Proceedings of the 19th International Seminar of the ISME Commission on Music in Special Education, Music Therapy, and Music Medicine

University of Macedonia
Department of Educational and Social Policy
Thessaloniki, Greece

12-14 July 2012

Editor
Lyn E. Schraer-Joiner

www.isme.org

All abstracts presented at the 2012 ISME World Conference in Thessaloniki, Greece, were peer refereed before inclusion in the Conference program. In addition, completed papers were fully (blind) refereed by a panel of international authorities before inclusion in the Seminar Proceedings."

National Library of Australia Cataloguing-in-Publication
Author: ISME Commission for Special Education, Music Therapy, and
Music Medicine International Seminar
(19th : 2012: Thessaloniki, Greece)
Title: Proceedings of the 19th International Seminar of the
Commission on Music in Special Education, Music Therapy, and Music
Medicine, University of Macedonia Department of Educational and Social Policy
Thessaloniki, Greece [electronic resource] /
Mary Adamek ... [et al.].

ISBN: 9780987351166 (ebook)
Notes: Includes bibliographical references.
Subjects: Music--Congresses.
Music in education--Congresses.
Music therapy--Congresses.
Music--therapy--Congresses.

Other Authors/Contributors: Mary Adamek,, Melita Belgrave, Hsiao-Shien (Jessie) Chen, Cynthia Colwell, Alice-Ann Darrow, Shirley Day-Salmon, Yoshiko Fukuda, Amelia Furman, Alan Gertner, Lori Gooding, Julia Heath, Yen Huai Jen, Liza Lee, Bo Wah Leung, Yim Ting Leung, I-Yun Liang, Hua Liu, Kimberly McCord, Dora Psaltopoulou, Daphne Rickson, Patricia Sabbatella, Maritza Sadowsky, Shirley Salmon, Lyn Schraer-Joiner, Kimberly VanWeelden, Victoria Vega, Wei-Chun Wang, Jennifer Whipple, Yen-Hsuan Yang, Maria Yennari, Gina Yi

ISME Commission for Special Education, Music therapy, and Music Medicine..
Dewey Number: 780.7

The Conference Organizing Committee and ISME are grateful to the following people who provided expert, independent advice and who acted as referees for selecting papers and workshops for presentation at the 2012 ISME World Conference:

Our sincere appreciation is expressed to the following people and organizations for their support and sponsorship:

Lefkothea Kartasidou, Ph.D.
Seminar Host
Assistant Professor of Special Education
Department of Educational and Social
Policy, University of Macedonia
Thessaloniki, GREECE

Regina Murphy
ISME Board Liaison
Senior Lecturer, Education Department
St Patrick's College
Dublin City University
IRELAND

The University of Macedonia-Department of Educational and Social Policy, The Greek Society for Music Education, and Hellenic Research Association of Individuals with Visual Impairme

Commissioners 2010-2012

CHAIR, Alice Ann Darrow, Florida State University, United States of America
Melita Belgrave, University of Missouri-Kansas City, United States of America
Helen Farrell, University of Melbourne, Australia
Ling-Yu Liza Lee, Chaoyang University of Technology, Taiwan
Kimberly McCord, Illinois State University, United States of America
Lyn Schraer-Joiner, Kean University, New Jersey, United States of America
Liseslotte van Leeuwen, University of Sunderland, United Kingdom

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.

TABLE OF CONTENTS

Page

MISSION STATEMENT AND ACKNOWLEDGEMENTS 4

I. Perception Research

Reflections on a disability simulation by preservice music educators and student music therapists 9
Cynthia Colwell

The effect of presentation mode and labels on pre-service music educators' perceptions of performance by musicians with disabilities 25
Julia Heath

II. Music Therapy and Older Adults

Exploring the benefits of using piano wizard with older adult piano students 39
Melita Belgrave

Participation in musical activities and quality of life for elders in Taiwan 49
Jessie Chen & I-Yun Liang

Music therapy – Breathing methods incorporated into health promoting exercises. A music therapy for people in their 60s to 90s currently leading normal lives 56
Yoshiko Fukuda

III. Music and Medicine

Music therapy in pediatric oncology treatment: Clinical practice guidelines from the research literature 62
Lori Gooding

IV. Music Therapy and Clients with Autism

Students with autism spectrum disorders (ASD): Implications for music educators 73
Mary Adamek & Amelia Furman

Evaluating the effectiveness of music activities on emotions and communication of a child with autism in a multi-sensory environment 85
Liza Lee & Hua Liu

Th e iPad and children with autism: Two case studies..... 97
Kimberly McCord

Developing music literacy skills for children with autism 106
Maritza M. Sadowsky

V. Clients with Special Needs

The effect of expressive and instrumental touch on the behavior states of individuals with severe and profound intellectual and multiple disabilities 112
Yen-Hsuan Yang

A world through sound: The musical experiences of a child with multiple disabilities in an early childhood music class..... 130
Gina Yi

The assessment of the quality of relationship by people with severe disabilities in a music educational setting 142
Shirley Salmon

Adapting musical experiences for children with cerebral palsy: Dialogues between music therapy and special education..... 153
Patricia Leonor Sabbatella

An exploration of the effectiveness of singing on English vocabulary learning for Chinese pupils with dyslexia 165
YimTing Leung & Bo Wah Leung

Coming together: Collaborative efforts toward musical inclusion 187
Daphne Rickson

Effects of age level and gender on emotional response to musical and visual stimuli using a two-dimensional mood scale 195
Wei-Chun Wang

VI. Community Music Therapy

Expressing yourself: Community building through art and music 213
Victoria Vega

Community music therapy interchange: New paths for personal and environmental changes 217
Dora Psaltopoulou

Music therapy for children with special needs: A complete therapy 224
Dora Psaltopoulou

VII. Music Therapy and Clients with Hearing Loss

Music perception via acoustical and electrical stimulated hearing: A descriptive meta-analysis 233
Alice-Ann Darrow

Musical gaming: crossing the cultural divide between deaf and hearing 248
Alice-Ann Darrow

The development of a cochlear implant music training program 257
Lyn E. Schraer-Joiner, Alan Gertner, Carol Goodman, Florence Arking Rachel Beleski, & Carolyn Mullay

Songs of young deaf children using cochlear implants: From mimesis to invention 268
Maria Yennari

I. Perception Research

Reflections on a Disability Simulation by Pre-service Music Educators and Student Music Therapists

Cynthia Colwell
The University of Kansas
ccolwell@ku.edu
USA

Abstract

The purpose of this study was to examine and compare reflections of individuals participating in a simulation experience designed to impact attitudes of pre-service music educators and student music therapists enrolled in coursework which targeted working with children with special needs. On the first day of class, participants completed a Mainstreaming Questionnaire. Following completion of the questionnaire, participants were asked to simulate one assigned disability in a public venue and included lower-limb paralysis in a wheelchair, one-arm amputation, hearing impairment, or visual impairment. After the specific assignment was made, participants were instructed to list pros and cons of simulating a disability. After the simulation, participants completed the questionnaire as a posttest measure and completed a post-simulation written reflection following five prompts. Results of the questionnaire indicated a significant change form pre- to posttest for the group as a whole when examining total attitude scores. Proposed questionnaire statements, responses to the pros and cons list as well as the post-simulation reflection were coded, categorized, and counted. Trends are discussed.

Modifying attitudes of individuals who will be interacting with children with disabilities is prevalent in the literature in regular education settings (Arvamidus, Bayliss, & Burden, 2000; Cook, 2001; Shippen, Crites, & Houchins, 2005) as well as music settings (Cassidy & Colwell, 2001; Colwell, 2003; in press; Darrow, 1999; Hourigan, 2007; Wilson & McCrary, 1996). Various approaches to alter attitudes include increasing knowledge of disabilities through academic content (Burke & Sutherland, 2004; Colwell, 1999; Moroz, Gozalez-Ramos, Festinger, Langer, Zefferino & Kalet, 2010), observing videos demonstrating successful participation (Cassidy & Colwell, 2011; Eichinger, Rizzo, & Sirotnik, 1992), engaging in interactive experiences (Buck, 1992; Hourigan, 2009; VanWeelden & Whipple, 2005; Wall, 2002), and simulating virtual or live disabilities (Behler, 1993; Colwell, 2003,

in press; Eiring, 1996; Grayson & Marini, 1996; McGowan, 1999; Scullion, 1996; Stamou & Padeliadu, 2009).

Disability simulations are intended to improve empathy, modify attitudes, or increase awareness of challenges and abilities of those with disabilities (Colwell, 2003; in press; Flowers, Burns, & Bottsford-Miller, 2007; Kiger, 1992; Moroz, Gozalez-Ramos, Festinger, Langer, Zefferino & Kalet; 2010; Wilson & Acorn, 1969). A simulation needs to be structured carefully with the intent for participants to think about how they will address needs in educational, medical, or social environments (Richardson, 1990; Semple, Vargo, & Vargo, 1980; Wadlington, Elliott, & Kirylo, 2008).

Those with opposing views on the effectiveness of disability simulations express concerns that there is a dearth of empirical evidence to support this practice and that they may inadvertently promote sympathy rather than empathy (Burgstahler & Doe, 2004; French, 1996; Smart, 2001). Authors caution that participants cannot truly experience a disability through a simulation as individuals with disabilities develop coping strategies that cannot be established in a time limited, artificial situation.

Burgstahler and Doe (2004) reviewed pros and cons of participating in a simulation and feel the core benefit is not so much the actual simulation but observing how others respond to the individual who is simulating the disability. They argue that carefully designed simulations can be effective tools and list seven guidelines: state objectives clearly, ensure voluntary participation, illustrate challenges and solutions, demonstrate value of universal design, include participants in planning and delivery, support positive attitude change, and debrief thoroughly and reflectively acknowledge discomfort.

Opportunity for reflection of the disability simulation is deemed critical for a successful experience (Behler, 1993; Burgstahler & Doe, 2004; Herbert, 2000; Houston, 1990; Jarrow, 1984; Stamou & Padeliadu, 2009). Structured planning of the simulation and a reflective discussion or written opportunity can direct the experience toward how best to meet needs in whatever setting they may happen to be in. Simulation experiences with a reflective component have been described in the literature. Physical Medicine and Rehabilitation residents participated in a disability simulation in pairs with one in a wheelchair while the other functioned as an aid. A

discussion was facilitated to provide an opportunity for verbal reflection (Moroz et al., 2010).

Elementary teachers simulated using wheelchairs, vision limiting goggles, or assistive devices for communication (Mickel & Griffin, 2007). After the simulation in a public venue, teachers were given an opportunity for reflection and presented positive impressions. Stamou and Padeliadu (2009) examined what elementary education majors *said* about a disability simulation rather than use a questionnaire to examine attitude shifts. Participants were asked to simulate blindness or a one-armed amputation during their daily lives and to spend time in a public space. After the simulation, they wrote freely about the experience. Researchers completed a critical discourse analysis comparing writings of participants in a traditional or progressive discourse.

Pfeiffer's (1989) students enrolled in a Masters of Public Administration curriculum participated in a wheelchair exercise. Participants discussed personal reactions as well as what they observed when peers were facilitating the simulation. A content analysis of these written reflections were completed and coded as positive, negative, and neutral statements with positive most prevalent.

Colwell completed two studies using disability simulations in music settings. In 2003, she examined the attitude impact of a simulation on student music therapists. Included in the design were opportunities for pre-simulation focus on pros and cons, as well as, post-simulation written reflection. As suggested in Burgstahler and Doe (2004), she focused their attention on how individuals in their environment responded to the individual enacting the simulation when they were functioning as aids. In a later study (Colwell, in press), she again examined the attitude impact of a simulation but this time compared student music therapists to pre-service music educators. Although not a part of that study's research design, a post-simulation written reflection as well as an in-class discussion was used for verbal processing.

The purpose of this study was to examine and compare reflections of individuals participating in a simulation experience designed to impact attitudes of pre-service music educators and student music therapists. Research questions were:

1) Was there a difference in the attitudes of participants from before to after the disability simulation experience? And between participant groups (music education and music therapy)?

2) Under what categories were the suggested attitudinal survey statements of the participants? How were they different between participant groups?
3) Under what categories were the pros and cons of the participants prior to the simulation? How were they different between participant groups?
4) Under what categories were the personal reflections of the simulation participants? How were they different across assigned simulations (paralysis, amputation, hearing impairment, visual impairment) and between participant groups?

Method

Participants

Participants (N= 50) were music education (n1=28) enrolled in a course *Exceptional Child in Music Education* and music therapy majors (n2=22) enrolled in a course *Clinical Techniques for Children* at a large mid-western university. The intent of these courses was to prepare participants to work with students with special needs as music educators in public school music settings and as music therapists with children with disabilities in public schools, medical settings, private practice, or mental health.

Questionnaire

On the first day of class, participants completed a Mainstreaming Questionnaire (Colwell, 2003, in press) adapted from the *Mainstreaming Opinionnaire* (Schaelkin, 1981) and the *Opinions Relative to Mainstreaming* (Larrivee & Cook, 1979). The Questionnaire had 44 statements representing either positive (22) or negative (22) attitudes toward children with special needs in the music setting. Examples of statements were "The social status of children with special needs as perceived by their non disabled peers will be enhanced through their interaction in regular classrooms." and "Children with special needs fail to make appropriate academic progress when they are integrated into the regular music classroom." Participants were to respond to each statement by indicating their level of agreement to the statement. Responses ranged from "disagree very strongly" at a -3 to "agree very strongly at a +3.

Simulation Experience

Following completion of the Mainstreaming Questionnaire, participants simulated one assigned disability in a public venue and included lower-limb paralysis in a wheelchair, one-arm amputation, hearing impairment, or visual impairment. Participants were put in pairs to function as an aid and as an observer in the simulation environment and asked to each facilitate the simulation for 30 minutes. After the specific assignment was completed, participants were instructed to list pros and cons of simulating a disability.

Participants were given two weeks to complete this assignment during which specific information about disabilities was not addressed in class. Participants simulating paralysis were provided a wheelchair to use as the primary source of mobility. Students simulating one-arm amputations could choose either the dominant or non-dominant hand and were told to put that hand behind their back and to hook the hand in their waistband, covering it with loose fitting clothing. Students simulating hearing impairments were asked to use various styles of earplugs while students simulating visual impairments either wore one eye patch or lightly taped their eyes closed behind dark sunglasses.

Data Analysis

Following the experience, participants completed the Questionnaire as a posttest measure. They were given an index card and asked to write one positively phrased and one negatively phrased statement comparable to those on the Questionnaire they felt would best assess attitudes of peers toward working with individuals with disabilities in music settings.

Each participant was asked to reflect on five prompts in writing:

1) personal reaction to the simulation experience
2) reaction as the aid to the simulation experience
3) observation of reactions of individuals around them
4) difficulties that were encountered during the simulation
5) issues they thought would be difficult but weren't.

The researcher analyzed the attitude of the participants using the *Mainstreaming Questionnaire* comparing before to after the simulation experience as well as between groups. The researcher coded, categorized, and counted the pros and

cons list and the newly created questionnaire statements in consideration of designing a revised attitude survey. These data were compared across participant groups. The researcher examined responses to the five prompts found in the reflection paper. Statements were again coded, categorized, counted, and compared across assigned disabilities (paralysis, amputation, hearing impairment, visual impairment) as well as between groups.

Results

Research Question 1

The Mainstreaming Questionnaire examined participants' attitudes toward inclusion of individuals with special needs in music settings. Because some were phrased positively and some negatively, numerical responses were adjusted for data analysis (1 to 6 for positive and 6 to 1 for negative). If the statement was positively stated, a response of -3 (disagree very strongly) was assigned a 1. Conversely, if the statement was negatively phased, a response of -3 was assigned a 6 representing a strongly positive attitude. Examination of the adjusted scale indicated a 1 as highly negative and a 6 as highly positive.

Three mixed-design ANOVAs were calculated, one on total scores, one on positive statements, and one on negative statements. Means and Standards Deviations are found in Table 1. An initial 2 x 2 mixed-design ANOVA was calculated to examine effects of major (music education or music therapy) and time (pretest, posttest) on total attitude scores on the questionnaire. A significant main effect for time was present ($F(1, 48) = 5.24$, $p = .027$) and revealed that scores increased significantly from pre- to posttest. The major x time interaction was not significant ($F(1,48) = .81$, $p > .05$) nor was the main effect for major ($F(1,48) = 1.73$, $p > .05$). Upon examination of the total score, student music therapists showed the most improvement in positive attitude.

A second 2 x 2 mixed-design ANOVA was calculated to examine effects of major (music education or music therapy) and time (pretest, posttest) on positive statement attitude scores. The main effects for time ($F(1,48) = 3.15$, $p > .05$) and major were not significant ($F(1,48) = ..08$, $p > .05$) nor was the major x time interaction ($F(1,48) = .23$, $p > .05$). Upon examination of positive statement score data, it appears student music therapists showed the most improvement in positive attitude.

A third 2 x 2 mixed-design ANOVA was calculated to examine effects of major (music education or music therapy) and time (pretest, posttest) on negative statement attitude scores. The main effects for time ($F(1,48) = 3.33$, $p > .05$) and major were not significant ($F(1,48) = 4.15$, $p > .05$) nor was the major x time interaction ($F(1,48) = .83$, $p > .05$). Upon examination of negative statement score data, it appears student music therapists showed the most improvement in positive attitude.

Table 1

Means and Standard Deviations for Scores on the Questionnaire

Participants	All		Pos		Neg	
	Pre M (SD)	Pos M (SD)	Pre M (SD)	Pos M (SD)	Pre M (SD)	Pos M (SD)
Music Ed (n=28)	189.6 (15.3)	192.9 (24.0)	88.5 (9.3)	90.3 (13.0)	101.2 (11.8)	102.5 (17.9)
Music Th (n=22)	180.1 (22.1)	187.5 (23.8)	88.6 (10.8)	91.8 (12.8)	91.5 (15.4)	95.7 (15.1)
Total (N=50)	185.5 (19.0)	190.5 (23.8)	88.6 (9.9)	91.0 (12.8)	97.0 (14.2)	99.5 (16.9)

Research Question 2

Statements participants wrote for possible inclusion in a revised *Questionnaire* were categorized, counted and compared between groups. Categories were: music skills and performance, peer acceptance and awareness, social skills and interaction, teaching methods and training, supporting special class placement, classroom environment and behavior issues, and general benefits to the student who is typically developing and general benefits to the student with special needs. Percentages of statements are found in Table 2. Student music therapists focused most on social skills when writing positively phrased statements and on music skills when writing negatively phrased statements. Pre-service music educators focused most on music skills regardless of whether written from a positive or negative perspective.

Table 2

Categorizing Positive and Negative Written Statements for a Revised Questionnaire (percentages)

	Music Therapy		**Music Education**	
	Positive	**Negative**	**Positive**	**Negative**
Music skills and performance	17.0	**30.0**	**35.0**	**45.0**
Peer acceptance and awareness	12.5	22.0		17.0
Social skills and interaction	**25.0**	4.5	10.0	3.5
Teaching methods and training	8.0	17.0	24.0	14.0
Support special placements	8.0			
Classroom environment/behavior		22.0	17.0	20.5
Beneficial to typically developing	12.5			
Beneficial to st with special needs	17.0	4.5	14.0	

Research Question 3

Pros and cons listed prior to the simulation were categorized, counted and compared across groups and found in Table 3. The three most prevalent pros included: gaining an understanding and knowledge of needs, wants, and obstacles of individuals with disabilities (most frequent for both groups); gaining empathy and ability to relate to clients/students (2nd most frequent for music therapy and 3rd for music education); observing how others respond (3rd most frequent for music therapy); and learning how to best respond to individuals with disabilities (2nd most frequent for music education).

The three most prevalent cons were concerns that they would: offend or insult someone with a disability (1st most prevalent for music therapy and 3rd for music education); simulate correctly/respectfully (2nd most prevalent for music therapy); feel embarrassed, awkward, or uncomfortable (tied for 2nd for music therapy and listed 1st for music education); sustain psychological stress during simulation, not being able to do what they wanted (2nd most prevalent for music education); and feel like they are lying or being fake, get caught or be judged; make observers uncomfortable; and react negatively if someone reacts negatively to them (all tied for 3rd for music therapy).

Table 3

Participants A Prior Pros and Cons of the Simulation Experience

Pros	Music Therapy	Music Education
gain understanding and knowledge of needs, wants, obstacles	**26**	**33**
gain empathy, ability to relate to clients	10	10
observe how others respond to individuals with disabilities	9	9
learn how to respond to individuals with disabilities	5	13
participate in a positive experience with peer partner	3	4
recognize characteristics of different disabilities to facilitate simulation	1	2
step outside personal comfort zone	1	1
Cons	**Music Therapy**	**Music Education**
offend or insult someone with a disability	**13**	**14**
simulate correctly/respectfully	9	5
feel embarrassed, awkward, uncomfortable	9	**17**
feel like I am lying or being fake, getting caught, being judged	6	8
make observers uncomfortable	6	0
react negatively if someone reacts negatively to them	6	4
not take experience seriously, seen as making fun of disabilities	4	5
not appreciate scope of disability from small but somewhat unrealistic experience	3	7
feel sympathy toward individual with a disability	2	0
sustain psychological stress during simulation, not being able to do what I want	1	**15**
receive limited view due to lack of ability to simulate certain disabilities	1	0
get physically hurt during simulation	1	3

Research Question 4

After completion of the simulation, participants wrote the reflection paper. Three hundred and twenty-one statements were made about the disability simulation as reported in Table 4. Pre-service music educators made slightly more comments (178 or 55.5%) than student music therapists (143 or 44.5%). Individuals simulating

hearing impairments made slightly more comments (90 or 28%) than those simulating other assigned disabilities, visual impairments (78 or 24%), one-arm amputation (76 or 24%), and lower-limb paralysis in a wheelchair (77 or 24%). Comparing the five prompts, there were more comments under the 'difficulties' prompt (83 or 26%). Trends are noted in the discussion.

Table 4

Frequency of Post-simulation Written Comments in Response to Prompts

Disability	Major	Personal	Aid	Observe	Difficulty	Issues	Total
VI	ME	12	9	9	11	6	47
	MT	7	4	7	9	4	31
HI	ME	11	13	12	13	10	59
	MT	9	9	6	2	5	31
One-arm	ME	5	5	5	12	4	31
	MT	9	7	8	13	8	45
W-Chair	ME	9	4	7	13	8	41
	MT	6	4	11	10	5	36
Total		68	55	65	83	50	**321**

Discussion

In a previous study (in press), I reviewed literature that discussed the reflective piece of disability simulation (Behler, 1993; Burgstahler & Doe, 2004; French, 1996; Herbert, 2000; Houston, 1990; Jarrow, 1984; Salend, 2005; Smart, 2001). While that study was primarily looking at changing attitudes using a *Questionnaire*, reflective writing and informal discussion followed the simulation. Themes emerged that I felt warranted a closer and determined examination.

Participants were concerned that others would think they were making fun of individuals with disabilities or that they might offend someone with a disability. In general, they did not feel participating in a simulation was necessary to gain an understanding of issues that might arise. After the experience, participants reported they felt it was more beneficial than initially anticipated. Participants were surprised by the visceral reaction they felt when observing a negative reaction to the "disability" when in the public venue (Colwell, in press). This observation benefit has been cited as vital to participation in a disability simulation (Burgstahler & Doe, 2004).

In an effort to more closely examine the personal reflection of participants, I kept the simulation experience and *Questionnaire* consistent but formalized the ++ritten reflective pieces. These included previous pros and cons lists as well as a post experience opportunity to reflect on observations and thoughts. Although not significant, music therapists showed greater gains for total, positively-phrased and negatively-phrased statements on the *Questionnaire*. This contrasts to my previous study (Colwell, in press) where pre-service music educators showed the most consistent improvement in positive attitude.

At the conclusion of this previous study (Colwell, in press), I was interested in revising the *Questionnaire* and thought it would be interesting to see what statements these participants would create. Statements were examined and themes extracted as indicated in Table 2. Not surprising, the majority of statements by pre-service music educators were focusing on music skills and performance (35% of positive statements, 45% of negative). The majority of statements by student music therapists differed somewhat with positively-phrased statements under social skills (25%) and negatively-phrased statements under music skills (30%). Music therapists use music to address non-music outcomes hence the focus on social rather than musical issues.

Prior to the experience, participants were asked to list what they thought would be the pros and cons of completing the simulation. No length requirements were given. Seven themes are noted in Table 3. Gain understanding and knowledge of needs, wants, obstacles was the pro stated most frequently by both groups. Gain empathy, ability to relate to clients was listed second most frequently by music therapists while learning to respond to individuals with disabilities was listed second most frequently by music educators. These responses support the intent of disability simulations as cited in literature (Colwell, 2003; in press; Flowers, Burns, & Bottsford-Miller, 2007; Kiger, 1992; Moroz, Gozalez-Ramos, Festinger, Langer, Zefferino & Kalet; 2010; Wilson & Acorn, 1969).

Twelve themes were found through a content analysis of stated cons and noted in Table 3. Music therapists were most concerned about offending someone with a disability while music educators were most concerned about feeling embarrassed. It is interesting to note both are affective albeit one focused outward and one inward.

The written reflection yielded diverse comments too numerous to include in the scope of this paper. Noteworthy comments with frequencies under Personal Reactions included “increased awareness of sensory input in my surroundings” (13),

‘”feeling of lost independence” (12), under Reaction as Aid included “partner didn’t need my help” (9), “had to be creative, organized, and focuses when helping my partner” (9), under Observation of Others included “people staring at us” (26), under Difficulties included “communicating with others” (12) “paying bill and manipulating wallet” (13) and “navigating in physical space” (17), and under Issues included “communicating with others” (9), and “dealing with blatant stares of questions” (9).

Suggestions for future research remain somewhat consistent from the original study (Colwell, in press). I would like to revise the questionnaire as length and clarity were noted as limitations, expand design to compare disability simulations with field experiences, and examine attitudes across the curriculum from freshman through senior year.

References

Avramidis, E., Bayliss, P., Burden, R. (2000). Student teachers’ attitudes towards the inclusion of children with special educational needs in the ordinary school. *Teaching and Teacher Education, 16*, 277-293.

Behler, G.T. Jr. (1993). Disability simulations as a teaching tool: Some ethical issues and implications. *Journal of Postsecondary Education and Disability, 10*(2), 3-8.

Buck, G. (1992). Preservice training: The role of field-based experiences in the preparation of effective special educators. *Teacher Education and Special Education, 15*(2), 108-123.

Burgstahler, S., & Doe. T. (2004). Disability-related simulations: If, when, and how to use them. *Review of Disability Studies, 1*(2), 4-17.

Burke, K., & Sutherland, C. (2004). Attitudes toward inclusion: Knowledge vs. experience. *Education, 125*(2), 163-172.

Cassidy, J.W., & Colwell, C.M. (in press). University students’ perceptions of an inclusive music production. *Journal of Music Teacher Education.*

Colwell, C.M. (in press). Simulating disabilities as a tool for altering individual perceptions of working with children with special needs. *International Journal of Music Education*.

Colwell, C.M. (2003). Integrating disability simulations into a course for student music therapists. *Music Therapy Perspectives, 21*(1), 14-20.

Cook, B.G. (2001). A comparison of teachers' attitudes toward their included students with mild and severe disabilities. *Journal of Special Education, 34*, 203-213.

Darrow, A.A. (1999). Music educators' perceptions regarding the inclusion of students with severe disabilities in music classrooms. *Journal of Music Therapy, 36*, 254-273.

