categories, such as the ability to make sounds, verbalize one word, and speak in simple sentences. A score of "5" showed the participant had full, 100% proficiency.

The first part ("A") illustrates the assessment of the three participants' attention span. The S1 is from one to three, the S2 is from one to three, and the S3 is from one to four. It shows the efficiency of the study. The second part ("B") shows three participant's language ability to make vocal sounds. The S1 increased from one to three, S2, from one to four, and S3, from one to three. The third part ("C") illustrates the three participants' language ability: speaking one word. All three participants increased their scores from one to three. The fourth part ("D") shows the three participants' language ability: speaking sentences. The S1 increased from one to two, S2 from one to three, and S3 is from one to three.

Figure 1: Expert's assessment



A. Attention Span
B. Language Ability of making sounds
C. Language Ability of speaking one word
D. Language Ability of speaking simple sentences

Observation forms and interview reports

For participant 1, there were four baseline observations**.** According to the parents and the teacher, participant 1 had no language ability and had an attention problem. During the third and fourth observation, when the three observers' baseline observations were in agreement and had matching assessment scores, the participant moved to intervention I phase. At this phase, the participant's attention span was shown to be improving. Both the teacher's and parents' observation reports showed that the participant was attracted to the instruments and musical storytelling. From the record of the three observers' observation forms, the participant soon reached the goal of improving attention span.

At intervention II – improving language ability – the participant was able to make sounds by playing pitched instruments, especially hand-bells. The teacher's report revealed that he liked to play the hand-bell and make nonsense vowel sounds, i.e. "o," "i," "u." According to his parental report, he liked to sing the "u" sound while taking a bath. After participant 1 showed stability, he moved to next phase: speaking one word. At this phase, the participant liked to say "fish" while rounding his lips (from parental reporting). During the last phase of the intervention, the researcher attempted to encourage simple conversation. By the end of the study, participant 1 was able to verbalize simple sentences, such as, "Thank you," "I want to eat," "Goodbye," etc. (from parental reporting).

For participant 2, there were six baseline observations**.** According to the parents and the teacher, participant 2 had attention problems and did not speak a word. At intervention I, the parents' reports showed that participant 2 liked the musical storytelling activities the most. At home, the participant was reported to be calm while the parents told a story along with some sound effects. The reports by the three observers' also revealed participant 2 had high scores for attention while listening to stories and engaging in musical role play. At intervention II, participant 2 liked to express the high and low sounds of the Nan-Hu through representational high and low body movement. At home, participant 2 played a slide-whistle to make high- and low-tone sounds. At intervention III, the participant could say the words "blow" and "thanks" and at intervention IV, the participant was able to say simple sentences, such as, "I want to play," "Thank you," "I don't want," etc. (from parents' reports).

For participant 3, there were eight baseline observations. According to the parents and the teacher, participant 3 did not want to talk (she could speak, but not clearly) and had a serious attention problem. At intervention I, the participant had high interest in instrument sounds (from the teacher's report). While singing the "Hello Song," she was attracted by the sound of the guitar (from the researcher's observation and the teacher's reports). "Attendance Song" received her attention when accompanied by playing her favorite instrument, the ocean drum (from the researcher's observation and the teacher's reports). During intervention II, she could make sounds by playing the Nan-Hu and correct her pronunciation by playing a toy horn instrument while at home, the parents continued this method to teach her pronunciation (from parental reports). At intervention III, participant 3 was able to say one word easily (from the teacher's reports) and at home, the instruments were the reinforcement to motivate her speaking (from the parental reports). During intervention IV, the participant was able to say "Thank you", "I like it", "I want to play" to the teacher (from the teacher's reports).

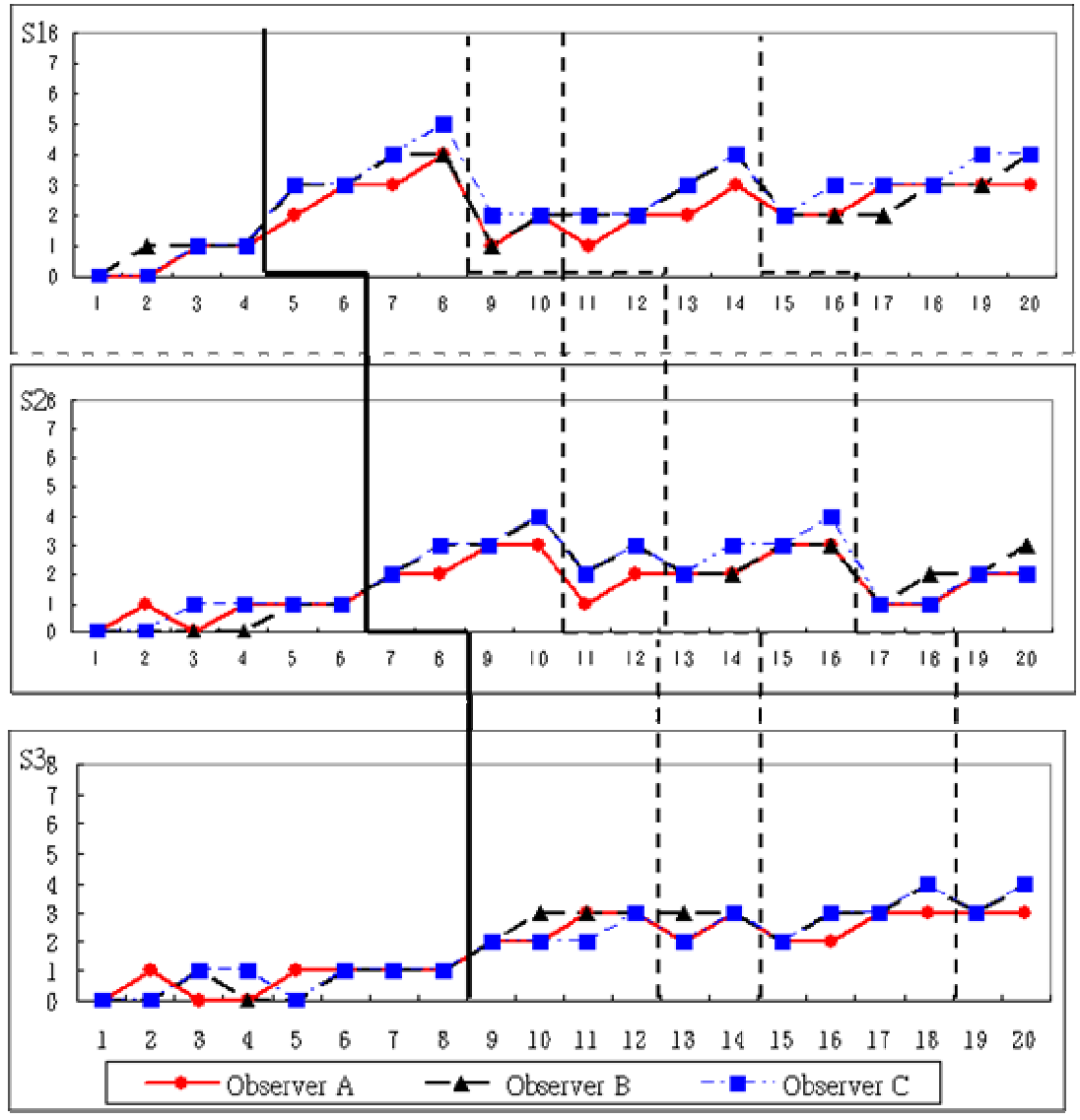


Figure 2: Frequency of target objectives across baseline and intervention

Statistical Analysis

Data were analyzed using statistical software "SPSS 10.0.7" for Microsoft Windows.

Reliability

In order to establish the reliability of the study, there were three observers. The consistency of scores for attention span among the three observers was .8691. The language ability for making sounds was .8444, the language ability for speaking one word was .7619, and the language ability for speaking sentences was .9069. Therefore, this study was deemed reliable.

Social Validity

In order to support the validity of the study, a feedback form was used by the principal, a teacher, and a parent. The reliability for the study is .8824. All respondents gave positive support for the study, and scored various aspects on a "1-5" scale. A score of "1" for questions in the "goals" section indicated that the respondent strongly disagreed with whether a goal of the study had been met whereas a score of "5"

signified that they strongly agreed that a goal had been met. There were 11 scores of "5," four scores of "4" (agree), no disagree and no strongly disagree scores.

For language ability, respondents gave a score of "1" if they felt the participant had shown a high level of regression in an area of language ability and gave "5" scores if they observed that the participants had made a high level of progress. There was one score of "5" recorded, 14 scores of "4" for progress, and no scores indicating the parent, teacher and principal felt participants had made fair progress, or had regressed (no "1" to "3" scores).

For attention span, the "1 – 5" scale was again used to register progress. A score of "1" indicated a high level of regression, and a "5" score showed that the participants were felt to have made a high level of progress. Fifteen "4" scores suggested that the participants had made progress. In addition to no "5" scores, no scores recorded for "1," "2," or "3" (high level of regression, regression, or fair progress).

Conclusions and Implications for further study

The report forms from interviews with the parents and teachers at the beginning and at the end of the study, as well as the data from three observers, revealed that all three participants made positive progress. The three special needs children enhanced their attention span through the music activities. They were motivated to make sounds through the use of musical instruments, to verbalize one word, and engage in simple conversation through the use of musical instruments. This research also provides support for the efficacy of music therapy in motivating attention span and improving the language ability of special needs children. Furthermore, this study reinforces the importance of the supportive environment, a necessity for providing special needs children with positive learning opportunities.

The findings of the study revealed that blowing musical instruments or whistles can be helpful for lip-rounding skills. Horns were also found to be very productive in teaching the production of certain phonemes. Using a horn is also viewed as a fun activity and will help to hold children's attention (Rosenfeld-Johnson, 1999). Additionally, musical storytelling could be a useful tool for enhancing the attention span of special needs children. Instrument role play also could be valuable. Furthermore, sound effect instruments, such as rain sticks, ocean drums, thunder tubes, and bird whistles, could motivate and get children's attention.

Suggestions for further study include the adaptation of western music therapy methods to the local culture in Taiwan. For example the horn, trombone, and string instruments are excellent tools for teaching pronunciation of Chinese words. Establishing a curriculum model for teachers of special needs children is another suggestion. In Taiwan, music therapy is a vastly under-utilized tool for working with children with developmental disabilities. It is hoped through this study and further research that more attention will be paid to the possibilities that exist for using music to reach and benefit the learning of these children.

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Pre-service special educators and music educators collaborating in teaching music to children who are hard of hearing or deaf

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The Individualized Education Plan (IEP) is intended to be a collaborative effort between school professionals and parents to set plans, goals, and objectives for the individual student. The Individuals with Disabilities Act (IDEA) (2004) stipulates that *all* teachers involved in a student's education should be involved in the IEP meeting(s). However, in a recent Illinois survey (McCord et al 2005), K-12 music teachers reported that they were not informed about the IEP meetings yet expected to implement the IEP goals. Regardless of whether music teachers attend the IEP meetings, communication and collaboration with the special education faculty is crucial for successful inclusion of the student with a disability in the music classroom.

Students with hearing loss (i.e., deaf or hard of hearing) are often the most difficult students to include in a music class, even for experienced music teachers. Furthermore, special educators may question the value of sending "their kids" to a music class. Research supports the value of collaboration between special educators and regular educators for successful inclusion of students with disabilities in the music classroom (Adamek & Darrow, 2005: Hammel, 2004; Halvorsen & Neary, 2001). Adamek and Darrow have provided many helpful strategies for inclusion of students with hearing loss and ways to collaborate with special educators in the school to meet the needs of all students with disabilities in music classes. Furthermore, Berghoff (2000) describes the collaboration between an special educator and a first grade general education teacher and the importance of finding time to worke and plan together for effective inclusion of students with disabilities in the general education classes. The two educators met in college and established the beginnings of collaboration as undergraduate pre-service teachers. Often special educators do not understand what occurs in the general music classroom and need to experience or observe general music classes to better understand how to provide effective support for inclusion. In order for deaf or hard of hearing students to have the opportunity to experience music, these two disciplines must be brought together to foster integrative learning.

This study focused on developing and implementing an innovative clinical experience model for special education and music education undergraduate majors at a Illinois State University. Until now, teacher education clinical experiences for those majoring in music education have been completely separate from those focusing on deaf education. Undergraduate deaf education majors have not had the opportunity to follow their students into music classes or to collaborate with music educators. Yet, we expect our future teachers to have collaborative skills that benefit students with disabilities, including those with hearing impairments.

In this project, students in music education methods courses and deaf education courses were paired during the fall of 2005 to plan and implement elementary general music lesson plans at the Metcalf Lab School. Lesson plans written by the music education students were e-mailed in advance to the deaf education students, who then provided suggestions on accommodation for hearing impaired children. Subsequently, the deaf education student attended the music class, observed as the music education student taught the lesson, and gave feedback. All class sessions and follow-up discussions were

videotaped. At the end of the semester, interviews were conducted with the music education and deaf education students. The interviews were transcribed and coded.

As a result of this collaboration, the deaf education students were convinced that music was an essential part of the curriculum for their students. Experiencing their students' excitement and success in music enabled them to appreciate the value of music education for students with hearing loss. They also gained appreciation for the music education students' efforts to integrate and accommodate students with disabilities into the music classroom.

The music education students became more aware and sensitive to the needs of students with hearing loss. They too became convinced that music is an important subject for this population. The music students learned how to interpret hearing tests and how to use that information to tailor their instruction to the needs of the individual student. They also learned to use some sign language and to work with sign language interpreters. A number of different strategies were developed such as use of visual cues, pre-teaching, peer teaching, and use of Universal Design for Teaching principles.

Music education and special education faculty need to provide leadership in building a model for collaboration that will endure from pre-service through student teaching and into the teacher's professional career. Structured experiences that encourage multidisciplinary collaboration enable pre-service teachers to recognize the value of music experiences for all children.

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It's not just what you say:
Research in nonverbal communication with
implications for special music education and music therapy

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The purposes of this paper are: (1) to introduce the topic of nonverbal communication, as well as to address the importance and relevance of nonverbal communication to the disciplines of music therapy and special music education, (2) to review relevant nonverbal research in education and therapy, and (3) to provide implications for clinical and educational practice.

Introduction to Nonverbal Communication

Nonverbal communication is the process of sending and receiving messages that are conveyed through any means other than through words. Components of nonverbal communication are generally recognized as body language, facial expressions, gestures, eye behaviors, or tone of voice—generally conveyed through the prosodic features of speech such as intonation, stress, and rhythm. However, other forms of nonverbal expression exist—such as one's physical appearance and posture, the environment, use of territory and personal space, touching behaviors between individuals, the proximity of individuals, and the paralinguistic features of speech—such voice quality, emotion, and style. Nonverbal communication only excludes messages sent through words; therefore, its features are virtually limitless and can occur through any sensory channel (Knapp & Hall, 2005). In the course of our daily lives, nonverbal communication serves numerous functions: (1) supplementing, reinforcing, or regulating verbal exchanges, (2) revealing emotional states or personality traits, (3) providing cues for impression formation, (4) indicating like or dislike for individuals, situations, or ideas, (5) communicating relative status of individuals, (6) persuading others, and (7) influencing the performance of others (Remland, 2003).

There are three primary types of communication codes: arbitrary, intrinsic, and iconic (Remland, 2003). A great deal of nonverbal communication is based on an *arbitrary code*—a learned signal system that is socially constructed and uses symbols to convey meaning. Examples are gestures such as thumbs up to mean "good job," or fingers to the lips to mean "be quiet," or a shoulder shrug to mean "I don't know." The meaning of many symbolic gestures, such the crossed fingers ("I hope") or thumbs up ("good job"), are arbitrary then and often differ from culture to culture. *An intrinsic code* is an innate signal system, and thus universally understood—such as pointing to an object, or facial expressions of anger, disgust, fear, joy, sadness, and surprise (Ekman & Friesen, 1969). The third type of communication code is *an iconic code*, or one that presents an image or provides some resemblance between the code and the referent. An example would be holding your hand to your ear to resemble a phone.

Several points can be made about nonverbal communication that illustrate its subtlety, versatility and usefulness.

1) Nonverbal communication can take place without conscience awareness or intent. An audience member who yawns or falls asleep may be seen by the speaker as uninterested, but in reality, may have had little sleep the night before.
2) Nonverbal messages are not always accurate. Most of us can think back to first impressions that we have had of others that were eventually found to be false. Or we may have thought that someone was upset with us, when in fact, they were not. Nevertheless, nonverbal

messages are often more accurate than words. All of can recall a time when a loved one, friend, or colleague said they were not upset with us; however, their behaviors—lack of eye contact or icy stare—definitely indicated otherwise.

3) Nonverbal messages are more efficient than words. A single message such as a special look, a gentle touch, a timely embrace can convey more than multiple words, and are often more convincing.
4) A great deal of information is conveyed through nonverbal communication. For example, we can determine through nonverbal means: the status of a relationship, the degree of relatedness between two people, and the extent of rapport between them. The next time you are in an airport, watch as passengers depart an airplane and greet their family or friends. It is often not difficult to determine the relationship and the closeness of the relationship by observing the type of greeting, the age and gender of the individuals involved, or specific objects—such as wedding rings.

Nonverbal communication has been categorized in various ways. The three broad areas of study are: (1) the environmental construction and conditions within which nonverbal communication takes place, (2) the physical characteristics of the communicators themselves, and (3) the various behaviors exhibited by the communicators (Knapp & Hall, 2005). A more detailed categorization involves:

Object communication. The most common form of object communication is clothing—which can indicate one's nationality, profession, gender, age, socio-economic status, various affiliations or political views—commonly displayed in printed t-shirts. To some extent, even personality is evident in the clothes one chooses to wear. Other examples of object communication are: body adornment such as tattoos or piercings, jewelry—especially objects such as wedding rings which indicate marital status, or any object used as a status symbol, such as readily identifiable expensive cars, watches, shoes, or handbags.

Touch. Hapics is the study of touching as nonverbal communication. Touches that can be defined as communication include: handshakes, holding hands, kissing (cheeks, lips, hand), back slaps, "high five," shoulder pat, etc. Each of these types of touch send nonverbal message as to degree of relatedness between two people, or one's feelings or intentions toward the other.

Eye behavior. Eye behavior is an important part of nonverbal study as it communicates much about attention to or interest in another person, one's level of comfort with another person, and in some countries, eye behaviors sends important messages about respect.

Vocal Characteristics. Vocal characteristics such tone, pitch, accent, and volume can all send off nonverbal cues that can indicate one's mood, nationality, and even information about his/her personality. Other vocal variables that convey information are: voice quality (timbre), speaking style (rate and inflection), emotional characteristics, and fluency of speech.

It is easy to see that it is actually impossible *not* to communicate nonverbally. Most people, however, give little thought to what they communicate nonverbally. Indeed, much of what we communicate in unintentional. Nevertheless, the messages are sent, and they have important implications regarding our interactions with others.

Importance and Relevance of Nonverbal Communication in Music Therapy and Education

Music therapists and music educators typically engage in three broad types of behaviors in the clinic and classroom: musical behaviors, verbal behaviors, and nonverbal behaviors—which are generally considered: eye contact, gestures, physical proximity and facial affect. Student music therapists and educators typically spend a great deal of time developing their musical skills, and for good reason. The musical behaviors they exhibit make important contributions to their goals in the classroom and clinic. Research has indicated that other behaviors, particularly those we generally give little attention to—our nonverbal behaviors, are also influential in determining our success in the classroom and clinic. Nonverbal behaviors are important factors in establishing relationships and in shaping others' perceptions of who we are and what we do.

Much of what we communicate in a classroom or therapy session is through nonverbal means. Sending appropriate nonverbal signals, as well as recognizing and interpreting the nonverbal signals of others then are essential features of good teaching and effective therapy. The importance of understanding nonverbal communication and its role in human interactions was made clear by the findings of pioneer scholar and researcher Abraham Mehrabian (1968). He found in experiments dealing with the communication of feelings and attitudes, that 93% of what is conveyed is through nonverbal means—with 55% being facial expression, 38% being tone of voice—and only 7% through verbal expressions; thus, indicating that how something is said is often more important than what is said.

Perhaps the best rationale for studying nonverbal phenomena is the set of assumptions set forth by other pioneer researchers Ekman and Friesen (1969). These assumptions state—first, that nonverbal behavior is the language of relationships, including the relationships between therapist and client or teacher and student. Nonverbal behaviors can indicate the intimacy of a relationship through the type of touches used, and the distance maintained or the amount of eye gazing between the two people. Their second assumption, which has already been stated, is that nonverbal behaviors are the primary means of expressing emotion. Words are not always persuasive in expressing emotions; behaviors are often more convincing. All of us are familiar with the saying, "actions speak louder than words." A third assumption is that nonverbal cues functions as qualifiers that explain how verbal statements ought to be interpreted, such as the wink that indicates, "I am just kidding. I don't really mean what I am saying" or a tone of voice that that indicates, "I am not kidding. Do it now." A fourth assumption is that nonverbal channels often convey true feelings that cannot be easily controlled or censored, such as a yawn that indicates, "I'm tired" or a tear that indicates, "I'm sad" or "I am hurt." A final assumption is that certain sets of nonverbal cues and responses are learned by the roles we play in life. These cues and responses are used and understood in their proper context. For example, a teacher uses a finger snap, a hand clap, or clears his or her throat to get students' attention. Students respond by getting quiet and making eye contact. Students likewise send messages, such as raising their hand to indicate, "I have a question" and the teacher responds by pointing or nodding to them to indicate, "You may ask your question now."