Eichinger, J., Rizzo, T.L., & Sirotnik, B.W. (1992). Attributes related to attitudes toward people with disabilities. *International Journal of Rehabilitation Research, 15*, 53-56.

Eiring, K.M. (1996). *Effect of disability simulation on attitudes.* (Doctoral dissertation, University of Wisconsin). *Dissertation Abstracts International, 57*, 1499.

Flowers, A., Burns, M.K., & Bottsford-Miller, N.A. (2007). Meta-analysis of disability awareness using the sport education model. *Journal of Physical Education, Recreation & Dance*, *78*(9), 32-36.

French, S. (1992). Simulation exercises in disability awareness training: A critique. *Disability, Handicap, & Society, 7*(3), 257-266.

Grayson, E., & Marini, I. (1996). Simulated disability exercises and their impact on attitudes toward persons with disabilities. *International Journal of Rehabilitation Research, 19*(2), 123-131.

Herbert, J.T. (2000). Simulation as a learning method to facilitate disability awareness. *The Journal of Experiential Education, 23*(1), 5-11.

Hourigan, R. (2007). Preparing music teachers to teach students with special needs. *Update: Applications of Research in Music Education, 26*(1), 5-14.

Hourigan, R. (2009). Preservice music teachers' perceptions of fieldwork experiences in a special needs classroom. *Journal of Research in Music Education, 57*(2), 152-168.

Houston, L. (1990). The effect of task difficulty level in disability simulation. *Dissertation Abstracts International: Section B*, *51*(10), 5029B. (UMI No. 9035185).

Jarrow, J. E. (1984). Disability simulations revisited. *Bulletin of the Association on Handicapped Student Service Programs in Post-Secondary Education, 2*(4), 6-7.

Kiger, G. (1992). Disability simulations: Logical, methodological and ethical issues. *Disability, Handicap & Society, 7*(1), 71-78.

Larrivee, B., & Cook, L.B. (1979). Mainstreaming: A study of the variables affecting teachers attitudes. *Journal of Special Education, 13*, 315-324.

McGowan, J.P. (1999). *The effects of disability simulations on attitudes toward persons with disabilities.* (Doctoral dissertation, Seton Hall University). *Dissertation Abstracts International, 60*, 1351.

Mickel, J., & Griffin, J. (2007). Inclusion and disability awareness training for educators in the Kids Like You, Kids Like me program. *Young Children, 62*(4), 42-45.

Moroz, A., Gozalez-Ramos, G., Festinger, T., Langer, K., Zefferino, S., & Kalet, A. (2010). Immediate and follow-up effects of a brief disability curriculum on disability knowledge and attitudes of PM&R residents: A comparison group trial. *Medical Teacher, 32*, 360-364.

Patterson, P. E. (1980). Simulations in therapeutic recreation training programs. *Therapeutic Recreational Journal, 14*, 15–20.

Pfeiffer, D. (1989). Disability simulation using a wheelchair exercise. *Journal of Postsecondary Education and Disability, 7*(2), 53-60.

Pivik, J., McComas, J., Macfarlane, I., & Laflamme, M. (2002). Using virtual reality to teach disability awareness. *Journal of Educational Computing Research, 26*(2), 203-218.

Richardson, M. (1990). Disabled for a day. *Nursing Times, 86*(21), 66-68.

Salend, S.J. (2005). Using technology to teach about individual differences related to disabilities. *Teaching Exceptional Children, 38*(2), 32-38.

Schaelkin, L.P. (1981). Teachers' and non-teachers attitudes toward mainstreaming. *Exceptional Children, 48*, 42-47.

Scullion, P. (1986). Quasidisability experiences using simulation. *British Journal of Therapy & Rehabilitation, 4*(4), 292-293.

Semple, J.E., Vargo, J.W., & Vargo, F.A. (1980). Disability simulation and its effect on changing the attitudes of physical therapy students towards disabled persons: Some preliminary experimental results. *New Zealand Journal of Physiotherapy, 8*(2), 6-8.

Shippen, M.E., Crites, S.A., & Houchins, D.E. (2005). Preservice teachers' perceptions of including students with disabilities. *Teacher Education and Special Education, 28*(2), 92-99.

Smart, J. (2001). *Disability, society and the individual.* Gaithersburg, MD: Aspen.

Stamou, A.G., & Padeliadu, S. (2009). Discourses of disability by teacher candidates: A critical discourse analysis by teacher candidates: A critical discourse analysis of written responses to a disability simulation. *Journal of Applied Social Psychology, 39*(3), 509-540.

VanWeelden, K., & Whipple, J. (2005). The effects of field experience on music education majors' perceptions of music instruction for secondary students with special needs. *Journal of Music Teacher Education, 14*(2), 62-69.

Wadlington, E., Elliot, C., & Kirylo, J. (2008). The dyslexia simulation: Impact and implications. *Literacy Research and Instruction, 47*, 264-272.

Wall, R. (2002). Teachers' exposure to people with visual impairments and the effect on attitudes toward inclusion. *RE:view, 34*(3), 111-119.

Wilson, B.L., & McCrary, J. (1996). The effect of instruction on music educators' attitudes toward students with disabilities. *Journal of Research in Music Education, 44*, 26-33.

Wilson, E.D., & Alcorn, D. (1969). Disability simulation and development of attitudes toward the exceptional. *Journal of Special Education, 3*(3), 303-307.

The effect of presentation mode and labels on pre-service music educators' perceptions of performance by musicians with disabilities

Julia Heath
Florida State University
juliadheath@gmail.com
USA

Keywords: labeling, developmental disabilities, performance

In this study, 32 pre-service music educators evaluated six different performances of musicians with disabilities. Approximately half of the participants received written information regarding the performers' disabilities. To control for visual "labeling," the performances were presented in two modes, audio only and audio/visual. After watching or listening to the six performances, which included strong, choral, and instrumental performances, the participants rated musical aspects using evaluation forms. Results indicated a significant difference between the evaluations of the six performances. No significant differences were found between the evaluation scores for label and no label groups or the audio only, audio/visual presentation modes. A string performance received the highest mean evaluation score, while an adaptive instrumental ensemble received the lowest overall score. Music educators must have clear and realistic goals for performance-based ensembles and the participants in each ensemble, with or without disability. Future research should include an assortment of fieldwork experiences for pre-service music educators to examine a variety of musical opportunities for students with developmental disabilities.

In 2003, almost half (49.9%) of all students, ages 6–21 with disabilities were educated for most (79%) of the school day in a regular, mainstreamed, classroom setting (U.S. Department of Education, 2007). The practice of mainstreaming and inclusion has been actively implemented since the passage of Public Law Number 101-476, the Individuals with Disabilities Education Act (IDEA) in 1990 (Darrow, 1999). The music classroom is a common place for students with disabilities. Often, these students are placed in a music classroom to simply listen to music, but they may also be placed there due to the potential for positive life impact in areas such as behavior modification, communication skills, and socialization (Darrow, 1999). The number of students with disabilities present in a music classroom is increasing and as such, pre-service music education programs have responded by providing courses and field experience to better prepare future teachers.

Research has shown that teachers have a generally positive outlook about incorporating students with disabilities into their music programs. However, resources, access to information, and training could substantially improve (Scott, Jellison, Chappell, & Standridge, 2007). Most negative feelings from teachers result from limited experience with students with disabilities (Gfeller, Darrow, & Hedden, 1990). Prior studies have examined different types of training methods to improve teacher preparedness to work in an inclusive music classroom. Colwell (1995) found that instructional strategies, like adaptive curriculums aid in student progress in the inclusive classroom. VanWeelden and Whipple (2005) found that pre-service music educators felt significantly less apprehensive about working with students with disabilities following a fieldwork experience. Hourigan (2009) found that an orientation class combined with an 8-week long field experience, and concluding with time for reflection allowed pre-service educators to gain confidence in teaching students with disabilities.

With developments in research and the implementation of courses for pre-service educators, inclusion in the music classroom draws less negativity from current music educators (Scott, Jellison, Chappell, & Standridge, 2007). Pre-service educators are taught concepts for adaptation, assessment, and curriculum development for successful inclusive music classroom. Current research however, lacks information regarding the perceptions and assessment of performance of students with disabilities. In the music classroom, performance assessment, typically focused on musical ability, is a common way for teachers to document progress (Conway & Jeffers, 2004).

Performance is a primary part of all music programs. Although the National Standards for Music include many aspects for teaching a varied music curriculum, performance remains a core ideal. The National Association for Music Education lists performing and singing alone and with others a varied repertoire of music as the initial standards for music classrooms in the United States (NAfME, 1994). Assessment tools for music performance such as categorical ratings in a pre-determined number of captions, have been created by researchers and educators (Bergee, 1995; Smith & Barnes, 2007). Even though rating sheets with a range of objective aspects for performance (e.g., rhythms, notes, tempo, dynamics) are used, subjective evaluation (e.g., physical appearance, program selection, posture, group size) still exists in assessment (Thompson & Williamon, 2003). Even when a rubric is provided subjective measures influence overall performance assessment.

Considering the aspects of performance assessment, there is a possibility that music educators may question the ability level of students with disabilities to participate in performance-based ensembles. Wapnick, Darrow, Kovacs and Dalrymple (1997) found that audiovisual recordings of choral soloists were rated higher than audio recordings, leading to the idea that physical attractiveness may play a role in assessment. VanWeelden and Whipple (2007 & 2005) explored perceptions and assessment of educational objectives during pre-service fieldwork in a special needs secondary general music. Music educators may approach grading practice for students with disabilities in the same manner as performance-based ensembles. However, as Darrow (2003) explains:

> Students placed in the inclusive music classroom may be educationally psychologically penalized by being evaluated using the same standards applied to students without disabilities. Music educators need to be flexible and fair by providing an evaluation system that accounts for students' varied abilities. (p. 54)

Few studies exist that examine performance assessment techniques for students with disabilities. VanWeelden and Whipple (2007) found that fieldwork experience and training in alternative assessment provided pre-service music educators with insight into subjective and objective grading scaled for student with disabilities. Most studies use questionnaires to measure attitudes of educators and peers, not necessarily performance perceptions. Gregory (1998) evaluated the responses of middle school, high school, and undergraduate music majors' attitudes towards a performance of a ballet involving individual performing in wheelchairs. Teachers and pre-service educators may make predictions of performance ability based only on the label or diagnosis of a student. Jellison and Duke (1994) altered the labels and descriptions of students' disabilities during evaluation. Regarding actual performance, Cassidy and Sims (1991) used a videotaped performance of a youth choir comprised of students with disabilities to evaluate performance perceptions by peers and adults.

The purpose of this study was to investigate pre-service music teacher's perceptions of musical performances by musicians with disabilities. Music educators must have clear and realistic goals for performance-based ensembles and the participants in each ensemble, with or without disability (Cassidy & Sims, 1991). Prior to fieldwork experiences, many pre-service music educators are reluctant and ill

prepared to work with students with disabilities (VanWeelden & Whipple, 2007). Exposure and the opportunity to interact with diverse populations may bring awareness to students with disabilities musical abilities and their participation and performance based ensembles. With the idea that music educators are reluctant to include students with disabilities in performance ensembles, the researcher will investigate pre-service music educators' evaluations of musical performances by musicians with disabilities. The following questions were guidelines for this study:

1. What is the effect of labeling performers as having a disability on listeners' perceptions of musical performances?

2. What is the effect of audio only and audio-visual conditions on listeners' perceptions of musical performances by persons with disabilities?

Method

Pre-service music educators ($N = 81$) at a large southeastern university were evaluators in this study. All participants were in their third or fourth year of a music education degree program and currently enrolled in professional sequence coursework. These students are close to internship, are participating in fieldwork and pursing teaching careers. Primary performance areas of participants were band ($n = 52$), choral ($n = 18$), and strings ($n = 11$).

The primary area of interest was the possible impact of labels on the evaluations of the performers. Audio only and audio/visual stimulus tapes were prepared. For both the audio only ($n = 39$) and audio/visual ($n = 42$) stimuli, half were provided with written labels stating that the performances being evaluated were of musicians who have developmental disabilities and the other half received no labels. This created four groups: (1) visual/no label ($n = 22$), (2) visual/label ($n = 20$), (3) audio/no label ($n = 21$), and (4) audio/label ($n = 18$).

The stimulus video was comprised of six videos of musicians with disabilities found on YouTube. Each of the videos was selected to provide a range of performances (e.g., instrumental, choral, strings) and nationality (e.g. Zimbabwe, Germany, Australia, Japan). The researcher elected to utilize performances that covered a range of performance qualities to avoid bias of particular performing mediums. Graduate music education majors who were experienced in performance evaluation ranked each performance and evaluated the videos. To control for the

possibility that a visual performance would provide disability "labeling" the researcher created two presentation modes, audio/visual, and audio only. Six orders of the examples were created to help balance for order effect.

The music selections included a range of instrumentation, style, and solo and ensemble performances. The visual stimulus was created using iMovie and loudness levels were equalized between the six performances. Each performance lasted approximately one minute, with one minute of silence provided for form completion between each performance. The stimulus video lasted for approximately 14 minutes.

The dependent variables consisted of evaluations of each performance. The evaluation form was a blended version of the adjudication sheets utilized by the Florida Bandmasters Association, the Florida Orchestra Association, and the Florida Vocal Association. Five categories listed on all three forms were used in the creation of evaluation forms for this study. The categories included: musicality, technique, balance and blend, intonation, and tone quality. Evaluators rated each item on a 10-point Likert-type scale, anchored with the words 1= Poor, 10 = Superior. In addition to these five categories, space was provided to allow participants to include additional comments. Demographic information was taken at the beginning of the evaluation packet (See Appendix A).

The stimulus recordings, both audio and visual, were played in classroom settings using DVD's on color projection screens. To control for sound quality, the same equipment was used for the audio presentations. Participant group sizes ranged from 16 to 24 people. Half of the participants in the study received evaluation packets providing written instructions without labeling information and half were given evaluation packets with written instructions including the labeling statement "the performances you are evaluating are of musicians with developmental disabilities."

Participants watched or listened to the entire clip of each performance before completing the evaluation form that corresponded to each performance. A total of six evaluation forms were completed by each participant.

Results

Research question #1: What is the effect of labeling performers as having a disability on listeners' perceptions of musical performances?

Participants' mean evaluation scores across the five categories of evaluation were the data used for analysis purposes. An analysis of variance (ANOVA) with repeated measures was computed to compare participants' ratings under the following conditions: labels given to the performances (performers with disabilities or no label given), presentation mode (audio only, audio and visual), and performance stimuli (instrumental, choral, string). Results revealed no significant differences between participants' evaluations of performances that were labeled and those without labels $F(1, 77) < 1$, $p > .3$. However, a significant difference was found between participants' evaluations of various performance stimuli used in the study $F(5, 385) = 67.06$, $p < .001$, partial $\eta^2 = .465$. A Bonferonni post hoc test for comparison revealed that Performance E (adaptive instrumental) received significantly lower evaluation scores than the all other performance stimuli (See Table 1). The overall means indicate that the Label group had slightly higher evaluation scores than the No Label group.

Table 1

Means and Standard Deviations of Evaluation Scores for Main Effects

		Perf. A	Perf. B	Perf. C	Perf. D	Perf. E	Perf. F
Overall	*M*	6.75	6.01	5.45	8.12	5.04	6.56
	SD	1.71	1.68	1.94	1.57	1.60	1.97
Audio Only	*M*	6.59	5.48	4.28	7.27	4.77	5.34
	SD	1.81	1.78	1.58	1.61	1.42	1.76
Audio/Visual	*M*	6.91	6.50	6.54	8.91	5.28	7.67
	SD	1.61	1.44	1.59	1.04	1.73	1.44
Label	*M*	6.76	5.89	5.85	8.22	5.01	6.88
	SD	1.36	1.46	1.41	1.12	1.41	1.54
No Label	*M*	6.74	6.11	5.10	8.02	5.06	6.25
	SD	1.98	1.87	2.27	1.89	1.77	2.27

Research question #2: What is the effect of audio only and audio-visual conditions on listeners' perceptions of musical performances by persons with disabilities?

A significant difference was also found in ratings between the audio only and audio-visual groups $F(1, 77) = 29.72$, $p < .001$, partial $\eta^2 = .278$. The audio only group ($M = 5.66$) rated the performances significantly lower than the audio-visual ($M = 6.95$) group. When comparing the overall means for the performance stimuli, the string performances (B, D) were rated slightly higher than the choral (C, F) and the instrumental (A, E) performances. The highest overall rating was found with violin concerto performance D ($M = 8.12$, $SD = 1.57$), while the lowest rating was associated with the adaptive band performance E ($M = 5.04$, $SD = 1.60$).

A significant two-way interaction was found between presentation mode and label effect, $F(1, 77) = 11.67$, $p < .01$, partial $\eta^2 = .132$. When analyzing the difference between the label and no label effect for the audio only presentation, no significant difference was found. For audio only, the mean for no label ($M = 5.14$) was not significantly lower than the mean for the label group ($M = 6.18$). A significant difference was found in the audio-visual presentation mode, where the label group ($M = 6.67$) rated the performances significantly lower than the no label group ($M = 7.24$).

Discussion

The analysis of mean scores for the main effects of label revealed no significant differences in the evaluation ratings; however, a significant difference was found between the performance stimuli and presentation mode. When considering the written labels provided on the evaluation forms, information was given in a generic format so as to not focus on a specific disability. Also of note is the element of the labeling effect for the audio-visual presentation mode.

The labeling group had a significantly lower overall mean evaluation score for all performances in the audio-visual presentation. This is surprising when considering that the participants in the no label group rated the performances significantly higher (See Figure 1). The opposite was true for the audio only presentation mode, where evaluations were slightly higher for the groups when labels were provided. This may be influenced by the visual impact of the disability or by the participants' inexperience with musicians with disabilities. Another consideration may be the coursework completed by the participants. The university offers courses with

fieldwork experience in inclusive music classrooms. This experience may have an impact on the evaluations of the performances in this study.

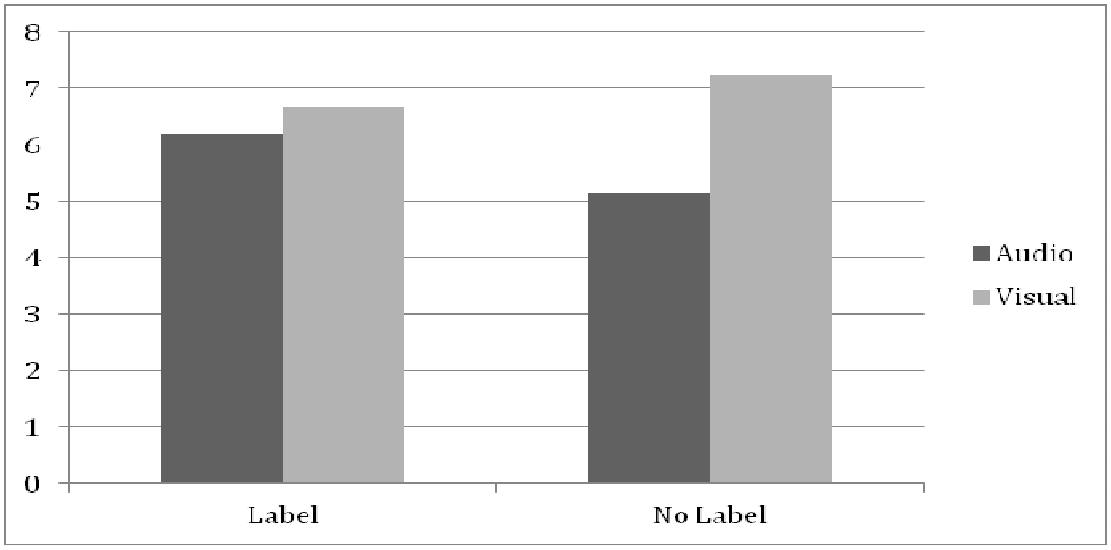


Figure 1. Overall means for interaction between Label effect and presentation mode. This shows the significant difference between No Label overall means.

The performance with the overall lowest rating in all presentation modes was the adaptive instrumental ensemble. This may be related to the lack of opportunities for pre-service music educators to interact with and utilize adaptive music instruments. These are also students who are surrounded by the highest level of musical performances and may not have experienced alternative modes of musical performance or a variety of ability. Labeling had no overall effect on the evaluation scores provided by pre-service music educators who only listened to the performances, indicating the possibility that they may be more willing to include students in that exhibit musical ability in their performance-based ensembles.

A significant difference was found between the ratings of the audio only and audio/visual groups, with the means of the audio/visual groups indicating higher overall ratings than those of the audio only group (See Figure 2). This may be a result of the subjective areas included in performance evaluations (e.g., physical appearance, size). The presentation, dress, and location of performances in the stimulus video may have affected participants who evaluated the performances with both audio and visual stimuli. Participants who evaluated performances with audio only stimuli did not have the opportunity to view the venues and cultural differences between the

performing ensembles, which may have impacted their ratings of the ensembles. Also with audio only, there was one stimulus for each participant to focus on, while the audio-visual has multiple stimuli to affect the overall ratings.

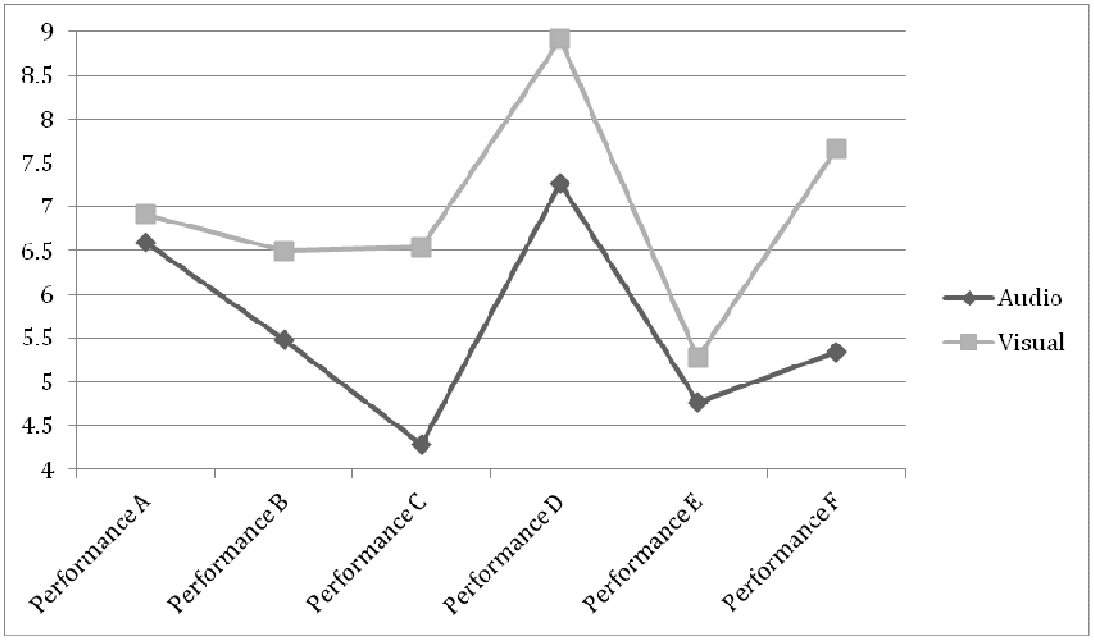


Figure 2. Overall means of presentation mode. Significant difference, $p < .05$ between audio and visual ratings of Performance C

Using internet-based resources such as YouTube, undergraduate music education majors may be exposed to a wider variety of musicians with disabilities. These technologies may be an effective method by which music educators might become more sensitized to this population. Increased sensitization may lead to increased acceptance of students with disabilities into mainstream, performance-based music ensembles. Labeling may present a stereotype and specific expectations of musical ability for students participating in a mainstreamed music classroom. Moving away from labeling and towards an accessible, all-inclusive, mainstreamed music classroom will allow for more musical opportunities for students with disabilities.

By increasing educators' exposure to students with disabilities (e.g., YouTube) and creating fieldwork experiences in special needs classrooms, pre-service music educators may be less apprehensive to include students with disabilities in their performance-based ensembles. This area of research may be of interest to educators in the American school systems, as well as international educational systems.

Students with disabilities may have the ability to participate in more than just general music courses. Increasing musical opportunities for students with disabilities may increase overall quality of life for these individuals. Future research may include studies investigating pre-service and in-service music educators'' willingness to include musicians with disabilities in their performing ensembles.

References

Bergee, M. (1995). Primary and higher-order factors in a scale assessing concert band performance. *Bulletin of the Council for Research in Music Education, 126*, 1–14.

Cassidy, J. W., & Sims, W. L. (1991). Effects of special education labels and peers' and adults' evaluations of a handicapped youth choir. *Journal for Research in Music Education, 39*(1), 23–34.

Conway, C., & Jeffers, T. (2004). Parent, student, and teacher perceptions of assessment procedures in beginning instrumental music. *Bulletin of the Council for Research in Music Education, 160*, 16–25.

Darrow, A. A. (2003). Dealing with diversity: The inclusion of students with disabilities in music. *Research Studies in Music Education, 21*, 48–60.

Darrow, A. A. (1999). Music educators' perceptions regarding the inclusion of students with severe disabilities. *Journal of Music Therapy, 36*(4), 254–273.

Darrow, A., & Armstrong, T. (1999). Research on music and autism implications for music educators, *Update: Applications of Research in Music Education*, *18*, 15–20.

Gfeller, K., Darrow, A. A., & Hedden, S. (1990). The perceived effectiveness of mainstreaming in Iowa and Kansas schools. *Journal of Research in Music Education, 38*, 90–101.

Gregory, D. (1998). Reactions to ballet in wheelchairs: Reflections of attitudes toward people with disabilities. *The Journal of Music Therapy, 35(*4), 274–283.

Hourigan, R. (2009). Preservice music teachers' perceptions of fieldwork experiences in a special needs classroom. *Journal of Research in Music Education, 57*(2), 152–172.

Jellison, J., & Duke, R. (1994). The mental retardation label: Music teachers' and prospective teachers' expectation for children's social and music behaviors. *The Journal of Music Therapy, 31*, 166–185.

NAfME: National Association for Music Education. (1994). *The school music program: A new vision.* Retrieved October 16, 2011, from http://www.menc.org/resources/view/the-school-music-program-a-new-vision

Scott, L. P., Jellison, J. A., Chappell, E. W., & Standridge, A. A. (2007). Talking with music educators about inclusion: Perceptions, opinions, and experiences. *Journal of Music Therapy, 64*(1), 38–56.

Smith, B. P, & Barnes, G. V. (2007). Development and validation of an orchestra performance rating scale. *Journal of Research in Music Education, 55*(3), 268–280.

Thompson, S., & Williamon, A. (2003). Evaluating evaluation: Music performance assessment as a research tool. *Music Perception, 21*(1), 21–41.

U.S. Department of Education. (2007). Individuals with disabilities act: To assure the free and appropriate public education of all children with disabilities. *Twenty-seventh annual report to Congress on the implementation of the Individuals with Disabilities Education Act*. Washington, DC: U.S. Government Printing Office.

VanWeelden, K. (2002). Relationships between perceptions of conducting effectiveness and ensemble performance. *Journal of Research in Music Education, 50*(2), 165–176.

VanWeelden, K., & Whipple, J. (2007). An exploratory study of the impact of field experiences on music education majors' attitudes and perceptions of music for secondary students with special needs. *Journal of Music Teacher Education, 16*, 34–44.

VanWeelden, K. & Whipple, J. (2005). Preservice teachers' predictions, perceptions, and actual assessment of students with special needs in secondary general music. *Journal of Music Therapy, 42*(3), 200–215.

Wapnick, J., Darrow A. A., Kovacs, J., & Dalrymple, L. (1997). Effects of physical attractiveness on evaluation of vocal performance. *Journal of Research in Music Education, 45*(3), 470–479.

Appendix A

Ensemble A

Instructions: Please rate the musicality and technique aspects of the performance by circling your rating on the 10-point Likert-type scale below. To indicate your rating on each performance aspect, please circle the appropriate number ranging from 1-10, with 1 representing a **poor performance** and 10 representing a **superior performance**.

Musical Effect

Poor									Superior
1	2	3	4	5	6	7	8	9	10

Technique

Poor									Superior
1	2	3	4	5	6	7	8	9	10

Balance and Blend

Poor									Superior
1	2	3	4	5	6	7	8	9	10

Tone Quality

Poor									Superior
1	2	3	4	5	6	7	8	9	10

Intonation

Poor									Superior
1	2	3	4	5	6	7	8	9	10

Please write additional comments that influenced your rating of Ensemble A:

II. Music Therapy and Older Adults

Exploring the benefits of using piano wizard with older adult piano students

Melita Belgrave
University of Missouri–Kansas City
melitajean@aol.com
USA

Keywords: Older Adult, Lifelong-Learning, Music Therapy, Piano Wizard, Piano

The purpose of this study was to create a lifelong learning experience for older adults through private piano instruction using Piano Wizard software. Piano Wizard is a technology-based instructional method that utilizes sensory learning. Piano Wizard operates through a laptop computer and midi keyboard. Five older adults, who attended an urban senior center in a large Midwestern city in the United States, volunteered to participate in the lifelong learning music program. Eight 30-minute sessions occurred in which the researcher taught older adults piano lessons individually with the Piano Wizard technology. Three research questions were examined in this study. 1) Is Piano Wizard an effective tool to teach older adults piano? 2) Does participation in a music-based lifelong learning program enhance older adult's subjective well-being? 3) What are older adults' perceptions of music technology as an instructional method? Results revealed that students progressed through the Piano Wizard method book over the 8-week period. Results of a researcher-developed survey revealed that older adults perceived that the piano lessons provided them with a weekly meaningful activity; and that the lessons required the use of cognitive skills. Additionally, older adult participants' perceived benefits of the Piano Wizard teaching method pertained to visual and audio feedback, ability to adjust the tempo while playing, and the overall teaching method. Implications for practice with older adults will be discussed.

The number of music-based lifelong learning programs is increasing as the aging population continues to rapidly grow. Programs exist as part of the community through universities, music centers, and senior centers. Active participation in music-based lifelong learning programs has resulted in improved psychosocial well-being and cognitive functioning for older adults. Programs that engage older adults in active music making-experiences occur in small or large group settings such as band, choral, or orchestra ensembles or individually such as private piano lessons (Administration

on Aging, 2010, Bittman, Berk, Felten, Westengard, Simonton, Pappas, et al., 2001; Coffman, 2002; Coffman & Adamak, 1999; Frego, 1995).

Researchers have explored older adults' motivation for taking piano lessons, motivation for continued participation in piano programs, and perceived benefits of participating in programs. An event or change in life, recall of a positive active music making experience, or desire to gain or increase piano skills have all served as motivating factors for older adults to enroll in piano lessons. Older adults often continue their participation in piano lessons because the lessons provide a meaningful activity. Other factors that influence continued participation in piano lessons is the opportunity to exercise choice and control (Taylor, 2011, Wristen, 2006).

While many older adults perceive similar benefits afforded to them from participation in music making experiences, it is also important to explore how older adults succeed in piano lessons. An important contributing factor to success is practice strategies. Bugos and High (2009) found that older adult novice students used practice strategies during their at-home practice, however older individuals tended to use some strategies more frequently. The most commonly used practice strategies were rhythmic accuracy and coordination. Rhythmic accuracy strategies were defined as practicing with a metronome, and coordination strategies were defined as practicing hands apart.

As lifelong learning programs continue to develop it is important to explore a variety of teaching methods to engage the variety of older adult learners. Therefore, the purpose of this study was to examine the use of a computer-based teaching method for piano lessons entitled Piano Wizard. The paper described here is part of a larger study exploring the benefits of lifelong learning music-based programs with beginning, intermediate, and advanced levels of older adult piano players. The current paper examines the benefits afforded to beginning piano students in the program. More specifically, three areas of focus were explored: 1) the effectiveness of Piano Wizard technology as a teaching tool for older adults; 2) the effect of participation on older adults' subjective well-being; and 3) older adults' perception of technology as an instructional method.

Method

Eight older adults volunteered to participate in the current study. However, three of the students completed five or less sessions, so their information is not included in this paper. As a result five beginning older adults served as participants

for this study (4 female and 1 male). The age range was 60- 81 years of age (*M* = 69.4). All participants were African-American and attended a senior center located in an urban environment. Three of the five participants played piano before but were classified as beginners upon completion of the assessment session. During the assessment session, older adults were asked to play song one *Your Dreams,* from the Piano Wizard method book. Students, who were unable to play the song or correctly identify the music theory concepts associated with song one, were classified as beginners. All participants decided to take lessons because of a desire to learn piano for the first time or relearn what they studied years ago. One participant also signed up for the program because of the convenience (the lessons were occurring the senior center) and the teaching method (Piano Wizard).

Piano lessons were taught using Piano Wizard methodology, a technology-based instructional method that utilizes sensory learning. Piano Wizard instruction was provided to older adult participants by the researcher through a laptop computer and midi keyboard. The Piano Wizard program utilizes a laptop computer to provide a moving image of sheet music. Notes appear on the screen and scroll across the screen from right to left on a staff. When the music note reaches a specific point on the left side of the screen, the participant plays the corresponding note on the keyboard. A background accompaniment track is played at all times. Piano Wizard contains four levels. Level one and level two of Piano Wizard was not used in the current study. The first two levels use a variety of shapes instead of music notes to simulate pre-music reading.

Level three and level four were utilized in the study as both levels use music notes. Level three uses colored notes on the computer screen that correspond to colored strips that are placed on the midi keyboard. Level four contains the music notes without color. The program is adaptable in tempo and screen display. Tempo can be adjusted at any time before the song starts or while playing. At level three participants had the choice of using colors, finger numbers, or note names displayed with the notes. At level four participants had the choice of using finger numbers or note names. The program also provides immediate visual and audio feedback. When an individual plays the correct note an eagle spreads its wings (visual feedback), and the correct note is sounded (audio feedback). The program also provides an accuracy score at the end of the song ranging from 0 -100 based on the rhythmic and melodic accuracy in which the participant plays the song.

The Piano Wizard computer program is accompanied with a method book that contains teaching notes and sheet music. The researcher selected seven songs from book one as songs for this study. Each song utilized the right hand and left hand to play songs with the black keys. Each song progresses in difficulty with an increase in measure numbers, the number of notes, note values, and rhythms. The songs are listed in Table 1.

Table 1

Song List from Book One of Piano Wizard

Song	Title	Measures	Note Values	Number of Notes	Notes Per Hand
1	Your Dreams	8	Quarter Half Whole	2	RH: D# and C# LH: D# and C#
2	The Eagle	10	Quarter Half Whole	2	RH: D# and C# LH: D# and C#
3	Merrily we Roll Along	16	Quarter Half Whole	3	RH: F#, G#, and A# LH: F#, G#, and A#
4	Northern Lights	16	Quarter Half	5	RH: F#, G#, and A# LH: D# and C#
5	Jolly Old Saint Nicholas	16	Quarter Half Whole	5	RH: F#, G#, and A# LH: D# and C#
6	Wings	32	Eighth Quarter Half Dotted Half	5	RH: F#, G#, and A# LH: D# and C#
7	At the Foot of Yonder Mountain	32	Eighth Quarter Half	6	RH: F#, G#, A#, and C# LH: C# and D#

**Note RH = Right Hand, LH = Left Hand

Eight 30-minute music therapy sessions were provided to each participant. Each session followed the same format; a review of previously assigned song at the piano to assess for transfer of skills away from the computer, introduction and review of music theory concepts presented in the song, instructions with the Piano Wizard software, and end of session wrap-up which included assigning music and theory concepts for at-home practice and completion of post-session survey. Participants completed three conditions per song, 1) right hand separately, 2) left hand separately, and 3) hands together. Participants were allowed to move on to the next condition or

song, once an accuracy score of 85% or better was obtained. All sessions were videotaped for later observation.

Effectiveness of Piano Wizard was measured through the number of songs completed by older adults during the program, the participants' Piano Wizard accuracy score, the practice strategies utilized during the lesson, and participant initiated mistake identification. Piano Wizard provided an accuracy score after completion of each song. Practice strategy categories were adapted from Bugos and High (2009). Practice strategies identified in this study were categorized as verbal rhythmic accuracy, nonverbal rhythmic accuracy, and vocalization. Verbal rhythmic accuracy was defined as counting out loud while playing. Nonverbal rhythmic accuracy was defined as, clapping, tapping, or nodding head in tempo while playing. Vocalization was defined as singing the letter name, finger number, words or melody out loud while playing. Participant initiated mistake identification was defined as a verbal or nonverbal response that indicated that the participant was aware that they made a mistake while playing. Examples of verbal responses were "oops" or "I missed that note." Examples of nonverbal responses were facial grimaces or shoulder shrug.

Additional measures employed in this study were the *Flourishing Scale* (Diener et al, 2009), a researcher developed questionnaire, and a researcher developed interview. The *Flourishing Scale* (Diener et al, 2009) was used to measure participants' subjective well-being. The researcher-developed questionnaire was completed weekly after each session to assess participants' weekly perception of the music program. Participants rated their enjoyment of their lesson and the teaching method on a 5-point Likert-type scale, with 1 being least enjoyed and 5 being most enjoyed. The researcher-developed interview was completed after the last session of the lifelong-learning program. Questions addressed participants' perception of the program and perceived benefits. A reliability rater was used for observational and qualitative data. Once reliability of 85% or higher was obtained the researcher began to analyze the data.

Results

The effectiveness of Piano Wizard as a teaching method was explored through participants' song completion, accuracy score per condition (right hand, left hand, both hands), frequency of practice strategy employed per condition, and the use of participant initiated mistake identification. Three of the five participants completed all

7 songs during the 8-week program. Two of the five participants completed 5 of the 7 songs during the 8-week program. Each time a participant played the song for the condition of right hand, left hand, or both an accuracy score was reported. Participants repeated the condition until an accuracy score of at least 85% was obtained. The number of trials needed until the participant obtained an accuracy score of 85% or higher ranged from one to four times per condition. The average number of trials per condition was as follows: right hand (2 trials), left hand (1 trial), and both hands (2 trials). The mean and range of accuracy scores per condition are listed in Table 2.

Table 2

Mean and Range of Accuracy Score Per Condition

Category	R.H. Trial 1	R.H. Trial 2	R. H. Trial 3**	L.H. Trial 1	L.H. Trial 2	L.H. Trial 3**	B.H. Trial 1	B.H. Trial 2	B.H. Trial 3	B.H. Trial 4**
Mean Accuracy Score	79	91	87	90	97	87	83	93	93	92
Range of Accuracy Score	66-100	50-100	77-94	70-100	83-100	87	50-100	82-100	87-100	92

**Trial occurred for less than 20% of sessions

All participants employed practice strategies during the Piano Wizard sessions. The types of practice strategies utilized by the participants pertained to verbal rhythmic accuracy-counted out loud, or said the note name or finger number in tempo while they played the keyboard; nonverbal rhythmic accuracy-participant nodded their head in tempo or tapped their foot or hand in tempo while they played; and vocalization-participant sang the letter name, finger number, words, or melody out loud while they played.

Participant 2 and 3 employed practice strategies across 100% of the trials. Participant 4 employed practice strategies across 94% of the trials. Participant 1 employed practice strategies across 74% of the trials. Participant 5 employed practice strategies across 58% of the trials. Table 3 provides a detailed list of the type of practice strategies used by participant. Instances of participant initiated mistake identification while playing were observed across conditions and tallied. Results are shown in Table 4.

Table 3

Types of Practice Strategies Used By Participant

Participant	Verbal Rhythmic Accuracy	Nonverbal Rhythmic Accuracy	Vocalization
1	46%	54%	0
2	50%	40%	10%
3	27%	48%	25%
4	56%	44%	0
5	100%	0	0

Table 4

Participant Initiated Independent Mistake Identification

Participant	Percent of All Trials	Verbal Mistake Identification	Nonverbal Mistake Identification
1	51%	58%	42%
2	100%	80%	20%
3	70%	36%	64%
4	38%	100%	0
5	50%	47%	53%

Participants' subjective well-being was examined using the *Flourishing Scale* and the researcher-developed interview. Results of the *Flourishing Scale* revealed a slight increase in participants' perceived well-being from pretest ($M = 49.4$) to posttest ($M = 52$). Additionally participants were asked to describe how the lifelong learning program affected their lives. Results revealed that participants perceived the program provided them with a meaningful activity (57%) and influenced their learning and cognitive skills (43%). Responses categorized as learning and cognitive skills pertained to concentration, music theory concepts, and independent identification of mistakes and self-correction while playing. Responses categorized as meaningful activity pertained to practice time and engagement in new activities.

Participants' perception of the lifelong learning program was explored through weekly responses to the lesson and teaching method and the post-program interview. The weekly questionnaire asked participants to rate their enjoyment of the lesson and teaching method on a 5-point Likert-type scale with 1 being did not enjoy and 5 being enjoyed a lot. The average rating for enjoyment of the lesson was 4 and the average

rating for enjoyment of the teaching method was 5. Participants were also allowed to write comments about their lesson. A content analysis was conducted on responses, which pertained to emotions (52%) or the learning process (42%). Emotion responses were positive (92%), neutral (4%), or negative (4%). Twenty-nine percent of responses categorizes as learning process responses pertained to difficulty or struggles participants had with new concepts.

Participants were also asked why they continued to take lessons each week. Responses were categorized as they learned something new (33%), the teaching method (33%), the instructor (32%), and their subjective well-being (22%). Teaching method responses included the use of repetition, starting with the black keys, and being able to play with both hands immediately. Instructor responses included patience and pacing of the instructor. Subjective well-being responses pertained to self-worth and success.

Participants' perception of the Piano Wizard teaching method was also explored after the last session during an interview. Responses to the interview questions revealed that all participants enjoyed the teaching method, and none of the participants had any dislikes associated with the program. Participants shared the specific aspects of Piano Wizard they enjoyed. Their responses were as follows: a) the choice of display screen such as the use of color notes or finger numbers on the computer screen (38%), b) the ability to adjust the tempo of the songs (31%), c) immediate audio feedback (8%), d) immediate visual feedback (8%), and e) general enjoyment (8%). Participants were also asked the likelihood of taking piano lessons again on a 7-point Likert-type scale, with 1 being the least likely and 7 being the most likely. Results revealed that all participants selected 7 for the likelihood of continuing with piano lessons.

Discussion

In this study, it appears that Piano Wizard was an effective teaching method. All participants completed the majority of the songs selected for the study across the 8 weeks; participants either learned 5 songs or 7 songs. Accuracy scores, a report of rhythmic and melodic accuracy improved from trial to trial the majority of times for all participants. Although there was a range of scores all participants scored at least a 50% accuracy score on all trials regardless of whether they were playing hands apart or hands together. This progress continued for each participant across the 8-week period even when the songs increased in difficulty such as an increase in measure

numbers, a change of meter, the use of both hands playing different notes, and switching hands mid-measure. Although there were instances where the average accuracy score on trial three or four was lower than trial one or 2, this only occurred in less than 20% of all trials. Consistently for the majority of all trials and conditions, the average number of trials completed by participant to obtain an 85% accuracy score was one to two trials.

Participants used practice strategies in the majority of trials. There was a variety in the frequency of strategies used. The use of different practice strategies relates to the individualization of an older adult learner and the importance of allowing opportunities for choice within a music session. Choice is one of the benefits participants identified from working with the Piano Wizard methodology. Opportunities for choice and adaptability, such as tempo and screen display, are inherent to the Piano Wizard program and support the suggestion that Piano Wizard can be an effective teaching method for older adults. An additional benefit of the Piano Wizard program was the ability for participants to identify their mistakes while playing. This may be related to the immediate audio and visual feedback that participants received while using the computer. Additionally, the immediacy of feedback may be related to the limited number of trials needed per condition.

Older adults perceived that participating in the lifelong learning program enhanced their well-being, cognitive skills, and provided them with a meaningful activity. The majority of participants rated their lessons as a 5 across all sessions. One participant rated their lesson as a 3 and a 4 for two sessions. Upon further examination this rating was followed by an open-ended written response of the difficulty with new concepts. Additionally, 29% of participants' weekly open-ended responses pertained to difficulty or struggles they had with new concepts. This suggests that as a music therapist working with this population, one needs to be aware of possible struggles with new concepts and provide validation and reinforcement that the challenging material will become easier. Additionally, older adults who join lifelong learning programs are seeking out a learning process, but one must provide a good balance of reviewing previously learned materials and learning new concepts. The music therapist needs to provide an opportunity for developing a new skill, while moving at a pace that does not overwhelm the older adult learner.

References

Administration on Aging (2010). *A profile of older Americans: 2010.* Washington, D.C.

Bittman, B. B., Berk, L. S. Felten, D. L., Westengard, J., Simonton, C., Pappas, J., et al. (2001). Composite effects of group drumming music therapy on modulation of neuroendocrine-immune parameters in normal subjects. *Alternative Therapies, 7*, 38-47.

Coffman, D. D. (2002). Music and quality of life in older adults. *Psychomusicology, 18*, 76-88.

Coffman, D. D., & Adamek, M. S. (1999). The contributions of wind band participation to quality of life in senior adults. *Music Therapy Perspectives, 17,* 27-31.

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi. D., Oishi, S., & Biswas-Diener, R. (2009). New measures of well-being: Flourishing and positive and negative feelings. *Social Indicators Research, 39,* 247-266.

Frego, R. J. D. (1995). Uniting the generations with music programs. *Music Educators Journal, 81*(6), 17-19.

Taylor, A. (2011). Older amateur keyboard players learning for self-fulfillment. *Psychology of Music, 39*, 345-363.

Wristen, B. (2006). Demographics and motivation of adult group piano students. *Music Education Research, 8*(3), 387-406.

Participation in musical activities and quality of life for elders in Taiwan

Jessie Chen &I-Yun Liang
National Taichung University of Education
jessiehsc@hotmail.com
TAIWAN

Keywords: Elders, Quality of Life, Musical Activities

People experience music in their lives both consciously and unconsciously. Some people listen to music passively as they shop or engage in other activities. Others actively engage in music by participating musical activities, such as going to concerts or singing, One population which has expressed great interest in active music participation is known as the "Elderly Society." The Taiwanese government has provided the impetus for active engagement by offering various courses in order to improve elders' quality of life. Among the courses being offered, such as health, entertainment, social intercourse, technology, finance, and art, music is one that stands out by its nature and functions. The purpose of this study was to explore the relationship between participation in musical activities and quality of life for the elder society. Survey instruments included the "Taiwan concise version WHOQOL-BREF" and the "Music Activities Survey." Participants were drawn from three major metropolitan areas in Taiwan and the target population was elders over 55 years of age. Two hundred and fifty questionnaires were sent with an 89.9% return rate. Elders believed that physical and psychological well being, independence, social relationships, environment, and spirituality/religion/personal beliefs were very important to their quality of life. Results also revealed that elders who were learning or who had previous experience in learning to play music instruments obtained significantly higher quality of life scores. Additionally, elders who had previous experience in playing musical instruments showed significantly more positive attitudes towards "the importance of health conditions." Moreover, elders who had attended concerts for several years prior to the study had significantly different responses regarding quality of life and health conditions ratings in comparison to those who had only attended concerts within the last year.

Since ancient times, music has beena common language for all human beings through which to convey thoughts and emotions. The Greek philosopher Plato

believed that music is as important to people's minds as air is to the body. In other words, music takes a principal role in people's lives. People have music in their lives in both conscious and unconscious ways or in active and passive ways. Some of them "receive" music from watching television programs or shopping in a grocery store, where music passes by them unconsciously. On the other hand, some people show aggressive attitudes toward music by participating in musical activities, such as going to concerts, singing, performing, by attending music classes or by participating in clubs.

Taiwan has an increasing elderly population. The Ministry of the Interior (2011, July) indicated that elders ages 65 and older occupy 10.77% of the total population. Taiwan is already an "Elderly Society" based on the definition of WHO (World Health Organization). While the facts and issues draw people's attention, our government gives an impetus to take care both of elders' physical and psychological lives. In order to fulfill their needs and make a learning society, local governments launch "College of Elders" and offer various courses. Among courses about health, entertainment, social intercourse, technology, finance, and art, music is one that stands out due to its nature and various functions. Thus, the researchers sought to examine whether elders use of music as a tool to express their emotions, learning of music as entertainment or fulfill their expressive needs, or concert attendance as aesthetic enjoyment or entertainment, would increase their quality of life.

Literature Review

Aging happens both biologically and psychologically. Characteristics of biological aging include losing reproduction ability, growing grey hair, decreasing physiological functions, and chronic disease (Huang, 2008). Major events defining the stages in one's life include marriage, obtaining a job, losing a spouse, and retiring (Chiu, 1991). Huang (2008) indicated three characteristics of the elderly: a) retirement; b) becoming grandparents; c) losing parents; and d) becoming the eldest generation in the family. Tasks of social development for elders that were identified include a) remaining healthy; b) adapting social status after retirement; c) adapting single life after losing spouse; d) accepting self and others; d) joining activities with same age group; e) re-evaluating financial status; f) seeking different ways of achievement; g) a changing life style that is satisfying; h) seeking the true meaning of life; and i) facing the end of time (Chiu, 1991; Tsai, 1995; Schein, 1978). Elders also face physiological changes as well as psychological developments. According to Erikson (1963), elders step into the last stage of psychosocial development known as

"integrity vs. despair," and develop their ego integrity. He found that elders examined their whole life and were readily able to accept death if they felt satisfied about what they had achieved. However, they might be disappointed if they did not have the opportunity to make change. With regard to psychological development, researchers examined a) ego differentiation versus work-role preoccupation, b) body transcendence versus body preoccupation, and c) ego transcendence versus ego preoccupation. Researchers found that if elders had good ego differentiation, then they were more satisfied with their current status (Peck, 1955).

Education has been a primary way to improve one's quality of life, and elders can grow and gain self-actualization through life-long learning (Peterson, 1985). Four indentified learning needs of elders include coping, expressive, contributive, and influence needs (Peterson, 1983). Researchers found that although elders may have abandoned hobbies due to busy work when they were young, they may now want to revisit it or explore a new one, thus creating expressive needs.

From the view of utilizationism, music is a great channel to fulfill expressive needs of the elderly population (Gaston, 1968; Hargreaves & North, 1999; Merriam, 1964).From a cultural anthropological view, Merriam (1964) believed that music provides important functions, such as emotional expression, aesthetic enjoyment, entertainment, communication, symbolic representation, physical response, enforcing conformity to social norms, validation of social institutions and religious rituals, contributions to the continuity and stability of culture, and contributions to the integration of society. Hargreaves and North (1999) assert that music was not only a channel for expressing emotions but also a bridge between people for communication and understanding. Most people seek happiness in their life time. In seeking happiness, quality of life has had a wide range of context, including wealth, employment, built environment, physical and mental health, education, recreation and leisure time, and social belongings (Abbey & Andrews, 1985; Campbell, Converse, & Rodgers, 1976). Ferrans and Powers (1992) indicate that a good life depends upon personal experience and that happiness is related to satisfaction in the areas of health, social-economic, spiritual, and family life. Meeberg (1993) proposed however that quality of life is not only the satisfaction of someone's own life but also others' expectations. Nevertheless, the research of Allison, Locker, and Feine (1997) revealed that quality of life is a unique and continuously developing process related to self-adaption, coping, expectation, uncertainty, self-control, self-concept, and self-efficacy.

Methodology

The “Taiwan concise version WHOQOL-BREF” and the “Music Activities Survey” were the primary data collection tools. The “Taiwan concise version WHOQOL-BREF” was extracted from 100 items of “Taiwan WHOQOL” by the Taiwan Research Team of WHOQOL. It contained 26 items from the original core questions plus two questions related to Taiwan. Researchers used the "Taiwan concise version WHOQOL-BREF" with permission from the Taiwan Research Team of WHOQOL.

“Taiwan concise version WHOQOL-BREF” was comprised of six domains. These were physical, psychological, level of independence, social relationship, environment, and spirituality/religion/personal beliefs. In addition to the six domains, participants also evaluated their quality of life, overall.

The “Music Activities Survey,” developed by the researchers, was used to gather information pertaining to participants’ music learning experiences as well as those music activities (i.e. concert attendance, participation in an ensemble) in which they were involved for the past year. Participants had to indicate whether they were music majors in college and whether they had ever learned to play an instrument or to sing.

Research participants were drawn from three major metropolitan areas in Taiwan. The cities were Taipei, Taichung, and Kaohsiung which represented northern, central, and southern Taiwan geographically. The target population for this study was elders ages 55 years and older. Researchers contacted organizations that provided services for elders and enlisted their help in administering the questionnaires. Two hundred and fifty questionnaires were sent and an 89.9% return rate was obtained.

Results

The maximum score for the quality of life questionnaire was 140. Sampled elders obtained a mean score of 94.6 with a range of 69 to 120. Elders believed that physical, psychological, level of independence, social relationship, environment, and spirituality/religion/personal beliefs were very important to their quality of life (3.73 on a 5-point Likert scale). Moreover, they indicated that 41 health-related items were very important to their quality of life (4.04 out of 5). In summary, quality of life was considered by elders to be important while they considered their health condition as very important.

Data analysis revealed that 41.7% of elders were currently learning an instrument or music while 56.9% of the sample had learned an instrument or music in the past. Revealed also was that 52.8% elders had attended concerts but that only 36.1% had attended a concert in the past year. Only 44.4% of elders participated in musical groups in the past year.

Elders who learned and used to learn an instrument or music obtained significantly higher scores in quality of life as compared to those who had never learned music ($t = 2.02$, $p < .05$; $t = 2.46$, $p < .05$). Moreover, elders who used to learn an instrument or music showed significantly more positive attitudes toward the importance of five domains of health conditions and other health-related items ($t = 3.60$, $p < .01$; $t = 3.71$, $p < .01$). In contrast, elders who were learning instruments or music were not significantly different than those who were not. The responses of elders who had attended concerts were significantly different in quality of life, health conditions and health-related domains ($t = 2.62$, $p < .05$; $t = 2.87$, $p < .01$; $t = 2.92$, $p < .01$). Conversely, the responses of elders who had attended concerts in the last year were only significantly different in quality of life ($t = 2.18$, $p < .05$) but not health conditions and related items. The responses of elders who joined or used to join music groups were not significantly different in their ratings of quality of life, domains of health conditions, and health-related domains.

Conclusion

According to the results of this study, past musical experiences seem to be more influential to elders' quality of life as well as their attitudes toward health. Nevertheless, learning an instrument or music had positive influence on elders' quality of life more so than attending concerts or being in music groups. Music educators in the past have proposed the learning of music as early as possible, and the findings of this study advocated for this theory. Early experiences of music learning have benefited participant's quality of life. Researchers continue to gather more data. This includes the expansion of the size of sample.

References

Abbey, A., & Andrews, F. M. (1985). Modeling the psychological determinants of life quality. Social Indicators Research,16, 1-34.

Allison, P. J., Locker, D., & Feine, J. S. (1997). Quality of life: A dynamic construct. Social Science & Medicine, 45 (2), 221-230.