It is important to remember that not all persons understand these behavioral cues, and it is likely that we will encounter them in our work as therapists and teachers. We have all encountered the person who stands too close, who doesn't understand cues that it is time to leave, or to let someone else talk. In addition, students with some disabilities, such as Asperger's Syndrome, nonverbal learning disabilities—sometimes referred to as Dyssemia, or cognitive disabilities, often do not comprehend nonverbal behaviors. Dyssymia is a specific nonverbal learning disability characterized by the inability to understand symbols and their meaning. Such individuals are generally regarded as having poor social skills (Nowicki & Duke, 1992).

There are numerous other reasons that we should be concerned with the role of nonverbal communication in our work. Again, nonverbal behaviors are the primary means of expressing emotions, and there are some emotions, such as "emotional hurts, vulnerabilities, despair, or a lack of trust, that are not easily conveyed through words" (Galloway, 1977, p. 129). A client or student may feel more comfortable revealing these emotions through some means other than verbalizing them. In addition, words used in therapy or teaching are often less effective than certain nonverbal behaviors, such as the frown of a teacher, a consoling hand on one's shoulder, an encouraging smile, a reassuring nod, or a personal wink—though a wink can have multiple meanings and should be used perhaps with caution ("Good job!" "I'm kidding" "Hey there handsome"). We know too that no words can express concern like a heartfelt embrace from the therapist or teacher when a client or student is need of comforting.

Review of Nonverbal Communication Research in Helping Professions

The task of nonverbal communication research has been to determine the unwritten rules of a silent language. Like music—also a language without words, nonverbal communication is universal because it is exhibited in all cultures; however, this wordless language is not understood in the same way by all cultures. The earliest known systematic study of nonverbal behavior was reported in Charles Darwin's *The Expression of Emotions in Man and Animals*, first published in 1872. It was the seminal work from which all later nonverbal research originated.

Nonverbal Communication in Medical Settings. In medical settings, nonverbal behaviors can be of utmost importance to the health of the patient. Nonverbal cues augment communication between the doctor and patient by providing an additional channel of information. Instead of strictly relying on verbal information, awareness of patients' nonverbal behaviors, especially during initial interviews, provide the doctor with valuable clues into patients' physical and emotional well-being. Skill in decoding nonverbal behaviors is particularly helpful when patients are unable to clearly state their concerns, or when they misinterpret or purposefully conceal information (Philippot, Feldman, & Coats, 2003). Furthermore, during treatment physicians and nurses utilize nonverbal cues to provide proper care for the patient. For example, facial expressions may be used to evaluate levels of pain.

While doctors evaluate patients' mannerisms, nonverbal behaviors exhibited by the doctor impart contextual clues to the meaning of confusing medical jargon. Although a patient may not fully understand a diagnosis, proper interpretation of the doctor's tone of voice and facial expression are valuable indicators regarding the prognosis. For example, a frown, long pause or deep sigh by the doctor might represent a serious prognosis. Patients' understanding of medical jargon and their diagnoses foster feelings of involvement throughout treatment. Therefore, through encoding and decoding nonverbal cues doctors can engage patients in the medical process.

Nonverbal Communication in Therapeutic Settings. As in medical settings, nonverbal behaviors are an integral part of the therapy process. Knapp and Hall (2005, p. 465) state four basic functions of nonverbal behaviors in therapeutic interactions: understanding the disorder and diagnosis, aiding in therapy, and the therapist- client relationship. First, therapists can utilize nonverbal cues to aid in gaining additional understanding of the disorder. Second, observing nonverbal behaviors assist in diagnostic procedures. For example, decoding clients' nonverbal behaviors is especially important in children with autism since nonverbal behaviors are the initial indicators that autism is evident and early intervention is needed (Philipot, Feldman, & Coats, 2003). Next, observation of clients' nonverbal behavior can offer clues on treatment progress and potential problems. Therefore, it is important for therapists to be adept in observing and interpreting clients' nonverbal behaviors with the goal of

providing higher quality of care. Finally, a trusting client/therapist relationship can be developed through the use of engaging nonverbal behaviors.

Nonverbal Communication in Music Therapy

Nonverbal qualities of music allow others who are unable to communicate verbally the opportunity to express emotions through playing instruments, vocalizing and physical movement (Clair, 1996, p. 15). Clair (1996, p. 14) states, "As with all art forms, music is communication. What it conveys is unique. It cannot be done better in any other way or through any other medium." Music therapists and music educators work with a variety of populations that have communication impairments. Music therapy clients who benefit most from nonverbal communication styles include individuals with dementia, patients in hospice and hospitalized patients who have had a tracheotomy or who are ventilator-dependent. Both music educators and therapists often work with persons who have developmental disabilities, autism and hearing loss. Persons with all of these disabilities can receive great benefit from music therapists and music educators versed in nonverbal communication.

Patients with dementia experience language declines as the disease progresses. By late stages of the disease, they may lose total verbal abilities or their words may become unintelligible. In addition, hearing loss, common to older adults, decreases communication abilities. With a hearing loss, it can become difficult to effectively communicate with others which can cause much frustration for the patient and caregiver. Music therapists can teach such clients to express their needs through gestures and to enhance their relationship with caregivers through interactive music activities. Hubbard, Cook, Tester and Downs (2002) recognized several advantages of using nonverbal communication with dementia patients: greater understanding of the patient, increased involvement with nonverbal patients and development of interpersonal relationships between nonverbal patients. Since music does not extensively rely on verbal processing, it is an effective medium for persons with dementia to express themselves (Brotons & Koger, 2000). In addition, music therapy elicits nonverbal interactions with the patient and caregiver, allowing them a mode in which to communicate.

Patients receiving palliative care for terminal illnesses may also have decreases in language abilities. Music therapy can cultivate communication between patients and loved ones, and offer alternative communication opportunities for brain impaired patients through nonverbal means (O'Callaghan, 1996). For example, improvisation, song writing and singing client preferred songs all set the stage for intimate nonverbal behaviors such as prolonged eye contact and personal touch, which can help cultivate communication between patients and loved ones. In addition, music interventions can help facilitate reminiscing, sharing of emotions and celebrating of the patient's life. For uncommunicative patients, music therapy encourages expression of feelings and can ultimately help improve their quality of life.

Whether terminally ill or not, patients with progressive diseases, illnesses, deformities or injuries that affect their ability to breathe may require a tracheotomy. A tracheotomy is a tube that is inserted into the windpipe. The patient inhales and exhales through this tube instead of through the nose and mouth. If life support measures are needed, a ventilator is attached to the tube and gases are passed through the tube to further aid in breathing. Many intubated patients are unable to talk because they do not have enough air pressure to power the vocal chords that produce sound. As a result, patients may experience frustration from being unable to speak. Young children on mechanical ventilation may also be fearful from the unfamiliar medical environment or procedures and might be unable to verbally express this fear. Music therapists can teach patients to use forms of nonverbal communication such as gestures and various eye behaviors to communicate their needs and to fears. Additionally, intubated patients or

ventilator-dependent persons can use music for communication purposes in ways similar to patients receiving palliative care for terminal illnesses. Furthermore, music therapy can decrease anxiety and promote relaxation with intubated and ventilator-dependent patients through patient-preferred music listening (Jaber, Bahloul, Guetin, Chanques, Sebbane & Eledjam, 2007; Wong, Lopez-Nahas & Molassiotis, 2001; Lee, Chung, Chan & Chan, 2005).

Another population often with deficiencies in verbal communication are persons with autism, a disorder in abnormal development diagnosed by behavioral criteria found in the Diagnostic and Statistical Manual of Developmental Disorders (America Psychiatric Association, 2000). Criteria include abnormal functioning in three areas: social interaction, communication and imaginative play (America Psychiatric Association, 2000). Impairments in nonverbal behaviors such as eye contact, facial expression, body posture and gestures are typically evident in persons with autism. Additionally, unusual repetitive movements and self stimulative behaviors such as finger flapping are common.

Persons with autism also exhibit difficulties in processing nonverbal information, which decreases their ability to be socially appropriate. Since the rate of persons being diagnosed with autism is increasing (CDC, 2006), it is likely that music educators and music therapists will have persons with autism receiving their services and it is important for music educators and therapists to be educated on the nonverbal communication deficits of these children. Music therapy and music education can provide a structure for nonverbal communication and social interaction to occur. Since approximately 30% of children with autism have not developed language skills, nonverbal communication may help to facilitate speech, and thus decrease client frustration (Farmer, 2003). For example, musical components such as rhythm, melody and dynamics teach discrimination skills that are necessary for language development (Adamek & Darrow, 2005). Rhythmic activities aid in development of imitation or pacing skills that can then be transferred to verbal language (Adamek & Darrow, 2005). Music is also an excellent reinforcement to increase desirable nonverbal behaviors like respecting personal space, maintaining eye contact, and appropriate touch.

Finally, persons who are deaf or hard-of-hearing benefit from the nonverbal qualities of music and the learning of nonverbal behaviors. Contrary to popular belief, people who are deaf do not display a heightened ability to accurately read other's nonverbal behaviors (Rollman & Harrison, 1996). However, instead of focusing on facial features to interpret visual cues about a person, those who are hard-of-hearing tend to gain clues from the arms and hands (Rollman & Harrison, 1996). Since hands and arms are integral to sign language, it makes sense that nonverbal cues are gained from watching these body parts. However, being able to accurately interpret facial expressions, emotions and nonverbal information requires learning and practice. Music therapists can help bridge the gap between the hearing and deaf populations by teaching nonverbal behaviors through structured musical interventions.

Due to communication differences, many hard-of-hearing persons are at greater risk for social isolation. Since music making involves tactile, visual and auditory processing (Adamek & Darrow, 2005), it is a great medium through which positive peer interactions can take place. Music educators can help facilitate these interactions between hearing and deaf students. Additionally, with children who are hard-of-hearing and with all of the populations previously discussed, not only can music therapists use music to aid in nonverbal communication or social interactions, but they can also employ nonverbal behaviors with the purpose of building rapport with clients.

Relationship of Rapport to Nonverbal Behaviors

To establish a trusting client/therapist relationship, one must know what constitutes rapport. According to the Merriam—Webster Dictionary (2005) rapport is defined as a "relationship marked by harmony, conformity, accord or affinity." In a clinic setting, "Rapport is the feeling of harmony and confidence that should exist between patient and clinician" (Morrision, 1995**,** p. 23). Feeling this sense of harmony is important in establishing patients' trust and confidence in their therapist.

Prior to being able to establish "good rapport" with a client, therapists must acquire competence in using and detecting nonverbal behaviors. In addition, one should be adept in accurately evaluating the level of rapport within a relationship. Nonverbal behaviors are essential for establishing and indicating rapport between individuals (Tickle-Dengen & Rosenthal, 1990; Larsen & Smith, 1981; Duggan & Parrott, 2001). While rapport generally develops over time, it is important for therapists to establish this type of trusting relationship with clients as quickly as possible (Barnett, 2001). Bernieri, Gillis, Davis & Grahe (1996) found that self-reports of rapport can be accurately predicted within one minute of the start of an interaction through judgments of nonverbal behavior. Since trust or mistrust can be substantiated and perceived quickly in a relationship, it is important for therapists to make a positive first impression.

Several nonverbal behaviors are positively correlated with rapport (Knapp & Hall, 2006). One such behavior is mimicry, in which facial expressions and postures are matched between two or more individuals. Therapists generally desire to develop a connection with their patients, and research suggests that mimicry, or mimicking another's behavior, enhances this connection. Many times however, matching another's behavior is an unconscious effort in which to create rapport (Lakin & Chartrand, 2003). Interestingly, this nonconcious use of mimicry increases when an individual has a desired goal to enhance affiliation with another (Lakin & Chartrand, 2003). Therapists' increased awareness of clients' nonverbal behaviors and conscious use of mimicry may aid in developing rapport with their clients.

Immediacy behaviors, such as leaning forward and eye contact are also important factors in establishing rapport. Appropriate use of these nonverbal behaviors by doctors has been reported to increase patient satisfaction (Larsen & Smith, 1981). In therapeutic settings, a forward lean by the doctor or therapist signals interest and helps to facilitate rapport building (Tickle-Dengen & Rosenthal, 1990; Trout & Rosenfeld, 1980). One can also use eye contact to present the impression of being, "diligent, conscientious and occupied to the task at hand" (Harrigan, Oxman & Rosenthal, 1985). Conversely, breaking eye contact or lack of eye contact can convey disinterest and decrease patient disclosure (Duggan & Parrott, 2001). Since the social norms for use of eye behavior varies within cultures, it is important to be aware of the appropriate level of eye contact to use with specific clients. For example, in Asian cultures, making eye contact with others is often considered rude or arrogant (Bola, Driggers, Dunlap & Ebersole, 2003). Barnett (2001) recommends professionals use the degree of eye contact that is perceived as comfortable for the client, despite one's own comfort level (Barnett, 2001).

In addition to mimicry and immediacy behaviors, expressivity, facial expressions, hand gestures and vocal qualities () also aid in establishing rapport. Physicians' facial reinforcers including head nodding and animated facial expressions signal attentiveness and are associated with higher rates of self-disclosure (Duggan & Parrott, 2001). In addition, therapists use of positive facial expressivity (smiling, head nodding and furrowed brow) communicates concern to clients and therapists exhibiting these nonverbals behavior are typically judged by clients as being "warm, caring, concerned and empathic"

(Ambady, Koo, Rosenthal & Winograd, 2002, p. 450). In summary, therapists' awareness and positive use of mimicry, immediacy behaviors and expressivity appears to aid in building rapport.

Nonverbal Communication in Music Education

Immediacy refers to communication behaviors that enhance one's rapport with others (Mehrabian, 1968). Mehrabian noted a number of potent nonverbal immediacy cues such as: touch, distance, forward lean, eye contact, and body orientation. He found that positive attitudes toward the communicator were related to their use of immediacy behaviors. Immediacy has been studied in various contexts, including the classroom where McCroskey and Richmond (1992) found a relationship between a teacher's nonverbal immediacy behaviors and students' positive evaluations for the teacher.

A number of studies exist that reinforce the notion that nonverbal behaviors are as important to teachers as they are to therapists. Researchers have found that classroom teachers' nonverbal behaviors are related to student evaluations and to rapport (Ambady & Rosenthal, 1993; Anderson & Anderson, 1982; Baringer & McCroskey, 2000; Guerrero & Miller, 1998; Hamann, Lineburgh & Paul, 1998). For conductors, studies have shown that nonverbal communication such as posture, eye contact and facial expression affects the ensemble's perceptions of the conductor's ability even before the rehearsal begins (Fredrickson, Johnson, & Robinson, 1998; Julian, 1989). Nonverbal behaviors have also played a role in conveying teachers' expectations of students (Babad, 1992; Chaikin, Sigler, & Derlega, 1974).

In the study of nonverbal communication, physical appearance has been found to be an important factor in how persons are perceived (Knapp & Hall, 2002; Wapnick, Darrow, Kovacs, & Dalrymple, 1997). A number of researchers have examined the effects of teachers' or conductors' appearance on others' perceptions of their competence or effectiveness (Van Weelden, 2002; Wapnick, Darrow, Kovacs & Dalrymple, 1997; Wapnick, Kovacs, & Darrow, 1998; Wapnick, Kovacs-Mazza, & Darrow, 2000). VanWeelden (2002) examined whether a conductor's body type played a role in the evaluation of the conductor and the ensemble's performance, as well as investigated whether or not a relationship existed between the ensemble's performance rating and the conductor's physical characteristics such as posture, eye contact and facial expression. While there was no significant correlation between body type and performance rating, moderate to moderately high relationships were observed between the ensemble's performance scores and the conductor's posture, facial expression, and overall conductor effectiveness. Wapnick, et al, (1997, 1998, 2000) found that attractiveness, dress, and stage behavior had important implications for the performance evaluations of vocalists, violinists, and even child pianists. These researchers also found that attractiveness is generally a more potent variable for women than for men.

Implications for Practice

Interpretations of other people's nonverbal communication, and the messages we send to our students and clients and their family members through our nonverbal communication is an important part of clinical practice. When the nonverbal signal is understood and is placed within the context of the verbal statement, the interpretation of the client's message is much more complete. It is the language of sensitivity—communication without words. All human relationships have more meaning that words can provide. So what are the nonverbal language skills that we as therapists and teachers need to practice decoding and encoding?

There are basically three kinds of nonverbal language skills that are imperative to good communication (Hennings, 1977). They are: physical expressive skills, vocal expressive skills, and interpretational skills. Effective therapists use the following skills to convey intentional messages.

Physical Expressive Skills

- Use of gestures of hands, arms, fingers, head, and body.
- Use of body stance and posture.
- Use of physical distance, touch, and time.
- Awareness of physical appearance and setting.
- Control of nervous mannerisms.

Vocal Expressive Skills

- Using tone of voice to communicate concern/lack of concern, approval/ disapproval, interest/disinterest.
- Varying loudness to achieve effect: startle, emphasize, emotion.
- Use pauses to emphasize or gain attention.
- Use rate of speech that is compatible with the message being sent.

Interpreting Skills

- Identifying biases that determine how messages are received.
- Perceiving actual meanings beneath the facades people maintain.
- Interpreting messages through people's manipulation of objects, time, and space.
- Interpreting messages sent through physical contact and the manner of the contact.
- Readings messages sent through gestures, eyes, facial expressions, and body language.

There are a number of ways to practice nonverbal skills. Most people benefit from videotaping themselves. They often find that they exhibit behaviors they were unaware of. By asking a colleague to view the videotape and interpret your nonverbal behaviors, it is easy to determine if the nonverbal message intended to be sent, was in fact, the one received. Another way to improve both expressive and receptive nonverbal skills is by studying various channels of nonverbal communication, such as:

- Rethinking personal experiences, such as when you had the wrong impression about someone. What was it that gave you that impression? Have you ever conveyed the wrong impression?
- Study pictures, advertising ads, scenes from movies, or photographs for nonverbal messages.
- Read research from the *Journal of Nonverbal Behavior*, or other articles found in popular magazines and the newspaper, as well as passages from popular novels.
- View some of the relevant web sites on your handout.
- People watch—study the nonverbal behaviors of others. Restaurants and airports are excellent observation sites.

<u>Conclusions</u>

Until we learn to say what we mean and mean what we say, the study of nonverbal behaviors and related research will continue to be of importance to anyone who works in people oriented professions. Research can tell us much about nonverbal behavior, but only if we make practical applications of the research to our clinical work. Nonverbal skills are improved in the same way that all skills are improved, by practice. Fortunately for us, it is also a skill that can be taught, and there are many good reasons for

to do so; the most important of which is—that being aware of one's own and other's nonverbal behaviors greatly increases the likelihood of satisfying interpersonal relationships and productive professional careers.

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Music therapy in the rehabilitation of cochlear implant patients: Some reflections and implications from research

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The Cochlear Implant: Functions and Indications

The cochlear implant (CI) is an assistive hearing device that has been surgically provided since the mid 1980's to persons with prelingual or postlingual hearing loss (Leonhardt 1997, 11). Unlike acoustic devices, the CI can be utilized by persons with complete deafness or minimal residual hearing to help them (re)gain their ability to hear (Wisotzki 1996, 230). For those with sensorineural hearing loss, the cochlea's sensory receptors are either completely destroyed or extensively damaged so that the conversion from mechanical to electric signals is disrupted. This malfunction of the inner ear results in minimal or no residual hearing. However, the auditory nerve fibres and the central hearing system are often largely intact offering the possibility of implanting an assistive hearing device in the inner ear (Bucher, Arnold, & Mathis 1991, 45).

During cochlear implant surgery, electrodes are implanted into the inner ear as a substitute, so to speak, for the organ of Corti and its function (Figure 1). "The little microphone worn at the pinna receives acoustic stimuli. The stimuli are then relayed in the form of electric waves to the speech processor where they are electronically converted into electric signal patterns. Impulse patterns are then transmitted to the implanted electrodes via a supracutaneous transmitter system and a subcutaneous receiver system (Bucher, Arnold, & Mathis 1991, 45). Because every transmitted frequency triggers a potential within the nerve fibres responding to this frequency, a specific impulse pattern occurs in the auditory nerve. This direct stimulation of the still functional cochlear neurons may enable individuals with a profound hearing impairment to experience sounds and also possibly understand spoken language (Illg et al. 1999, 170).

Cochlear implantation may be recommended if conventional hearing aids prove to be useless while the auditory nerve is still functional and if the patient suffers from absolute binaural deafness. The central problem inherent in the implantation is the possible irreversible destruction of sensory hair cells with the effect that a previously still existing residual hearing cannot be restored should the CI fail (Bucher, Arnold, & Mathis 1991, 45).

Today, people ranging from 6 months to 80 years old undergo cochlear implant surgery. The number of people with a cochlear implant is steadily growing, and many of them express their hope for musical experience (Gfeller & Lansing 1991, 916; Gfeller et al. 1997, 252). Research has revealed that patients indicate that they enjoy listening to music. After receiving a cochlear implant, many individuals with postlingual hearing loss have indeed regained their ability not only to understand spoken language but also to experience music. However, the sound quality of the music remains limited so that listening to music with a CI cannot be compared to unimpaired listening to music (Dorman et al. 1991, 35). The improvement of CI systems and speech processors continues to enhance the quality of music reception and the options of experiencing music.

Music Therapy in the Rehabilitation of Patients with Cochlear Implants

Music therapy is increasingly playing an important role in the rehabilitation of cochlear-implanted patients, especially children. Knowledge about the music experience of patients with cochlear implants is still very limited. However, some research studies support the use of music and music therapy in the rehabilitation of these patients. For example, Prause-Weber (2004) found that adult implant users with postlingual hearing impairment want to have access to music, even if this initially requires a great deal of effort.