Campbell, A., Converse, P. E., & Rodgers, W. L. (1976) The quality of American life: Perceptions, evaluations and satisfactions. New York: Russell Sage Foundation.

Chiu, T. Z. (1991). Development of elders and educational needs [老年發展及其教育需求]. In Ministry of Education-Department of Social Education (Ed.), Elder Education [老人教育] (pp. 181-202). Taipei: Normal University Bookstore.

Erickson, E. H. (1963). Childhood and society (2nd ed.). New York: Norton.

Ferrans, C. E., & Powers, M. J. (1992). Psychometric assessment of the quality of life index. Research in Nursing& Health, 75 (1), 29-38.

Gaston, E. T. (Ed.). (1968). Music in therapy. New York: Macmillan.

Hargreaves, D. J., & North, A. C. (1999). The function of the music in everyday life: Redefining the social in music psychology. Psychology of music, 27, 71-83.

Huang, F. S. (2008). Pedagogy of the elders [高齡教育學]. Taipei: Wunan.

Meeberg, G. A. (1993). Quality of life:A concept analysis. Journal of Advanced nursing, 18, 32-38.

Merriam, A. P. (1964). The anthropology of music. Chicago: Northwestern University.

Ministry of the Interior (2011). Monthly bulletin of interior statistics. [Statistical Tables]. Retrieved Nov 10, 2011, from the World Wide Web: http://sowf.moi.gov.tw/stat/ebook/100/10007.pdf

Peck, R. C. (1955). Psychological development in second half of life. In J. E. Anderson (Ed.), Psychological aspects of aging (pp. 73-79). Washington, D. C.: American Psychological Association.

Peterson, D. A. (1983). Facilitating education for older learners. San Francisco: Jossey-Bass.

Peterson, D. A. (1985). A history of education for older learners. In D. B. Lumsden (Ed.), The older adult as learner: Aspect of educational gerontology (pp. 1-23). Washington, D. C.: Hemisphere.

Schein, E. H. (1978). Career dynamics: Matching individual and organizational need. MA: Addison-Wesley.

Tsai, P. C. (1995). Learning and Career of the elders [老人學習與生涯發展]. Kaohsiung: Liwen

Music therapy – Breathing methods incorporated into health promoting exercises. A music therapy for people in their 60's to 90's currently leading normal lives

Yoshiko Fukuda
YQR03743@nifty.com
JAPAN

Keywords Active life, Elderly, Breathing methods, Lung capacity.

This music therapy approach is designed for the elderly who receive medical treatment or who take medication but who ultimately leading normal lives and wish to remain active into the future. Between 16 to 18 subjects participated in therapeutic sessions. Before and after each session, peak flow value, blood pressure, and pulse rates were measured. From this, participants were able to gauge their physical condition which had a useful application for their everyday lives. After participating in sessions for four years, and allowing for individual differences, the following was achieved. On average, peak flow values increased by 40.5%; average high blood pressure reading levels decreased by 57%; and average low blood pressure readings decreased by 49.7%. Moreover, pulse rates decreased by 74.2%. From these figures, we understand that singing and exercising at the same time allowed participants to become aware of their lung capacity thus helping them improve the quality of their everyday lives.

Japan has one of the largest populations of aged people in the world, with many in their 80's and 90's. Not all of these adults are able to lead normal lives. Many are bedridden and staying in hospitals. Others, while not in hospitals, are unable to live independently requiring the help of their families or health care professionals. Still others are severely disabled. In the "S" residential area, the number of aged people living alone, or who live in families comprised of only the aged, has increased. While they are reliant on medical treatment, many are able to live reasonably healthy lives. However, their advancing age makes them vulnerable and therefore difficult to maintain good health. Due to participants' interests in improving and maintaining their health, "Breathing Methods" were infused with "Health Promoting Exercises."

Purpose

The purpose of this study was to introduce participants to a breathing method based on "Asthma Music." Asthma music is a form of therapy for asthma patients whereby music is used as a tool to relieve the suffering experienced by asthma patients. This therapy is implemented in order to help make people aware of their lung capacity for everyday activities such as climbing stairs or walking. The researcher also sought to help those participants who tended to stay at home by encouraging them to socialize with others through the sessions.

Methodology

Participants

Participants for this study were 16 men and women, ranging in age from 50 to 90. At the time of the study, all participants were described as leading normal lives. They represented 100 households from the "S" residential area as they were able to walk or bicycle to the session venue.

Activities

Activity sessions were held twice a month for 60 minutes. While singing songs, and playing instruments, people played hand games, bounced balls, performed simple folk dances and other light exercise involving their hands and feet. Singing was an essential during exercise. Practice breathing activities, which involved blowing on a pitch pipe, were also introduced. The pitch pipe is typically used for guitar tuning, however, for the purposes of this study, it was slightly redesigned to help asthma patients' practice abdominal breathing. Such activities enabled participants to verify the efficacy of their abdominal breathing. Another activity introduced involved practice breathing while blowing on a choir horn. This instrument looks like a toy trumpet and produces a single note. Therefore, eight horns are required to produce an octave. Each person has one horn and they play songs together.

Data Analysis

Before and after each session, peak flow values were measured using a Peak Flow Meter (PEFR) (Figure 1).This device measures the instantaneous maximum speed and volume of exhalation. It is designed to measure the maximum speed of

exhalation when a patient breathes out as quickly as they are able. The reading tends to be low when the respiratory tract is narrow. Before and after each session, blood pressure and pulse rates were also measured (Figures 2, 3, and 4). By measuring peak flow, blood pressure, and pulse, participants are made aware of their current condition as influenced by the day's session.

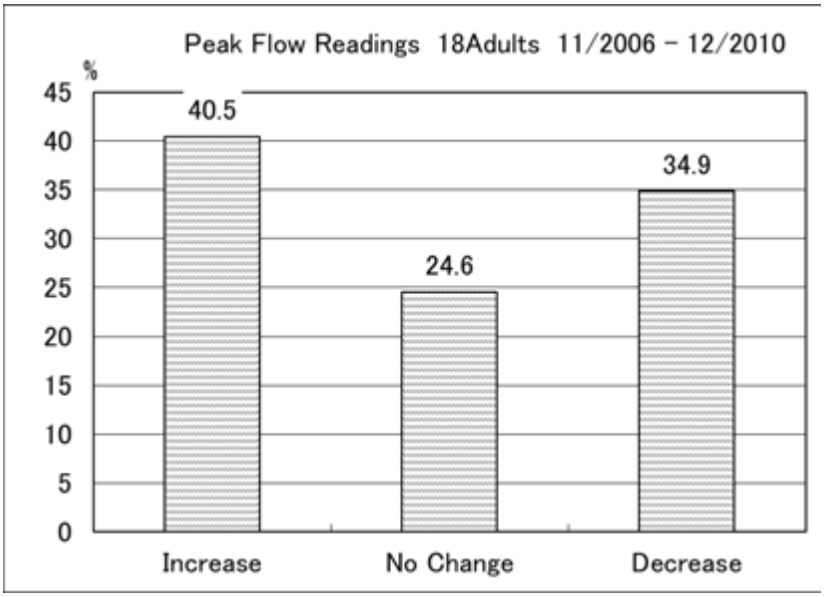


Figure 1. Peak flow readings for participants.

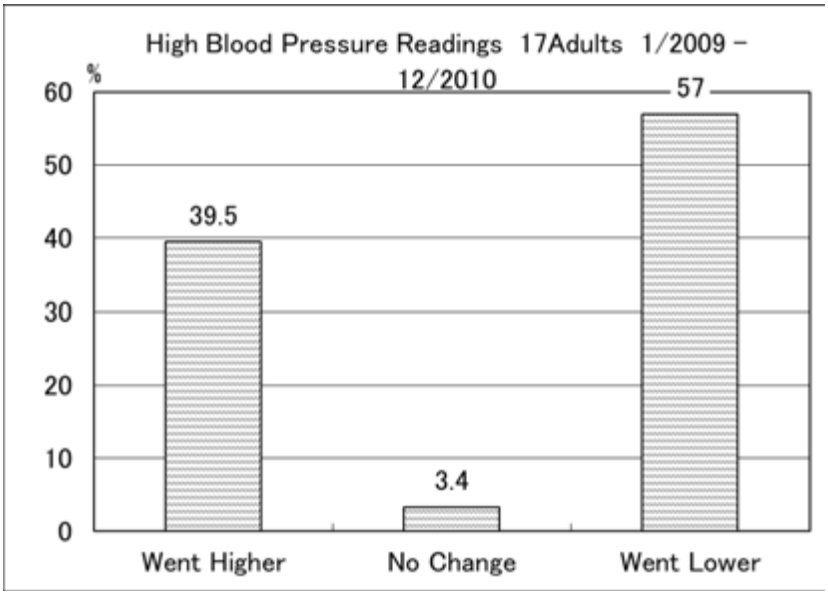


Figure 2. High blood pressure readings for participants.

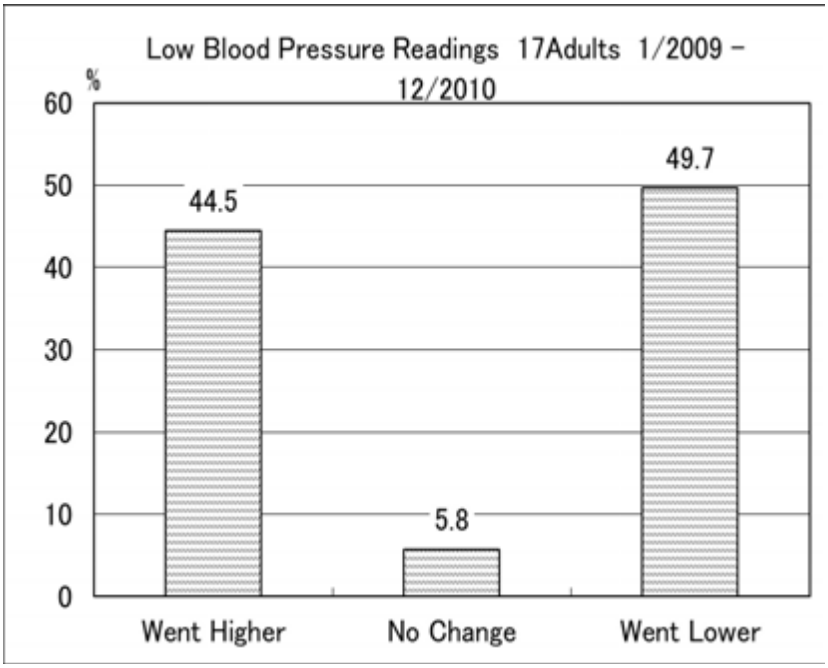


Figure 3. Low blood pressure readings for participants.

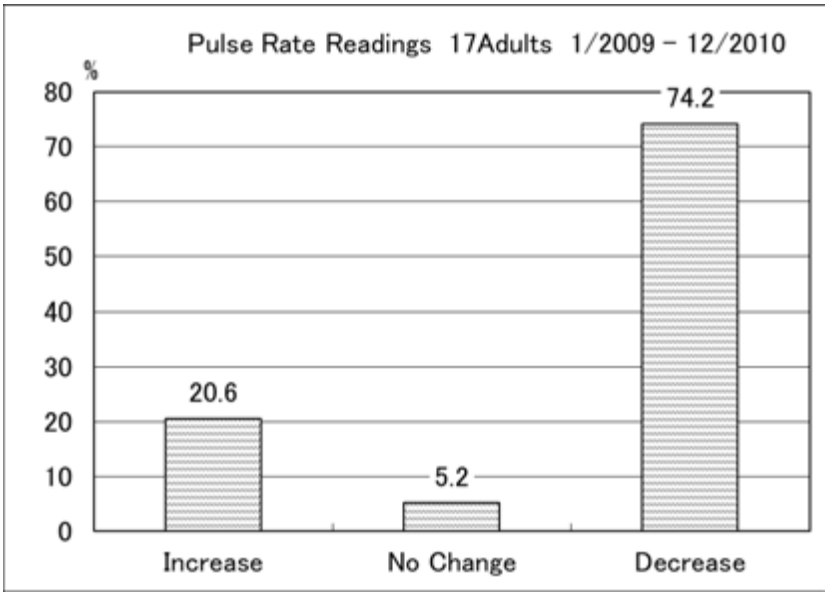


Figure 4. Pulse rate for participants.

Results

Participants took part in the sessions even if they were unable to perform all tasks. Responses revealed that they were satisfied with the experience and that they

enjoyed themselves. Moreover, the researcher noted that the participants were always laughing. In the past five years, participants sang over 60 songs including songs they sang in elementary school or high school, old children's songs, nursery rhymes, and seasonal songs. Participants typically moved wile they sang. Their ability to master various bodily movements aided them in everyday life. By blowing on the pitch pipe and moving at the same time, it became easier for them to breathe. In the case of the choir horn, where each horn can only produce one tone, everyone cooperated in creating a melody. Their enjoyment in completing a song was noted. This practice was also useful and was also transferred to their everyday lives. To solve the problems that the aged have with articulation and loss of finger mobility, tongue twisters were sung or participants sang songs while doing finger games.

Conclusions

The most important outcome is that almost all 16 participants gradually came to understand their own lung capacity and are currently living their everyday lives without difficulty. It can be argued that having an understanding of the positive impact of exercise on blood pressure or pulse rates enabled them to incorporate these habits effortlessly into their everyday lives. Participants have also started to socialize more, and those who had tendency to stay home, have continuously attended. It has been an important experience to realize that if they continue step by step, they can achieve their goal.

Findings from this research support the benefits of music therapy sessions for people from all backgrounds and ability levels. As a music therapist, I have enjoyed thinking about the activities and approaches which will be the most helpful for participants' daily lives. I feel that this is a music therapy for "improving respiratory function," "improving muscle strength and co-ordination," and for "improving oral function." Additional benefits include socialization and mobility, specifically, encouraging older adults to leave their homes for such activity potentially serving as a preventative measure against senility, and depression. I am also a resident of the "S" residential area and in the same age group as those who participated in the sessions. Future endeavors include the continuation of this research and support for older populations.

III. Music and Medicine

Music therapy in pediatric oncology treatment: Clinical practice guidelines from the research literature

Lori Gooding
University Of Kentucky
lori.gooding@uky.edu
USA

Keywords: clinical, guidelines, music therapy, oncology, pediatric

Abstract

The development of evidence-based clinical practice guidelines in music therapy treatment for pediatric patients with cancer has been limited in the past by small sample sizes, poor design, and limited descriptions of music therapy interventions in the research literature. In recent years, the growing recognition of complementary approaches like music therapy has led to an increased investigation of applications in oncology treatment. Research has revealed that music therapy interventions, in particular, have been effective with pediatric oncology patients. Moreover, treatment protocols are becoming more standardized as evidence increases. The purpose of this paper is to provide an overview of current research-based practices in music therapy for the treatment of children with cancer. Specifically, clinical practice guidelines from the literature in the areas of (a) treatment objectives, (b) musical considerations; and (c) specific interventions will be addressed. Strategies for implementation will be summarized and charts, highlighting selected articles available in the research literature, will be provided.

The development of best practices in music therapy treatment for pediatric patients with cancer has been limited due to small sample size, poor designs and limited descriptions of music therapy interventions (Barrera, Rykov & Doyle, 2002). However, music therapy research as part of an integrative medicine approach demonstrates growing support for the use of music therapy for children undergoing treatment for cancer (Hilliard, 2006). The following information will highlight results from the research on music therapy for the treatment of children with cancer with specific focus on the areas of (a) treatment objectives, (b) musical considerations, (c) specific interventions and (d) implementation strategies.

Treatment Objectives

Music therapists use music as a medium to target physical, psychological, cognitive and social goals and objectives (Davis, Gfellar, & Thaut, 1999). While specific treatment objectives vary from patient to patient, commonalities can be found. Music therapists working in pediatric oncology regularly target: (a) anxiety and pain reduction, (b) tension release/relaxation, (c) opportunities for control, (d) normalization, (e) improved quality of life, (f) improved interpersonal relationships, (g) emotional expression and (g) enhanced self-esteem (Bailey, 1984; Hilliard, 2006; Standley & Hanser, 1995). Moreover, music therapists focusing on palliative care within the pediatric oncology community address: (a) reducing pain and nausea (b) increased comfort, (c) communication problems, (d) psychosocial needs, (e) anticipatory grief, and (f) family conflict (Daveson & Kennelly, 2000; Hilliard, 2003). Support for the use of music therapy interventions with these and other goal areas is increasing; indeed, the literature suggests that music therapy is effective in addressing many of these goal areas. A list of supporting evidence can be found in Table 1. As can be seen in the table, the research provides support for the use of music therapy with a wide variety of objectives.

Table 1

Supporting Evidence for Specific Treatment Objectives

Author	Music Therapy Treatment Objective	Results
Aasgaard (2001); Daveson (2000) & Kennelly (2001)	Reduce pain/distress; promote cognitive/physical development; increase emotional expression	Case study support for the effectiveness of music therapy in addressing stated treatment objectives
Bailey (1983)	Decrease discomfort, tension and anxiety	Significantly less discomfort, tension and anxiety in patients
Barrera, Rykov & Doyle (2002)	Reduce anxiety and increase comfort	Significant improvement in self-rated feelings and improved parental perceptions of play performance
Bouhairie, Kemper, Martin, & Woods (2006)	Reduce stress and improve sleep	A survey of pediatric oncology staff found that 100% believed music therapy reduced stress and 95% believed that it improved sleep

Table 1

Supporting Evidence for Specific Treatment Objectives

Author	Music Therapy Treatment Objective	Results
Fagen (1982); Hilliard (2003)	Palliative care objectives	Case study support for the use of music therapy in palliative care
Frank (1985)	Decrease nausea and emesis	Mean nausea duration decreased from 10.4 to 7.1 hours with music listening
Froehlich (1984)	Increase verbalizations	Significantly better quantity and quality of verbalizations in children
Lane (1994)	Anxiety reduction	Changes in salivary IgA
Lane 91996)	Improved QofL	Case study support for improved QofL
Robb (2000)	Increase engagement	Increased active engagement in environment
Robb & Ebberts (2003a, 2003b)	Increase control and relaxation; improve mood	Increased control/relaxation; improved mood in children with cancer
Sahler, Hunter & Liesveld (2003)	Decrease pain and nausea	Self-reported pain and nausea significantly decreased
Walworth (2005)	Reduce sedation	Successful elimination of patient sedation, reduced procedural times and decreased staffing

Musical Considerations

Research suggests that the effects of music are influenced by age, sex and cultural background combined with the amount of pain, type of treatment and stress levels of the patient (Standley & Hanser, 1995). Patient musical preferences also strongly influence treatment outcomes, with preferred music producing more positive effects (Stouffer, Shirk & Polomano, 2007). As a result, careful consideration should be given to these factors to increase the effectiveness of the music therapy intervention. Likewise, specific musical properties have been shown to impact treatment. For example, stimulative music (faster tempo, louder volume, irregular/syncopated rhythm, disjunct melody and varied instrumentation) tends to increase physiological measures (e.g., heart rate) while sedative music (slower, softer volume, steady rhythm, conjunct melody, limited instrumentation) tends to have

relaxing effects (e.g., decreased muscle tension) (Radocy & Boyle, 2003; Stouffer, Shirk & Polomano, 2007). Consequently the functional outcome, i.e., stimulation or sedation, of the music intervention should be factored into all musical selections.

Other musical considerations that influence treatment outcomes include the use of Iso principle, use of live music, and active patient participation. Use of the Iso principle, i.e., matching the music to the mood of the patient in order to alter mood or physiological reactions, has been suggested as an effective means of altering mood during music therapy treatment (Standley & Hanser, 1995; Walworth, 2005). The literature further suggests that live music is more effective than recorded music, resulting in greater benefits (Bailey, 1983; Robb, 2003; Stouffer, Shirk & Polomano, 2007). Finally, active musical participation is recommended, with positive outcomes demonstrated in hospitalized pediatric oncology patients (Robb, 2000).

Specific Interventions

As Brodsky (1989) stated, music therapy interventions must meet patients' needs, build trust and improve quality of life. A variety of interventions are used with pediatric oncology patients to accomplish these aims. Success-oriented singing, instruments lessons and listening activities are effective techniques that have been outlined in the music therapy literature. Song selection, songwriting, lyric substitution, improvisation, guided imagery and music combined with other art forms have also been identified (Brodsky, 1989). While all of these techniques have been shown to be effective, research support is stronger for some than others, largely due to the still-limited research in this area. Table 2 contains a list of selected interventions supported in the research literature. As can be seen in the table, many of the interventions are active in nature and several incorporate patient preference.

Table 2

Specific Interventions with Documented Support in the Literature

Author(s)	Intervention
Bailey (1983)	Live singing with guitar accompaniment
Bailey (1984); Brodsky & Niedorf (1986)	Patient song selection

Table 2

Specific Interventions with Documented Support in the Literature

Author(s)	Intervention
Barrera, Rykov & Doyle (2002)	Interactive music therapy (singing, song writing, instrumental improvisation, music listening, vocal play/play songs, instrument play)
Barry, O'Callaghan, Wheeler & Grocke (2010)	CD creation
Burns, Harbuz, Hucklebridge & Bunt (2001)	Music improvisation
Burns, Harbuz, Hucklebridge & Bunt (2001)	Therapist-selected music listening
Frank (1985)	Preferred music listening
Pfaff, Smith & Gowan (1989)	Music-assisted relaxation
Robb & Ebberts (2003a)	Songwriting
Robb & Ebberts (2003b)	Video production
Sahler, Hunter, & Liesveld (2003)	Music paired with relaxation imagery
Standley, J. M. (1985)	Procedural support music (i.e., music applications during specific medical treatments)

Implementation Strategies

Successful music therapy treatment is dependent upon a trained therapist using individually tailored music experiences within a therapeutic process to address a variety of functional, non-musical goals and objectives (Bradt, Dileo, & Magill, 2011). While the research base is still somewhat limited at this time, the ever-growing body of research provides increasingly effective guidelines for the implementation of music therapy treatment. Table 3 provides a list of implementation strategies from the research literature that can be used to facilitate successful implementation of music therapy procedures. These strategies, when combined with research-supported interventions and musical considerations and used to address research-based treatment objectives, can further enhance the effectiveness of music therapy treatment.

Table 3

Implementation Strategies from the Research Literature

Author(s)	Strategy
Bailey (1984); Standley & Hanser (1995)	Incorporating family members can increase parent-child bonding
Brodsky (1989)	Precautions may necessitate the use of patient dedicated equipment to avoid germ contamination. Use of technology-based equipment (headphones, mp3 players, etc.) can facilitate functional use and sanitary cleansing when necessary.
Klein & Winkelstein (1996); Stouffer, Shirk & Polomano (2007)	The patient's developmental stage must be considered.
Standley & Hanser (1995)	Music must begin before the aversive stimulus to be effective in reducing pain.
Stouffer, Shirk & Polomano (2007)	To produce short-term sedative or calming effects, recorded music is most frequently presented for 20-30 minutes. This time frame is suggested for effective treatment.
Stouffer, Shirk & Polomano (2007)	Effective recorded music for sedative purposes is generally between 60-72 bpm and 65-70 dB.
Walworth (2005)	Successful use of patient preferred music is well documented in the literature. Preference is based on repetition and exposure, degree of liking and cultural environment, so these factors should be considered during song selection.
Stouffer, Shirk & Polomano (2007); Walworth (2005)	Distraction techniques are recommended as a standard component of clinical programs. Music can serve as a distraction from unpleasant stimuli.

Conclusion

Music therapy interventions can be designed to ameliorate the side effects of the treatment process, improve quality of life, and facilitate palliative care in pediatric oncology patients. Incorporating research-based guidelines can increase the efficacy of music therapy interventions and facilitate wider use of music therapy as a complementary approach in the treatment of children with cancer. The ever-growing body of support provides increasing guidance for music therapists working with pediatric oncology patients. The guidelines outlined in this paper can help direct effective treatment and facilitate positive outcomes for the patients served in music therapy services.

References

Aasgaard, T. (2001). An ecology of love: Aspects of music therapy in the pediatric oncology environment. *Journal of Palliative Care, 17*, 177-81.

American Cancer Society (2010). Childhood cancer: Late effects of cancer treatment. Retrieved from http://www.cancer.org/Treatment/ChildrenandCancer/When YourChildHas Cancer/childhood-cancer-late-effects-of-cancer-treatment.

American Music Therapy Association (2011). What is music therapy? Retrieved from http://www.musictherapy.org/.

Bailey, L. M. (1983). The effects of live music versus tape-recorded music on hospitalized cancer patients. *Music Therapy, 3*, 17-28.

Bailey, L. M. (1984). The use of songs in music therapy with cancer patients and their families. *Music Therapy, 4*, 5-17.

Barrera, M. E., Rykov, M. H., & Doyle, S. L. (2002). The effects of interactive music therapy on hospitalized children with cancer: A pilot study. *Psycho-Oncology, 11*, 379-388.

Barry, P., O'Callaghan, C., Wheeler, G. & Grocke, D. (2010). Music therapy CD creation for initial pediatric radiation therapy: A mixed methods analysis. *Journal of Music Therapy, 47,* 233-263.

Bouhairie, A., Kemper, K. J., Martin, K., & Woods, C. (2006). Staff attitudes and expectations about music therapy: Pediatric oncology versus neonatal intensive care unit. *Journal of the Society for Integrative Oncology, 4(2)*, 71-74.

Bradt, J., Dileo, C., Grocke, D., & Magill, L. (2011). Music interventions for improving psychological and physical outcomes in cancer patients. Cochrane Database of Systematic Reviews 2011, Issue 8. Art. No.: CD006911. DOI: 10.1002/14651858.CD006911.pub2

Brodsky, W. (1989). Music therapy as an intervention for children with cancer in isolation rooms. *Music Therapy, 8,* 17-34.

Brodsky, W., & Niedorf, H. (1986). "Songs from the heart!" New paths to greater maturity. *Arts in Psychotherapy, 13*, 331-341.

Daveson, B. (2000). Music therapy in palliative care for hospitalized children. *Journal of Palliative Care, 16,* 35-38.

Daveson, B. A., & Kennelly, J. (2000). Music therapy in palliative care for hospitalized children and adolescents. *Journal of Palliative Care, 16*, 35-38.

Davis, W. B., Gfellar, K. E., & Thaut, M. H. (1999). *An introduction to music therapy theory and practice* (2nd ed.). Silver Spring, MD: American Music Therapy Association.

Fagen, T. S. (1982). Music therapy in the treatment of anxiety and fear in terminal pediatric patients. *Music therapy, 21*, 13-23.

Frank, J. (1985). The effects of music therapy and guided visual imagery on chemotherapy induced nausea and vomiting. *Oncology Nursing Forum, 12*, 47- 52.

Froehlich, M. A. R. (1984). A comparison of the effect of music therapy and medical play therapy on the verbalization behavior of pediatric patients. *Journal of Music Therapy, 21*, 2-15.

Hilliard. R. E. (2003). Music therapy in pediatric palliative care: Complementing the interdisciplinary approach. *Journal of Palliative Care, 19*, 127-132.

Hilliard, R. E. (2006). Music therapy in pediatric oncology: a review of the literature. *Journal of the Society for Integrated Oncology, 4,* 75-78.

Kemper, K. J., Hamilton, C. A., McLean, T. W., & Lovato, J. (2008). Impact of music on pediatric oncology outpatients. *Pediatric Research, 64*, 105-109.

Kennelly, J. (2001). Music therapy in the bone marrow transplant unit: Providing emotional support during adolescence. *Music Therapy Perspectives, 19*, 104-108.