After the CI speech processor has been adjusted, patients have to learn to deal with hearing new sounds. This includes increased psychological demand which occurs initially. CI recipients have often described their experience as disconcerting (´ghostly voice') and unpleasant (´dreadful, only high voices´) as sounds are different from unimpaired listening (Prause-Weber 2004). This is especially the case if a long period of time has passed between becoming deaf and cochlear implantation. The change in hearing may, in the initial phase, lead to loss of orientation and in extreme cases, to a kind of ´hearing shock´ (ibid.).

The sudden exposition to a new world of sound and experience can also lead to nervousness. In his *cochlear implant diary*, Victor Senn, an adult CI user with postlingual deafness, described this loss of orientation as his "implant-crisis." "I feel as if I am always travelling, even though I am always staying here…Everything within me is changing - my reception, my feelings, my personality… The CI sometimes sounds brutal. Psychologically, I feel destabilized. My personality is changing all the time, and I cannot do anything. New sounds irritate me all the time and I have to learn where they come from and what they mean. As soon as I hear a noise, I cannot continue what I was doing before because this noise makes me more and more nervous" (Senn, 1995, 294-295; translation M. P.W.).

Kammerer (1994) found that a loss of orientation and feelings of shock and nervousness are also particularly prevalent in children because they experience the new hearing completely unprepared. Every time the speech processor is adjusted, the children have a new hearing experience which also leads to nervousness and uncertainty (Kammerer 1994, 17). According to Radbruch (2001), music therapy can help CI patients overcome these initial feelings of crisis by helping them to (re)gain stability and confidence.

Music therapy can provide a way to express emotion particularly in the early phases after the processor adaptation (Radbruch 2001, 7). For example, Radbruch (2001) used video analysis to investigate the change in communicative behaviours of cochlear implanted children (in particular, the two categories of co-activity and alternation described by Daniel Stern). He found that the lengths of the interactive phases between child and music therapist increased within music therapy (Radbruch 2001, 8-13). As a result of these preliminary research findings and experiences, it can be concluded that music may help children with CI accommodate to the new world of sounds and sensations, render support, and help them to overcome the initial disappointment after the first processor adjustment.

The advantage of using music (therapy) is that such interactions involve less stress compared to the audio-oral communicative requirements of every day life situations and listening lessons. Because of its wider frequency spectrum, music is more easily accessible than speech, and facilitates interaction. The frequency field of music lies between 30 and 4000 Hz, whereas the relevant frequencies for speech lie

between 250 and 2000/2500 Hz. Music, therefore, has a far wider frequency spectrum (in particular below 250 Hz). Figure 2 shows the voice field (piano and forte line of the singing voice) of a 33 year old woman. The speech field is only a very small field within this voice field.

Because music provides sensations rather than information, it also facilitates interaction. It is not necessary to receive correct information, as there is no right or wrong understanding. The results Prause-Weber's survey (2004) revealed that the individuals affected find listening to music less stressful than understanding spoken language. Discovered also was that oral-communicative situations often involve errors and frustration and that musical interactions, free improvisations in particular, expand existing capabilities so that one's own feelings of worth may be developed. Unlike oral situations in which the CI user is always at a disadvantage, they find instead an autonomous and stress-free environment in which to interact and communicate with their typical hearing counterparts. Thus, the therapeutic relationship, according to Prause-Weber (2004), can give the CI patient stability, helping him regain confidence.

The concept of self-worth is particularly important in music therapy with CI children. In this situation, the feeling of a person's own worth is often extremely restricted, because it develops in early childhood where there is often uncertainty in the interaction between parents and child. Psychosomatic difficulties often arise due to communicative problems. For example, Kammerer (1994) found that 30% of cochlear implanted children were diagnosed with hyperactivity syndrome. It is very important for children to feel valued by their parents. The problem for the cochlear implanted child is that, because his parents want him to wear the speech processor all the time, he gets the feeling of being imperfect, and not being accepted as he really is (as a person with hearing loss) (Kammerer 1994).

Music therapy sessions should not always focus upon speech and listening skills, but rather a single element of intervention so as to offer the child a place where he or she can express emotions without speech. Children with cochlear implants are often misunderstood by others thus leading to both frustration and anger (Kammerer 1994, 18). According to Radbruch (2001), music therapy allows cochlear implanted children opportunities to make themselves understood. Radbruch (2001) concludes on the basis of her research, that getting in contact with others through music leads to a positive communicative experience which will increase the cochlear implanted child's self-esteem as well as their boldness to get in touch with others (ibid.).

The cochlear implanted child usually has to learn "around the clock" which requires that parents function as co-therapists. Such an intensive learning environment tends to leave little room for real "playing" - a very important component of human development. According to Langenberg (1988), playing is a space ("Zwischenraum") to move, explore, try, dare, and to decide what lies in between imagination and reality, a space which human beings need (Langenberg 1988, 11). If the child knows that in the music therapy setting he can freely experiment and play (e.g. with the voice, without having to fear that he says something wrong), he gains interest in his own actions, boldness to act autonomously and to find something which is truly his own. According to Voigt (1998), music therapy provides these children with the possibility to form a relationship and to take the initiative within human interaction (p. 293).

In two studies investigating the musical behaviour of CI users, visual aids were considered to be helpful in experiencing music (Linsenmeier 1999; Prause-Weber 2004). Visual cues, such as gestures when singing (Example: Song signing "Kumbayah"), can be incorporated into musical or music therapeutic work with CI patients. For example, a study by Gfeller et al. (1998), investigating the musical involvement and enjoyment of children who use cochlear implants, revealed that "the use of visual cues

or pairing of music with movement or art can increase understanding and successful participation" for these children (p. 225).

Another major problem that cannot be eliminated by the implantation is the acceptance of the hearing loss. Prause-Weber (2004) mentioned the tendency of many CI users to "play down" their hearing loss (to pretend as if there was nothing wrong), to keep the CI a secret. Hearing loss frequently represents a trauma (e.g. in case of acute hearing losses), and repression or denial are rather detrimental. Despite implantation, it is important for the individual affected to accept and come to terms with his or her hearing loss. During postoperative rehabilitation, music therapy can help individuals come to terms with and accept hearing loss as well as help them find their new psychosocial identity. In the work with adult CI patients, music therapy improvisation has the advantage that there is something to work on without the need to talk about it (Weymann 2000, 199).

Prause-Weber (2004) found that listening to familiar music was important to all interviewees. Tunes CI users knew from the time when they were still able to hear could elicit reminiscence thus providing cues for how to accept the loss of hearing, to rediscover and accept the present, and to reflect on one's own life story. Music could help the individual regulate and express associated emotions, such as the frustration felt upon realizing that the cochlear implant does not bring back hearing and can never replace a hearing organ.

The stigma-related problem of being unable to accept help when trying to come to terms with what has happened is often rationalized away and repressed. Here, music therapy offers enormous possibilities because the patient might not see music as stigmatising and so, accepts treatment. In a study with 65 cochlear implanted children, Gfeller et al. (1998) found "that 20% of the children enrolled in formal music activities participate in choir, given that implanted children are significantly less accurate than normally hearing children with perception of simple melodies" (p. 225). Furthermore, Haus (2000, 10), in his study comparing the effects of music therapy between children using either cochlear implants or hearing aids, found that music therapy increased all participants' vocal abilities and motivation to use their voice. Based on these studies, it seems that music therapy can offer valuable possibilities for reducing vocal insecurity and for developing self-confidence with respect to one's own singing and speech voice.

In summary, music therapy as a treatment procedure in the rehabilitation of CI patients can be beneficial because as it provides psychological care and eliminates the communicative problems arising in a purely verbal therapy. However, research results also reveal that the experience of sound and music varies widely among CI patients and the processor adjustment is frequently disappointing (Prause-Weber, 2004). Therefore, music therapy does not seem suitable for every CI patient, but rather has to be understood as an optional offer.

Today, music therapy with cochlear implant patients represents a new and important sub-area of music therapy for both group and individual settings. It seems fundamental to make use of the great potential inherent in the appreciation of music for the rehabilitation of CI users. It should be noted though that it is imperative for the music therapist who works with CI patients to be informed about all issues concerning the CI, including the controversy which still exists over its use. Music therapists should develop a thorough sensibility for the psychological aspects involved and also develop a grasp of manual communication modes

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2008 ABSTRACTS

Music therapy for adult asthma patients

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Many individuals, young and old, suffer from bronchial asthma. Causes associated with this respiratory disease include allergies, air pollution, and some psychological factors. An immediate remedy for asthma patients is medication; however, this may not be the best long term solution. In order to keep the sudden attacks often suffered by these individuals from impacting their everyday lives, other approaches should be considered such as mastering the correct way of breathing. Since the early 1980s, research has been conducted by the author resulting in the establishment of “asthma music,” a therapeutic approach developed to meet the specific needs of the asthma patient.Asthma music is comprised of Three Principles for Mastering Abdominal Breathing as well as Ten Methods of Asthma Music.

Recent research has involved the introduction of breathing practice principles to bronchial asthma patients, ranging from 50 to 80 years of age, suffering from pollution-related illnesses. Patients participating in the asthma music therapy training were evaluated to determine a.) if they had the mastered abdominal breathing approach, and b.) the impact of the training program upon their psychological well-being. Participants were also monitored before and after breathing practice with a peak flow meter to determine efficiency of their practice.

Findings from this research revealed that patients did master the asthma music therapy. Also revealed was that patients felt uneasy about their disease often times resisting the regular medical attention necessary (i.e. doctors’ visits, taking prescribed medication.). Data from the peak flow meter revealed that patients found encouragement when attending sessions with friends rather than help received from the medical profession or when practicing alone. Overall, working alongside friends during sessions was found to positively impact the efficiency with which they practices exercises and activities associated with the asthma music therapy.

2008 PAPERS

Special music education and neurodidactics: A comparison between neurodidactcal principles and a lesson in music education at a school for students with a mental handicap

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Abstract

The paper examines the relationship between special music education and the new discipline neurodidactics. By analyzing a specific lesson from special music education in a school for the mentally handicapped matches and differencies are described.

Keywords: Special music education/neurodidactics/mental handicap

Introduction

With the development of brain imaging techniques like Electroencephalography (EEG), Magnetoencephalography (MEG), Pet Scans, and Functional Magnetic Resonance Imaging *(*fMRI*)* the neurosciences promise an insight in the structure and performance of the brain. The decade of the brain, which was proclaimed by the former US president,George Bush in 1989, has brought an unimaginable amount of scientific data and insights in the active brain (e. g. Spitzer 2002). A wide range of researchers, including those in music education, as well as other disciplines, and pedagogy have been attracted by these insights.

Neurosciences describe learning as a very dynamic process, in which all human dispositions senses, values, emotions, cognitive processes (the act of understanding), and actions are involved. The latter mean that learning is not merely built by a gathering and storage of information, but by converting this information into activity... it is this putting into practice which completes the learning process. (Arnold 2006, 145; translation D.L.)[1]

Therefore, **neurodidactics** is a new discipline (Preiss 1998) which combines neurosciences and education under the headline: *What makes a good learning environment appropriate to the conditions of the learning brain?* (Gruhn 2004) A question which is also applicable and applied to the field of music and music education.

Although planned and executed **before** neurodidactics became one of the new didactic paradigms, this paper examines whether **special music education,** in theory and practice, already involves brain-based principles of learning and teaching. An ongoing discussion persists regarding whether neurodidactics can really offer something new to the didactic theory or if it simply attests what good teachers have already known and done beforehand (Herrmann 2006, 7; translation by D.L.)[2]. This paper will

[1] „Die Neurowissenschaften beschreiben Lernen als einen sehr dynamischen Vorgang, an dem *alle* menschlichen Dispositionen beteiligt sind: alle Sinne, Werte, Emotionen, kognitive Abläufe (Verstehensprozesse), aber auch Handlungen. D. h. Lernen besteht nicht nur aus der Aufnahme und Speicherung von Informationen, sondern in gleichem Maße aus der Umsetzung der Information in Handlung... Erst durch die praktische Umsetzung wird der Lernprozess vollendet."

[2] „... sei eigentlich nur die Bestätigung dessen, was ... ‚gute Lehrer' immer schon gewußt und getan hätten."

contribute to the ongoing discussion in fundamental research and quality management in special music education in the context of lessons taught at a school for mentally challenged students.

Music with the Drum: The Comprehensive Teaching Plan of the Lesson

Topic of the lesson: ***African drumming - We make music with our drums.***
This lesson was part of the project entitled *Around the World in Eighty Questions*[3] and the musical topic: *In Eighty Sounds around the World* (c. f. Hoefele/Steffe 2000). The mindmaps at the end of the paper provide an overview.

The lesson embedded in the course of the project

Africa as a continent:

- We identify the continent Africa on several maps through its silhouette and outline.
- We draw the outline of Africa for our classroom map in XXL.
- African impressions: We have a look at an illustrated book and several videos of the landscape and people of Africa.
- A story about two African kids.
- Landscapes in Africa.
- Wildlife in Africa.
- African music:
  - We listen to African music.
  - We build African drums.
  - We design our drums.
  - The sound of the drums: We experiment with drumming.
  - Drums and body percussion.
  - *We make music with our drums.*
  - Drumming and singing: We exercise an African call-and-response-song.
  - Drumming and dancing.

Table 1: The Lesson

The course of action	Didactic comments
1. The students enter the classroom in which many drums are provided. The students decide on one drum and initiate a musical contact to the drum.	• open, but known beginning of the music lessons which allows an individual start-up; • allows the teacher to monitor the students and the interaction of the group.
2. First change of instruments following to an acoustic signal.	• students with motoric problems may stay with the same drum; • this arrangement fosters flexibility: due to changes students cannot count on „my drum“.
3. Students decide on one drum. They gather in a circle. An African song is to be heard and an African poster is put in place.	• remaining drums are stored; • these visual and acoustic signals bring into focus the content of the lesson;

[3] c. f. Jules Verne (reprint 2004): Around the World in Eighty Days.

Students collect impressions and exchange information.	• this collection of impressions and information is the platform for the following drumming.
4. We play with our drums: a musical field of action.	• c. f. text as follows.
5. Repetition of the African song as a signal for the end of the lesson: students' names are played on the drum as an invitation to leave the room.	• well-known ending of each lesson.

Playing the Drums: A Musical Field of Action

According to Fischer[2] (1981), arrangement has to be defined as a *field of action,* which for the purposes of this study, was adapted to a music lesson. The most important task of the teacher in a *field of action* is to monitor the students, their individual approach, the group's interactions, as well as the reaction on student impulses. The open structure of teaching allows insights in the ways students cope with the situation, create the situation, and interact with each other. This way of monitoring can be seen as a *didactic diagnosis* (Pfeffer 1981, 128).

Because of preceeding lessons, students were used to the lesson structure. They started to play and use the drums for different musical structurings. The following drum patterns are possibilities which can be used due to the impulses the students give:

a) drumming using free, individual rhythms:
- *Stop and Go*: all participants play the drums at the same time. One participant can stop the action using a pre-defined signal. The task of conducting can be given to several students.
- Two groups play the drums according to the signals of a conductor.
- *Sound Imitation*: Movement or sound patterns (the movement of animals like snake, lion, antelope etc. or sounds like wind-blowing, raining, …) are imitated through drum-playing. The group can be devided into students moving and students playing.
- *Drum-Talk*: every student gives a speech with the drum. At the end, he or she gets a warm drum-applause.
- *A Telephone Call with the Drums*: Two students interact with their drums imitating a telephon call.

b) Drumming with using rhythmical patterns (during the rehearsal easy text patterns are given as a help; the hands of each student have coloured marks in order to coordinate left-and-right-hand-playing):
- *Circling Pattern*: A rhythmical pattern is passed on from one student to the other.
- *Impulse – Response*: One player offers a rhythmical pattern, the group answers through imitating.
- *The Echo*: A rhythmical pattern is offered and answered as an echo.
- *Half and Half*:A long pattern is split up and performed by two groups.
- Playing a rhythmic canon/roundabout.
- Using the students' names or African terms as rhythmical patterns.

Information about the Classroom

The classroom consisted of twelve students, ages 11 to 14, with mental handicaps, who visit a special school designed to meet their unique needs. Four of the students were considered severely handicapped with an even higher need of personal assistance and care and five demonstrated challenging social behaviours. Therefore, the researchers had to consider a very high degree of heterogenity and diversity, of uniqueness. Students, ages11-14, for example, are inbetween childhood and adolescence meaning that they, while in the midst of their puberal process of dissociation from parents, teachers, or other authorities, are trying to define their specific lifestyles. These prerequisites were taken into account by a classroom setting which included individual furthering on the basis of assisted self-study and lessons organized as a project work with a chosen topic.

Since some of the students have had to cope with the experience of being transferred from a school for students with learning disabilities to our school, they still lacked self confidence and self esteem; because of a low level of self efficacy they avoided demands and tasks even before they were given (*"I can't do this/I don't feel like it/I am too tired/I'm not in the mood/I'd rather do something else..."*). If one answered their needs, they were often easy to motivate and their learning enhanced. For these students it wa extremely vital to allow a learning setting in which they could relax and feel welcomed and taken seriously in order to destabilize their own self image of a "poor learner." They also had a need for social-emotional furthering. An individual, action-oriented setting, in music education allowed for mutual perception and interactivity between the students. Personal involvement and engagement lead to the perception of their own feelings. It is the interdependency between individual actions and mutual interactions which allowed for effectivity and success. Learning in this sense does not follow the paradigm of input and output, but is an action-oriented self-organizing feedback process in an integrated learning setting with a common topic, in which knowledge and skills are built. Invitations to learning are given; didactical theory moves from the production-oriented to the enabling-oriented basis (c. f. ARNOLD/SCHÜßLER 1998, chap. 4.1; compare also again: "*That means learning is not merely built by a gathering and storage of information, but at the same time by converting this information in activity... it is this putting into practice which completes this learning process*" [Arnold 2006, 145]).

The Content of the Lesson: African Music

Music in form of dancing, singing, listening and drumming plays a central role in Africa. African music lives from the immediate expression. It is used for the passing on of information, of one's own emotional status, and the transfer of cultural identity. Music is integrated in all areas of individual and common life. It is grounded in an aesthetic position which is quite different from the European:

"African music is based on an aesthetic position opposite to the European approach. While in Europe the „the beautiful sound", rehearsed for years, … is praised as the aesthetic ideal, the Africans use all available musical means, irrespective of the subjective beauty of the sound." (Hoefele/Steffe 2000, 16;

translation D.L.)[4] The musical variety of sound is due to the use of nearly all possible objects: together with singing and drumming the African people use body percussion, rattles, sticks, flutes, claves, tinkerbells, gongs, plucked and string instruments (c. f. www.weltmusik-fuer-kinder.de). Basis of all African music making is – no doubt – the drum. Its use describes the aesthetic foundation of the African definition of music and living: Music is not an artistic product but a way of experiencing and expressing the self fostering cultural identity: *"This African way of musicality is a good possibility to make children experience the core music of by using easy means: the physical power of vibrations, which allows mankind to express the inner self."* (Höfele/Steffe 2000, 16; translation D.L.)[5] By this it also fosters self-imaging and personal identity and the sense of togetherness or team-spirit.

Learning targets

This resumé of African music aesthetics mirrors the basis of special music education. It always claims a twofold way of deducing learning targets:
a) education **in** music: the learning target aims at musical knowledge and behaviour;
b) education **through** music investigates, how music is used to aim at learning targets in the field of individual furthering (c. f. Moog 1979/Laufer 1987).

Therefore, we can now give the two-fold learning targets for our drumming lessons:

a) Education in Music
The students are able to use the drums in various musical stucturings and drum patterns.

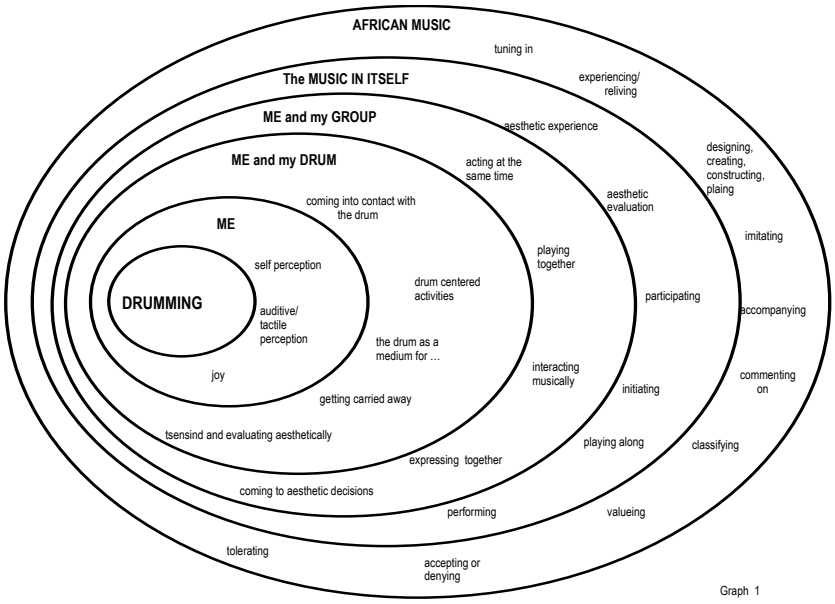
b) Education through Music (emphazising on emotional and social abiltities):
Due to the work with the drums in a musical field of action which lives from the impulses from the group, the students have a wide variety of interaction which allow the following opportunities for emotional and social learning:

1. a differenciated perception of own competencies, the expansion of personal abilities, the perception and development of self-esteem;
2. a differentiated perception and training of social behaviour due to a change in the perception of the single person;
3. the fostering and establishing of team-spirit.