Klein, S. A., & Winkelstein, M. L. (1996). Enhancing pediatric health care with music. *Journal of Pediatric Health Care, 10,* 74-81.

Lane, D. (1994). Effects of music therapy on immune function of hospitalized patients. *Quality of Life-A Nursing Challenge, 3,* 74-80.

Lane, D. (1996). Songs of love: Music therapy can make a difference in the care of dying children. *Hospice, 6,* 6-8.

Lin, Y. C., Lee, A.C., Kemper, K. J., & Berde, C. B. (2005). Use of complementary and alternative medicine in pediatric pain management service: A survey. *Pain Medicine, 6*, 452-458.

Magill, L. (2006). Role of music therapy in integrative oncology. *Journal of the Society for Integrative Oncology, 4*, 79-81.

National Cancer Institute (2010). *A snapshot of pediatric cancer*. Retrieved from http://www.cancer.gov/aboutnci/servingpeople/snapshots/pediatric.pdf

Pfaff, V. K., Smith, K. E., & Gowan, D. (1989). The effects of music-assisted relaxation on the distress of pediatric cancer patients undergoing bone marrow aspirations. *Children's Health Care, 18*, 232-236.

Radocy, R. E., & Boyle, J. D. (2003). *Psychological foundations of musical behavior* (4th ed.) Springfield, IL: Charles C Thomas.

Robb, S. L. (2000). The effect of therapeutic music interventions on the behavior of hospitalized children in isolation: Developing a contextual support model of music therapy. *Journal of Music Therapy, 37,* 118-146.

Robb, S. L. (2003). Coping and chronic illness: Music therapy for children and adolescents with cancer. In S. L. Robb (Ed.) *Music therapy in pediatric healthcare: Research and evidenced-based practice* (101-136). Silver Spring, MD: American Music Therapy Association.

Robb, S. L., & Ebberts, A. G. (2003a). Songwriting and digital video production interventions for pediatric patients undergoing bone marrow transplantation: Part I. An analysis of depression and anxiety levels according to phase of treatment. *Journal of Pediatric Oncology Nursing, 20,* 2–15.

Robb, S. L., & Ebberts, A. G. (2003b). Songwriting and digital video production interventions for pediatric patients undergoing bone marrow transplantation: Part II. An analysis of patient-generated songs and patients perceptions regarding intervention efficacy. *Journal of Pediatric Oncology Nursing, 20*, 16–25.

Sahler, O. J., Hunter, B. C., & Liesveld, J. L. (2003). The effect of using music therapy with relaxation imagery in the management of patients undergoing bone marrow transplantation: A pilot feasibility study. Alternative Therapies, 9, 70-74.

Standley, J. M. (1992). Clinical applications of music and chemotherapy: The effects on nausea and emesis. *Music Therapy Perspectives, 10*, 27-35.

Standley, J. M., & Hanser, S. B. (1995). Music therapy research and applications in pediatric oncology treatment. *Journal of Pediatric Oncology Nursing*, *12,* 3-8.

Walworth, D. D. (2005). Procedural-support music therapy in the healthcare setting: A cost-effectiveness analysis. *Journal of Pediatric Nursing, 20*, 276-284.

IV. Music Therapy and Clients with Autism

Students with autism spectrum disorders (ASD): Implications for music educators

Mary Adamek
The University of Iowa
mary-adamek@uiowa.edu
USA

Amelia Furman
Minneapolis Public Schools
afurman@mpls.k12.mn.us
USA

Abstract

According to data collected for the U.S. Department of Education, over 258,000 students with autism received services in the US under the Individuals with Disabilities Act (IDEA) in 2007 (Data Accountability Center, 2007). This is more than three times the number of students with autism served just five years earlier in 2002. Approximately 1 in 100 children are diagnosed with ASD and this disorder is four times more prevalent in boys than in girls. The number of individuals diagnosed with autism is increasing rapidly by a rate of 10-17 percent each year (Autism Society of America, 2010). Although autism is considered a low incidence disorder, many music educators work with students with autism each week in schools.

This paper includes information on the following topics:

- Characteristics of students with autism spectrum disorders (ASD)
- Educational Implications
- Music education for students with autism spectrum disorders, including adaptations for successful music education experiences

Characteristics of Autism Spectrum Disorders

Autism Spectrum Disorder (ASD) includes autism as well as other disorders that are like autism but do not meet all of the same diagnostic criteria for autism. Students with ASD usually require similar types of educational interventions, adapted to their specific needs and abilities. Autism and ASD affect children of all social classes, financial levels, educational levels, cultures, and races throughout the world (Scott, Clark, & Brady, 2000, Turnbull, Turnbull & Wehmeyer, 2010).

Children who are diagnosed with autism or other ASD have qualitative impairments in communication skills and social skills. These students may have

difficulty with expressive and receptive language or interacting with others, and they usually are unable to understand that others' thoughts, feelings, and perspectives might be different from their own (Mastropieri & Scruggs, 2000; Coleman, 2005; Scott et al., 2000). Some students with autism are nonverbal, while others may be highly verbal but have difficulty with interpretation or meaning in language. In addition to communication and social problems, they have a limited range of interests and activities when compared to typically developing peers, and they may exhibit unusual stereotypic and self-stimulating behaviors. Many, but not all, children with autism also have intellectual disabilities; however, children with Asperger's syndrome do not have delays in intellectual functioning and can be very intelligent. Individuals with Asperger's Syndrome have significant challenges and delays in social functioning but do not have significant delays in language skills.

The characteristics of autism may be present in a wide combination of behaviors and levels of severity, so a group of children all diagnosed with autism can have very different abilities, personalities, and skills. As a spectrum disorder, the range of abilities and degree of developmental delay manifest as individual differences unique to each child; however, all children with autism have some sort of difficulty with communication and social skills. (See Figure 1.) Children with autism can learn and make developmental gains in many areas of functioning when provided with appropriate educational support and treatment.

Area of Functioning	**Variability Levels**
Measured Intelligence	Severely impaired ----------Gifted
Social Interaction	Aloof ------Passive -----Active but odd
Communication	Nonverbal ----------Verbal
Behaviors	Intense ----------Mild
Sensory	Hyposensitive ----------Hypersensitive
Motor	Uncoordinated ----------Coordinated

Figure 1. Continuum of Abilities and Limitations for Persons with Autism (Adamek, Thaut & Furman, 2008, p. 120)

Children who are typically developing have intact sensory systems that help them perceive the world around them. Their senses of vision, hearing, touch, taste,

and smell work together to help them make sense of their environment and understand what they are experiencing. Some children with autism have sensory integration problems that can cause over-sensitivity or under-sensitivity to certain stimuli. For a child with sensory integration problems, the environment may be confusing, painful, or frightening because these systems are not working together to help him or her to decode and understand the environment. For instance, children with autism might be particularly sensitive to high or loud sounds and, when presented with this type of sound, they will shriek, hold their ears, or be aggressive in some way. Teachers should be aware of a child's reactions to certain stimuli and adapt or avoid certain sounds or movements when appropriate.

Educational Implications

Communication Skills

One of the primary deficits for students with autism and other ASD is communication, so it is important to help the student develop effective communication skills. Students who have severe autism may have little or no receptive or expressive language, while students with mild forms of autism may have developed language skills that allow them to communicate with others. There are many alternative and augmentative communication (AAC) systems available to either enhance a student's verbal communication skills or become a student's primary means of communication. These alternative systems help a student express wants and needs, initiate and maintain conversations, and receive and understand information from others. A team of speech and language professionals assesses the students in all areas to match the students' needs and abilities to the best AAC system. AAC systems can be a simple system of pointing to pictures, words, or letter boards, or more sophisticated methods, such as use of sign language, voice output computers, or visual tracking devices (Mitchell, 2008; National Research Council, 2001; Scott et al., 2000; Turnbull et al, 2010). Communication systems can provide a means for students to communicate with others in a meaningful way and allow two-way, interactive communication between the student with autism and others.

Examples of some possible responses added to a student's AAC system for use in music education:

- Yes or No
- Icon to represent music, or a picture of the music room
- Pictures or drawings of instruments used in music

- Iconic representation of note values, such as for whole note, half note, quarter note, eighth note

Use of Visuals and Structure to Enhance Receptive and Expressive Communication

Teachers may need to give additional thought to the organization and facilitation of instruction to promote the most successful outcomes. Organizing instruction includes such preparatory tasks as preparing visual structure for the student, developing a schedule for classroom activities, preparing adaptations of the lesson plan, and making sure the environment is conducive to the needs of the students. Music professionals can gain insight and ideas for structure from the classroom teachers and other professionals who work with the student each day.

Visuals can be used in music class to support the student's learning and increase success in an inclusive setting. Visual cues may be icons, photos, or functional signs to convey information. Suggested uses for visuals include:

- Describing classroom rules (listen, hands to self—by using drawings, pictures, or acting out the behavior);
- Presenting the schedule for class activities—helps student understand order of events in a predictable manner;

Thoughtful classroom structure and placement help the student organize and focus attention appropriately. Some students need to be close to others for structure and support, while other students may need more space due to tactile defensiveness or hyperactivity.

Social Skills and Peer Interactions

Appropriate social skills are necessary for successful inclusion and normalization. Individuals with autism and ASD have core deficits in social interaction and social perception, which manifest in difficulty initiating interaction, difficulty maintaining social relationships, and difficulty understanding the perceptions of others (Prizant, Wetherby, Rubin, Laurent, & Rydell, 2006; Turnbull et al, 2010). Social skills are a major feature of a child's growth and development and they play an important role in students' ability to function in integrated classroom or community settings. Students with autism my need direct training to improve social

skills in a variety of settings. Students' social deficits can range from mild, such as difficulty making and maintaining eye contact, to more severe, such as inability to share experiences and interests with others. Some students with severe social deficits may seem oblivious to others and the environment, while other students with less severe deficits may interact spontaneously with others. Even students with higher functioning skills may have problems understanding the perspective of others, and have difficulty understanding that the thoughts, beliefs, and intentions of others may be different than their own. Since communication provides the foundation for developing and maintaining social relationships, students with autism need to develop functional communication along with social skills in order to enhance their abilities to interact with others, make friends, and be included in classroom and social activities.

A variety of techniques can be used to teach social skills. Teachers must keep in mind the age, language skills, developmental level, and interests of the student in order to develop effective approaches. Some current educational approaches used to teach social skills include (Kern, Wakeford, & Aldridge, 2007; Mitchell, 2008; Register & Humpal, 2007; Scott et al., 2000; Turnbull et al., 2010):

- direct instruction—students taught to directly interact with peers with support from teacher prompts, modeling, or providing physical assistance during the interaction;
- leisure related social skill development—teaching social interaction and rules of play through leisure skills; developing friendships through peer buddies;
- positive behavioral supports – tailoring the students' environments to their needs, interests and strengths.

(Brown, Branston, Hamre-Nietupski, Pumpian, Certo, & Gruenewald, 1979; Jellison, Brooks & Huck, 1984).

Managing Difficult Behaviors

Students with autism may have behaviors that are difficult to manage in an inclusive setting or in a self-contained classroom. Deficits in language and communication, social interaction, focus of attention, aggression, stereotypic or self-stimulating behaviors, oversensitivity to sensory input, and difficulty with generalization of skills are some characteristic features of autism that affect behavior (Coleman, 2005; National Research Council, 2001; Simpson & Miles, 1998). These behaviors can be among the most challenging and stressful factors for teachers as they

strive to provide appropriate and effective educational experiences for the students. The child may exhibit problem behaviors due to inability to understand the expectations of the classroom or because of the inability to communicate wants and needs. Students may also be confused about the consequences of their behavior, especially in relation to the severe difficulty that these students may have in initiating and maintaining positive social relationships. Behaviors such as aggression towards others, self-injurious behaviors, noncompliance, and disruption of classroom routines may create difficult and frustrating situations for the teacher and other students in the class.

While no single intervention will deal effectively with all problem behaviors, most professionals recommend using a preventative approach to decrease problem behaviors and increase positive behaviors. A proactive approach, such as utilizing positive behavioral interventions and supports, can create an environment for students' success in the classroom. This approach, which builds on the strengths of the student, focuses on changes in the environment (class structure, amount of time in activities, appropriateness of setting), instructional changes (teaching skills to the student and those who work with the student to improve the student's academic, social, communication, and behavioral functioning), and behavioral consequences (to minimize impeding behaviors and increase positive behaviors) (National Education Association, 2006). Music educators should utilize methods to promote positive behaviors, including:

- creating a sense of predictability and routine in the classroom—using a visual schedule, having a predictable room set up, using familiar materials *(for example: pictures that represent types of activities will help the student understand what is coming next. Small drawings to represent "opening song/warm-up," "movement," "singing," "instrument playing," and "closing" will help the student understand the class schedule).*

- providing alternative or adapted goals, activities, and settings *(for example: give the student small, concrete tasks that can be completed before adding complexity; allow student to complete work in a quiet setting, or do music tasks on the computer if he or she is getting overstimulated or distracted by the group).*

- using a functional approach to problem behaviors—identification of events that occur before the problem behavior and events that occur after the behavior

and serve to reinforce the behavior *(for example: notice what happens to "set off" a student's outburst; Is the music very loud or is there a high amount of activity in the room? What happens after an outburst? Does the student get to leave the class or get to play anything he wants? Changing these factors may help improve the student's behavior).*

- providing a means of communication for the student, and making sure that communication system transfers to all school environments including music *(for example: Does the student have a communication system that he or she uses in the classroom? If so, make sure there are music words included, and familiarize yourself with how the student can communicate and at what level. Is it a yes/no system or more complex?).*

- teaching peers how to interact in a positive way with the student *(for example: be sure peers know that this student has a disability that impacts language and behavior. If a student strikes out when someone touches him or her, be sure the peers know that the student needs additional space).*

- understanding the student's individual plan for creating positive behaviors and dealing with problem behaviors—this should be a part of the student's IEP *(for example: What does the classroom teacher do to manage behavior? Is there an approach that can also be used in music class? Does the teacher use tokens, a point system, or other behavior modification technique that you can also use in music?).*

Behavioral strategies are widely used to teach appropriate behaviors to students with autism. Using a behavioral approach, it is important to recognize antecedents (what happens before the target behavior) and consequences (what happens as a result of the behavior) in order to determine some possible causes and reinforcing events.

Music Education for Students with Autism Spectrum Disorders

Some students with autism excel in music and may need few adaptations in order to be successful in an inclusive music classroom. Other students might need significant individualized adaptations due to severe social, communication or behavioral difficulties. Each child with autism is different so teachers must get to know the individual needs of the individual student.

Adaptations for the Music Classroom

In general, students with autism need a structured classroom that is predictable and consistent to help the students learn. Information should be presented visually as well as verbally to support students' processing and understanding. Typically developing peers can provide models of appropriate behavior and age-appropriate social interaction for students with autism when engaged in structured experiences (Pierangelo & Giuliani, 2001, Turnbull et al., 2010). These general strategies, combined with strategies developed based on individual student needs, will promote success in the music classroom.

Educators should always consider using the principles of Universal Design for Learning (UDL). Strategies such as using visuals, providing multiple means of instructional delivery, and proximity may all support the needs of students with autism without additional adaptations. However, some students will need additional adaptations due to their level of disability. The following adaptations can be used in an inclusive music class to promote students' success.

- *Participation—Vary the level of participation that is expected of the student.*
    - For some students, partial participation might be most appropriate. For example, Johnny is a student with autism in the 5th grade. His class is learning a dance with Orff ensemble accompaniment for a familiar folk song. Johnny has great difficulty playing instruments as part of an ensemble, but he is able to do the movement part of the activity with assistance from a peer buddy. The music teacher decides to have Johnny focus only on the dance/movement aspect of the activity to build on his strengths, even though the other students rotate around the room playing instruments and dancing.

    - Another student with autism might be able to successfully participate in the music class for only 20 minutes of the 40-minute period. After 20 minutes the stimulation becomes too great and he becomes aggressive to himself and others. Rather than making him stay in the class for the entire time, it might be more effective to have him participate for the first half of the class then go to another setting for the remainder of the class (e.g., computer time back in his classroom with an aide or peer buddy). His time in music could be extended when he is better able to handle the stimulation in the class.

- *Input—Adapt the way that instruction is delivered to the students.*
    - Using visuals to enhance directions, structure the class (i.e., schedule), and reinforce concepts that may be useful for students with auditory processing problems. Routines are very important. Be consistent whenever possible, and when a major shift in routine is imminent, work with the student (and teacher or aide) to prepare the student for new schedule or routine.
    - Break steps down into small steps or tasks.
    - Discuss the student's communication system with the classroom teacher and speech and language pathologist and utilize a consistent approach in music.
    - When giving the student choices, offer a limited number of choices initially then increase number of options as the student becomes better at making decisions.

- *Output—Adapt how the students can respond to instruction.*
    - Make sure that responses appropriate to music are a part of the student's alternative communication system, if used. Icons/words related to instruments, concepts (fast/slow), notation (half note, whole note) as well as yes/no responses can be a part of the student's communication system.

- *Alternate goals—While using the same materials for all students, adapt the outcome expectations or goals.*
    - The goals related to music learning could be different for a student with autism, especially if the student has intellectual disabilities as well as autism.

- *Managing the physical space—Adapt the classroom arrangement to best suit the needs of the students.*
    - Structure the space depending on the needs of the student. Some students may need to be somewhat confined by sitting between other students to help them focus, while other students may need to have more space to accommodate excessive movement.
    - Be aware of how the lighting or extraneous sounds are affecting the student. Some students have a high sensitivity to the flicker of lights or the sounds from electronic equipment. Other students have difficulty

tuning out sounds from the playground or hallway and tuning in to the teacher.

- *Level of support—Increase amount of support from others.*
    - Foster independence as much as possible, offering additional support when needed and tapering off support as student develops more skills.
    - Ask peers to assist the student when the student needs additional help or support—be sure the peer buddy is aware of effective methods for working with the student to ensure the most success for both students.

Although autism is considered to be a low incidence disability, many music educators will have students with autism in their music classes. These students may provide challenges to the music educator, whether in an inclusive setting or in a self-contained classroom. This paper outlines key characteristics of autism and provides a variety of recommendations for music educators who are working with students with autism in the music classroom.

References

Adamek, M., Thaut, M., & Furman, A. (2008). Individuals with autism and autism spectrum disorders (ASD). In Davis, Gfeller, & Thaut, (Eds.), An introduction to music therapy theory and practice (3rd ed., pp. 117-142). Silver Spring, MD: American Music Therapy Association.

Autism Society of America. (2010). Website: www.autism-society.org

Brown, L., Branston, M. B., Hamre-Nietupski, S., Pumpian, I., Certo, N., & Gruenewald, L. (1979). A strategy for developing chronological, age appropriate and functional curricular content for severely handicapped adolescents and young adults. *Journal of Special Education, 13*, 81–90.

Coleman, M. (2005). The neurology of autism. NY, NY: Oxford University Press.

Data Accountability Center (2007). *Individuals with Disabilities Education Act (IDEA) data: Part B data & notes*. Retrieved on April 6, 2010, from https://www.ideadata.org/PartBData.asp.

Jellison, J. A., Brooks, B. H., & Huck, A. M. (1984). Structuring small groups and music reinforcement to facilitate positive interactions and acceptance of severely handicapped students in regular music classrooms. *Journal of Research in Music Education, 32*, 243–264.

Kern, P., Wakeford, L., & Aldridge, D. (2007). Improving the performance of a young child with autism during self-care tasks using embedded song interventions: A case study. *Music Therapy Perspectives, 25*, 43-51.

Mastropieri, M., & Scruggs, T. (2000). *The inclusive classroom: Strategies for effective instruction*. Upper Saddle River, NJ: Merrill/Prentice Hall.

Mitchell, D. (2008). What really works in special and inclusive education: Using evidence-based teaching strategies. New York: Rutledge.

National Education Association. (2006). *The puzzle of autism*. Washington, DC: National Education Association.

National Research Council. (2001). *Educating children with autism.* Committee on Educational Interventions for Children with Autism. Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

Pierangelo, R., & Giuliani, G. A. (2001). *What every teacher should know about students with special needs: Promoting success in the classroom*. Champaign, IL: Research Press.

Prizant, B., Wetherby, E., Laurent, A., & Rydell, P. (2006). The SCERTS® Model: A comprehensive educational approach for children with autism spectrum disorders. Baltimore, MD: Paul H. Brookes Publishing Co.

Register, D., & Humpal, M. (2007). Using musical transitions in early childhood classrooms: Three case examples. *Music Therapy Perspectives*, 25, 5-31.

Scott, J., Clark, C., & Brady, M. (2000). *Students with autism: Characteristics and instruction programming.* San Diego, CA: Singular Publishing Group.

Simpson, R. L., & Miles, B. S. (1998). *Educating children and youth with autism*. Austin, TX: PRO-ED.

Turnbull, A., Turnbull, R., & Wehmeyer, M. (2010). Exceptional lives: Special education in today's schools. Upper Saddle River, NJ: Merrill.

Evaluating the effectiveness of music activities on emotions and communication of a child with autism in a multi-sensory environment

Liza Lee
Associate Professor
Chaoyang University of Technology
lylee@cyut.edu.tw
TAIWAN

Hua Liu
Associate Professor
Zhejiang University
chonghua2nd@gmail.com
CHINA

Keywords: Music Activities, Autism, Emotions, Communication, Multi-sensory Environment

Abstract

Music activities in multi-sensory environments have provided support and proven potential benefits for children with disabilities. Through a number of studies, the effects of music activities have been examined for children with autism and profound multiple disabilities. The purpose of the study was to explore the influence of the researcher's music teaching approach in the multi-sensory environment on a child with autism and multiple disabilities. A 3.6-year-old boy with autism and multiple disabilities was selected by purposive sampling to participate in the research. The duration was 20 weeks with 50-minute instructional sessions once per week. Both qualitative and quantitative methods were used to obtain the results. The results showed the effectiveness of music activities on emotions and communication for the participant in the multi-sensory environment. Furthermore, the participant's tactile defensiveness was improved as well through the assessment of music activities.

Background

Multi-sensory stimulation combines the senses of sight, hearing, touch and smell to help children's mental function and understanding of the environment. It can be used to help children with learning disabilities, such as autism and sensory impairments. During the last decade, this type of approach has increased and become very popular as an environment in which gentle stimulation and relaxation can be provided throughout Europe.

Motivation of the Study

Multi-sensory environments have provided support and proven potential benefits for children with disabilities. Through a number of studies, the effects of multi-sensory environments have been examined for children with profound multiple

disabilities. The rationale for music teaching in a multi-sensory environment is not only to provide a non-threatening and stimulating environment allows children to have a safe time out away from the regular school environment, but also to facilitate and enhance the outcomes of the communication, emotions, cognitive language, social interaction and behavioral changes. Therefore, the motivation of the study was to apply and extend the researcher's framework of music curriculum in order to help a child with autism develop positive emotions and communication skills all within a multi-sensory environment.

The Purpose of the Study

The purpose of the study was to explore the influence of the researcher's music teaching approaches in a multi-sensory environment on the positive emotions, communication and tactile defensiveness of a child with autism and multiple disabilities.

Research Questions

According to the purposes of the study, the research questions were:

1. Will the music activities be effective on positive emotions for the participant, a child with autism in a multi-sensory environment?
2. Will the music activities be effective on communication for the participant, a child with autism in a multi-sensory environment?
3. Will the music activities be effective on tactile defensiveness for the participant, a child with autism through multi-sensory stimulations?

Relative Literature Review

Characteristics of Autism

According to American Psychological Association (2000), Autism Spectrum Disorders (ASD) is a developmental disorder that is generally diagnosed in childhood. Characteristics of autism include failure to develop language or other forms of social communication, failure to develop normal relationships, abnormal responses to at least one type of sensory stimulus, stereotypic movements, limited attention span, excessive off-task behavior, and touch aversion (American Psychiatric Association 2000). Thirty to 100% of these children have some sort of sensory difficulty integrating sensory information (Dawson & Watling, 2000), which is a necessary process in order for a child to interact effectively with the world (Watling et al., 2001). If a child does not develop normally in terms of perceptive and sensory integration this often leads to maladaptive emotional and physical responses to stimuli in the environment (Watling et al., 2001).

Music Therapy for Children with Autism

Research studies (Kern, Wolery & Aldridge, 2007; Whipple, 2004) show potential for interactive and individualized music strategies to enhance individuals with autism communication and socialization. A study of music therapy for children with autism showed after a 7-week family-based group music therapy intervention, the parents responded positively and articulated new insights about themselves and

their children (Allgood, 2005). Another study of music therapy on the communication skills of toddlers with autism, the preliminary findings indicated increased communication through therapeutic musical activities with six participants (Ma, et al., 2001).

A study indicated songs can be an effective approach to multiple-step tasks for children with autism within inclusive classrooms. Song was more effective than lyric/ spoken interventions for hand-washing and cleaning up while lyrics/spoken words worked better for toileting (Kern, Wakeford, & Aldridge, 2007).

Three small studies examined the short-term effect of brief music therapy interventions (daily sessions over one week) for children with autism. The results showed music therapy was superior to that of "placebo" therapy with respect to verbal and gestural communicative skills (Gold, Wigram & Elefant, 2006).

The Effectiveness of Multi-sensory Environments for Children with Disabilities

Multi-sensory environments are dedicated spaces where multisensory stimulation is controlled to match the perceived needs and interests of people with disabilities. This type of approach has increased during the last decade. More and more professionals who work with individuals with severe or profound mental retardation accept this approach (Lancioni et al., 2002). Multi-sensory environments are used to improve the behaviors and quality of life for people with disabilities (Lancioni et al., 2002; Stephenson, 2002). They provide various technical and instrumental resources that offer multiple stimulation opportunities. The stimulation is used to promote a sense of enjoyment and a relief from tension and pressure, with consequent improvement in general behavior (Lindsay et al., 2001).

Methodology

The main methodology was a qualitative study and quantitative data was used to receive objective support. Data from the observation forms by observers, interviews with the classroom teacher and parents, and researcher's teaching log were collected. The parents, classroom teacher and observers completed activity feedback forms to obtain the social validity.

Participants and Setting

The participant was a 3.6-year-old autistic boy who had received a clinical diagnosis of autism with severe disabilities in emotion, cognition and speech language, as well as some physical handicaps, such as visual impairment and encephalitis.

Duration

The 20 week study consisted of 50 minute sessions held one day per week.

Assessment

The assessment instruments included the child's information from the medical doctor and the early intervention center, observation forms from observers, interview

with the parents and the classroom teacher, the researcher's anecdotal log and social validity of the feedback form from the parent and observers.

Results

The results were based on the observation forms, interview reports and teaching logs.

The Changes of the Participant's Emotions

Figure 1 and table 1 both illustrate the changes of the participant's emotions. The participant made progress as shown on table 1, the chi-square was obvious. The changes of the participant's emotions at stage 2 were more obvious. It proved the therapeutic music activities had the positive outcomes on positive emotions for the child with autism. When combining multi-sensory stimulation, it was more efficient than simply music activities.