Musical experience is subjective, there is only inner evaluation. In the field of experience, there is no *„right or wrong"* (c. f. Probst 1978, 145), since the music in itself allows a wide field of different strategies of experiencing, processing and acting. These strategies are on an equal footing and have the same value, as the following possibilities to sense, to listen to, to produce, to act simultaneously, to play together, to imitate, to initiate, to accompany, to play along, to comment on, to classify, to arrange, to name, to experience aesthetically, to evaluate aesthetically, to enjoy.

[4] „Die afrikanische Musik basiert geradezu auf einer der europäischen Musik entgegengesetzten ästhetischen Grundlage. Während in Europa der durch jahrelange Übung erworbene ‚schöne Ton' … als ästhetisches Ideal gepriesen wird, verwenden die Afrikaner die ihnen zur Verfügung stehenden musikalischen Mittel, unabhängig von ihrer subjektiven klanglichen Schönheit."
[5] „Diese ‚afrikanische' Form von Musikalität bietet sich daher an, um Kinder durch Lautäußerungen und einfache Instrumen-tierungen das Wesentliche der Musik erleben zu lassen: Die physikalische Kraft der Schwingungen und Vibrationen, die dem Menschen die Möglichkeit geben, seinem Seelenleben Ausdruck zu verleihen."

Graph 1 gives these different ways of being touched and motivated in a developmental layering which starts in the field of self-experience and ends in experiencing African music.
With this this musical lessons imply the individualization and diffentiation in the musical classroom by offering a variety of individual answers to the musical inputs.



Graph 1

Curriculum discussion

Since the curriculum of the schools for the mentally challenged in Northrhine-Westphalia is undergoing a revision and change, the following guidelines served as the a basis for the curriculum discussion:

a) the legal directives for the school for the mentally handicapped from 1980;
b) the legal directives for the teaching the severely handicapped from 1985;
c) recommendations for teaching students, who are mentally challenged from 1998;
d) recommendations for supporting the needs of students with learning difficulties from 1999;
e) recommendations for supporting the needs of students with noticeable problems in their emotional and social behaviour from 2000.

In order to avoid a simple focus on the students' deficits, the quoted recommendations claim an integral view, which invites "*the students to direct and intuitive encounter with the own self, with their own wishes, ideas and beliefs*"(1998)[6]. It also invites to an inner argument about *„culture and the own view of life*"(1998)[7]. „*The intensity and effectiveness of the process of development and acquisition are positively affected by the learner's activity and autonomy. This stands for empowerment in the sense of the best possible self-development.*" (1999)[8]

[6] der die "Schülerinnen und Schüler zu unmittelbarer Begegnung und Auseinandersetzung mit sich selbst, mit eigenen Wünschen und Vorstellungen" und zur Auseinandersetzung mit
[7] "Kultur und Weltanschauung" einlädt.
[8] "Intensität und Effektivität des Entwicklungs- und Aneignungsprozesses werden durch Aktivität und Selbstbestimmtheit des Lernenden positiv beeinflusst und es werden die Handlungskompetenzen im Sinne einer bestmöglichen Persönlichkeitsentwicklung erweitert."

Musical targets covered the areas of *„making music – listening to music – making music“*[9], as described in the Bavarian recommendations for teaching music in the school for the mentally handicapped (no year) and in the new draft for the curriculum "music in primary schools" (2002). Making music, listening to music and putting music into action are interdependent. On the basis of the individual concerns and the ones of the group involved they have to be connected by hands-on learning. Graph 1 shows possible connections and interdependencies.

Individual Consequences

Table 2 provides a comparison of three students from the class is including a short description of the student, didactic, and methodological consequences as well as possible individual learning successes.

Table 2

Student	**description**	**didactic and methodological consequences**	**possible individual learning success**
1	is severely handicapped; has to sit in a wheel-chair; loves and enjoys music; enjoys group activities and being involved; is highly sensitive for the atmosphere in the room and within the group.	is seated on log drums to give him intense sensorial feedback via vibrations; wrist bells on his arms or legs give feedback about his rhythmic movements; needs individual help to play a hand drum; needs his own timing for sensing/feeling, perceiving, enjoying, coming into contact with the music, the persons involved, the group...	to come to sense and perceive the body and the self; to differentiate between various perceptions; to be proactive; to enjoy music; to put music into action; to allow and initiate contacts with other students, to be part of the group, ...
2	is classified as autistic, easily overwhelmed, reacts with screaming and tics, might want to leave the situation; enjoys music; uses stereotype patterns from well-known movies; starts to allow interaction; starts shily to imitate musical actions.	needs to be offered secure structures; needs the balance between offering and neglecting, between direct or indirect adressing; needs support to use her impulses for contact and for participation, to allow the own timing for the balance between "me – drumming – we", to allow her own measure for distance or closeness...	to allow and initiate contacts with other students, to be part of the group, to participate shortly in musical activities; to enjoy music; to be impressed without being overwhelmed; to observe group activities and join in; ...

[9] "Musik machen – Musik hören – Musik umsetzen"

3	has a high degree of cognitive resources; social behaviour is either appropriate or very negative and aggressive; defines herself as „a bad person“; very provocative; has great difficulties to relax and to enjoy; strong leadership in the group; loves music, but hesitates to put music into action.	needs a high cognitive input (drumming and text patterns); needs structure and positive feedbacks for cooperation and engagement; needs support to enforce musical initiatives, to delegate responsibility for musical activities as long as she allows it, to allow cooperation.	to show knowledge and engagement; to accept abilities and needs; to allow herself to be seen as a "good student"; to develop her musical abilities; to put music into action; to behave and communicate appropriately in the group because of the aesthetic appreciation for the topic of the lesson; to be involved musically in the group; to change her self-image; ...

Synopsis

In 1994 and 1997, Caine &Caine summarized the twelve neurodidactic principles and elements due to a thorough analysis and interpretation of various studies in brain research (in Arnold 2006, 153-155). The following synopsis provides an overview of how special music education interacts with neurodidactic principles.

Table 3

Neurodidactic Principles by Caine/Caine[10]	**Comments on the given lesson in special music education**
Principle (P) 1: All learning is physiological.	The lesson highlights the necessity for offering music in a multi-sensory scenario. Music education has to offer auditory, visual, haptic and motoric inputs (c. f. Laufer 2004) in order to allow individual gateways for individual learning and experience in an action-oriented setting. *„Students learn more effectively if they are able to gather experiences in which the senses are multifacetedly adressed.“* (Arnold 2006, 153; translation D. L.)[11]
P2 The brain/mind ist social.	If we have a look on the learning targets and the methodological decisions in the example given we see that the complete lesson is structured due to the needs of social interaction. Through the open, but known beginning and the well-known ending and through the open field of action students get many invitations to act socially and to enhance their social abilities in the aesthetic field of (African) drumming by mutual perception and interactivity.
P3 The search for meaning is innate.	All learning in the example given is embedded into the theme frame „Around the World in Eighty questions“ and the clear structure in the lesson. Strictly organized and free phases take turns and therefore allow the including and appreciation of each student’s ideas and interests.

[10] in: Arnold 2006, 153-155

[11] „Schüler lernen effektiver, wenn sie Erfahrungen machen können, die vielfältig ihre Sinne ansprechen.“ (Arnold 2006, 153)

P4 The search for meaning occurs through patterning.	The whole lesson and the lesson plans for the project work follow the musical idea of repetition and variation. In a sort of spiral curriculum the knowledge and interests of the students are taken into account, valued and enlarged due to the individual needs of each student.
P5 Emotions are critical to patterning.	The lesson plan explicitly demands the emotional statement of the students in combination with social interactions, especially in the musical field of actions. Students have the opportunity for learning in a relaxed and welcomed way.
P6 The brain/mind processes parts and wholes simultaneously.	This single music lesson is embedded in a learning arrangement connected in music and in content through the given topic „Around the world in eighty questions“. So students get an overview and integrational insight on one hand and the opportunity of knowledge and abilities in detail on the other hand.
P7 Learning involves both focused attention and peripheral perception.	The well-prepared learning surroundings, the supporting visual and auditory media, the text patterns allow individual balancing of involvement and withdrawal or time-out. The student is allowed as much focused attention he or she needs as well as peripheral perception.
P8 Learning always involves conscious and unconscious processes.	Along with P7also goes a balancing of conscious and unconscious learning processes; especially the musical field of action allows reflexive phases and positive feedback through success in music-making or social and/or musical interaction.
P9 There are at least two approaches to memory: Archiving isolated facts and skills or making sense of experience.	principle is also served by the already shown connections in P7.
P10 Learning is developmental.	Since the individual needs and abilities of every student is taken into account the lesson gives each student his own personal starting point and his own chance for the next step in development (c. f. layered analysis in graph 1).
P11 Complex learning is enhanced by challenge and inhibited by threat association with helplessness.	The learning setting destabilizes the self-image of some students as „poor learners“ and invites them to make new learning experiences due to the supporting, highly motivating and challenging structure of the learning items.
P 12 Each brain is uniquely organized.	The classroom setting includes individual furthering on the basis of assisted self-study under a common chosen topic. Therefore the structure of the lesson supports individuality and diversity.

As we can see, special music education already serves the neurodidactic principles in a high degree. All principles are executed by the principles of special music education which can be summarized as follows:

Special music education is individuum-based and aims at education in music and education through music. Although the individual needs are clearly seen special music education is not serving egocentric manners but instead always highlights social teaching and learning. Invitations for learning are given in a multi-sensory and multi-modal way (c. f. Laufer 2004). These are embedded in clear structuring of the lessons allowing the individual search for meaning by given theme frames and ritual beginnings and

endings of the lessons. Learning in this sense does not follow the paradigm of input and output, but is an action-oriented self-organizing feedback process, in which knowledge and skills are built and enlarged. With that special music education shares the same view of man as the neurodidactic discussion does: „Man is a creative, complex, flexible, self-organizing system. He is determined and dynamic. The ability of self-actualization has to be highlighted. Because of that the change of basic attitudes, values and mindsets are the most important characteristics of meaningful learning. Only then man is able to effectively change." (Arnold 2006, 157; translation D.L.)[12] Everyone working in special music education will agree.

Music is aesthetic resonance (Ellis 1994) resulting from sounding phenomena. Ribke (1995, 183; translation D. L.)[13] provides the etymology of the Greek term ‚aisthetis'(aesthetics) which is to feel, to experience, to sense; to notice, to feel/realise, to find out; to understand, to get an insight. With this semantic field, we have a three-fold way of each personal activity: sensorial, experience-oriented and understanding, as shown in the example given. Powerful tools to use for effective changes.*What makes a good learning environment appropriate to the conditions of the learning brain?* (Gruhn 2004) As we have seen, there is a strong connection between neurodidactics and special music education. Both can share the same basic understanding of teaching and learning in looking for and providing learning arrangements in content and method to allow effective changes to happen. In contrast to the brain-centered thinking of neurodidactics and neuroscience, we, as teachers, work on an individual, person-centered basis since not only the brain, but always the whole person is involved. Therefore the question to be asked is: *"What makes a good learning environment appropriate to the conditions of the learning from the person/persons involved?"* As we have seen, the findings of neurodidactics confirm the person-centered view of special music education. Both professions have proven to find gateways to the complexity of teaching by allowing the student to examine and experience the world *„... in order to find answers to the deepest and most important questions. The quest for these answers causes a learning process which leads to self-actualization culminating in such answers and thoughts contributing to the process of coping in life."*(Arnold 2006, 158)[14]

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[13] „Fühlen, wahrnehmen, empfinden/bemerken, merken, erfahren/verstehen, einsehen"; „Trias aus sinnenhafter, erfahrungsorientierter und verstehender Aktivität"

[14] „... und Antworten auf die tiefsten und wichtigsten Fragen zu finden. Durch die Suche nach Antworten auf solche Fragen wird ein Lernprozess ausgelöst, der zur Selbstaktualisierung führt und der in Antworten und Gedanken gipfelt, die zur Bewältigung des Lebens beitragen."

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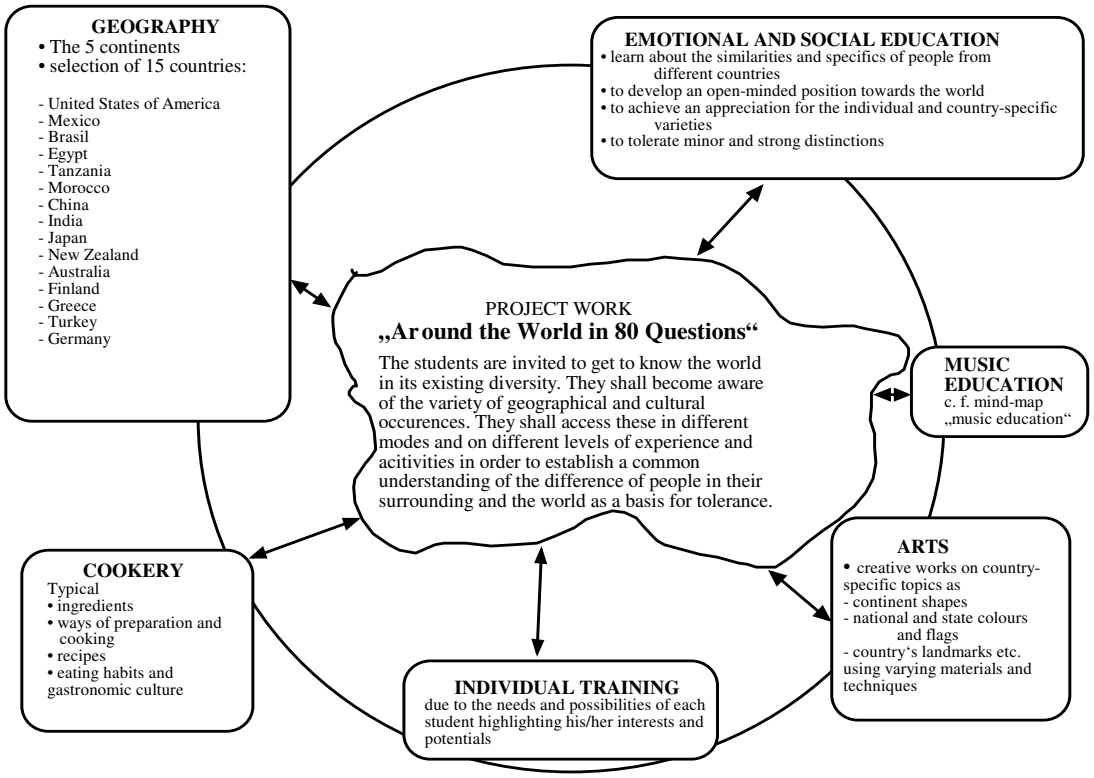
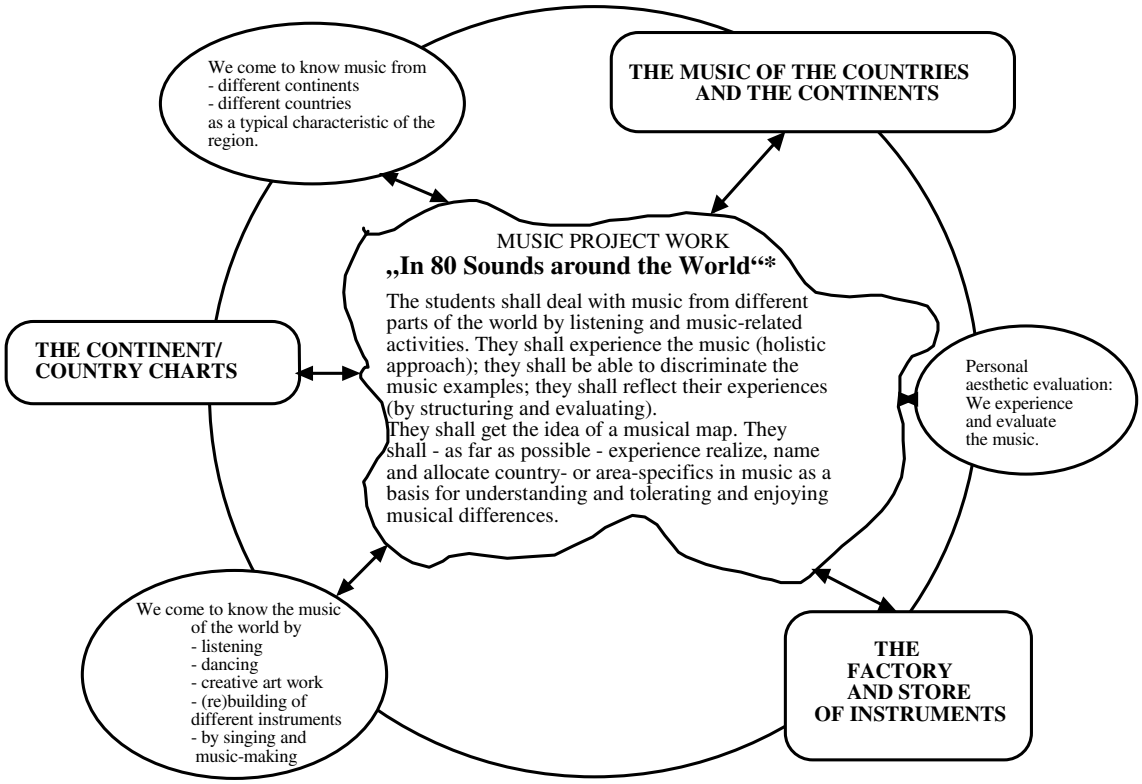


Mind Map 1



Mind Map 2

The use of musical instruments and supplemental materials to enhance spoken language acquisition by children with autism: A case study

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Abstract

The purpose of the study was to examine the use of musical instruments and supplemental materials in helping to improve a young autistic child's spoken language ability. The methodology of the study used a quantitative analysis to measure validity based on assessment scales used in the observation forms by three observers. Qualitative analysis using interviews with parents, classroom teachers and observation reports from three observers were also completed. A 5 year-old autistic subject enrolled in a private kindergarten in central Taiwan was selected by purposive sampling to participate. The study was 20 weeks in length with 30-minute instructional sessions twice per week. Comparisons of pre- and post-test scores and observation forms revealed that the quantitative scores for the subject were clearly enhanced. Parents and teachers observations also revealed that the use of the musical instruments and supplemental materials for the subject's spoken language were improved.

Keywords: Musical Instruments, Supplemental Materials, Autistic Child, Spoken Language, Case Study

Introduction

Background

In earlier work (Lee, 2006a,b; Lee, Chan, Ho & Lin, 2006; Lee, Chan, Ho, Cheng & Su, 2005; Lee, 2004a, b), the researcher observed positive outcomes giving developmentally challenged children the chance to interact and experiment with simple and complex musical instruments. Special needs children have a great need for encouragement and for learning activities that can help develop language and pronunciation skills. It is certainly worthwhile to explore educational activities and materials that can supplement existing methods for communication development.

Motivation of the study

Through the researcher's latest study (Lee, 2007), its has been found that horns can be very productive in teaching the production of certain phonemes and that blowing musical instruments or whistles can be helpful for teaching lip-rounding skills. Therefore, the researcher hoped to apply this method with an autistic child who had exhibited no spoken language development.

Aims

The purpose of the study was to examine the use of musical instruments and supplemental materials in helping to improve a young autistic child's spoken language. The specific research questions asked are:

1. Can musical instruments help to improve the subject's spoken language?

2. Can supplemental materials help to improve the subject's spoken language?

Relative Literature Review

Music therapy has shown its usefulness in working with the autistic community (Hooper, 2002; Lee, 2004a, b; Lee, 2007). The application of methods has helped foster proper social behavior and the forming of social relationships. It is often found that autistic individuals have a greater interest in music. While it is unusual for an autistic child to respond to emotional elements of speech, this is not the case with music, which can draw out emotional response (Heaton, Hermelin, & Pring, 1999).

What is needed for many autistics is a connection, and music can be an ideal bridge between them and others because it is a nonverbal, low-stress communication (Lee, 2004; Wagner, 2000). Simply tossing a ball in time to music can encourage social interaction for autistics. Holding an instrument or making clapping sounds near the eyes can also help encourage eye contact. To promote social interaction, it is important to put someone with autism at ease, to help them relax. Music can help do this.

Music and speech share a number of qualities (Sloboda, 1997). To perceive both requires discriminating between durations, intensities, pitches, timbres, the sounds, and how they change over time. Doing so helps to interpret sounds and connect meaning to them. Pleasurable music activities and music therapy can enhance the palette of auditory training techniques. In a related study, wind instruments can be helpful in teaching lip-rounding and pronunciation of certain words (Lee, 2007).

The families of many autistic children have confirmed the marked improvements music therapy can bring (Allgood, 2005; Pasiali, 2004). The learning of proper behavior in social settings can also be taught through therapeutic songs. For example, lyrics from children's favorite songs were used to create "directions" for them to follow. The children were able, after several days of exposure, to repeat back the song verses; and they generally reduced their undesirable behavior (Pasiali, 2004). While music therapy's effects on behavior were said by one group of researchers to be unclear, it was still found to be more effective than a placebo treament for building gesture- and verbal-based communications (Gold, Wigram, Elefant, 2006).

Methodology

The methodology of the study used a quantitative analysis to measure validity based on assessment scales used in the pre-test and post-test by a local speech therapist and observation forms by three observers. Qualitative analysis using interviews with parents, classroom teachers and observation reports from three observers were also completed.

Participants and setting

The subject was a 5 year-old autistic subject who had received a clinical diagnosis of having severe spoken language disabilities. The child was enrolled in a private kindergarten in Taichung, Taiwan, and was selected by purposive sampling to participate.

Duration

This was a 20-week study, with half-hour sessions twice per week of specific, study-focused music activities. There were a total of 40 sessions.

Research Design

All observations of the participant undertaken during all sessions were recorded on videotape.

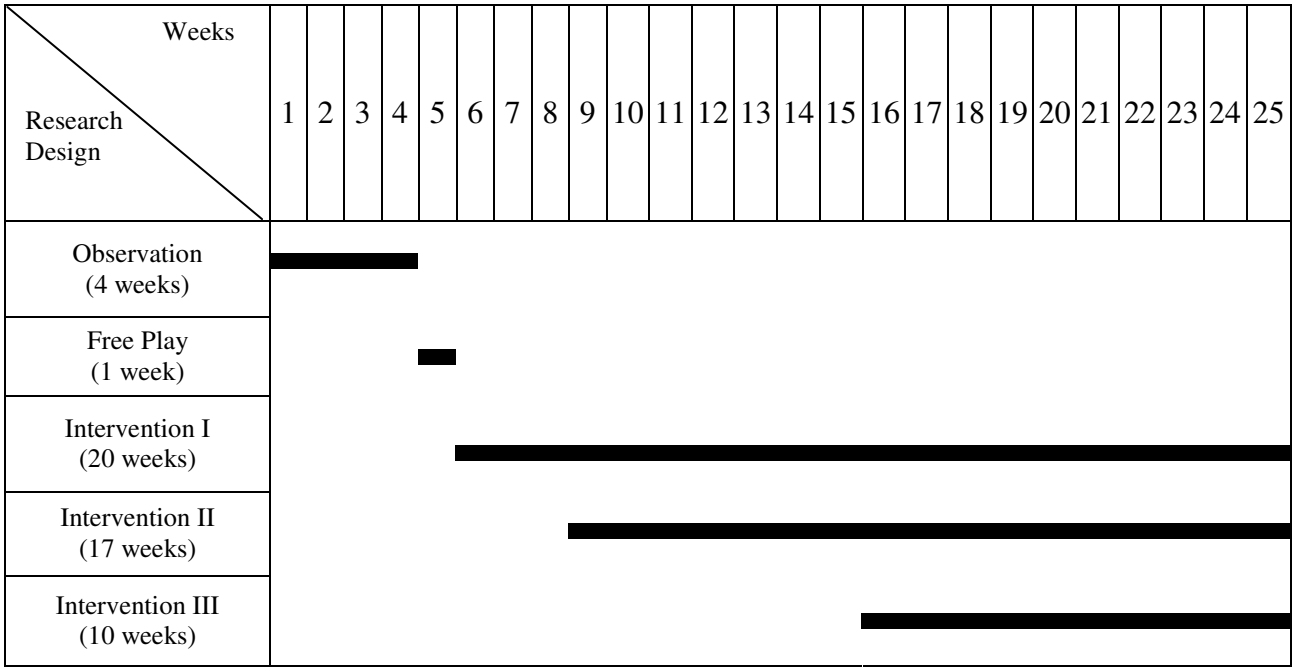

Figure 1: Research Design

Baseline

In assessing the subject's initial behavior, prior to the formal teaching, 4 observations were taken to obtain the subject's condition. The baseline observations concluded when the observers were in agreement about the specific nature of the participant's behavioral and developmental challenges.

Intervention

Prior to the start of the formal curriculum, one free-play of musical instruments and supplemental materials session was held where the subject was given the opportunity to play target musical instruments and supplemental materials that would be used for the therapeutic session (table 1). Mandarin Chinese was used for curriculum, materials, and all target sounds and words.

Table 1. Target Musical Instruments & Supplemental Materials and Participant's Response.

Target Musical Instruments & Supplemental Materials		Participant's Response
Horn Instruments	Choir Horn	Didn't know how to play, just put it into his mouth
	Toy Horn	Didn't know how to play, just put it into his mouth
	Ocean Horn	Didn't know how to play, just put it into his mouth
Pipe Instruments	Pitched Pipes	Put into his mouth, but couldn't make sounds
	Toy Pipe	Put into his mouth, but couldn't make

		sounds
Whistle Instruments	Bird Whistle	Put into his mouth and spilt the water
	Slide-Whistle	Put into his mouth, but didn't know how to pull the slide and blow
	Toy Whistle	Put into his mouth, but couldn't make sounds
Struck Pitched Instruments	Tone Bars	Could play the sounds
	Pitched Desk Bells	Could strike the bells and make sounds
	Pitched Hand Bells	Could shake the bells and make sounds
Hand-made Supplemental Materials	Hand-made Rabbit	Didn't know how to play, just put it into his mouth
	Hand-made Ball (big)	Didn't know how to play, just put it into his mouth
	Hand-made Ball (small)	Didn't know how to play, just put it into his mouth

The curriculum design is as shown in table 2. Musical Activities including a "Hello Song", "Relaxation Time," and "Goodbye Song" were used throughout the therapeutic session. The "Sound Games" included three different phases for different target objectives. Each phase is described as shown in below:

Table 2. Curriculum design

Musical Activities	Instruments used	Therapeutic Sessions	Target Objectives
Hello Song	Guitar	Phase 1, 2, 3	The subject would be able to do the sound echo part of the song.
Sound Games	Pipe Instruments,	Phase 1,2,3	By playing the blown instruments, the subject could form more correct lip shapes and make target sounds: such as "a," "u," "e," "i," and "o". The subject would be able to say one word, then make simple sentences.
	Horn Instruments,	Phase 2,3	
	Whistle Instruments,	Phase 3	
	Hand-made Supplemental Materials	Phase 3	
	String instrument: Nan-Hu	Phase 1, 2, 3	By playing the Nan-Hu, children would imitate, make nonsense sounds and different sounds.
Relaxation Time	Soft relaxed music composed by the researcher	Phase 1, 2, 3	By listening to the music, the subject would be able calm down after the class activities.
Goodbye Song	Guitar	Phase 1, 2, 3	Develop the subject's concept that the music class is coming to an end.

Therapeutic Session: phase 1

The main goal of phase 1 was to promote the subject's language ability, specifically in making sounds, such as: "a," "u," "e," "i," and "o." The "u" and "o" were the most difficult sounds for the participant. By playing the Nan-Hu, the participant could make nonsense sounds and imitate the instrument's sound. By blowing the target instruments and using supplemental materials, the participant could shape his lips for correct pronunciation.

Therapeutic Session: phase 2

The main goal of this stage was to promote the subject's language ability in speaking one word. After phase 1 – making correct main Chinese vowel sounds – the participant started learning one word with meaning.

Therapeutic Session: phase 3

The main goal of this stage was to promote the subject's spoken language ability specifically being able to say some simple sentences and make simple conversation with people. After phase 2 – making one meaningful word – the participant moved to learn simple sentences.

Assessment

The assessment instruments included pre-test and post-test forms completed by a speech therapist at a local hospital; semi-structured observation forms to gather data on spoken language ability from three observers who were trained graduate students; interview reports from the kindergarten teachers; the parents at home; and teaching logs from the researcher. All intervention sessions were recorded on video and these were viewed and scored by three observers**.** At the end of the study**,** three social reliability assessment reports were completed by a parent, a teacher, and the kindergarten's director.

Coding

The following is the researcher's coding symbol:

1. PI 01052007: The Parental Interview on January 5, 2007.
2. TI 01062007: The Interview on January 6, 2007.
3. TOF 02132007: The Teacher Observation Form on February 13, 2007.
4. POF02182007: The Parent Observation Form on February 18, 2007.
5. O1B01052007: The Observer one observed the session of baseline on January 5, 2007.
6. O1MS02022007: The Observer one observed the session of making sounds on February 2, 2007.
7. O2SW02062007: The Observer two observed the session of speaking one word on February 6, 2007.
8. O3SS04062007: The Observer three observed the session of speaking simple sentences on April 6, 2007.
9. RTL06222007: The researcher's teaching logs on June 22, 2007.

Statistical Analysis

Data were analyzed using statistical software "SPSS 10.0.7" for Microsoft Windows.

Results

Pre-test and post-test expert assessment

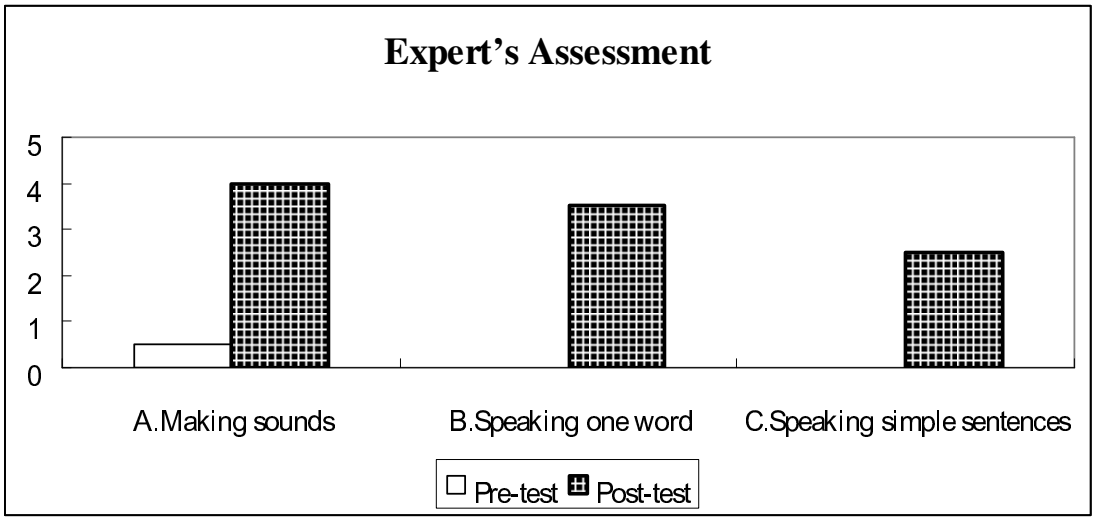

Figure 2: Expert's assessment

The comparison of pre-test and post-test is shown in figure 2. The participant was scored on a "1-5" scale on a range of aspects related to spoken language ability. For the assessment standard of spoken language ability, a score of "1" indicated the participant had less than 40% proficiency across 10 categories, such as the ability to make sounds, verbalize one word and speak in simple sentences. A score of "5" showed the participant had full, 100% proficiency.

The first part ("A") shows assessment of the participant's spoke language of making sounds. The subject is from 0.5 to 4. It shows the efficiency of the study. The second part ("B"), illustrates the participant's language ability of speaking one word. The subject increased from 0 to 3.5. The third part ("C") shows the participant's language ability of speaking simple sentences. The subject increased his scores from 0 to 2.5.

Observation forms, interview reports and teaching logs

For the participant, there were four baseline observations**.** According to the parents and the teacher, the participant had no language ability and had severe problems making proper sounds.

> *"He doesn't speak at all. When he wanted something, he would just use gestures to express." "When he got angry, he would make noises. We took him to the pediatrician and the doctor said that he has a severe speech problem."* (PI 01052007)

> *"He never spoke at school. The one time he would make noise was when he couldn't get something he wanted. We had the pediatrician and speech therapist diagnose the sounds he made. Both of them said he used the wrong way to 'speak'."* (TI 01062007)

After four observations, when the three observers' baseline observations were in agreement and had matching assessment scores, the participant had free play of target musical instruments and supplemental materials before moving to intervention I phase.

> *"Most of the time the subject didn't speak. When he got angry, he used strange sounds to make noise."* (O1B01192007, O2B01192007, O3B01192007)

> *"The subject showed his interest in all the target instruments and supplemental materials."* (O1B01192007, O2B01192007, O3B01192007)

> *"The subject picked up all the target instruments and supplemental materials. It seemed he just put them into his mouth, but didn't know how to play."* (O1B01192007, O2B01192007, O3B01192007)

At phase I, the participant's spoken language ability of making sounds was shown to be improving. The teacher's observation form (TOF 02132007) reported that the participant was motivated to play the slide whistle and imitated the slide sounds up and down. The parents' observation form (POF02162007) showed that the participant liked to blow the pitched pipe and say "u." From the record of the researcher's logs and the three observers' observation forms, the participant soon reached the goal of improving the spoken language ability of making sounds.

> *"After learning the toy pipe, the subject could make proper vowel sound of 'u'."* (O1MS02132007, O2MS02132007, O3MS02132007RTL02132007)

> *"After learning to blow the choir horn, he could open his mouth, round and say 'a' sound more correctly."* (O1MS02162007, O2MS02162007, O3MS02162007, RTL02162007)

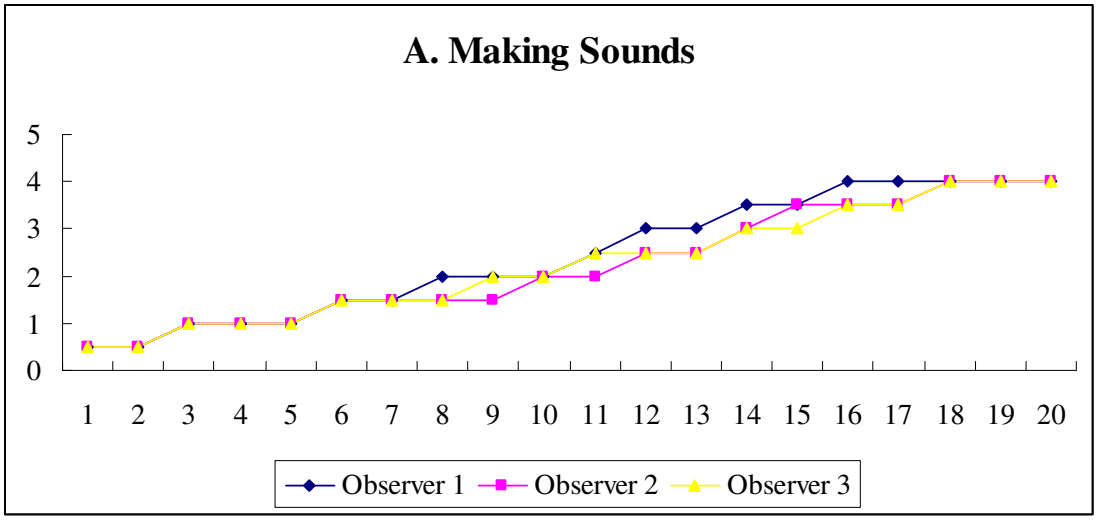

Figure 3: Three Observer's assessment of making sounds

After participant 1 showed stability, he moved to the next phase – improving spoken language ability of speaking one word. At this phase, the participant was able to say some basic one word vocabulary. According to the teacher's report (TOF 03162007), the participant liked to say "mother" while the teacher played "Sol Mi" on any pitched instruments. The parents' observation report revealed that by rounding the lips and holding both hands together, the participant would say "fish" (POF04222007). Both the parents' and teacher's reports showed that after the thirteenth session, the subject could say

"hungry" by pressing his tummy to his parents and the teacher when he was hungry (POF05052007, TOF05042007).

The participant was making progress gradually. At the sixteenth session, the researcher and three observers reached the agreement of the participant had made great progress in speaking one word properly and correctly.

> *"By blowing the hand-made paper rabbit, the participant said 'rabbit' more correctly."* (O1SW05042007, O2SW05042007, O3SW05042007, RTL05042007).
>
> *"When the teacher held hands together, the participant took the Nan-Hu to the teacher. The teacher asked him 'Would you like to be a fish and go swimming up and down?' The participant nodded his head. The teacher had him say 'yes' so he could play the sound game. The participant followed the teacher's direction and said few target words, such as: 'yes,' 'fish,' 'up,' 'down'* (O1SW05042007, O2SW05042007, O3SW05042007, RTL05042007).

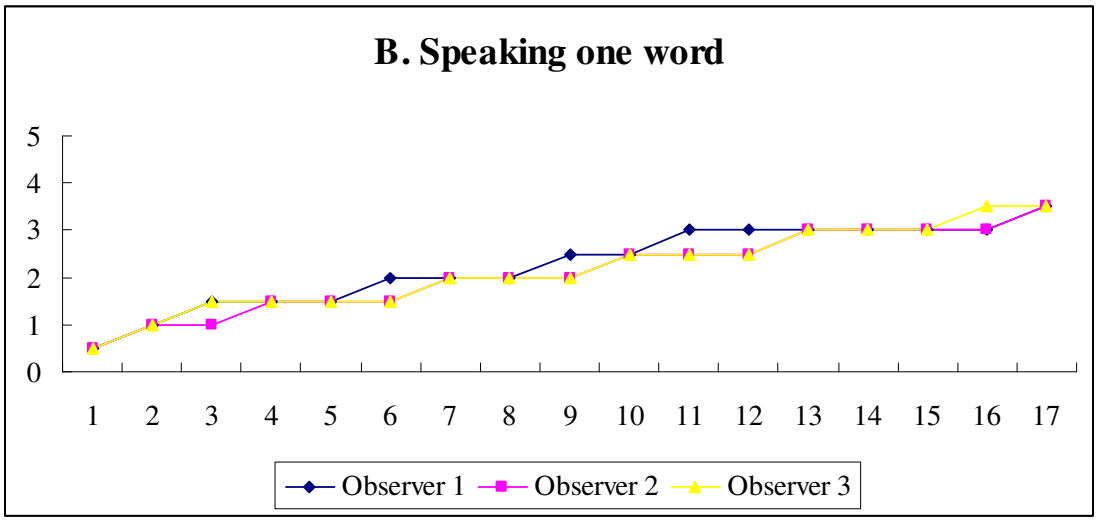

Figure 4: Three Observer's assessment on speaking on word

During the last phase of the intervention, the researcher attempted to teach simple sentences so the participant could make basic conversation with people. At the end of the study, he was able to verbalize simple sentences, such as "Thank you," "You are welcome," "Good morning," "How are you," "I am hungry," "I am full," "I don't want," "Yes, I do," "Goodbye," etc. (TOF06222007, POF06222007, O1SS06222007, O2SS06222007, O3SS06222007, RTL06222007).

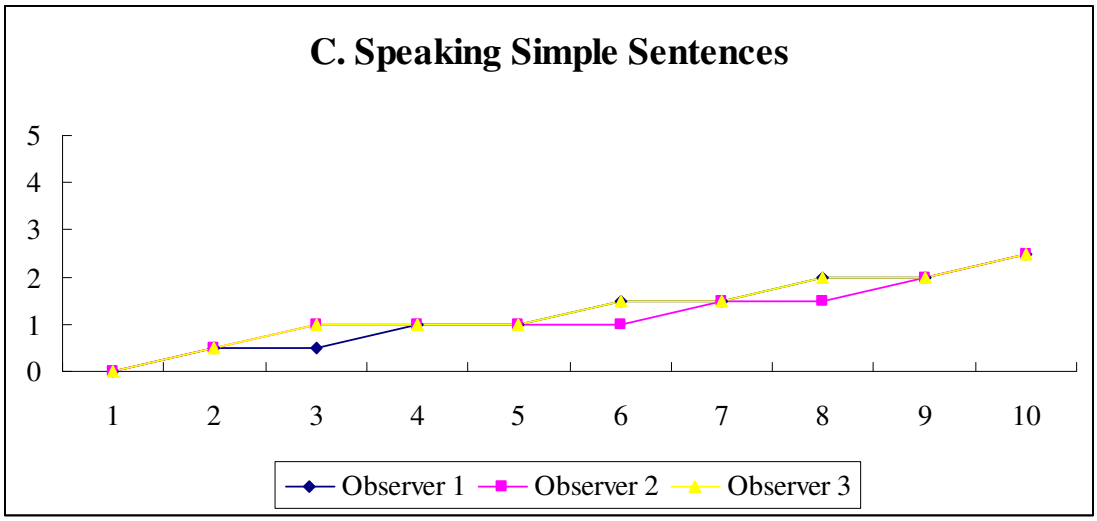

Figure 5: Three Observer's assessment on speaking simple sentences

Reliability

In order to establish the reliability of the study, there were three observers. The scores of internal consistency reliability for the spoken language ability of making sounds was .9939; the scores of internal consistency reliability for the spoken language ability of speaking one word was .9882; the scores of internal consistency reliability for the spoken language ability of speaking simple sentences was .9849; therefore, this study was reliable.

Social Validity

In order to support the validity of the study, a feedback form was used by the principal, a teacher and a parent. The reliability for the study of coefficient of internal consistency was .8929. All respondents gave positive support for the study, and scored various aspects on a "1-5" scale. A score of "1" for questions in the "goals" section indicated that the respondent strongly disagreed with whether a goal of the study had been met; a score of "5" showed that they strongly agreed that a goal had been met. There were 15 scores of "5" (strongly agree), no agree, no disagree and no strongly disagree scores.

For spoken language ability, respondents gave a score of "1" if they felt the participant had shown a high level of regression in an area of language ability; they gave "5" scores if they observed that the participants had made a high level of progress. There were 11 scores of "5" recorded, 4 scores of "4" for progress, and no scores indicating the parent, teacher and principal felt participants had made fair progress, or had regressed (no "1" to "3" scores).