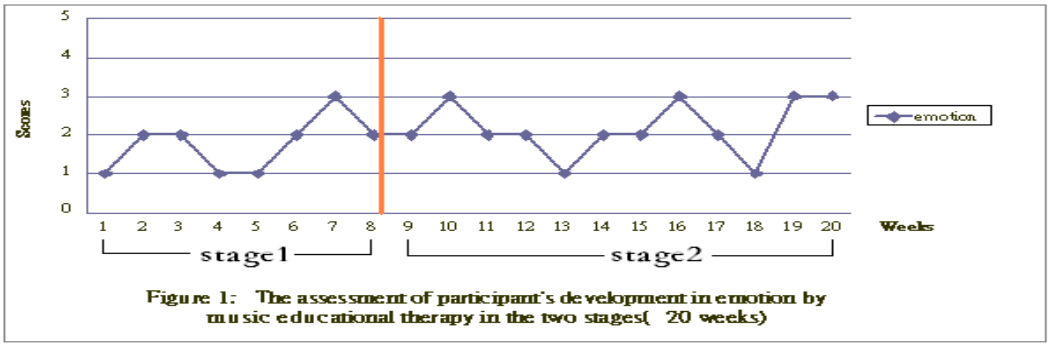


Figure 1: The assessment of participant's development in emotion by music educational therapy in the two stages(20 weeks)

Figure 1. The Changes of the Participant's Emotions

Table 1

The descriptive statistics and X2 test of participant's development of emotions

Duration	f	Mean	Std. Error	Std. Deviation	Variance	Chi-Square
Stage 1	8	1.75	.250	.707	.500	1.75**
Stage 2	12	2.17	.207	.718	.515	2.364**

** $p < .01$(2-tailed)

Figure 1, illustrates the participant's score went down on the 5th, 13th and 18th week. The rest of the weeks also indicated his unstable condition. The reasons might be due to the following:

1. It was caused by two contradictory characters. The same things or activities might lead into a positive or negative emotion. They could be counterbalanced, such

as: the development of emotions possesses soft characters. The changes from extreme negative to positive could be sudden. It was not like the cognitive development changing gradually.

2. The combination of multi-sensory music activities and visual stimulation from sounds and lights, such as high and low; fast and slow, long and short, dark and light. It made the participant experiencing the different changes through continuous fluctuation. The purpose was that the participant would experience multiple types of emotions; the final goal was to enhance his self-control of his emotions. It was noted that this experience could cause the participant's unstable emotions.

3. For a child with autism and multiple disabilities, the development of emotions was effected by more uncontrolled factors, such as: visual impairment, language barrier and encephalitis. These factors might cause his conflict of inner behaviors and lead into his unstable emotions.

4. For a child with autism, his emotions were affected by the changes of the moment and environments. For example, at 5th week, when the participant intended to pick up the new objective, seeds, he showed his anxious and scared emotions; at 7th week, when the participant was asked to smack the switch, he showed his happiness and willingness by smiling. It was obvious that he did not like using uncontrolled fine motor skills, such as picking up seeds; but he liked using gross motor skills, such as: hitting and smacking. Therefore, there was a huge difference between week 5 and 7.

The Changes of the Participant's Communication Ability

The figure 2 and table 2 show the changes of the participant's communication ability.

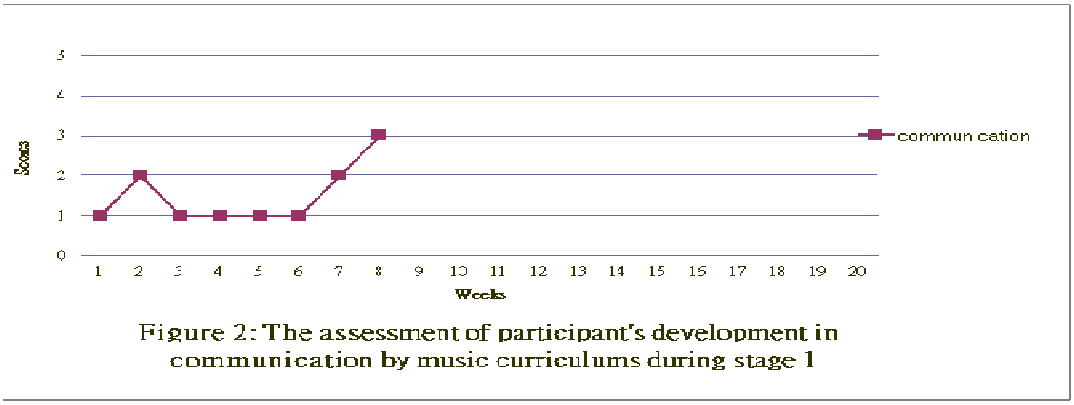


Figure 2: The assessment of participant's development in communication by music curriculums during stage 1

Figure 2. The Changes of the Participant's Development of Communication

Table 2

The descriptive statistics and X2 test of participant's development of communication during stage 1

Duration	f	Mean	Std. Error	Std. Deviation	Variance	Chi-Square
Stage 1	8	1.500	.26726	.75593	.571	.3250**

** p < .01(2-tailed)

Table 3:

The Pearson-correlations of participant's developments between emotions and communication

emotions	communication	
	Sig. (2-tailed)	correlations
stage1	.172	.535
Stage2	.037	.737*

* p < .05

Figure 2 and table 2 illustrate that the participant's communication ability was unstable, but still indicate his obvious changes. At the beginning, the participant only understood a third of the instructions. According to the observation report, he did not want to interact with others. He also did not want to hold hands with the instructor either. This changed in week eight as the participant revealed his pleasant interaction by holding and clapping hands with his mother. He also followed the researcher's instruction of creeping without his mother's help. This proved that the music activities did provide positive reinforcement for the development of communication for the child with autism.

Based upon two considerations, the communication goal for the participant was only indicated for the first stage. First of all, it was taken into account because the multi-sensory stimulation could enhance the participant's cognitive development. The latter was due to the changes of sounds and lights which resulted in the improvement of his visual, hearing and attention following through the session. The adjustment of the participant's emotions was obvious even though this did not impact interaction. This was likely because he was so focused on the changes of the sounds and lights that the participant did not want to interact with others. Secondly, emotions and communication can be affected by each other. A good interactive relation with

others is an external condition of improving an individual's emotion control. The young child did not form a stable inner self-concept and therefore social interaction was a crucial factor for the development of his self-control. Thus, it is an important fundamental factor to build up a good relationship of therapeutic teaching when it comes to a successful effect for a child with autism. Table 3 illustrated the correlation of the participant's emotional and communication development. It means they were enhanced mutually.

His communication did not show the obvious correlation with the development of emotions at the first stage. It might be due to the unfamiliarity between the participant and the instructor. At the second stage, it reached the obvious standard. It indicated the participant formed a good relationship with the instructor. Therefore, it enhanced his positive emotions. Third, the participant was a child with autism and multiple disabilities so he needed multiple developments, such as communication, emotions, cognition and tactile sense etc. A person with autism usually has problems communicating and displays a lack of emotional reciprocity (O.Reilly, & Smith, 2008). Tactile defensiveness is a sensory issue often interferes with learning and cause odd or inappropriate behavior (O.Reilly, & Smith, 2008). Therefore, after building up the better communication ability, the next goal for the participant was to improve his tactile defensiveness. The curriculum was designed and based on the participant's needs, especially for his tactile defensiveness. Figure 3 and table 4 indicated the participant's changes of communication and tactile sense. This illustrated the obvious positive correlation. Also explained was the obvious positive effect of the good relationship between the participant and the instructor at the first stage and the development of tactile sense at the second stage. Also illustrated was the appropriateness of setting up the communication goal for stage one. According to three observers' reports, they also indicated the proper research goals (i.e. the observation report at week 12 (stage 2) and the average score of emotions and tactile sense (stage 3). The following statements support this.

> *"Before the class, the participant could lie down on the "beam bag" quietly during the visual stimulation time."*
>
> *"While the instructor asked the participant to play the drum, he was laughing with biting his apron."*
>
> *"He was willing to hold the drum stick. When playing the drum, he looked up and laughed." (O-12-1000722-C2)*

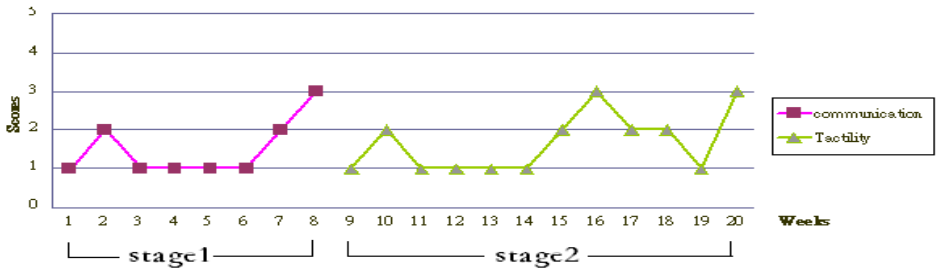


Figure 3. The Changes of the Participant's Development of Communication and Tactile Sense

Table 4

The Correlations between communication and tactility throughout the music activities

	tactility	communication
tactility	1	1.000**
communication	1.000**	1

** p < .01 (2-tailed)

Overall, Figure 4 and Table 5 indicated that the music activities had an obvious effect on the development of communication and positive emotions (X^2=2.00, p < 0.05). It also showed the enhancement of music activities for the participant's development of positive emotions, communication, and tactile sense in the multi-sensory room.

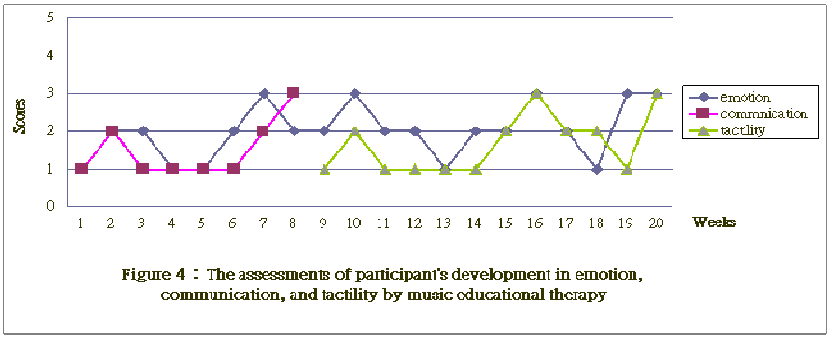


Figure 4 : The assessments of participant's development in emotion, communication, and tactility by music educational therapy

Figure 4. The Changes of the Participant's Development of Emotions, Communication and Tactile Sense

Table 5

The descriptive statistics and X^2 test of participant's development in tactile sense, communication and emotions throughout the music activities

	Mean	SD	Min.	Max.	Mean Rank
tactile	1.50	.756	1.00	3.00	1.88
communication	1.50	.756	1.00	3.00	1.88
emotion	1.75	.707	1.00	3.00	2.25

X^2	2.00*

* $p < .05$

Social Validity

In order to support the research results, a feedback form was completed by three professional observers, the researcher, physical therapist, a trained graduate student, and the participant's parent.

All respondents gave positive support for the study, and evaluated various elements of the study on a 1-5 scale. Most of the respondents chose scores ranging from 3-5. Data was analyzed using a Kendall Coefficient of Concordance. Revealed was that there was a high consistency between the observers and the parent. It reached the high standard ($p<.001$) and the Kendall coefficient of concordance was 1.00. However, here were some differences between score 5 and 3. The scores of Kendall coefficient of concordance were 0.124 and 0. This showed the consistency of the effectiveness of the research goal between the observers and the parent. Overall, parents gave the highest score of 5 (48.1%) and no scores of 3. The physical therapist indicated that the study was 60% effective. This may be due to some recessive or uncontrolled factors of the participant's rejection such as his limited performance in the areas of communication, cognition, emotions, tactile sense, self-protection and group attachment. These phenomena cannot be observed by the physical therapist in the music session, but they were observed by the parent. This suggests that the therapeutic music activities had latent effectiveness and the participant's responses to the music activities possessed hysteresis effectiveness and delayed outcomes. Secondly, the parent was different from the professional observers. They might have been more subjective in their judgements or unsure as to how to evealuate what they observed. The latter may be due to the closeness of the parents to their children in terms of high expectations and sensitivity for their needs. Therefore, even a slight change in the child's behavior, might have been exaggerated by the parent observer. A quote from the parental observation report in support od this phenomenon is included below:

> *"He wouldn't give the instant responses, but after the class, he would respond the teaching content at home. It is like Liza said his performance might be happened in the future. We thanks for Liza's research team and the Early Intervention Center. You made my son a big progress. As his mother, it did touch me a lot. Seeing everyone's efforts, patience and devotion, I am so grateful."*

Table 6

The Outcomes of the feedbacks from professional observers and the participant's parent

Items of feedbacks \ Frequencies (100%)		Professional observers			Participant's parent		
		V	IV	III	V	IV	III
Purpose of music educational therapy		9 (60)	6 (40)		3 (60)	2 (40)	
Interpersonal relationship (communication)			12 (50)	12 (50)	2 (25)	6 (75)	
Cognitives				6 (100)		2 (100)	
Emotion			9 (60)	6 (40)	5 (100)		
Tactility			6 (100)			2 (100)	
Others (self-protection, affiliation, etc.)			8 (53.3)	7 (46.7)	3 (60)	2 (40)	
Total	Frequencies	9	41	31	13	14	
	Percent	11.1	50.6	38.3	48.1	51.9	

Note: The default value is zero in the table.

Conclusions and Implications

The participant had enhanced his positive emotions and communication ability through the music activities in the multi-sensory room. His emotions improved from negative to positive responses. His communication ability was from no responses to understanding the instructions.

The results of this study provide support for the efficacy of music activities in the multi-sensory room on motivating and improving the participant's positive emotions and communication. Further, the study was able to prove a safe and non-threatening environment that can be used in an individual music-therapy setting is invaluable in providing the opportunity for the learning of the child with autism.

After the completion of the study, the findings of the study are:

1. Both of the therapeutic music activities in regular music classroom & multi-sensory room showed obvious positive effectiveness on the participant's development of positive emotions and communication.

2. The ability of emotion control is always a crucial therapeutic goal for a child with autism. When combining the stimulation of multi-sensory, the effect was more remarkable.

3. A child with autism and multiple disabilities, he needs to build up a good relationship of communication with the instructor, so he would be able to develop his positive emotions, tactile sense and cognitive abilities.

4. The therapeutic music activities had a potential effect for the child with autism and multiple disabilities.

It is hoped through this study and further research that more attention will be paid to the possibilities that exist for creating multi-sensory environments with music activities to reach and benefit the learning of autistic children with autism and multiple disabilities.

References

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders IV, Text Revision.*

Allgood, N. (2005). Parents' perception of family-based group music therapy for children with autism spectrum disorders. *Music Therapy Perspectives, 23(2)*, pp. 92-99.

Dawson, G., & Watling, R. (2000). Interventions to facilitate auditory, visual, and motor integration: A review of the evidence. *Journal of Autism and Developmental Disorder*s, 30, 415–421.

Gold. C, Wigram T, & Elefant C. (2006). Music therapy for autistic spectrum disorder. *Cochrane Database of Systematic Reviews, 2*.

Kern, P., Wakeford, L., & Aldridge, D. (2007). Improving the performance of a young child with autism during self-care tasks using embedded song interventions: a case study. *Music Therapy Perspectives, 25(1)*, pp. 43-51.

Kern, P., Wolery, M., & Aldridge, D. (2007). Use of songs to promote independence in morning greeting routines for young children with autism. *Journal of Autism and Developmental Disorders, 37(7)*, pp. 1264-1271.

Lancioni, G. E., Cuvo, A. J. & O'Reilly, M. F., (2002). *Snoezelen: an overview of research with people with developmental disabilities and dementia. Disability and Rehabilitation, 24*, pp. 175–184.

Lindsay et al., (2001). Effects of four therapy procedures on communication in people with profound intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities, 14*, pp. 110–119.

Ma, Y., Nagler, J., Lee, M., & Cabrera, I. (2001). Impact of music therapy on the communication skills of toddlers with pervasive developmental disorder. *Annals of the New York Academy of Sciences, 930*, pp. 445-7.

O.Reilly, B. & Smith, S. (2008). *Australian Autism Handbook: The essential resource for autism spectrum disorders*. Jane Curry Publishing

Stephenson, J. (2002). Characterization of multi-sensory environments: Why do teachers use them? *Journal of Applied Research in Intellectual Disabilities, 15*, pp. 73–90.

Watling, R. L., Deitz, J. & White, O. (2001). Comparison of sensory profile score of young children with and without autism spectrum disorders. *The American Journal of Occupational Therapy, 55(4),* 416-423.

Whipple, J. (2004). Music in intervention for children and adolescents with autism: Meta-*analysis*. *Journal of Music Therapy, 41(2)*, pp. 90-106.

The iPad and children with autism: Two case studies

Kimberly McCord
Illinois State University
kamccor@ilstu.edu
USA

Abstract

Two students with autism and communication disabilities in a self-contained music class are introduced to iPads that are used as calming and transitional tools and as alternatives to traditional instruments that irritate the student. Both students responded positively when we substituted the iPad for traditional instruments or as a way to calm them.

The Study

Technology is becoming an increasingly important tool for professionals in Special Education and Music Therapy (Adams, 2006). AT devices can be grouped into types or categories. One of the foremost organizations that managed the task of grouping the vast number of AT devices is RehabTool. This organization is an information technology company that devised the following eleven categories of AT tools: communication aids, computer access aids, daily living aids, education and learning aids, environmental aids, ergonomic equipment, hearing and listening aids, prosthetics and orthotics, recreation and leisure aids, seating and positioning aids, and vision and reading aids.

In 2003, an adapted version of RehabTool's categorization of AT devices and equipment was developed to include the additional category of Creativity Aids that included music (Thompson, Watts, Wojcik, & McCord, 2003). The category of Creativity Aids was given the following definition: "products that allow participation or promote creative expression through the arts. Examples are music composition or improvisation; creation of visual arts (e.g., painting, drawing, sculpture); theatre and dance performance."

Children on the autism spectrum (ASD) show increased social responsiveness when music interventions including recordings, acoustic instruments and electronic instruments are used (Finnigan, & Starr, 2010; Lee, 2006). Improvisational music and movement has been a key intervention in children with ASD in music therapy and music education settings (Orff, 1974; McCord, 2004; McCord, 2009).

The recent introduction of the iPad in special education and inclusive classrooms has opened up a new level of accessibility for students on the autism spectrum. Many children with ASD are sensitive to sound and sometimes sensitive to touching instruments. Children with communication disorders are not always successful in singing or speech activities in music. For these students technology has offered new possibilities for children with communication disabilities (Desch, 2008; Millar, Light. & Schlosser, 2006). Due to the importance of communication, socialization and interacting with others, children with autism need researchers to develop new solutions for increasing communication through verbal and non-verbal means (Hailpern, 2007). Some children are using assistive devices to aid in communication such as the Dynavox in their other classes. The Dynavox is a communication device that speaks a word or phrase when the child touches an image on the screen. For these students the transition to using the iPad is fairly seamless. Most other students are using the Picture Exchange Communication System (PECS) that involves pointing to images to answer questions or to indicate a need. Transition to the iPad requires teaching the student how to handle the device and making them comfortable with the sound or visual stimuli that occurs when touching the iPad surface. For children who are sound sensitive, the volume can be turned down on the iPad and a wireless speaker can be used. Placing the speaker at a comfortable distance and adjusting the volume control helps to reduce anxiety about loud sounds.

The iPad is still too new for much published research, but special educators are finding success with the devices in classrooms. They are being used as

communication devices, aids for focusing and relaxation, and to support with daily routines. Videos are programmed that can help model appropriate behavior and ways to socially interact with others. Videos can be developed for musical skills and models for concert behavior, etc.

One study demonstrated the benefits of developing an audiovisual immersive interactive environment to encourage creative interaction and expression for a 12-year-old male with Autistic Spectrum Disorder. Results indicated increased engagement spans and vocal utterance while in the environment (Williams, 2008).

Purpose

The purpose of this study is to musically engage two eight-year-old children with autism who also have communication disabilities. Traditional activities such as movement, singing and playing instruments will be used along with tailored experiences using the iPad. The iPad will also be used to focus and calm children when they have tantrums.

Procedure

I was invited by Leigh, a music teacher, to help with two classes of children with severe disabilities. The music teacher was a former student of mine and is teaching elementary general music in a local school district. She is also finishing a master's degree in special education. The district assigned her to teach three self-contained music classes at a different elementary school than her home school. The music teacher in the other school was frustrated with the three classes and asked the district to release her from doing those classes. Leigh had never worked with students with severe disabilities and was having a hard time developing music activities with children who had communication disabilities in a class with students who regularly have tantrums and need restraining by their aids.

Leigh and I had been using iPads in her home school in an inclusive music class with a kindergarten student with autism and communication disabilities the previous year with success. He did not have behavioral issues other than hiding under the teacher's desk when he became overwhelmed by sound. Leigh was interested in

trying iPads with her self-contained classes and wondered if I could help with ideas for engaging the more severe students.

There were two classes; the first one had seven children age six to ten with various developmental delays including autism. The second class had two children; both age eight with autism and communication disabilities. One child, Maria, has speech but it is primarily echolalia. The other child, Joe, has no speech and uses a Dynavox for speech. Both have full-time aids that accompany them to class. This study will focus on the second class with two children who are somewhat similar.

Leigh meets the class twice a week for thirty minutes each. I attend the second class of the week and I bring a box of assistive mallets, adapted instruments, scarves and electronic instruments in addition to my iPad. We only use the iPads on the day I attend. Leigh has an iPad too. On the days I do not attend Leigh introduces one new song or activity and we review it on the second day. The study lasted for twelve weeks.

We quickly established a routine that is represented by PECS that are posted on a chart in order of the activity. As we complete each activity a student removes the PECS that represent what we just completed. We begin each class by a calming transitional activity with the lights off. The students walk on a line created with masking tape on the floor. The line was first in the shape of a rectangle for six weeks, and then it was changed to an oval for the second eight weeks. We then turn on the lights and have the students sit on the floor with their aids and use the same calming music with large colorful see-through scarves that we move over their heads up and down letting the scarf fall over their bodies. The students are then asked to participate by holding the scarf and moving it up and down as we say “up” and “down. “ This activity is designed to engage them with the music and us. The next activity is a review of the song or activity introduced in the previous class. That is followed by an iPad activity that reinforces the musical concept focused on in the reviewed activity. For example, if tempo is the concept we might use an App that has virtual bongos and have the student play fast and slow on the bongos as we listen to recorded music. We follow that with a few minutes playing on an App called *Bloom.* This is used to transition the students to leave class.

Leigh and I then write each other emails about how we thought about the class session. She teaches another class directly after this so there isn’t time to debrief in person. As we email and talk about different strategies or Apps we might use in the

future, we often talk about the need to involve the special educator, speech therapist, or occupational therapist. Leigh will then meet with that professional and get more information or help that we need. Sometimes we will talk about a way the aid handled a temper tantrum or helped with an activity and Leigh will then speak to the aid about thoughts about trying something different. For example, Maria's aid tends to try to hold Maria's hands and guide them for her instead of letting Maria play an instrument or move the scarf herself. Joe's aid will help get him started but then let's go after he helps him. We want Maria's aid to assist Maria in a similar way that Joe's aid works with him.

All classes were videotaped and transcribed and entered into a qualitative research software program. Lincoln and Guba (1985) report, "For naturalistic inquirers, the reporting mode of choice is the case study." (Lincoln & Guba, 1985, p. 357) Studying children with disabilities is best achieved through qualitative methods because a researcher is unlikely to find two children alike enough to draw similarities. Although Maria and Joe have some similarities, they are different enough in abilities and interests that a case study approach seemed the most appropriate way to understand their use of the iPad in musical situations.

Stake, (1995) identifies the most interesting cases in education are people and programs. "We are interested in them for both their uniqueness and commonality" (p. 1). Case studies are an excellent approach toward understanding children with disabilities since it is very difficult to find large groups of children similar enough with disabilities to gather statistics that would be meaningful. Joe lacks speech but is very fluent on his Dynavox, Maria speaks but with an echo (echolalia). Her echolalia is even present in songs. She will sing but not with others, she echoes what we sing. Once she learns a song she will echo the entire song once she learns it. Maria also tends to have more tantrums when tired or over stimulated and needs to be restrained. Joe will sometimes be sleepy or unfocused.

In addition to the emails with Leigh, I interviewed Joe's parents. Maria's parents speak Spanish and I was not fluent enough in Spanish to interview them. The special educator who works with Joe and Maria was also interviewed.

Using the iPad

The iPad was used as a method to focus and calm the student if they became agitated and as an alternate way to create sound. We also ended each class using the

iPad for five minutes before the students returned to their special education classrooms. Two Apps were used for calming and transitioning, *Bloom* and *MeMoves*. Apps used to create sound were, *Percussions*, *iTriangle*, and *Bongos*.

We began the first time using *Bloom*; an App that responds to touch by creating a pitch based on how high or low the finger is touched on the screen. After touching the screen colored circles appear.

Joe has his own iPad at home and is fairly sophisticated with how to operate it. He knows how to exit programs, how to change settings and how to adjust the volume. He was fascinated by *Bloom* and touched the screen in different places to create different pitches. In the second session he took a wet fingertip and tried to connect the circles with the streak made by his finger. He often covers his ears with his hands in class if we use traditional instruments but showed no sensitivity to sound with the iPad. We used a wireless Bluetooth speaker for both iPads and Joe sometimes would also turn the volume up on his device to hear his music above Maria's.

> Special Educator: We use an iPad in the class and Joe uses one at home but we don't have anything like this that captivates them this way. I am going to look into downloading this to have on the iPad in our classroom; it would be perfect to help them calm down. (The App cost too much so it was never put on the classroom iPad)
>
> Joe's father: We were glad to hear about this App, we downloaded it and Joe uses it all the time. We aren't sure if he is most interested in the sound or using it as a game. He likes to take his wet finger and write on the iPad while *Bloom* is playing.

Maria quickly discovered that she liked to make as many sounds as possible and tries to play *Bloom* with all ten fingers at once. She does not want any help with holding the iPad or being distracted by turning the volume up or down. She has no interest in using *MeMoves* and the one time we tried to introduce her to it she had a tantrum and tried to hit and kick us.

Joe enjoys *MeMoves*, an App that is a guided tracing game with accompanying music. He has some trouble tracing fast enough to go with the animation but he still likes to try. Music can be selected for three different moods;

joy, calm and focus. The patterns that are traced change every minute or so but the same music continues. Joe will interact with *MeMoves* without wetting his finger.

Maria also will cover her ears when traditional instruments are played in the class. She does not cover her ears when using the iPad. Leigh and I use virtual instruments on the iPads in the same way we would use traditional instruments. For example, a song was taught that had different animals responding with actions. Joe and Maria are not able to sing the song or perform the actions but they will respond by playing an instrument on the iPad on cue. Joe will select the percussion instrument he wants to play himself on the iPad. Maria will play whatever instrument is displayed on the screen.

Discussion

Using an iPad with these two students with autism has helped to make music more accessible for them. Students who lack speech and show sensitivity to sound are often challenging to incorporate in the inclusive music classroom. In addition, finding a method to calm a student having a tantrum is difficult when they are screaming and resisting other attempts at trying to end tantrum. The aid that works with Maria will restrain her and shout at her to stop kicking, etc. We noticed that Maria only becomes more agitated when she is restrained. One time we stopped the activity and gave Joe an iPad while Maria was screaming. As soon as Maria noticed him working on the iPad she stopped screaming and joined us ready to focus on the iPad. The aid and special education teacher had never seen Maria respond that way.

These are two short case studies of two students with autism with communication disabilities. It is hard to generalize the success Joe and Maria have had to others, but we are using the iPads with some of the students in the first class who are able to touch the screen. Some of the students in that class have additional physical or vision disabilities and are unable to participate using an iPad.

One of the most promising aspects of using the iPad has been the apparent comfort with sound produced from the iPad. Both students are comfortable with the wireless speaker or the sound coming from the iPad and do not show any signs of needing to cover their ears. The next step for Leigh and I might be to gradually introduce the traditional instruments and see if they can tolerate them.

References

Adams, D. (2006). An Investigation into the use of Music Technology in Music Therapy and Special Needs Education. Leeds Metropolitan University, BSc Music Technology.

Desch, L. (2008). The spectrum of assistive and augmentative technology for individuals with developmental disabilities. In P. Accardo (Ed.), *Capute and Accardo's neurodevelopmental disabilities in infancy and childhood* (3rd ed., Vol. 1, pp. 691-719). Baltimore: Paul H. Brookes.

Finnigan, E. & Starr, E. (2010). Increasing social responsiveness in a child with autism. *Autism, 14*(4), 321-348.

Hailpern, J. (2007). Encouraging speech and vocalization in children with autistic spectrum disorder. *Accessibility and Computing, 89*, 47-52.

Lee, L. (2006). Music Education In The Facilitation Of Social And Behavioral Changes In A Cohort Of Autistic Children. In M. Prause-Weber (ed.), Musica – res severa verum gaudium – Proceeding of the ISME Commission Seminar on Music in Special Education, Music Therapy, and Music Medicine (pp. 29-36). International Society for Music Education

Lincoln, Y. M. & Guba, E.G. (1985). *Naturalistic inquiry*. (7th ed.) Newberry Park, CA: SAGE Publications.

McCord, K. A. (2004). Moving beyond "That's all I can do:" encouraging musical creativity in children with learning disabilities. *Bulletin of the Council for Research in Music Education, 159*, 23-32 .

McCord, K.A. (2010). Improvisatory Musical Experiences in the Lives of Children with Severe Disabilities Music experience in our lives. In C. Abril, C. & J. Kerchner.J. (Ed.). *Musical Experience in Our Lives: Things We Learn and Meanings We Make*. Lanham, MD Rowman & Littlefield.

Millar, D., Light, J., & Schlosser, R. (2006). The impact of augmentative and alternative communication intervention on the speech production of

individuals with developmental disabilities: A research review. *Journal of Speech, Language, and Hearing Research*, 49, 248-264.

Orff, G. (1980). *The Orff music therapy*. (M. Murray, Trans.) New York: Schott Music Corp.

Orff, G. (1989). *Key concepts in the Orff music therapy*. (J. Day & S. Salmon, Trans.) London: Schott Music Corp.

Stake, R.E. (1995). *The art of case study research.* Thousand Oaks, CA: Sage Publications.

Thompson, J. R., Watts, E. H., Wojcik, B. W., & McCord, K. (2003). The AT matching game. Unpublished manuscript, Illinois State University at Normal.

Williams, C. (2008). Creative engagement in interactive immersive environments. *Digital Creativity, 19*(3), 203-211.

Developing music literacy skills for children with autism

Maritza M. Sadowsky
Arlington Public Schools Jamestown Elementary
doctorm@verizon.net
USA/Brazil

Keywords: Autism, Music Lesson Plans, Special Education, Music Education, Children with Disabilities

The purpose of this workshop is to share music lesson plans created and/or adapted from several different music curricula, websites, and books, with music teachers who teach autistic children with severe developmental disabilities in grades K-5. There are few resources in which one can find information to create and/or adapt music lesson plans for children with severe autism. Many general music teachers have not had special education training requirements as part of their music education curriculum. This workshop will feature many musical activities that can be used by music teachers who are not trained as music therapists but who find themselves in the position of teaching children with severe autism. The intent is to share music lesson plans in order to provide children who suffer from severe autism disorder with opportunities for music making. I have organized the materials for this workshop as follows: (a) a power point presentation as a guide; (b) an overview of the music lesson plans format relevant to music concepts; (c) a chart including the titles of materials and activities in

the lesson plans classified under different categories according to the lesson plan format and to the Strategies for Teaching Based on Autism Research Program (STAR); and, (d) a video of students' performance in class. Participants will be asked to join in a circle and participate in some music activities and will receive a booklet with several music lesson plans used by myself. In conclusion, provided with musical activities at the curriculum grade level, children with severe autism in an inclusive classroom demonstrate the same grade level understanding of musical concepts as non-autistic children. It is my hope that this workshop will help other music teachers to improve their skills in adapting specific strategies to enhance their music lesson plans for children with severe autism.

Definition of Autism

Autism is a developmental disability that appears by age three and significantly affects verbal and nonverbal communication, social interaction, and adversely affects a child's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

Background

I have been teaching children with severe autism since 2007 in the Arlington Public Schools, Virginia. For the purposes of this presentation, severe autism refers specifically to children who have limited speech if any. In my work as a general music teacher, I have observed the responsiveness of autistic children to my music instruction (in a slower and modified manner) in comparison to that of their normal peers. Specifically, I have found that they respond to appropriate grade level music instruction similar to that of their normal peers.

My presentation will include several general music lesson plans and ideas that have been modified for my autistic students. The intent is to share these so as to ease the teaching experiences of other music teachers who find themselves in similar situations.

Methodology

I always incorporate a child's favorite activity into his/her learning experience. These may include but are nit limited to Simon Says; Trace the Names of the Musical Instruments*;* Classroom Instrument Bingo; Sort the Classroom Instruments by Family; Freeze Dance, Limbo, Listen & Move. Considered also is the individual child's sensory capabilities. Concepts are typically presented verbally and reinforced via repetition and positive reinforcement including a reward system. I typically do not use any visuals to support instruction and I do not make a list of educational goals for each child - I treat them as I do any other student.

Procedure

The materials for this workshop include a power point presentation; an overview of the music lesson plans; a chart including the titles of materials and activities in the lessons which have been classified according to lesson plan format as well as the Strategies for Teaching Based on Autism Research Program (STAR); and finally, a video of students' performance in class. Moreover, participants will be asked to join in a circle and participate in music activities. They will receive a handout with samples of the music lesson plans demonstrated.

Target Audience

This workshop will include many activities involving musical concepts which incorporate instruments, songs, and movement. The materials were originally used by general music teachers who were not trained as music therapists but who have taught children with severe autism. Results of this program include confident teaching, a more enjoyable teaching experience overall as well as a, change in teachers' attitudes towards children with autism.

There are very few sources that provide specific music lesson plans for teaching children with autism in a group setting. In many cases, general music teachers have not previously received training in the area of teaching music to special learners, yet they are expected to adapt music lesson plans to suit the needs of these

students. There is a need for an organized collection of materials in this area of teaching.

Results and Discussion

There was a significant increase in engagement and progressive learning of music concepts among the Multi-Intervention Program for students with Autism (MIPA) following music instruction. In some cases, non-verbal autistic children responded verbally to musical prompts. This reinforces the important practice of modifing existing lesson plans as a means for supporting music learning and enjoyment for children with autism.

Strategies for Success

Strategies for the successful inclusion and instruction of children with autism include the following.

Be proactive. Find out as much as you can about each student and his or her individual needs by reviewing the Individual Educational Program (IEP) goals. Collaboration with the student's special and regular education teachers and talking with parents is also an integral part of the success of such lessons.

Be reflective. Think about how each student participates in your music class and develop appropriate individual expectations. Upon identifying those concepts or activities that might be difficult for the student, think about adaptations and modifications which might help him/her to feel comfortable and to be successful.

Be positive. Most students with special needs suffer from low self-esteem. Focus on their abilities, not their disabilities. Celebrate their successes.

Be patient. Have high expectations, but be willing to try new approaches.

Future Directions

I plan to continue the preparation and documentation of my lessons and plan to expand by incorporating the use of computer assisted technology (IPad2) and visual imagery.

References

Hammel, Alice M. & Hourigan, Ryan M. (2011). *Teaching Music to Students with Special Needs*. New York, NY: Oxford University Press.

Kokaska, Sharen Metz (1974). *Creative Movement for Special Education*. Belmont, California: David S. Lake Publishers.

Notbohm, Ellen (2005). *Ten Things Every Child with Autism Wishes You Knew*. Arlington, Texas: Future Horizons.

Ott, Pamela (2011). *Music for Special Kids*. London, England: Jessica Kingsley Publishers.

Sobol, Elise S. (2008). *An Attitude and Approach for Teaching Music to Special Learners*. Lanham, Marylan: Rowman & Littlefield Education.

V. Clients with Special Needs

The effect of expressive and instrumental touch on the behavior states of individuals with severe and profound intellectual and multiple disabilities

Yen-Hsuan Yang
Florida State University
yhyang1111@gmail.com
TAIWAN/USA

Keywords: Severe and profound disabilities, behavior states, music therapy, touch

The purpose of the study was to examine the effect of music therapy interventions utilizing two types of touch—expressive touch and instrumental touch—on the behavior states of individuals with severe and profound intellectual and multiple disabilities. A secondary purpose of the study was to examine therapist-client rapport when expressive and instrumental touches were used during music therapy sessions. A within-subject design was used with 15 participants receiving three sessions in each of the experimental conditions: no touch, expressive touch, and instrumental touch. All sessions were videotaped for analysis to: (1) measure and code the time participants spent in preferred alert behavior states according to the behavior state coding system (Guess et al., 1988), and (2) rate the music therapist's perceived client rapport. Results of a oneway ANOVA indicated that expressive touch and instrumental touch were significantly more effective than the baseline condition in

eliciting and maintaining participants' preferred alert behavior states. In addition, independent observers' rapport ratings revealed the therapist's client rapport was perceived to be significantly higher during the expressive and instrumental touch conditions than during the control condition. These findings have important implications regarding the use of nonverbal forms of communication in music therapy practice with individuals who have severe and profound intellectual and multiple disabilities.

People with severe and profound intellectual and multiple disabilities need support in almost every aspect of their daily lives. Their complex and specific needs, low levels of functioning, and high levels of dependency make their daily lives different from those of individuals with less severe disabilities. Nakken and Vlaskamp (2002) stated that "individuals with profound multiple disabilities form a heterogeneous group, in terms of both the origin of their disability and their functional and behavioral repertoires." (p. 11) Individuals with severe and profound multiple disabilities not only have profound intellectual and motor disabilities, but also have sensory disabilities and a broad range of additional health problems (Kapell et al., 1998). Researchers also reported that individuals with severe and profound disabilities frequently exhibit a variety of challenging behaviors with a prevalence rate of 82% for self-injurious behavior and stereotypical behavior and 45% for aggressive/destructive behavior (Hogg, 1998; Poppes, van der Putten, & Vlaskamp, 2010).

Many of individuals with profound intellectual and multiple disabilities have limited ambulatory abilities and need others to take care of them physically. They not only need daily living care, but some of them also need medical care. A majority of their lives is often spent having their basic needs met; therefore, limiting their time and opportunities for leisure activities or social interactions with others. Consequently, staying alert and participating actively during social interactions will result in individuals with profound intellectual and multiple disabilities having a better quality of life.

A few researchers have investigated the domains of quality of life in persons with profound disabilities from the perspectives of parents and direct support staff (Petry, Maes, & Vlaskamp, 2005). More than half of the respondents mentioned that the domains of physical, material, social, and emotional well-being, and activity participation were important for the quality of life of people with profound multiple disabilities. However, not every individual receives equal care and activity opportunities. It was found that individuals with lower adaptive and communication

skills and a lower activity level received less positive staff contact and affection, and they were offered less stimulating activities (Seys, Duker, Salemink, & Franken-Wijnhoven, 1998).

Individuals with profound intellectual and multiple disabilities typically use nonverbal forms of communication, such as facial expressions, movements, sounds, body posture or muscle tension (Maes, Lambrechts, Hostyn, & Petry, 2007). As a form of nonverbal communication, touch conveys meaning in social interactions among human beings, such as appreciation, support, affection, etc. Touch conveys different information depending on the tenseness of touch, speed of movement, and the degree of pressure. When visual information is lacking, Downing and Chen (2003) suggested that teaching through the sense of touch is a primary alternative strategy when assisting individuals with visual impairments and severe multiple disabilities.

Touch has commonly been investigated as a nonverbal communication in educational settings, medical service, and nursing care. Hewett (2007) stated that staff members may routinely touch students with profound multiple disabilities in order to: reinforce their communication, give physical support and guidance, intervene physically, manage negative behaviors, play and interact, communicate affection, and give personal care. He also stated that there is little evidence indicating physical contact is harmful to students with severe and profound intellectual and multiple disabilities if practitioners are thoughtful, sensitive and observant. Additionally, Vlaskamp, Geeter, Huilsmans, and Smit (2003) found that people with profound multiple disabilities responded strongly to stimuli—such as touching and talking to the person.

Touch has been found to enhance the nursing care of individuals in long-term care facilities (Gleenson & Timmins, 2004). Two forms of touch that have been empirically studied are expressive touch and instrumental touch (Jones & Yarbrough, 1985; McCann & McKenna, 1993). Expressive touch involves feelings of support, comfort, and care, whereas instrumental touch is used to assist an individual in completing a task. Belgrave (2009) conducted a research utilizing expressive and instrumental touch along with music, and found that instrumental touch was more effective than the no-touch condition in eliciting and maintaining alert behavior states in individuals who had late-stage dementia of the Alzheimer's type. Several researchers have also utilized music and touch to decrease disruptive behaviors, maintain alertness, and improve interactions between caregivers/therapists and individuals (Belgrave, 2009; Clair, 1996; Norgerg, Melin, & Asplund, 2003).

Music is another form of nonverbal communication that when used therapeutically can be beneficial to individuals with profound intellectual and multiple disabilities. Using music as sensory stimulation has been found to be a beneficial intervention for individuals with profound, multiple disabilities (Meadows, 1997). Music has been used to assist individuals with profound intellectual disabilities in non-verbal communication, self-expression, social interaction, learning, and a prevention to self-injurious behaviors (Boswell & Vidret, 1993; Ford, 1999; Ghetti, 2002). Stephenson (2006) concluded in a literature review that individuals with profound disabilities are encouraged and motivated to communicate when nonverbal strategies are used within musical activities.

Ford (1999) suggested to music therapists who work with individuals with severe developmental disabilities that increasing social-communication skills and providing appropriate client-preferred sensory stimulation (including music) can lower tendencies toward self-injurious behaviors. Ghetti (2002), in her work with students with profound developmental disabilities, used a variety of music conditions to modulate their behavior states. She found that students demonstrated learning during the procedures and spent up to 90% of the time in the alert behavior states during music conditions. Behavior states is frequently used as an indicator of interventions' effectiveness with persons who have multiple disabilities.

Behavior state is a major variable that affects the level of alertness and responsiveness of individuals with profound intellectual and multiple disabilities. In a literature review by Munde, Vlaskamp, Ruijssenaars, and Nakken (2009), many researchers have adapted the behavior state observation scale developed by Guess et al. (1993). Originally, the categories of behavior states were established by Wolff (1959) for infants. Researchers suggested that older individuals with profound disabilities who function at the same level as a normally developing infant are comparable in their behavior state organization (Zine, Ferolo, Hass, & Hass, 1975). Hogg (1998) suggested that knowing behavior states helps to determine alertness and how receptive a person is to learning or other experiences. Guess et al. (1993) found that individuals with profound disabilities exhibit rapid state changes, approximately every 30 seconds or less.

In a study on the quality of life of people with profound and multiple disabilities (Petry, Maes, & Vlaskamp, 2005), parents and direct care staff stated that a person's involvement in activities was an important factor. Participation in music activities by individuals with profound intellectual and multiple disabilities has been found to be

beneficial in their social interactions with others. In addition, touch has also been identified as a useful intervention strategy. However, there is limited documentation of music therapy practice incorporating touch for individuals with profound intellectual and multiple disabilities. Considering the benefits of touch and music therapy for individuals with profound intellectual and multiple disabilities, it seems advantageous to explore the combined use of these two interventions with this population. Therefore, the purpose of the study was to examine the effect of music therapy interventions utilizing two types of touch—expressive touch and instrumental touch—on the behavior states of individuals with severe and profound intellectual and multiple disabilities. This study was designed to address the following research questions:

Does expressive touch or instrumental touch paired with unaccompanied singing have an effect on the percentage of time spent in alert behavior states for individuals with severe and profound intellectual and multiple disabilities?

Are music therapist-client interactions involving expressive or instrumental touch perceived more positively than interactions without touch?

Method

Participants

The participants were recruited from a long-term care facility in the Southeastern United States. The treatment team of the facility evaluated and referred individuals who might benefit from the interventions. After the potential participants were selected to the study, a consent form was mailed to their legal guardians or family representatives. Fifteen adults (four males and eleven females) with profound and severe intellectual and multiple disabilities participated in this study. The ages of the participants ranged from 26 to 71 years old (M = 49.08, SD = 12.99). These individuals had various medical, physical, developmental, and mental concerns, which included profound intellectual disability, cerebral palsy, autism, visual and other sensory impairments, and multiple medical problems. All of the individuals were non-ambulatory and non-verbal. One participant was diagnosed with pica disorder, a pattern of eating non-food materials (such as dirt or paper). One participant had a history of exhibiting self-injurious behaviors and was taking antidepressants. Fourteen out of fifteen participants exhibited self-stimulatory or stereotypical movements, including rocking, head moving, tongue/mouth chewing, hands mouthing, teeth grinding, shoulder shrinking, hair touching, etc.

Research Design

A within-subject design was used with each participant receiving three sessions in each of the conditions: no touch, expressive touch, and instrumental touch. Each participant received nine 15-minute individual music therapy sessions over a month period. Expressive touch in this study is defined as touch applied to the shoulder, arm, or hand. Instrumental touch for this study is defined as touch used to assist with musical tasks. The dependent measure of the study was individuals' behavior states.

Materials

The materials used during the music therapy session were guitar, cabasa, maraca, ocean drum, and tambourine. The researcher used participant preferred music as the intervention. The song lists were collected from the participants' current music therapists, medical team members, or family members. Preference was also based upon their nonverbal responses (such as facial expression, vocal utterance, movement, etc.) to the music. A song list of fifteen songs was compiled for the following genres of music: gospel, folk, and country. The researcher used songs that varied in tempo for each music category. A Sony digital video camera was used to videotape all sessions for data collection and further analysis. A digital timer was used to time the sessions and interventions.

Procedures

All music therapy sessions were held in the participants' private rooms or in quiet activity rooms at the facility. Participants were in bed or in a wheelchair with the music therapist at bedside or next to the participants during the sessions. Participants engaged in the music therapy sessions by listening to the music or playing the instruments. All music therapy sessions consisted of the same format. Approximately six to seven songs were sung during each session. The sessions began with a three-minute introductory period, a 10-minute treatment intervention, and a two-minute closing period. The introduction, including a verbal greeting to the participant and an opening hello song performed with live singing and guitar accompaniment, oriented the participants to the music therapy sessions. The next 10 minutes of the sessions

utilized either treatments of no touch, expressive touch, or instrumental touch, with unaccompanied singing. The order of treatments was counterbalanced across participants. The two-minute closing consisted of live singing, guitar accompaniment, and a verbal closure.

The baseline condition consisted of the music therapist singing to the participant without providing touch. During the experimental condition expressive touch, the music therapist sang to the participant unaccompanied using expressive touch. Expressive touch was defined as a caring touch applied to the shoulder, arm, or hand. Expressive touch was provided throughout the songs. Approximately 10 to 20 touches per minute occurred during the music; touches varied according to the style of the songs. During the experimental condition instrumental touch, the music therapist sang to the participant unaccompanied and assisted participants in playing instruments. Since the participants were nonverbal, the intervention needed to be paused or ceased if participants revealed any negative behaviors or emotional symptoms (i.e., agitation, restlessness, screaming, etc.) during the procedure. The music therapist and the medical team members conducted a re-evaluation of the participant to continue in the study.

Data Collection

All sessions were videotaped in order to analyze the behavior states of the participants during sessions and the perceived client rapport of the therapist during interactions.

Behavior states. The observed behavior states of the participants were examined as the dependent variable for this study. Behavior states, ranging from sleep to awake, consist of eight observable levels for an individual. According to the Guess et al.'s (1988) classification system, the eight states are categorized by four observable levels: sleep state, indeterminate state, preferred awake state, and other awake state. Further, they are divided into two sub-categories of active behavior or inactive behavior. The sleep state is identified as either asleep inactive (S^1) or sleep active (S^2). The intermediate state is identified as either drowsy (DR) or daze (DA). The preferred awake states include awake inactive-alert (A^1) and awake active-alert (A^2). The other awake state, which is non-preferred awake state, is identified as either awake-active/stereotypy or self-stimulatory (A^2/S), and crying/agitated (C/A). Each state is determined by a list of observable behaviors (see Appendix).

From the session videotapes, behavior state data were collected for the 10-minute treatment sessions. The researcher edited the videos in order to delete the introduction and closing parts of the sessions. Two observers viewed training videotapes and applied the behavior state coding system. Once a reliability of 85% occurred with the training tapes, the observers began coding the experimental data. Interval recording was used in this study. For each 10-minute session, the raters observed for 10 seconds and then recorded for five seconds for a total of 40 observation intervals using a paper-and-pencil observation form. They recorded the predominant (longest) behavior state condition that coccurred during the period. For each participant, two out of nine (22%) videos were examined for interrater reliability. Reliability data are reported in the results.

Rapport ratings. Four health-related profesional observers (in speech pathdology, special education, art therapy, and music therapy) viewed randomly selected video clips of each experimental condition: no touch, expressive touch, and insturmental touch. Each observer viewed a total of 45 30-second excerpts. The observers rated their perception of the music therapist's rapport with the participant on a 10-point Likert scale (1 = *poor therapist-client rapport* and 10 = *exceptional therapist-cliecnt rapport*). Reliability data are reported in the results.

Results

Interrater Reliability Results. The mean interrater reliability, calculated according to joint probability of agreement, was 92% for the total group of fifteen subjects. This percentage is consistent with overall coding reliability levels from the earlier studies for this population (Guess, Roberts, et al., 1993; Guess, Siegel-Causey et al., 1990). Reliability percentages ranged from 81% to 100%.

Data Analyses for Research Question One

Does expressive touch or instrumental touch paired with unaccompanied singing have an effect on the percentage of time spent in preferred alert behavior states for individuals with severe and profound intellectual and multiple disabilities?

Means and standard deviations for percentage of time spent in alert states for participants are displayed in Table 1. A within subjects one-way Analysis of Variance (ANOVA) was computed to compare the differences of participants' alert behavior states (combined state A^1 and A^2) between three experimental conditions (no touch,

expressive touch, and instrumental touch). Results indicated a significantly difference between three conditions, F (2,28) = 4.86, $p < .05$, partial $\eta^2 = .26$. The post hoc analysis through the Tukey HSD Test for significance indicated that the expressive touch condition (M = 51.17, SD = 28.08) was significantly more effective in eliciting and sustaining participants' alert behavior states than baseline (no touch) condition (M = 37.56, SD = 26.67), $p < .05$; the instrumental touch condition (M = 51.50, SD = 31.8) was significantly more effective in eliciting and sustaining participants' alert behavior states than baseline (no touch) condition (M = 37.56, SD = 26.67), $p < .05$. However, no significant difference was found between the participants' alert behavior states in expressive touch condition and in instrumental touch condition.

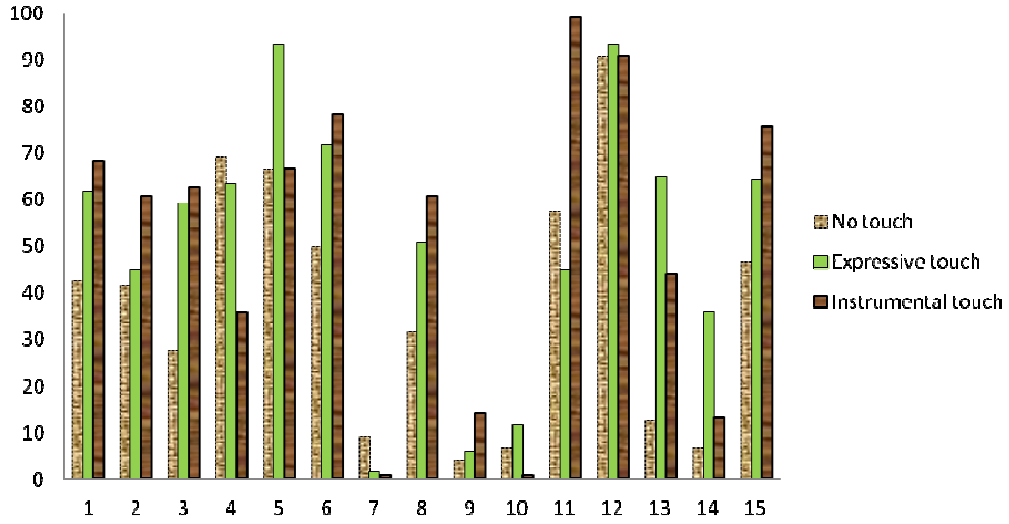


Figure 1. Mean percentage of time spent in combined alert states of A^1 and A^2 for all participants during experimental conditions.

Data Analyses for Research Question Two

Are music therapist-client interactions involving expressive or instrumental touch perceived more positively than interactions without touch?

The rater's rapport scores were analyzed to determine inter-rater reliability. A Cronbach's α coefficient of .81 was obtained, which suggested that raters had reasonable agreement across all observations. A within subjects one-way Analysis of Variance (ANOVA) was computed to compare the differences between the scores of perceived therapist's rapport during no touch, expressive touch, and instrumental

touch conditions. The one-way ANOVA, F (2,28) = 5.52, $p < .05$, partial $\eta^2 = .28$, demonstrated statistically significant difference between the three rapport scores. The post hoc analysis through the Tukey HSD Test for significance indicated that the rating for the expressive touch condition ($M = 8.07$, $SD = 0.71$) was significantly different from the rating for the no touch condition ($M = 7.37$, $SD = 0.69$), $p < .05$; the rating for the instrumental touch condition ($M = 8.25$, $SD = 0.74$) was significantly different from the rating for the no touch condition ($M = 7.37$, $SD = 0.69$), $p < .05$. However, no significant difference was found between the expressive touch condition ($M = 8.07$, $SD = 0.71$) and the instrumental touch condition ($M = 8.25$, $SD = 0.74$). In conclusion, the therapist's client rapport during expressive touch and instrumental touch conditions was perceived higher than during baseline condition.

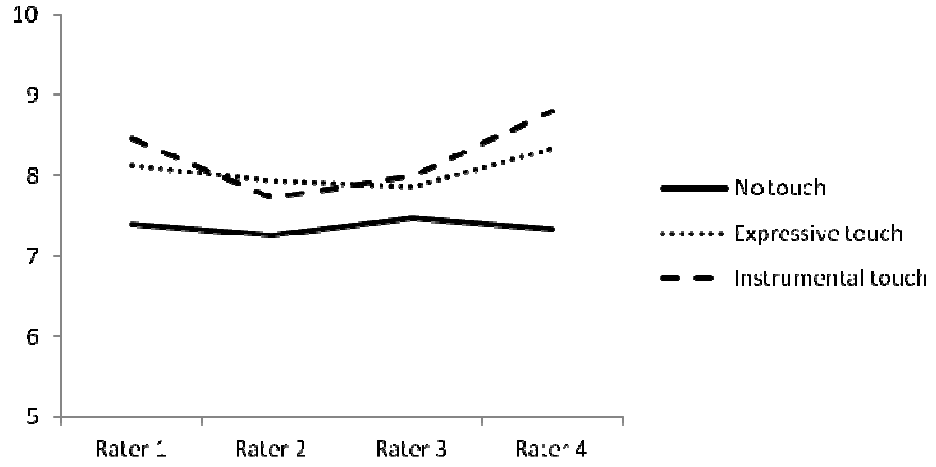


Figure 2. Mean rapport ratings for all raters during experimental conditions.