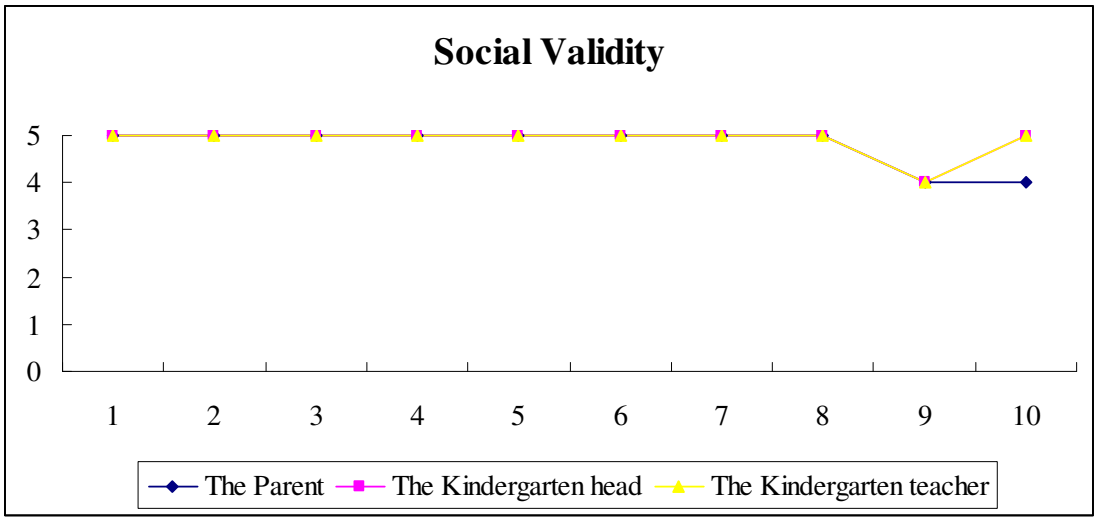

Figure 6: Social Validity of Coefficient of Internal Consistency

Conclusions and implications for further study

The findings from this study revealed that musical instruments, such as the guitar, could be useful tools to attract a special needs child's attention and motivate learning desire. String instruments, specifically the Nan-Hu noted for the sliding sound effects it can create, was a useful tool for improving the autistic child's flat tone. Blowing musical instruments or whistles were also found to be helpful for lip-rounding skills to pronounce Chinese words correctly and horn instruments productive in teaching the production of certain phonemes. Hand-made blowing supplemental materials were very economical, fun, and useful for the parents as a means for encouraged practice with the child at home. Such activities also enabled the parents to bond with the child.

Overall, the participant enhanced his spoken language ability through the music activities. He was motivated to make sounds and improved the spoken pronunciation through the use of musical instruments and supplemental materials. He was also motivated to verbalize one word and engage in simple conversation through the use of musical instruments and supplemental materials. The results of this research provide support for the efficacy of music activities in motivating and improving the autistic child's spoken language ability. Furthermore, the study was able to prove the non-threatening environment that can be created in an individual music-therapy setting is invaluable in providing the opportunity for autistic children's learning.

Suggestions for further study include a larger pool of participants (including children with a variety of special needs) for the purposes of validity as well as longer therapy sessions so as to produce more effective and obvious results. It is hoped through this study and further research that more attention will be paid to the possibilities that exist for using music to reach and benefit the learning of autistic children.

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Music for prelingually deafened children, ages 3-4: A multiple case study

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ABSTRACT

This paper describes the responsiveness of five prelingually deafened children, ages 3 to 4, to singing and sound versus no sound activities as well as comparisons of the children on each music activity. The children, identified as "A," "C," "D," "N," and "T," were students at a preschool program located at a Deaf school in the Northeastern United States. Lesson development was based upon student progress, instructional need, and preschool curriculum. Data analyses were based upon the responsiveness of the children to singing and "Walk and Stop" activities as well as comparisons of the children on each music activity.

Results from this study revealed that the children were involved and successful in the music activities introduced, and that these activities influenced the children's speech and language skills. Repetition and familiarity were crucial to music lesson development providing the children with a stable and comfortable environment in which to learn and explore as evidenced by their signing, increased vocalizations, and the incorporation of both tempo and dynamic changes when playing the drum. Activities also provided children with opportunities for socialization. Factors such as experience with the implant, length of involvement in music activities, and fatigue and may account for individual differences. Findings from this study may be used as a habilitative starting point for the development of music methods and materials for school music classrooms.

Keywords

prelingual deafness, preschool, habilitation, cochlear implants

INTRODUCTION

The assumption that individuals with hearing loss are incapable of perceiving sound and subsequently music is often made. However, few hard of hearing/deaf individuals are without some residual hearing, the hearing remaining after the onset of a hearing loss. Furthermore, many are fitted with hearing aids, which amplify sound, and/or the cochlear implant, a biomedical device which converts sound into electrical currents by directly stimulate remaining auditory nerve fibers of the inner ear. While this device cannot cure hearing loss, it can aid implanted individuals to understand speech and experience music.

Although hearing loss can hinder musical capacity, research and the anecdotal reports of music educators have revealed that hard of hearing/deaf children, those fitted with hearing aids or implanted with the cochlear prosthesis, can experience and respond to musical stimuli (Butler, 2005; Jahns, 2001; Bilar, Artan, & Bal, 1995; Darrow, 1993, 1992, 1989, 1987, 1979; Gfeller, Witt, Spenser, Stordahl, & Tomblin, 1998; Stordahl, 2002; Vongpaisal, Trehub, Schellenberg, & Papsin, 2004; Vongpaisal, Trehub, & Schellenberg, 2006). Ford (1985) found that the complex tones of music can be perceived by hard of hearing/deaf children. According to Ford, the capacity to perceive and assimilate vibrations in music resides in the brain, and although hearing loss may impose certain

limitations upon the extent to which musical potential is realized, a hearing disability does not negate the presence of innate musicality (p. 2).

Music researchers have found that children implanted with the cochlear prosthesis are capable of experiencing music regardless of the limitations imposed by the device. Gfeller et al. (1998), also found that these children participated in school choir, band, and general music classes, as well as activities, either at home or in community settings, such as watching music videos, and listening to music.

The aforementioned research supports music for hard of hearing/deaf children, ages 5 to 18. However, limited research involving younger children is available. Therefore, the present paper describes the responsiveness of prelingually deafened children, ages 3 to 4, to music activities. From such observations, implications can be drawn concerning the effects of music on the musical, linguistic, and social development of young children.

METHOD

Five prelingually deafened children, identified as "A," "C," "D," "N," and "T" served as the subjects for this case study. The children, ages 3 to 4, attended a preschool program located at a Deaf school in the Northeastern United States. Music lessons were attended by the subjects, two classroom teachers, Teacher A and Teacher B, teacher aides, and the researcher. Music lessons, approximately 30 minutes in length, were provided by the researcher and Teacher A. Lessons were ongoing from October 2005 - June 2007. All lessons were video taped; field notes were recorded; and teachers' interviews conducted at the end of the study. Transcripts detailing all activities and responses were created. Videos were reviewed multiple times to evaluate each child's responsiveness to two specific musical activities: *Singing* and *Walk and Stop* (Estabrooks & Birkenshaw-Fleming, 1994).

Singing activities were incorporated into music lessons to promote speech and language development. Songs such as "Clap Your Hands," "The Train," and "The Plane" song emphasized concepts such as body parts, directions, and the vowel sounds "oo" and "ah."

The *Walk and Stop* activity emphasized the first level of auditory development, *detection,* defined as the awareness of the presence or absence of sound (Erber, 1982.) The children, initially introduced to a recording of the song, moved in a circle as the researcher and Teacher A sang and signed the song. They were instructed to stop on the word "stop" and walk on the word "walk." In later lessons, the Walk and Stop activity was executed with just the drum (no singing or sign) during which each child had the opportunity to serve as soloist and activity leader.

For the purposes of this study, a detailed observation of each child's responses in two lessons was analyzed. Lesson 1 was the second lesson taught to this group of children while Lesson 2 was the final lesson taught. These lessons were approximately two months apart.

RESULTS

Case 1: A

A, a prelingually deafened three year old, used bilateral "Behind The Ear" (BTE) Gaia aids during the study. Hearing evaluations for A were inconsistent - ranging from typical hearing to that of a mild to moderate loss. His hearing loss was thought to have resulted from premature birth or multiple ear infections.

Lesson 1

A was not yet a student at the school.

Lesson 2

Singing. A did not sing The Train or The Airplane song. He did, with help from Teacher B, sign the word "choo-choo" (a movement associated with pulling of a train whistle) during the Train song. He also signed the word "airplane" by himself during The Airplane song. A did not sing or sign the Goodbye song. He instead observed his teachers and peers. He did wave good bye in response to the researcher and Teacher A.

Walk and Stop. A always stopped when the drum stopped and walked when the drum was played. He was able to do this without always viewing the sound source. Additionally, A was very observant of his peers when they played the drum. As a result, he tended to react slower to changes in tempo and dynamics. A also signed the word "stop" for the first time. When he played the drum, he did so with intensity. A demonstrated his ability to maintain a steady beat as well as his ability to alternate between soft and loud, slow and fast.

Case 2: C

C, a prelingually deafened four year old, was implanted with the Nucleus Freedom Cochlear Implant at eight months of age. C's bilateral sensorineural hearing loss resulted from bacterial meningitis which she contracted at the age of two months. At the time of Lessons 1 and 2, C had been using the cochlear implant for three years.

Lesson 1

Singing. C did not sing The Train song. However, she did say and sign the word "choo-choo." C also signed the vowel sound "oo" and the word "train." C did not sing The Airplane song, however, she did move her arms like an airplane while the class sang and said "ah," when prompted following the song. When Teacher A gave her a toy plane she signed the word "thank you."

C did not sing the Goodbye song. She did wave goodbye to everyone as the researcher and Teacher A sang.

Walk and Stop. C stopped moving when the song stopped and walked when the song was played. She reinforced these actions by signing the words "walk" and "stop."

Lesson 2

Singing. C sang The Train song with enthusiasm particularly when the vowel sound "oo" was emphasized. She also sang the vowel "ah" during The Airplane song. Following song activities, C sang a descending melodic pattern of a Perfect 4th and signed the name of the little girl sitting next to her. C did this several times. This lesson marked the first time that C sang the Goodbye song. Her participation included singing the words "goodbye," "you," and "soon."

Walk and Stop. C exhibited great enthusiasm for this activity as evidenced by her drum playing. For example, she began playing softly gradually increasing the dynamic level and tempo. While the other children played the drum, C responded by moving with the drum - running when the tempo was fast and walking when the tempo was slow.

Case 3: D

D was born with *Atresia* of the left ear - no left ear canal, a malformation of the ossicles of the middle ear, and malrotated inner ear structures. At the time of the study, D had typical or normal hearing in the right ear, however, he was being monitored for progressive hearing loss. This child was not fitted with hearing aids.

Lesson 1

Singing. D observed during the singing activities. He did say "choo-choo" during the Train song when prompted by Teacher A and the researcher. He also indicated during the Airplane song that he wanted a green toy airplane. D did not sing or sign during the Goodbye song. Following the activity, however, D said "Wanna go bye-bye."

Walk and Stop. D stopped moving and signed the word "stop" when the song stopped and walked when the song was played.

Lesson 2

Singing. "D" was hesitant when the class began to sing The Train song. He gradually began to move his head rhythmically from side to side in addition to signing and singing enthusiastically. D signed and sang the vowel "oo" as well as the words "track" and "back." He also sang the word "choo choo" at the end of the song. After the students had been given train whistles, D exclaimed "I hear the train" while pointing to his ear. He then sang the words "Hear my whistle."

During the plane song, D sang the words "airplane," the vowel "ah," and the phrase "way up in the sky."

D did not sing or sign the Goodbye song. He did wave to everyone at the end of the song when prompted by the researcher and Teacher A.

Walk and Stop. D really enjoyed this activity. When the researcher indicated that it was drum time, D stated "I want this (the drum)!" and "No! My turn!" As the other children played the drum, D responded by moving with the drum - running when the tempo was fast and walking when the tempo slowed. He did sign "stop" when the drum stopped, although this was inconsistent. When it was his turn to play, D first struck the drum forcefully and at a fast tempo. He then alternated between soft and slow, fast and loud. D also demonstrated his ability to maintain a steady beat.

Case 4: N

N, a prelingually deafened four year old, was implanted in March 2007 with a Nucleus Freedom Cochlear Implant. He was diagnosed with a progressive severe to profound bilateral hearing loss at 2 years and 11 months of age. At the time of the lessons described, N had been using his device for approximately one month.

Lesson 1

Singing. N did not participate in The Train song. He did move his arms like an airplane moving back and forth maintaining a steady beat during The Airplane song. He also emulated Teacher A and the researcher by forming the vowel "ah" with his mouth. When the toy plane was given to him by Teacher A, he signed the word "thank you." N did not sing or sign the Goodbye song.

Walk and Stop. N stopped when the song stopped and walked when the song was played. He reinforced these actions by signing the words "walk" and "stop."

Lesson 2

Singing. N sang the vowel "ah" during The Airplane song and "oo" during The Train song. This lesson marked the first time that N sang the phrase "in the sky" during The Airplane song and the word "bye" during the Goodbye song. N also waved goodbye to the researcher and Teacher A at the end of the Goodbye song.

Walk and Stop. During his turn on the drum, N demonstrated the ability to maintain a steady beat. While the other children played the drum, N responded by moving with the drum - running when the tempo was fast and walking when the tempo slowed.

Case 5: T

T, a prelingually deafened four year old, was diagnosed with profound hearing loss at birth. She was implanted with a Nucleus Freedom Cochlear Implant in the Spring of 2006. T's hearing loss was thought to be hereditary as her older brother and another relative were diagnosed with hearing loss. T's brother was also implanted with a cochlear prosthesis. At the time of the lessons described, T had been using the device for approximately one year.

Lesson 1

Singing. T signed the vowel "oo" during the Train song. She also said the word "choo-choo" when prompted by Teacher A following the song. During The Airplane song, T moved her arms like an airplane and said the word "ah" when prompted after the song. When the toy plane was given to her by Teacher A, she signed the word "thank you."

T worked very hard to emulate Teacher A by both singing and signing during the Goodbye song. T also said "bye-bye" at the end of the class.

Walk and Stop. T stopped moving when the song stopped and walked when the song was played. She reinforced these actions by signing the words "walk" and "stop."

Lesson 2

Singing. T sang the vowel "ah" during The Airplane song and "oo" during The Train song.

T, for the first time, sang the word "goodbye" during the Goodbye song.

Walk and Stop. T not only exhibited a steady beat but also experimented by varying her tempo. While the other children played the drum, T responded by moving with the drum - running when the tempo was fast and walking when the tempo slowed.

DISCUSSION

Singing activities promoted speech and language

Findings from this study revealed that music activities promoted speech and language, both signed and verbal.

Signing. Data revealed that the children signed during at least one of the activities in Lessons 1 or 2. The children most consistently signed the word "stop" during *Walk and Stop*, which was most likely due to their enjoyment of this activity. C, N, and T seemed to do less signing and more singing during Lesson 2. This was perhaps due to their increased familiarity of these songs as well as the vocal models provided for them. In comparison, D, seemed to do more signing during Lesson 2. This was particularly noticeable during The Train song as D closely observed and mirrored Teacher A's signs. This was possibly due to his familiarity of and enjoyment of this song.

Singing. C, N, T, and D sang during the music activities presented in Lesson 2, which took place after two months of music study. Researcher and teacher observations revealed that the songs selected for this study successfully encouraged the pronunciation of the vowel sounds "ah" and "oo" for C, D, N, and T, the most active singers. This was most likely due to their repeated exposure to and simple structure of the songs. Similarly, C, N, and T also seemed more interested and confident in the Goodbye song as evidenced by their enthusiastic singing of the words "bye" or "goodbye."

Rhythmic independence via walk and stop

Students' performance on the drum evolved as lessons progressed from a moderate steady beat to the incorporation of tempo and dynamic changes. Variations in performance may be attributed to the children's musical creativity in addition to researcher modeling models provided by the researcher. While all of the children enjoyed playing the drum, the performance of N was particularly noted as he always smiled while playing. His interest may be attributed to the very tactile/kinesthetic nature of this particular music activity. Children's abilities to maintain a steady beat including variations in tempo in addition to their movement mirroring drum performance supports previous research studies indicating that hard of hearing/deaf children, those who use hearing aids and/or cochlear implants, are able to perceive and respond to rhythm (Gfeller & Lansing, 1991, 1992; Pijl, 1997; Darrow 1979, 1984, 1987, 1989).

Socialization via walk and stop

Real life skills were also promoted during the *Walk and Stop* activity. For example, sharing was reinforced by taking turns on the drum as was the opportunity for musical leadership as the children each had a chance to decide when the group should move and stop. Etiquette was also modeled and reinforced throughout all lessons, and in response, the children were responsive to these cues. For example, C, N, and T signed "thank you" after receiving a toy plane. These results are also in compliance with studies suggesting that music can serve as a motivation for the development of self esteem and social skills (Gfeller, 1990; Darrow, 1989; Gfeller & Darrow, 1987).

Factors contributing to individual differences

Implant experience. C was observed to be a stronger singer than N and T. For example, C sang more of the lyrics in the goodbye song, and exhibited melodic vocalizations (descending patterns of a Perfect 4th) in between songs, while

singing the name of another little. Her singing was also observed to be more frequent and spontaneous than N and T. This may be attributed to her experience with the cochlear prosthesis (three years). In comparison, N who had the least experience with the cochlear implant, was the least involved vocally and always very observant and imitative of adult vocal models. N tended to sing only when it was a song that he knew well. He also closely observed and emulated Teacher A when she signed during singing activities.

Program experience. A's limited involvement during a majority of activities was most likely due to the fact that he was still very new to the program at the time of the lessons described.

Fatigue. D's limited involvement during the Goodbye Song may have been due to boredom or fatigue resulting from his energetic involvement in previous activities (Hicks & Tharpe, 2002).

These factors have important implications for music educators as skills will vary based upon the experiences and individual differences of the child. Additionally, music educators will need to consider such factors as they will impact lesson planning, design, and musical content.

CONCLUSIONS

Musical involvement can offer children with hearing loss the same opportunities for music learning and pleasure as their typical hearing peers. Music educators must, however, consider the hard of hearing/deaf child when planning instruction such as type of hearing loss, age of onset, type of hearing aids and/or cochlear implant, as well as their experiences with these devices. In addition to providing enjoyable auditory experiences, music can also promote increased vocalization, reinforce vocabulary, encourage socialization, as well as build confidence subsequently aiding in the development of leadership skills of young hard of hearing /deaf children.

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Adapting music for special needs

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Introduction

Music plays a vital role in expression of the human spirit. A musical instrument fuses mind, body, and spirit, stimulating an increase in brain activity, physical motivation, and creative expression. It is therefore crucial that a musical instrument is physically accessible. Studies have shown that music confers non-musical benefits that have particular consequences for pupils with special needs. "It contributes to reasoning ability, reading skills, feelings and response, personal fulfillment, language development, promotes communication, motor control, and physical well-being, as well as positive attitudes towards school, socialization, and pleasurable group experience" (Walker,1996). For these reasons, music therapists have worked tediously to open the world of music to the child with special needs. Sobol (2000) has stated that in teaching music to special learners, whole language activities of listening, speaking (singing), reading (notation), and creative writing (composing) touch all four standards with even the simplest of themes. In this way, Sobol reinforces Walker's theory that music is important to the development of every child.

Music also taps the creative expression of the individual reaping benefits of emotional stability. "Within every handicapped individual lives a real being, an individuality that is not handicapped in any way, which functions regardless of impairment. It is something that works within the personality of the individual and finds expression through music."(Clark, 1979) Thus, it is imperative to adapt musical instruments to enable creative expression of every individual. Studies have revealed that using traditional instruments without success may damage self-concept and hinder further efforts for individuals with involuntarily neurological impulses, missing limbs, and restricted motor abilities. Adaptive equipment or assistance is necessary (Clark, 1979).

Students with severe physical limitations, participating in summer school at the Henry Viscardi School in Long Island, NY, enjoy music but struggle with accessing musical instruments. This article explores some of the ways musical instruments can be adapted for students with physical limitations. The adaptations in this project were designed for children with cerebral palsy, Duchenne Muscular Dystrophy, intracranial aneurysm, arthrogryposis, osteogenesis imperfecta, head injury, and spinal cord injury.

Cerebral palsy is one of the more common congenital conditions. It is a collection of motor disorders resulting from damage to the brain that occurs before, during or after birth. Damage to the brain affects the motor system causing poor coordination, poor balance, or abnormal movement patterns, or a combination of these characteristics (Miller, 1995). The most common form of cerebral palsy involves limb spasticity. Ataxia, which affects fine coordination, is the second most common form of cerebral palsy

Muscular dystrophy disorders are characterized by progressive muscle weakness and wasting. There may be skeletal deformities, muscular contractures, and cardiac involvement (Aminoff, 2003).Intracranial aneurysms are usually asymptomatic until they rupture at which time there is localized bleeding and decreased blood supply to the area around the ruptured aneurysm (Aminoff , 2003). Depending on the location, there could be deficits in motor function, perception, and sensory processing. Head injury can result from trauma leading to scalp lacerations and skull fractures. The clinical presentation is usually with mental changes such as slowness, drowsiness, headache, confusion, and memory disturbance. Localized neurological deficits such as hemiparesis or hemisensory disturbance may also occur (Aminoff, 2003).Spinal trauma may result from whiplash injury, severe injury usually relates to fracture –dislocation causing compression of the cord resulting in spastic paraplegia or quadriplegia (Aminoff, 2003). Arthrogryposis is a congenital disorder and consists of incomplete fusion of many joints of the body. Upper extremity deformities usually consist of adduction of the shoulder, extension of the elbows, flexion of the wrists, and stiff, straight fingers with poor muscle control of the thumbs (Eilert, 2001). Osteogenesis Imperfecta, a rare connective tissue disease, is characterized by multiple and recurrent fractures which lead to deformities (Eilert, 2001). Overall, the array of disabilities of the children at the Henry Viscardi School included motor weakness, deficits in coordination, range of motion, perception, and sensory processing.

Adapting the instruments

Strength and coordination were assessed to gain a better understanding of each child's abilities and limitations and interests. After the data were collected and reviewed, paper models were fabricated and transferred onto orthoplast and aquaplast (splinting materials that are easily molded at high temperatures). Different materials were experimented upon in order to construct the best possible prototype.

The success of the adaptation was measured via the music which was selected to fit the parameters of the modification. During practice sessions, each child played their piece of music using the adapted instruments. At that time, comments on the adaptations were recorded. Then, the adaptation was modified and the process was repeated until the device worked effectively. Alternate material usage and production of these modifications on a larger scale to enable public availability and access, was explored with an adaptive equipment specialist and the adaptations were fine-tuned. These adaptations have been used for the past three summers by "Music Connectors," a peer-peer mentoring program with students from Herricks High School in New Hyde Park, NY, that culminated in a musical performance.

Adaptations for the Guitar:

Diminished finger strength, pinch, and limitation in wrist flexion impacted the ability to hold a guitar pick An adaptation was constructed to provide a wider surface area for those with decreased pinch. A pick was inserted in a slit in the tubing, and secured with scotch tape. Those with limited pinch held the outside of the tubing and were able to strum the strings. Those who did not have a strong grip placed their finger in the hollow side of the tube which allowed them to strum the strings. Adaptations were constructed to amplify strengths of each individual, using the best angles to create the greatest torque with minimal force by the student.

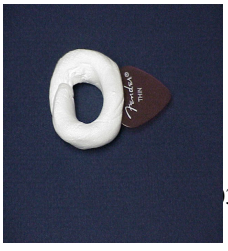

Figure 1: Guitar Adaptations. a: Hand casted pick allows accessibility to children with limited grasp. b: Pick attached to a ring around finger for children with decreased pinch. c: Picks attached to bracelet, strumming achieved by elbow/shoulder movement.

Adaptations for Violin:

Impairments in bilateral integration, decreased muscle strength, and inability to maintain co-contraction of muscle groups made it difficult to play the violin..A paper model was constructed and transposed to an orthoplast tray to hold the violin. A height-adjustable and angle-adjustable tray was attached on the wheelchair to hold the violin. The violin, which sat in the tray, was attached to the tubing and armrest of the wheelchair. The tubing was height adjustable and could be used for angle adjustment. The angle could also be adjusted to optimize the sound of the instruments. The disadvantage of using the tray was that it was specific to only one violin size. In order to utilize the concept for any size violin, an adaptive equipment specialist was consulted to construct the tray of a more durable material and universal shape .The violin was attached to it with straps. It was then connected to the interlocking tubing and the wheelchair where it could be height adjusted and angled.

Figure 2: Height and angle adjustable violin tray attached with interlocking tubing to wheelchair.

Steps were taken to attach the tubing to violin base and to the wheelchair. Velcro straps with padding were used to guide and secure bow hand and an angled support at the side of the chair to enable child to play on different strings.

An elbow support was constructed for the bowing hand to increase precision of the bow across a single string. This elbow support was created to provide proper increments to balance and steady the hand when playing on a single string. The bottom increment corresponded to the lowest string (G) and the highest increment to the highest string (A). This adaptation was developed to help those with decreased strength and coordination. When there was decreased grip, padding and strapping was used to hold the bow.

Adaptations for the Piano:

A lack of finger isolation, finger strength, and synchronized finger contraction was a deterrent in playing the piano. The main problems encountered in accessing a piano was lack of fine motor coordination, decreased strength and reach, a common problem with children with muscular dystrophy. An adapted device was therefore developed to enable them to perform this function using gross grasp. Glass tubing was angled (by melting) to produce appropriate angle for maximum force (torque). The

handle was widened for those with reduced grasp. Velcro and straps used for attaching hand to piano adaptation if needed for those who had difficulty-maintaining grasp.

An angled pointer with an enlarged grip was constructed for those with limited reach and a lack of finger isolation. The handle was enlarged for better grip, the tip was angled to increase force exerted onto the piano key (torque), and rubber placed at the tip to prevent sliding over the keys. Many children were unable to press down three fingers at a time to play a chord in root position. For example, to help the children play A major, D major, and E major chords, pointer tips, differing in height and length, were used to enable access of both black and white keys.

Rubber coating was added at the tips to increase grip and to prevent damage to the instrument. Color coated tips were used for beginner students. These tips coincided with the colored cue on the keyboard. In order to play a chord, the student had to align the color on the chord to the corresponding colored sticker on the keyboard. Different colored handles with different colored tips could be used for all chords in root position, (first inversions and second inversion cords may be constructed in the future).

Some children had difficulty pronating and supinating their forearms and some had restricted wrist movements. The chord compressors were therefore angled.

Figure 3: The chord-playing device made out of layered foam core and tubing.

Through music, physically limited students can experience success and pleasure which build confidence, foster attention span, promote involvement, body awareness, communication, and language development. (Clark, 1979) Improvements in sophisticated processing can also be achieved in musical work, because the elements of music involve both hemispheres of the brain. The key elements of rhythm and melody should be stressed to facilitate refinement of processing. One purpose of rhythms with handicapped children is to provide experiences in which they can connect sensorimotor procedures and auditory processes. (Clark, 1979)

Playing an instrument enhances coordination, mobility and endurance (Gaston, 1979). A musical instrument reinforces motor control and spatial judgment. Stringed instruments provide experiences in finger manipulation and arm and wrist movements: barred instruments lend themselves to work on grasp, eye hand coordination and wrist and shoulder actions; percussion instruments help increase the spectrum of movement for the physically limited. (Clark, 1979).

Some of the benefits to students as a result of the modified instruments included improvement in physical strength as active range of motion increased, emotional gratification, and psychomotor

development. Additionally, there was an increase in motivation as a result of their increased ability to play a musical instrument effectively.

Future modifications may assist a severely physically limited individual to play the violin. The close proximity of the strings, led to troubles for some children who did not posses fine motor skills. Though the bow and hand rest adaptation might help these children with limited muscular movement, a wider bridge must also be constructed. The latter will eliminate the clashing of two strings, yet its affect on the sound of the instrument is unknown. Future studies are necessary to ascertain the best balance between tonality and function. Children with reduced motor skills in both hands might find it difficult to finger notes on the violin. The solution to this problem could be to tune the instrument to different notes having each child responsible for only four notes (tune the strings to these notes). Then, have a group of children play their assigned notes in an order to form music. This functioned similarly to that of a Handbell choir.

Throughout the experiment, various paws/claws were constructed. The claws were primarily made of orthoplast. After consulting with the adaptive equipment specialist, the paws were transformed into layer foam core. Alternative materials and aesthetics should be considered in the future. For example, for children different paws could be constructed to resemble animal paws. This will create a more fun atmosphere to learn music. The paw was primarily coated with Fun-Tak to decrease friction between the keys and the paw. The Fun-Tak often stuck to the keys, leading to the search of new materials. The next most familiar material was eraser tips available in four different colors to match the keyboard. In the future, rubber "Dip-it" can be used and spray-painted to form a more aesthetically sound product.

The violin tray was constructed in order to hold the instrument up. This tray was created of orthoplast and was designed only for only a half size violin. Separate trays were needed for different sizes. After consulting with the adaptive equipment specialist, the design was modified to a flat non-skid surface with straps. This model was not only light weighted, it also fit the sizes of various violins, and violas.

Future developments for those with minimal head movements include advanced technology options such as a mercury sensor that activates depending upon the position of the head in space and infra red circuits broken by movements. Adaptations for other instruments such as cello and the flute may also be created, and perhaps encourage those with physical limitations to be able to pursue music later on in their life. These adaptations are but a beginning in the process of making music accessible to the severely physically limited population.

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Designing instruments for evaluating classroom outcomes of music therapy intervention in a specialist adolescent mental health education rehabilitation program

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ABSTRACT

This paper focuses on the designing of new evaluation instruments to capture data on the effects of music therapy sessions on classroom behaviour outcomes. The instruments are to be used in a study which seeks to evaluate the classroom outcomes of music therapy intervention on secondary school aged students attending a specialist mental health education rehabilitation program at Redbank House, and Redbank School (Sydney, Australia), a facility that provides tertiary level child and adolescent mental health services for clients from pre-school age up to 18 years. There has been a growing awareness of the mental health needs of adolescents and children attending New South Wales (Australia) schools. Projections indicate an increasing demand for services. It is imperative, therefore, to develop evidence-based programmes which will improve self regulation, communication, social/behavioural function and learning of these students so they are able to complete their secondary education. Music therapy intervention can be applied to many different populations. It elicits perceptual cognitive and emotional processes which can hypothetically, quickly engage the young person's motivation to work with their teachers to solve their problems. While music therapists see changes in their clients, research involving statistical analysis is rare and lack of statistical data can result in skepticism on the part of many, about the benefits of music therapy. Because the study is awaiting final approval, the design of, and subsequent changes to, the six new instruments will be discussed in the paper and an evaluation of their efficacy will be given at the Commission meeting

Keywords

Music therapy, adolescents, classroom outcomes

INTRODUCTION

There has been a growing awareness of the mental health needs of adolescents and children attending New South Wales (Australia) schools. Projections indicate an increasing demand for services. It is imperative, therefore, to develop evidence-based programmes which will improve self regulation, communication, social/behavioural function and learning of these students so they are able to complete their secondary education. Music therapy intervention can be applied to many different populations. It elicits perceptual cognitive and emotional processes which can hypothetically, quickly engage the young person's motivation to work with their teachers to solve their problems. While music therapists see changes in their clients, research involving statistical analysis is rare. Through case studies and occasionally small group studies, music therapy research, by and large, examines the role of music therapy on individuals rather than large populations. This focus on the individual or small group is largely because of the difficulty of finding and working with a population with all the same 'base' diagnoses.

Lack of statistical data can result in skepticism on the part of many (but not all) in the medical community, about the role and results of music therapy. Few institutions (although this is

growing) employ music therapists to work with their clients/patients. There is, therefore, a need for music therapy to find ways of engaging large population numbers in research studies. There is also a need to develop ways of evaluating the music therapy intervention.

This paper focuses on the designing of new evaluation instruments to capture data on the effects of music therapy sessions on classroom behaviour outcomes. The project within which the evaluation instruments will be used seeks to evaluate the classroom outcomes of music therapy intervention on secondary school aged students attending a specialist mental health education rehabilitation program at Redbank House in Sydney, Australia. Therapeutic intervention programs at Redbank House operate in conjunction with the Redbank School program to optimise individual educational success. The project, therefore, is targeting music therapy with a particular population (however, with varied diagnoses). It is a pilot study trialling several new evaluation instruments in music therapy and classroom outcomes. If these instruments prove useful, they can be employed to gather data over a larger population and we hope, provide findings which are statistically significant.

LITERATURE REVIEW

Challenging behaviours that lie outside the normal range are classified under the general heading of a *behaviour disorder* (BD). The most common disruptive behaviour disorders include attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and conduct disorder (CD). These three behaviour disorders share some common symptoms, and are often comorbid so diagnosis can often be difficult and time consuming (Busamante, 2000). These disorders in children and adolescents are caused by:

- biological factors such as genetics, chemical imbalances in the body, and damage to the central nervous system, such as a head injury.
- environmental factors including exposure to violence, extreme stress, and the loss or death of an important person.

The term "emotional disorder" (ED) is not a fully accurate medical term, but is commonly used in ordinary context to refer to those psychological disorders that appear to affect the emotions – including bipolar disorder, schizophrenia, post traumatic stress syndrome, depression, borderline personality disorder, eating disorders, anxiety disorders and obsessive compulsive disorder. As well as acknowledging that biological and environmental factors are the major causes for ED's, Peterson & Ishii-Jordan (1994) add that they can also be greatly affected by race and gender. Without these issues being considered, they believe that accurate referring, identifying, planning, and intervening to change student behaviour cannot effectively take place.

A significant percentage of adolescents in NSW have reported high levels of psychological stress (NSW Health Survey High Psychological distress by Health Area, 2005). The annual prevalence of self-harm behaviours in 15 year old adolescent girls in Australia, for example, is about 12% (De Leo and Heller, 2004). Very few young people with mental health disorders, however, have been identified, or referred for specialist programmes. But this will change and is changing in NSW due to the rapid expansion of specialist behavioural school programmes.

Many behaviour strategies, plans and approaches are available to manage and treat these disorders, including individual education plans (I.E.P.) (see Dice, 1993), cognitive behaviour therapy (CBT) (see Braswell and Bloomquist 1991), medication (see Forness et al 1999), psychotherapy, dietary treatment, physical treatment plus alternative treatments. However the disorders are so varied that often a combination of several approaches is employed to gain satisfactory outcomes.
Several researchers, authors and practitioners have written of the benefits of music therapy with behaviourally and emotionally disordered adolescents (Stratton & Zalanowski 1989;

Friedlander, 1994; Walker, 1996; Hendricks et al., 1999; and Montello and Coons 1998).

RESEARCH QUESTION

The research question for this paper asks: how can newly designed evaluation instruments gather data on:

i) classroom behaviour, specifically improvement in self-regulating behaviour, communication and response to the teacher's requests, attention and focus on schoolwork?
ii) social behaviour in the class environment?
iii) improvement in a sense of connection to the school?
iv) improvement in academic behaviour and achievement?

RESEARCH DESIGN

The study will investigate 30-50 secondary school age students undertaking the 10 week program at Redbank House, a tertiary referral centre[15], and Redbank School. This number of participants is sought to add validity to the data being gathered. All participants will have a range of cognitive and emotional difficulties including: 1. Depressive Disorders which may be associated with recurrent self harm; 2. Generalised Anxiety Disorder; 3. ADHD/ODD which may be associated with Learning Difficulties; 4. Obsessive Compulsive Disorder; 5. Asperger's Syndrome; 6. Eating Disorders; 7. First Episode Psychosis. The parents of the participants will be asked to take part in parent-reporting measures.

Student participants will be participating in music therapy as part of this program and attending Redbank School. The music therapy sessions will include improvised and structured music-making; playing tuned and percussion instruments; contributing to writing a song i.e. lyrics and/or melody; playing music as part of a group; and playing music as an individual. The students will work with music therapy in groups of 5-6 and some work as individuals. Over 4 terms (students attend Redbank House for one or two school terms), several groups of students will be asked to take part in the study. A separate group of students with similar emotional and behavioural difficulties, but not involved with music therapy, will act as a non-treatment group for the study. The permission of all participants in the study - students and parents - will be sought.

Data will be drawn from three sources – psychological testing, music therapy tools and classroom outcome tools. In the week prior to the commencement of music therapy, the student participants will be evaluated using psychological testing and questionnaire data. The combination of one to one and group contact, observation, reporting, parent response and direct student response brings to the study a combination of qualitative and quantitative data which allows a thorough examination of the classroom and educational environment and also offers a triangulation of views, thus strengthening the validity of the data obtained. As each student comes with problems unique to him- or herself, a case study approach within a 'bounded system' (Creswell 1998) will be adopted, the 'bounded system' being time (10 week program) and location (Redbank House and Redbank School). The music therapy groups of 5-6 students will also be treated as a collective case study, seeking any similarities in classroom and educational outcomes.

PSYCHOLOGICAL TESTING AND EVALUATION TOOLS

A number of existing and standardised psychological tests are already conducted as part of the ongoing Redbank House evaluation and treatment of clients and results from these will be included in the study's results. Where needed

[15] Redbank School is part of the Department of Child, Adolescent and Family Psychiatry at Westmead Hospital, which is a component of the Sydney West Area Mental Health Service responsible for the provision of tertiary level child and adolescent mental health services for clients from pre-school age up to 18 years.

other testing is undertaken but this is not part of the study.

All students will undertake:
i) the Strengths and Difficulties Questionnaire (SDQ), which is a self-reporting measure for a variety of emotional and behavioural issues;

ii) the Youth Self Report measure (YSR) which captures more specifically, adolescent attitudes about themselves;

iii) the Children's Edinburgh Scale of Depression (CESD) a self-reporting measure for depression;
iv) the Kessler 10 (K 10) a self reporting measure for depression and anxiety.

Their parents also will rate them on:
i) the Strengths and Difficulties Questionnaire (SDQ),

ii) the Child Behaviour Check List (CBCL) which is a comprehensive questionnaire covering the range of emotional and behavioural symptoms;

iii) the Family Assessment Device (FAD) and the Parenting Problem Checklist which measure attitudes to problem solving, emotional expression and conflict resolution within the family unit,

iv) and other measures specific to their condition deemed necessary by the Redbank House Staff

EVALUATION INSTRUMENTS

Within the music therapy literature, Gregory (2000) found that in the *Journal of Music Therapy* from 1984-1997 one hundred and fifty different test instruments were used in research investigations. Less than half, 40%, were published and validated and 25% were constructed by the researcher. Of the forty-six published tests 2 measured student attainment and goals in a music therapy session and 3 focused music therapist observation on musical and general behaviour, and musical response. None were designed for use with adolescents with mental and behavioural difficulties.
The evaluating tools for our study are designed to focus on the more severe end of the spectrum. 1. The Self-Rating Outcome Attainment Instrument **(overhead)** is designed to establish outcomes that the participants themselves would like to achieve over the 10 week period. The instrument is administered in weeks 1 and 10. Goals listed are considered relevant to participants and were chosen by drawing on the experience of team members working regularly with these clients. Participants choose 3 outcomes they would like to achieve in the next 10 weeks, and 3 outcomes that they feel are not important for them to work on in the next 10 weeks. There are three outcome groups – music skills, social skills, behaviour - and participants are to rate themselves now in relation to their chosen outcomes from 0 to 5. Using the same instrument, the music therapist will also assess the level of the participants in relation to their outcomes, twice a term. This will be done because the students often underestimate their own ability and the data will provide another observational viewpoint.
2. The Music Therapist Observation Rating Scale **(overhead)** requires the music therapist to observe, after each music therapy session, issues of musical behaviour, musical response, and general behaviour and rate treatment group students on a 6-point 'forced scale' from strongly inadequate to excellent. Issues include the student's concentration in the session, the student's overall attitude towards music and the student's ability to relate to others in the session. This scale draws on aspects of a music therapy mental health questionnaire designed by Cassity and Cassity (2004).
3. The Pre- During- and Post-Music Therapy Observation Instrument **(overhead)** measures observed behavioural aspects by someone who knows the participant – the teacher's aide, and class teacher. On a 'forced choice' scale of 1 – 6, teachers' aides and teachers determine whether a student appears, for example, 'unsettled' or 'settled', 'distracted' or 'attending to work'. The 'before' evaluation will be undertaken by staff observing the students before they attend music

therapy; the 'during' evaluation by the teacher's aide during music therapy; and the 'after' evaluation by the class teacher after music therapy.
4. The Self-reporting Goal Attainment Instrument **(overhead**) is to be completed by participants on the day, but after, the music therapy session in the classroom to determine the carry-over effect of the therapy. Goals include the wish to contribute to class, whether he/she enjoys being in school, feels they are doing well in school work.

Video and audio recordings will be made of music therapy sessions to review sessions, track the progress of the student and review the music therapist's approach. 5. The Student Profile **(overhead)** will compile information about each participant's psychological and medical issues, gender, age, private or public school and previous music experience.

To evaluate academic achievement in literacy and numeracy, several pre and post tests are routinely administered to all students – see project Design document - and results from these will be included in the study.

DATA ANALYSIS

Analysis of these multiple data sets, involving both qualitative and quantitative data, will begin by examining the results of the classroom outcomes data, then map back through the music therapy data seeking connections, links and patterns. This combined analytical information will then be informed by the psychological evaluation and questionnaire data and the parents' reporting. The aim is to build a profile of each participant and then analyse the profiles as a group, seeking evidence as both individual case studies and a group case study, of the impact or effect of music therapy on educational outcomes. The data will be analysed in relation to several factors, including the students' gender, age, private or public school, internalising or externalising disorders, and whether the student has previously been involved in music.

The classroom and educational environment data, combined with responses drawn from psychological, music therapy and evaluation of other intervention strategies undertaken by clinicians, classroom teachers, music therapist and nursing staff will offer deeper insights into each case study and the group as a whole.

RESPONSE TO THE NEW DATA EVALUATION INSTRUMENTS TO DATE

We feel that the new instruments are designed to gather data on classroom behaviour, social behaviour in the class environment, improvement in a sense of connection to the school and in academic behaviour and achievement. However the true test will come when they are used for the study. While the study is waiting for a new term to commence and for final approval to be received, the newly designed tools are being discussed further with the research team. New evaluation tools require validity and reliability and several issues have emerged and changes made or suggested.

In the Goal Attainment Self Measurement Tool we are considering substituting a Likert scale with phrase choices instead of numbers, thereby facilitating an easier rating process by student participants. We are also discussing the possibility of using visual images to help participants make their decisions although this may be more suited to primary students. We feel that the music therapist should read out loud, the goals listed, to ensure all participants have understood them.

The 4-point 'forced scale' in the Music Therapist Observation instrument may require a 6-point scale in order to allow a fairer evaluation response as the behaviour of student participants can vary within a session.
The student Self-reporting Goal Attainment Instrument (Classroom) has been reshaped to allow more reliable analytical comparison with results from the Pre- During- and Post-Music Therapy Observation instrument. Through some rewording and the addition and deletion of some observations, the goals and observations listed

now focus on the same issues. In the later instrument, the Likert scale of 1-4 has been replaced by words, for example, 'unsettled, a bit unsettled, mostly settled, settled', to help the class teacher's evaluation. We are reconsidering the practicality of student participants completing this instrument twice after every music therapy session, and if this change occurs, will choose the optimum timing for administering this instrument to determine the carry-over effect of the therapy. A member of the team will arrange for the Teacher's Evaluation of Student Progress to be trialed with a local high school. This could help determine whether the instrument is differentiating behaviour from the severe end of the spectrum.

We are also thinking of adding to the study a short interview with student participants by the music therapist, asking them to think retrospectively, about what they thought music therapy would be like, what it was like in the middle of their term, and by the end, what they thought of music therapy.

As of July 2008, the instruments had been used for two terms resulting in further changes discussed with Commission members.

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Musician in hospital: Contours of an emerging profession

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Abstract
The paper focuses on the nature of 'musician in hospital' as a new profession and on its defining characteristics. The main sources of evidence presented herein are two empirical studies undertaken as part of a research on the dynamics of musical communication in a paediatric hospital setting, its emergent features and their relationships to each other. The first study was a web-based survey of existing 'music in hospital' activities and the nature of associations promoting such activities.
A total numbers 39 of organizations were reviewed. Hospital programmes were analysed according to: 1) Nature of the programme; 2) Frequency of the musical intervention; 3) Kind of musicians employed; 4) Variety of music(s) and instruments employed in the programme; 5) Definition of the service as advertised in the web page. Associations were analysed according to: 1) Their stated aims; 2) Activities offered; 3) Selection criteria to employ musicians; 4) Structure of their training.
The second study was a case study of two groups of musicians playing in hospital, the former based in UK (n=8), the latter based in Italy (n=9). In-depth interviews about musicians' biographies, their motivations and beliefs in undertaking such profession, suggest a similarity of intents and aims between the two groups.
Both studies suggest that 'musician in hospital' represents a fairly homogeneous professional group in terms of musical activities and personal motivations. Musicians playing in hospitals constitute a 'community of practice' at a cross-cultural level, in so far as musicians from UK and Italy share both common practices regarding their professional activities, an understanding about their nature and the impact they think they have on the hospital as a wider community.

Keywords
Music in Hospital, Musical communication, Musical identities, Cross-cultural perspectives

Introduction
Previous research in the fields of music therapy and music medicine indicates that music can be an effective means of decreasing the perception of pain among hospitalised children (Chetta 1981; Froehlich 1984; Curtis 1986; Aldridge 1993). The majority of this evidence, however, focuses on the child/patient without taking into account the role of the musician and the interactions, social and otherwise, that stem from the musical process. This bias in reporting is mainly due to the fact that, in these studies, music is perceived as something that stands in its own right without being too much connected with the role of the players. But music in hospital is a multifaceted process, involving not only the music played and the patients who are listening, together with their carers and medical staff, but also the performers (Daveson 2001; Preti & Welch, 2004).
Of the limited previous research, what it is known about these musicians is that they frequently do not have a music therapy background and that their stated purpose within the hospital is primarily to entertain children, carers and staff (Lindsay 1995). They do not necessarily play regularly in hospital, for this is not their main employment, but they are not employed on a voluntary basis either. Moreover, musicians in hospital make up a fairly new occupational group, with the result that we do not

know very much about particular practical aspects of their work, least of all if activities are generalizable. Accordingly, two researches have been conducted in order to address the lack of studies and to explore: (i) a sample of associations and charities involved in the organization of 'music in hospital' performances, their motivations and different approaches; (ii) selection criteria adopted in selecting participant musicians and different attitudes towards the necessity of a specific training prior their actual employment; and (iii) personal and professional identities, motivations and believes of a sample of 17 freelance musicians from the UK and Italy that play in hospitals. All the documents were collated for textual analysis using Atlas.ti (version 5) (Atlas.ti 2005), a qualitative data analysis package for textual and video data.
The study addressed three main questions:
1.What is required to become a 'musician in hospital' from both a personal and professional perspective?
2.Which are the intended outcomes of a musical intervention in hospital?
3.What is the emerging definition of what count as a musical intervention in a hospital setting?

Methodology

The first study was a web-based search that was conducted in order to draw an initial map of the organizations involved in providing musical activities in hospitals. The main aims were to gather a general perspective on: (a) existing musical activities across different hospitals; and b) the nature of a sample of associations involved in providing music in hospital activities. Music programmes were selected as a result of a key-word search run through Google which included the following combinations: 'music in hospital', 'music in hospitals', 'hospital music', 'hospital with music', 'musicians children hospital', 'children's hospital music', 'children hospital bedside music', 'music program children hospital', 'music intervention children hospital', 'healing music children hospital', 'bedside music healing children hospital'. The results considered were those listed within the first 10 pages. The methodology presents clear and considerable limitations, due both to the nature of the database (primarily US managed that lists web sites on the basis of how often they get searched) and the use of English key words that restricted the search mainly to United States and United Kingdom. Nevertheless, this was not considered to be a crucial issue, as the aim of the investigation was more to gather a general sense of the kind of organizations providing musical activities in paediatric hospitals (where possible) and the nature of such activities, than to carry out a comprehensive survey. Music programmes from France and Italy were also included as personally experienced by the researcher.
The total numbers of organization reviewed were 38. Of these, 27 were hospitals hosting music programmes, nine associations providing music services in hospitals, and three specific training programmes available for aspiring musicians in hospital. Hospitals were mainly based in US (n=19) and UK (n=5), 2 were from mainland Europe and 1 in Australia. Associations and programmes were represented both in Europe (n=7) and in the US (n=4).
Music in hospital programmes were analysed according to:

- Nature of the programme (which had to be a music programme, even though several programmes applied the label 'music therapy' to indicate a music programme);
- Frequency of the musical intervention;
- Kind of musicians employed (professional or volunteer, trained or not trained);
- Variety of music(s) and instruments employed in the programme;
- Definition of the service as advertised in the web page.

Associations were analysed according to:

- Their stated aims;
- Activities offered;
- Selection criteria for the employment of musicians;
- Structure of their training.

The second study was a comparative case study between a sample of UK and Italian musicians involved in music in hospital activities in their respective countries. UK musicians (n=8) were selected through a leading and established charity organizing musical events in hospitals across the UK, Scotland, and Northern Ireland. The Chief Executive of the charity facilitated contacts with a sample of musicians that were employed by the charity itself and who were chosen on the basis of regularly performances in children's hospital wards. Semi-structured interviews were conducted, both face-to-face (n=4) and through the telephone (n=4). Italian musicians (n=9) were selected as part of a 'music in hospital programme' which represents an isolated (in the sense of relatively rare) example of long-term musical intervention in a paediatric hospital and includes an ongoing collaboration with European partners involved in similar activities. The researcher was previously involved in this programme and knew all the interviewed musicians personally, which appeared to be an advantage during the interview process in terms of being trusted regarding a common understating of the topic. Data were collected across a month, in the course of broader period of fieldwork, and interviews were carried out before and after the musical intervention in hospital, unlike the interviews with English musicians that were arranged and carried out in neutral spaces and times.

Questions for both groups focussed on: 1) motivations to undertake such a professional role; 2) the necessary skills (musical and personal) needed to sustain it; 3) a detailed description of what the work entails on a practical level; and 4) the impact and any repercussions, both at a personal and professional level, that working in such environment had on their lives. Ethical issues were addressed in advance both with the hospital and musicians, according to local expectations and the best practice principles of the British Educational Research Association, related to ensuring the anonymity and confidentiality of the data.

Results

Study 1

A) Existing musical activities

There are four main typologies of musical interventions emerging from the selection of hospitals analysed[16].

Bedside music

The first typology embraces 'bedside music' which is a regular, long-term, intervention, either sponsored by the hospital or privately funded. Musicians 'make rounds' in the hospital, performing in some of the rooms. The frequency of such interventions varies according to different hospitals

Musicians performing in such programmes are often: (i) certified music practitioners (ranging from music therapists, musicians for healing and transition programme, and trained musicians in special programmes; (ii) voluntary musicians; (iii) professional musicians.

The modalities of bedside musical interventions embrace three main activities: (i) music performance at bedside on a one-to-one base; (ii) interactive music, by giving young patients drums and little percussions to join a music group; (iii) and in few cases, where a music therapist is involved in the program, writing song lyrics to help children express fears and anxieties due to hospitalization.

The musical instruments employed in such activities are mainly guitar & voice, and harp, although the majority of hospitals are rather vague about the musical details of their programmes. Music ranges from familiar popular, folk music and American songs, Jazz, Rock, Classical.

Regular Concerts in common spaces

Concerts usually take place in one of these areas: outpatient area, lobby, corridors, hospital atrium, or auditorium. The frequency of the concerts varies. Concerts are usually targeted for patients, families and hospital staff.

Concert musicians are often (i) professional musicians coordinated by the hospital itself; (ii)

[16] See the references for a list of Hospitals and Organizations quoted in this section.

music students from prestigious music schools, such as the Manhattan School of music and Harvard students (Mihnuet),that through their outreach programs performs regularly in hospitals and nursing homes.
The selection of music ranges from classical music to a more mixed selection, including world music, country, pop, jazz. In some cases – where music seems to be given a relevant role – the hospitals have a grand piano in the lobby, like in the Maria Fareri Children's Hospital and Stanford Hospital & Clinics.

Special music events

Special events often take the shape of (i) concerts organized by charities that employ musicians trained for this particular purpose. During such performances, musicians communicate and engage with the audience through a broad range of music genres and sometimes through verbal interaction, introducing a piece and talking with the audience; (ii) specific projects, organized by either charities or hospitals themselves, involving musicians from established orchestras.

Artist in residence programme

Musical activities range from music workshops where children learn how to build and play musical instruments, to sessions where they write and record songs, to a one-to-one interaction at bedside where the musicians play for the child in a more intimate situation.

B) The nature of Associations involved in the organization of Music in hospital activities

Nine associations providing music services in hospitals, and three specific training programmes for musicians in hospital were analysed according to:

- Stated aims;
- Activities offered;
- Selection criteria to employ musicians;
- Structure of the training.

Stated aims

Associations, charities, and organizations involved in the provision of musical activities in hospitals settings seems to have a common aim which is 'to help people access the joy of live music' as stated in the Live Music Now! website (www.livemusicnow.org retrieved April 16th 2007) and to 'to improve the quality of life of adults and children with all kinds of illness and disability through the joy and therapeutic benefits of live music' (www.music-in-hospitals.org.uk). The therapeutic potential of music, and live music in particular, is acknowledge by each association. The musical experience provided is commonly defined as 'exhilarating, educational and therapeutic' (Ibid) and it is considered a vehicle to 'help aid the healing process, physical, mental and spiritual' (www.musicforallseasons.org). Music is reported to 'help calm patients, alleviate pain and help lift symptoms of depression' (www.musiciansoncall.org) through the communication skills of their musicians and their high degree of musicianship. The distractive element is part of a broader educational outcome, as the presence of an artist in hospital becomes an opportunity for privileged encounters with artistic creations, not only for the young patients, but also for their carers and hospital staff. The hospital setting turns into a cultural venue where music helps to foster 'new expression and communication opportunities during a hospitalization' (www.musique-sante.com).

Activities offered

There are three different kinds of musical activities:

1. concerts (including bedside / in-room performance);
2. established music programmes running on a regular basis;
3. artist-in-residence programmes.

The common denominator is that they are live music interventions that often take the shape of 'interactive' concerts where a high degree of musicianship is combined with the musicians' interpersonal skills that act to facilitate the communication process between music and the audience, and between different members of the audience themselves. This specific kind of musical intervention seems to be the core activity of most associations as the funding available is

not sufficient to allow differentiated programs to happen in the same venue on a more regular basis, the likely ambition for any organization.

Selection criteria in the employment of musicians
The general criteria sought in a musician are reported to be: high level of musicianship, a varied and suitable choice of music, good presentation skills and an ability to establish a rapport with the audience. In one case (Live Music Now!), priority is given to young musicians (the maximum age for application is 27 for instrumentalist and 30 for singers). Freelance musicians are employed on the basis of the concerts for which they are considered to be most suitable (mainly on the base of their repertoire). On average, the number of concerts performed by each musician, or group ranges from 12 to 20 a year.

Structure of the training
Music in hospital is a fast growing area of activity and there is a general interest from different organizations, including music therapy organizations and conservatories, to set up specific training programmes. The University of Strasbourg, together with Musique et Santè, has refined the DUMI curriculum, establishing the first university degree focused on the training of musicians playing in a hospital setting (DUMIS: Diplôme Universitaire de musicien intervenant en milieu de la santé). The training takes place across one year, resembling a UK postgraduate certificate in education course, with 264 hours of theory and practical courses, 100 hours of independent work, 96 hours of hospital placement within designated structures and 90 hours of stage within similar structures in a different European country (http://musims.fr/, retrieved 3/08/07).
A very different kind of preparation is offered to musicians by charities and associations running 'music in hospital' performances. In such cases, the training becomes a rapid way of testing the awareness of musicians with regard to their sensitivities related to the settings where they will perform, rather than a more pedagogical occasion (which would need consistent funding and an appropriate organization). The training often takes the shape of a basic introductory session with a consequent monitoring support offered by former musicians or alternatively, members of the association.

Study 2:
Three main areas emerge from the interviews to a sample of the UK and Italian musicians playing in hospitals:

Motivations
Musicians are often motivated to work in hospital for strong moral reasons (e.g. 'sharing an advantage'; 'paying back a debt'). On the other hand, some of the respondents simultaneously reported, confessed even, more self-centred reasons for wanting to work for the charity, which coincided in a wish to use such employment as a means of obtaining regular opportunities to perform in public:

> 'If I am brutally honest, originally it was an opportunity to get the experience of performing straight out of college'.

Philosophies
The more experienced musicians that were interviewed shared with their less experienced counterparts various views about the importance of musical performance in hospitals. Most of them are convinced about the therapeutic potential of their intervention:

> CP: 'When you are in hospital, do you feel as if you are doing something else other than playing?'
> Tom: 'Oh, yes, definitely! I think it is close to therapy really.

'Helen', on the other hand, was not as convinced of such outcomes:

> 'I can't pretend to do anything more therapeutic than enabling people to enjoy themselves because it's not my role.'

Other musicians describe the musical performance in hospital using religious terms. This sense of both being in the world and being

in harmony with it through musical performance in hospital is present in 'Ann's' transcript, which at one point reports these words:

> 'I think music enables you to achieve an extraordinary intimacy with people you don't know very well. It's like a conduit, helping you to get very close to people…I think there is a mystical aspect to it all as well; for communication through music is more powerful to me than just communication.'

Skills

The importance of successfully making initial and maintaining personal contact subsequently with individual members of the hospital audience through the use of specific non-musical skills was mentioned by all musicians, albeit with varying degrees of emphasis.

> '…there is more to this work than the power of the music I play; it's also about making good eye-contact and making friendship […] remembering people's names…so as to make them feel special.'

Being flexible in what one chooses to perform is also highlighted by several of respondents. 'Ann' speaks for most of them when she says

> 'I always have a plan, but it's never a rule, for I drop things as the moment dictates, pick up something else, take on extra music, and encourage requests.'

Both he and 'May' also stress, like other members of the sample, the importance of having a sense of humour, and of being able to interact with patients in familiar, joking sorts of ways that make the performer 'an entertainer as much as a musician' ('May'). Perhaps is little surprising that 'Tom' concludes his interview by saying that 'it's really not a job to do if you take yourself too seriously'.

Moreover, all recognise that this ability was additional to being able to make music well. So, while clearly some music as performed is amusing in itself, all respondents were conscious of the added value that comes from having a performing personality that was friendly, engaging, and entertaining.

Discussion and Conclusions

Three main findings emerge about musicians playing in hospital and the nature of their activities:

1. Music in hospitals is a structured activity that is increasing in a number of hospitals across the US and Europe, shifting from a voluntary engagement by both charities and musicians to one that is more formalized. As an activity, it commonly comprises four sets of interventions: bedside music; regular concerts in common spaces; special musical events and artist in residence programmes. The nature of the activity, as stated in the aims of charities and associations involved in music in hospital provisions, is described as 'therapeutic and educational'. The therapeutic aspects of the intervention are delegated to the 'power of music', often described in mystical terms, and to the ability of musicians to communicate effectively through the music. An appropriate choice of repertoire is also mentioned as a criterion for a successful intervention. Hospital staff and management, as well as musicians, report enthusiastically on the positive effects of music on their patients and, even though the evidence is anecdotal, it seems sufficiently compelling to justify a relatively flourishing funding around music in hospital activities.
2. Musicians that play in hospitals constitute a new professional group, because performing in hospital requires a high level of professionalism which is defined by associations and charities through both their stated aims and their selection criteria. The emerging profile of a musician in hospital is the one of a skilled musician, often a professional one, highly motivated to play in hospital settings, often for a strong moral commitment, occasionally because of religious ones.
3. The personal and professional characteristic of musicians undertaking this profession and activity, as well as the nature of their engagement

in such activities, become relevant aspects that contribute to a more general understanding of the dynamics of a musical intervention itself. The emerging profile of musicians playing in hospital settings and their activity appears to embrace the five categories identified in the literature, namely: 1) Interconnections between psycho-acoustic phenomena and emotional responses, related to the communication and evocation of emotions through music and the related effects that this interconnected process has on the different people involved, 2) Physical/physiological impacts, concerning the influences that music has on the physical, physiological and psychological condition of children, and how these effects improve their hospitalization; 3) Therapeutic, related to the different ways/techniques of playing music in hospital and their use according to different situations; 4) Social, regarding the impact of music on facilitating interpersonal processes such as interaction and verbalization; 5) Educational, concerning the (usually unintended) educational outcomes that musical provision can have for children within a hospital setting (Preti & Welch, 2004).

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Preti, C., & Welch, G. F. (2004). Music in a Hospital Setting: A Multifaceted Experience. *British Journal of Music Education*, *21(3)*, 329-345.

Hospitals and Organizations:

Hospitals

(Europe)

Addenbrooke's Hospital, Cambridge
Birmingham Children's Hospital
Great Ormond Street Children's Hospital, London
Guy's and St Thomas', London
Royal Hospital for Sick Children, Glasgow
Ospedale Pediatrico Meyer , Florence, Italy
Hôpital, de Saint Nazaire, France

(US)

Beth Israel Hospital, NY
C.S. Children Hospital, Michigan
Cedars-Sinai, NY
Children Memorial Hospital, Chicago
Children's Hospital Boston
Children's Hospital, Los Angeles
C.S. Mott Children's Hospital, Michigan
El Camino Hospital, Mountain View, CA
Flagstaff Medical Center, Arizona
Golisano Children's Hospital, NY
Maria Fareri Children's Hospital, NY
Northwest Hospital, North Seattle
Our Lady of Lourdes Medical Center, NJ
Pembroke Hospital, MA
Rady Children's Hospital , San Diego
Stanford Hospital & Clinics
University of New Mexico Hospital

Thomas Jefferson University Hospital, Pennsylvania
University of Rochester Medical Centre, NY
The Children Hospital at Westmead, Sydney (AU)

Organizations
(Europe)
Musique & Santé - http://www.musique-sante.com/
Sparadrap http://www.sparadrap.org/english/index_links.htm
Centre de Formation de Musiciens Intervenants, Université Marc Bloch, Sélestat - http://musims.fr/
Athenaeum Musicale - http://www.athenaeummusicale.it/
Musica nos Hospitais - http://www.musicanoshospitais.com/
Live Music Now! - http://www.livemusicnow.org/
Music in Hospitals - http://www.music-in-hospitals.org.uk/

(US)
Music for All Seasons - http://www.musicforallseasons.org/
Musicians On Call - http://www.musiciansoncall.org
Snow City Arts - http://www.snowcityarts.com/index.html
Mihnuet (Music in Hospitals and Nursing Homes Using Entertainment as Therapy) - http://www.hcs.harvard.edu/~mih

Past Seminars for the Commission of Music in Special education, Music therapy, and Music Medicine

Tallin, Estonia	1990
Bad Honnef, Germany	1992
Boulder Colorado, USA	1994
Rennes, France	1996
Cape Town, South Africa	1998
Regina Canada,	2000
Jyvaskyla, Finland,	2002
Vitoria, Spain	2004
Serdang, Selangor D.E., Malaysia	2006
Bologna, Italy	2008

Past Proceedings for the Commission of Music in Special education, Music therapy, and Music Medicine

The First Research Seminar of the ISME Commission on Music Therapy and Music in Special Education
(Pratt & Moog, 1989)

Music Therapy and Music in Special Education: The International State of the Art, Volume I
(Pratt & Hesser, 1989)

Music Therapy and Music in Special Education: The International State of the Art Volume II (Pratt, 1989a)

Musica Movet
(Laufer & Piel, 1994)

Music as a Medium: Applications and Interventions
(Laufer & Montgomery, 1998)

Music as a Human Resource: Drafts and Developments
(Laufer, Chesky, & Ellis, 2000)

Resonances with Music in Education, Therapy, and Medicine
(Laufer & Montgomery, 2002)

Selected papers from the 2006-2008 International Seminars of the Commission on Music in Special Education, Music Therapy, and Music Medicine
Schraer-Joiner & McCord, 2010