Discussion

The purpose of this study was to examine the effect of music therapy interventions utilizing two types of touch—expressive touch and instrumental touch—on the behavior states of individuals with severe and profound intellectual and multiple disabilities. Results indicate that both expressive touch and instrumental touch were more effective than the baseline condition in eliciting and maintaining the preferred alert behavior states of participants. No significant difference was found between the expressive touch and instrumental touch conditions.

When interpreting the raw data for each participant, ten out of fifteen individuals spent more time in preferred alert behavior states during touch interventions. The

characteristics of the participants can be categorized based on previously established behavior state profile groupings (Guess et al., 1990; Guess, Siegel-Causey et al., 1993). Participants were categorized according to the raw data during the baseline condition. Two participants fit into the "impaired responsiveness" group, which means they spent more than 75% of their time in inactive-alert (A^1) and very little time in awake active-alert (A^2) or other states. Participants in this group were alert for a majority of the time, but they did not interact with the environment. Nine participants could be considered members of the "impaired alertness due to excessive self-stimulation and cry/agitation" profile group, since they spent relatively little time in A^1 or A^2 and substantial time in the non-optimal states of A^2/S (awake-active/stereotypy or self-stimulatory), S^1 (asleep inactive), and DR (drowsy). One participant could be categorized into the group of "impaired alertness due to excessive sleep, drowsiness, and daze," since she spent less than 75% of the time scored in A^1 and A^2 state conditions. The purpose of the categorization was not to identify which participant should fit into which profile group. However, this information is helpful for evaluating the effectiveness of the interventions and for setting up an appropriate goal that meets the needs of each individual.

The analysis indicated that, across three experimental conditions, most participants' profile groups stayed the same. However, two participants' profile groups changed during the instrumental touch condition. One participant changed from "undifferentiated" group during the baseline condition to "non-specified" during the instrumental touch condition. He stayed actively and interactively awake while playing the instruments, which indicated that he preferred instrumental playing over music listening. Furthermore, another participant's profile group changed from "undifferentiated" during the baseline and expressive touch conditions to "impaired alertness due to excessive self-stimulation and cry/agitation" during the instrumental touch condition, which indicated that instrumental playing functioned as a strong stimulus. These findings indicate that instrumental touch might affect behavior states of individuals differently.

Further analysis revealed that interventions of music paired with instrumental touch decreased certain stereotypical behaviors, such as hand mouthing, shoulder moving, face scratching, etc. The effectiveness of intervention through playing instruments was found particularly useful in a participant with pica disorder. This participant mouthed his fingers during both baseline and expressive touch conditions, but not during the instrumental touch condition. The findings indicated that playing

instruments replaced certain types of stereotypical behaviors; therefore, playing instruments functions as a competing behavior.

Moreover, when the music therapist provided expressive touch along with the music, one participant actively held and shook the therapist's hand along with the music throughout the session. Another participant held the therapist's hand tightly when the therapist touched his hand. As individuals in a long-care facility are away from their families, they often experience a decrease in touch resulting in "skin hunger" (Vortherms, 1991). Although individuals with severe and profound intellectual and multiple disabilities were unable to respond to physical social contact through verbalizations, their physical responses and positive facial expressions indicated their needs, beyond daily living care in a long-term care facility.

Relationship to Extant Literature

Influential factors on behavior states**.** Guess et al. (1993) explained that the behavior state of an individual can be altered either by internal or environmental factors; however, determining the influence of such factors are difficult to isolate. Internal factors noticed in the participants from the present study included sleeping cycle, the individual's mood status, severity of their disabilities, preference regarding the type of activity, physical condition, and medication. Environmental factors observed in this study included location, noise level, the presence of materials, level of activity, and body position. One participant spent over 80% of the time in drowsy or sleep states in six sessions. It could be that this participant's behavior states were influenced by a combination medication side effects and environmental change from a noisy environment to a quiet room. Listening to unaccompanied singing in a quiet environment might serve as a relaxation activity to this participant. Another participant spent over 85% of the time in drowsy or sleep states in two out of nine sessions. A possible explanation for this participant is that he had been awake for a period of time before coming to the music therapy sessions. Therefore, the internal need for rest was greater than a need to interact with others.

Effectiveness of music and touch. Pairing music and touch has been found effective not only in eliciting and maintaining preferred alert behavior states but also in promoting social interaction for individuals with severe and profound intellectual and multiple disabilities. Although three experimental conditions all provided musical stimulation, instrumental playing and music listening with expressive touch involve more mediating mechanisms, and require more attention. These findings were found to be consistent with earlier studies that indicated music served as a nonverbal

communication form and a social interaction medium for individuals with severe and profound intellectual and multiple disabilities (Boswell & Vidret, 1993; Ford, 1999; Stephenson, 2006). The use of music and touch increases the repertoire of responsiveness for individuals with severe and profound intellectual and multiple disabilities.

Furthermore, the combination of music and touch inhibited a participant, who normally exhibits self-injurious behaviors by biting hands when distressed or over-stimulated, stay alert and responsive to the musical stimuli. The participant exhibited no self-injurious behaviors during any of the three experimental conditions. As suggested by Ford (1999), providing appropriate client-preferred sensory stimulation can lower tendencies toward self-injurious behaviors. The participant's preferred activity is listening to recorded music. The acceptance of listening to live singing and playing instruments assisted by the therapist has taken this participant a step further to interacting with the environment and surrounding people.

Regarding learning behaviors observed in this study, the effectiveness of music therapy interventions along with touch were found to be beneficial for one participant. This participant demonstrated learning behaviors by holding an instrument for longer periods of time. In addition, this participant also learned to touch the therapist's hand actively during the expressive touch condition. An earlier study by Ghetti (2002) indicated that individuals with profound disabilities also demonstrated learning during music therapy interventions. Creating opportunities for learning should be always provided to individuals with profound disabilities regardless of the severity of their disability, their age, or the setting. The use of music and touch creates a learning environment for both musical tasks and social interactions.

Perceived therapist's rapport. A secondary purpose of this study was to investigate the perceived therapist's rapport during therapist-client interactions across three experimental conditions. Findings from the current study involving the music therapist's rapport specifically that it was rated higher during expressive touch and instrumental touch conditions, were consistent with findings in the earlier study by Belgrave (2009), who worked with individuals in the late stages of Alzheimer's disease. In this study, therapist-client rapport was perceived highest during the instrumental touch condition. As explained by Belgrave, the use of instrumental touch might be considered less contrived than expressive touch due to its appropriateness to a music therapy intervention. Another explanation for the application of instrumental touch is that the presence of the instruments allows for more social and physical

interactions between therapists and participants. The therapist-client interactions were considered dynamic during the instrumental touch condition, as opposed to static during the baseline or the expressive touch condition.

Furthermore, positive therapist-client interactions were not only seen during the expressive touch or the instrumental touch condition, but some positive therapist-client interactions were also observed during the baseline condition. According to the comments by the four raters, they considered better therapist-client rapport to consist of mutual eye contact and smiles—both appropriate forms of nonverbal communication. Without the distraction of the instrumental playing, several participants demonstrated longer eye contact with the therapist during the no touch or expressive touch conditions.

Limitations of the Present Study

A limitation in the present study was that individuals' optimal alert state (A^2) could interact with stereotyped state (A^2/S), and the behavior state coding system could not capture the interaction. According to the coding system of Guess et al. (1988), one of the non-preferred alert behavior states, A^2/S (awake-active/stereotypy or self-stimulatory), will be coded as the predominance behavior state when A^2/S, DA, DR, A^1, or A^2 co-occur. Fourteen out of fifteen participants in this study exhibited different degrees of stereotypical behaviors during sessions. Three participants exhibited stereotypical behaviors almost throughout all experimental conditions. One participant, with a visual impairment, exhibited head moving and two participants exhibited mouth chewing behaviors. The limitation of this observational instrument is that it ignored positive behavior changes, which participants exhibited, once stereotypical or self-stimulatory behaviors occurred. Thus, the behavior state scores were unable to reveal the effectiveness of the interventions, such as making longer eye contact with the therapist, actively touching the therapist's hand, and smiling. Moreover, a participant with visual impairment exhibited stereotypical movements (head moving) only during the instrumental touch condition. When comparing the behavior states across the three experimental conditions, this participant was more alert (recognized by opening his eyes widely) while playing the instruments assisted by the therapist. The results of the behavior state coding were unable to differentiate the cause-effect relationship in such cases.

Another limitation of the study was the environmental control of the interventions, such as location, body position, noise level, timing of receiving the interventions, and

presence of other people. Since this study was conducted in a long-term care facility, most participants had daily activity schedules. The investigator attempted to visit the participants during similar time frames (i.e., only in morning or only in afternoon), but the availability of the participants for the study varied. Their behavior states could have been affected by those environmental factors.

Suggestions for Future Research

The mean scores revealed that the participants spent approximately 80% of the time in alert states (combining A^1, A^2, and A^2/S) during baseline condition and over 90% of the time in alert states (combining A^1, A^2, and A^2/S) during the expressive and the instrumental touch conditions. However, in order to improve their quality of life and social interaction, two suggestions are made for future studies: (1) researchers should determine other or more effective interventions to assist individuals with severe and profound intellectual and multiple disabilities actively participate in activities, such as using a drum as a form of non-verbal communication, or other instruments to play, and (2) researchers should find additional music strategies to decrease stereotypical or self-stimulatory behaviors during social contact.

Although the intervention goal for adults with profound disabilities might not necessarily be to focus on eliminating the stereotypical behaviors, finding their preferred activity will serve to increase their alert states and their responsiveness to the environment and social contact. The latter will thus likely decrease stereotypical behaviors and improve their quality of life.

Conclusions

Individuals with severe and profound intellectual and multiple disabilities each react to stimuli and the environment differently. The analysis of behavior states helps to interpret how these individuals relate to others and their surrounding environments. The pairing of music therapy and touch has demonstrated some effectiveness on their

alertness and responsiveness. This study is one of only a few pairing the use music and touch with this population. Researchers are encouraged to explore the use of music with other non-verbal communication forms. Supporting individuals with profound disability in maintaining their physical, social, and emotional well-being should be considered by all professionals who work with this population.

References

Belgrave, M. (2009). The effect of expressive and instrumental touch on the behavior states of older adults with late-stage dementia of the Alzheimer's type and on music therapist's perceived rapport. *Journal of Music Therapy, 46*(2), 132-146.

Boswell, B., & Vidret, M. (1993). Rhythmic movement and music for adolescents with severe and profound disabilities. *Music Therapy Perspectives, 11*(1), 37-41.

Custodero, L. A., & Johnson-Green, E. (2008). Caregiving in counterpoint: Reciprocal influences in the musical parenting of young and older infants. *Early Child Development and Care, 178*(1), 15-39.

Downing, J., & Chen, D. (2003). Using tactile strategies with students who are blind and have severe disabilities. *Teaching Exceptional Children, 36*(2), 56-60.

Ford, S. E. (1999). The effect of music on the self-injurious behavior of an adult female with severe developmental disabilities. *The Journal of Music Therapy, 36*(4), 293-313.

Gleeson, M., & Timmins, F. (2004). The use of touch to enhance nursing care of older person in long-term mental health care facilities. *Journal of Psychiatric and Mental Health Nursing, 11*, 541-545.

Ghetti, C. M. (2002). Comparison of the effectiveness of three music therapy conditions to modulate behavior states in students with profound disabilities: A pilot study. *Music Therapy Perspectives, 20*(1), 20-30.

Guess, D., Mulligan-Ault, M., Roberts, S., Struth, J., Siegel-Causey, E., Thompson, B., Bronicki, G. J. B., & Guy, B. (1988). Implications of biobehavioral states

for the education and treatment of students with the most profoundly handicapping conditions. *Journal of the Association for Persons with Severe Handicaps, 13*, 163-174.

Guess, D., Roberts, S., Siegel-Causey, E., Ault, M., Buy, B., Thompson, B., & Rues, J. (1993). Analysis of behavior state conditions and associated environmental variables among students with profound handicaps. *American Journal on Mental Retardation, 97*, 634-653.

Guess, D., Roberts, S., Siegel-Causey, E., & Rues, J. (1995). Replication and extended analysis with profound disabilities. *American Journal on Mental Retardation, 100*, 36-50.

Guess, D., Siegel-Causey, D. Roberts, S., Guy, B., Ault, M. M., & Rues, J. (1993). Analysis of state organizational patters among students with profound disabilities. *Journal of the Association for Persons with Severe Handicaps, 18*, 93-108.

Guess, D., Siegel-Causey, E., Roberts, S., Rues, J., Thompson, B., & Siegel-Causey, D. (1990). Assessment and analysis of behavior state and related variables among students with profoundly handicapping conditions. *Journal of the Association for Persons with Severe Handicaps, 15*, 211-230.

Hewett, D. (2007). Do touch: Physical contact and people who have sever, profound and multiple learning difficulties. *Support for Learning, 22*(3), 116-123.

Hogg, J. (1998). Competence and Quality in the lives of people with profound and multiple learning disabilities: Some recent research. *Tizard Learning Disability Review, 3*(1), 6-14.

Kapell, D., Nightingale, B., Rodriguez, A., Lee, J. H., Zigman, W. B., & Schupf, N. (1998). Prevalence of chronic medical conditions in adults with mental retardation: Comparison with the general population. *Mental Retardation, 36*, 269–279.

Maes, B., Lambrechts, G., Hostyn, I., & Petry, K. (2007). Quality-enhancing interventions for people with profound and multiple disabilities: A review of

the empirical research literature. *Journal of Intellectual & Developmental Disabilities, 32*(3), 163-178.

Meadows, T., (1997). Music therapy for children with severe and profound multiple disabilities: a review of literature. *The Australian Journal of Music Therapy, 8*, 3-17.

Munde, V. S., Vlaskamp, C., Ruijssenaars, A. J. J. M., & Nakken, H. (2009). Alertness in individuals with profound intellectual and multiple disabilities: A literature review. *Research in Developmental Disabilities, 30*, 462-480.

Nakken, H., & Vlaskamp, C. (2002). Joining forces: Supporting individuals with profound multiple learning disabilities. *Tizard Learning Disability Review, 7*(3), 10-15.

Petry, K., Maes, B., & Vlaskamp, C. (2005). Domains of quality of life of people with profound multiple disabilities: The perspective of parents and direct support staff. *Journal of Applied Research in Intellectual Disabilities, 18*, 36-46.

Poppes, P., van der Putten, A. J. J., & Vlasmap, C. (2010). Frequency and severity of challenging behavior in people with profound intellectual and multiple disabilities. *Research in Developmental Disabilities, 31*, 1269-1275.

Seys, D., Duker, P., Salemink, W., & Franken-Wijnhoven, J. (1998). Resident behaviors and characteristics as determinants of quality of residential care: An observational study. *Research in Developmental Disabilities, 19*(3), 261-273.

Stephenson, J. (2006). Music therapy and the education of students with severe disabilities. *Education and Training in Developmental Disabilities, 41*(3), 290-299.

Vortherms, R. C. (1991). Clinically improving communication through touch. *Journal of Gerontological Nursing, 17*(5)*,* 6-10.

A world through sound: The musical experiences of a child with multiple disabilities in an early childhood music class

Gina Yi
ginayi@hotmail.com
KOREA/USA

Keywords: cerebral palsy, cortical visual impairment, disabilities, early childhood music, musical experience

With the intent of improving early childhood music education for children with disabilities, the purpose of this case study was to explore the musical experiences of a child with multiple disabilities, specifically cortical visual impairment (CVI) and cerebral palsy (CP), in an early childhood music class. I observed the child in a class for children aged birth to three years, for four weeks of a 10-week program. The researcher also interviewed the teacher and the child's mother. Analysis of data revealed three main themes encompassing the musical experience of a child: engaging experience, exploratory experience and non-participatory experience. Additional emerging themes were awareness of mother, teacher adaptation, and role of caregiver. Certain facial expressions, vocal responses, and behaviors of the child were observed consistently during four-week observations and were identified and served as cues that she was responding musically. Due to the child's disabilities, she participated less in structured movement activities and activities with percussion manipulatives than other children in the class. However, she was "attuned" musically, giving random and purposeful vocal responses to music. Active participation of a caregiver and teacher's awareness of child's disabilities also was important factors that enhanced the child's participation in class.

Because vision provides a reliable source of information for sighted children (Warren, 1984), "[they] depend on this information [vision] to help them orient and identify objects and people, to regulate their own motor behaviors, and to provide an overall organization of space" (Warren, 1984, p.14). This implies that children with visual impairments have limited access to such reliable sources of information and that leaves them with only their auditory or tactile function to obtain necessary information (Robb, 2003). Cortical visual impairment (CVI) is one of the major types of childhood vision loss (Brodsky, Baker & Hamed, 1996). Since the vision of children with CVI fluctuates depending on the environment, individual, and during rehabilitation, some variation of vision is expected (Roman, Baker-Nobles, Dutton, Luiselli, Flener, Jan, Lantzy, Matsuba, Mayer, Newcomb, & Nielsen, 2010)

Children with CVI sometimes have concomitant disabilities (Cohen-Maitre & Haerich, 2005; Roman et al., 2010), and cerebral palsy (CP) is one of them. CP is a disorder of movement and posture due to damage of brain, often resulting from difficulties of the birth (Michel, 1984). Whereas typically developing children, using sensory-motor intelligence (Evans & Piaget, 1981), crawl, walk or reach out for objects, and manipulate them with some dexterity (Warren, 1984), children with CVI and CP are delayed in such development and impaired in both gross motor and sensory-motor functioning.

There are studies pertaining to teachers' perceptions of teaching children/students with disabilities in music education (Frisque, Niebur, & Humphreys, 1994; Gilbert & Asmus, 1981; Wilson & McCrary, 1996) and studies encompassing music learning of students with disabilities (Jellison & Flower, 1991). However, studies pertaining to children with disabilities in an early childhood music class are rare. Therefore, the purpose of this study was to explore the musical experience of a child with CVI and CP in an early childhood music class. The guiding questions for this study were: (1) How does the child respond to musical sounds? (2) How does the child respond to movement activities? and (3) How does the child respond to manipulatives?

Method

Participants

The primary participant in this study, Amanda, was 15 months old, and had CVI and CP. Amanda's mother informed me that doctors surmise that Amanda had

some visual ability, but they were not sure how much, and the quality and scope of her vision could change from day to day. Their best guess was that Amanda could see some movement and objects at very close range. In terms of her motor skill, she was completely assisted by her mother as she could not sit up, scoot, and be ambulatory.

Amanda's mother, the early childhood music teacher and Amanda's grandmother, were secondary participants. The teacher, Miss Kelly, had nine years of experience of teaching early childhood music classes, including some experiences in teaching children with disabilities such as Down syndrome and CP, but had not previously taught a child with CVI. The grandmother joined to participate on the third and fourth observations, as the mother could not maneuver Amanda due to her broken arm.

I was a participant-observer due to my role as an assistant teacher in the class. When I taught an activity, Miss Kelly took over the role of observer. My experiences as an early childhood music teacher for ten years informed my observations.

Design and Procedures

Ten children (birth to three years old) were enrolled in the music class, and a caregiver attended with each child. The class met for 45 minutes, once a week for 10 weeks, and my observations occurred from the fifth through the ninth weeks. Class activities included singing, chanting, moving to music, exploring manipulatives[1] and pattern instruction.

I took extensive field notes during observations of the classes to collect data. All four classes were videotaped so I could review them later. Brief conversations, discussions, and interviews, which took place before and after class, were audio-recorded and were transcribed within 24 hours for analysis. All data were coded and analyzed for emerging themes, using the lens of the research questions and my experience as an early childhood music teacher to guide the analysis. Data triangulation, peer-reviews of the analysis, and member checks were employed to establish trustworthiness (Creswell, 2007)

Findings

[1] Musical props such as beanbags, scarves, or egg shakers

Analysis of data revealed three main themes encompassing Amanda's musical experience: *engaging experience, exploratory experience* and *non-participatory experience*. Amanda's engaging experience was identified as when she gave random or purposeful responses to music (Gordon, 2003), such as smiling, and producing vocal sounds to songs or a dominant-tonic (V-I) pattern. Amanda's exploratory experience was identified as when she was mouthing, or "looking away"[2] (Jan, Groenveld, Sykanda, & Hoyt, 1987). Amanda's non-participatory experience was described as when she wanted non-musical interaction with her mother by touching her mother's chin or became fussy. The responses identified in this study were most common types of responses from Amanda.

Engaging Experience

Both engaging experience and exploratory experience were participatory for Amanda. However, there was a degree of participation distinguishing engaging from exploratory. Whereas engaging experience was a participatory experience that elicited various responses from random to purposeful, exploratory experience resided in the context of exploring, allowing Amanda to acculturate the musical sounds and manipulatives. During the observations, I identified Amanda's "sunshine smile" or purposeful vocal responses as the indicators of Amanda's *engaging experience*. When Amanda smiled, her face brightened up, and she radiated happiness. These indicators were consistently identified with songs that were familiar due to repetition. Also, any music that was played during the dancing activity elicited large smiles from Amanda.

As classes progressed and activities were repeated, Amanda began to respond vocally. She made random responses during a song, and purposeful responses after V-I patterns at the end of a song, matching the tonic pitch. The first unexpected vocal response was a precursor to her explosive vocal responses later on.

> After a song in major tonality, Miss Kelly sings V-I pattern, and Amanda responds vocally during the inserted silence. Miss Kelly continues to sing V-I patterns for Amanda, and she responds every time the pattern is given. The response occurred total <u>six</u> times. (Fieldnote and video transcript, 11/5/2009)

It was evident that familiar music elicited many random or purposeful vocal responses and unstructured movement engaged her right away. Amanda comfortably joined the activity when she recognized the music and was willing to respond to familiar songs.

---

[2] Reaching out behavior of children with CVI

Exploratory Experience

Amanda engaged in exploratory experience with certain manipulatives and activities. She rarely mouthed, or touched them, but she did show some interest in those that were soft such as the scarves, or streamers. When a manipulative became familiar enough, she recognized it and seemed to relate more fully to the activity in which it was used. Most often, children's behaviors related to associating manipulatives with certain activities are common. For example, children immediately associate the scarves with free dancing to recorded music, because that is how scarves are used most often in class. In Amanda's case, it was difficult for her to associate manipulatives to their corresponding activities. However, once she recognized a familiar manipulative, her exploratory experience extended and sometimes transferred to engaging experience.

When Amanda's grandmother puts the beanbag on her head, she drops the beanbag as a typical infant would do. When her grandmother puts the beanbag on her head again, she shakes her head dropping the beanbag and smiles. This was the eighth class of using the beanbags. (Field notes & video transcript 11/12/2009)

Sometimes there were overlapping experiences. With new activities, Amanda absorbed the musical sounds and reacted to the stimulation. For example, when the parachute activity was first introduced, it was exploratory, but as soon as she recognized V-I pattern at the end of the song, she was immediately engaged.

> Amanda's mother lays Amanda gently in the middle of the parachute. Parents and Miss Kelly slowly lift the parachute up and start singing. Amanda does not know how to react to this new activity, but seems to let it unfold. At the end of the song, Miss Kelly sings V-I pattern, and Amanda immediately smiles. (Field notes transcript 11/12/2009)

When activities were introduced for the first time, she participated with some exploration, and when familiar sound was incorporated, the exploratory experience elicited more participation from Amanda, sometimes transferring to engaging experience.

Non-participatory Experience

Elongated waiting time, percussion manipulatives, and structured movement activities that required vision seemed to disengage Amanda's participation. I identified Amanda's non-participatory experience by when she repeatedly touched her mother's chin or became fussy. According to Amanda's mother, this behavior was sort of like her way of saying, "I want something." This particular behavior of Amanda usually occurred when there was elongated waiting time, an extended silence within an activity or to a time of waiting for a turn with a manipulative or instrument. Miss Kelly's one-on-one pattern activity was one of the elongated waiting time. Although Amanda engaged in movement stimulation, structured movement activities that require vision disengaged her.

> Miss Kelly suggests children to be running dinosaurs, walking dinosaurs or flying dinosaurs. The mother tries some flying dinosaur but is bothered at not knowing how to engage this activity for Amanda. Amanda becomes fussy for not being stimulated. (Field notes, 10/29/2009)

Sighted children benefit from watching the teacher, caregivers and other children engaged in the activities. Conversely, Amanda experienced activities mostly through listening and body stimulation. Therefore, when elongated time was extended without being stimulated through music or movement, her participation decreased as well.

Awareness of Mother

Amanda's mother sang along with Miss Kelly quite often compared to other caregivers in the class. She remarked, *"Once you start singing, she [Amanda] won't let you stop" (Mother interview, 11/5/2009).* This implies that singing was already part of their interaction at home as well as in class. She also explained that Amanda has always been responsive to music, even prior to class.

Amanda's mother was not an energetic caregiver, but it was evident that her awareness of Amanda's disabilities facilitated Amanda's musical experience many times. For example, putting the beanbag on Amanda's back for a "Piggyback Ride" activity, while possible for the other children in the class, was impossible for Amanda. Amanda's mother adjusted the activity by moving the beanbag slowly in front of Amanda's eyes and this helped Amanda to engage in the activity.

Teacher Adaptation

Because Miss Kelly's previous experiences of teaching children with disabilities, she seemed confident adapting her teaching to meet Amanda's needs. She altered the activity for Amanda to facilitate her experience.

> Miss Kelly sweeps the floor with a pompom. She slides the pompom, teasing children, and sings a tonal pattern; *"Ya-ra-ram* (sings do-re-mi)*."* For Amanda, she uses her fingers while giving the patterns instead of using the pompom. Her fingers crawl up on Amanda's arm. Amanda listens and moves a little bit, but no response occurs.

Miss Kelly commented on altering one-on-one tonal activity for Amanda:

> *You know, for most of it [activity], it was the same. But, any time when I want to do something one-on-one, they've [children with visual impairment] got to respond to the touch rather than sight. (Teacher interview 10/22/2009)*

Miss Kelly was aware that Amanda would not get the same effect as the other children would if she had just used the pompom, so she changed her method of pattern delivery. She also mentioned that, although she altered the activity when working directly with Amanda, she did not change the activity for the group.

> *"I slightly changed the class activity but not a 100 percent. I am aware that with the parachute, all she is going to get is air in the face that's probably gonna bother her, but the other kids are gonna love it. I can't totally design the class for her because it is not fair to everyone else. But I do have enough in there that I know she is going to respond well." (Teacher interview 10/22/2009)*

Sensitivity to Amanda's disabilities helped Miss Kelly to be flexible with her teaching so that she could meet Amanda's needs, and it allowed Amanda and the teacher to share some musical experiences as well. She reflected:

> *She was babbling, but was clearly trying to match pitches.*
> *There were times when she was singing the dominant, there were times when she was singing the tonic. But she was just singing right along with a huge smile on her face and it was so exciting! (Teacher Interview, 11/12/2009)*

Miss Kelly shared her excitement with Amanda's mother and grandmother and that seemed to positively affect all of them.

Role of Caregiver

The role of caregiver emerged as an important factor in Amanda's musical experience. Amanda seemed to have a different musical experience depending on the caregiver. The grandmother constantly stimulated Amanda by rocking, tapping, and moving, and this "intentional arousing excitement" (Wheeler & Stulz, 2008) engaged Amanda in the activity. It was especially apparent during one-on-one pattern activity, which she got bored and became fussy before.

> While Miss Kelly gives patterns to other children, the grandmother taps Amanda's feet or sways on macrobeat. Sometimes, she imitates Miss Kelly's rhythm pattern, tapping Amanda's feet. (Field notes, 11/12/2009)

Interaction with the teacher was another facilitation that was different from the mother. Usually, Miss Kelly interacts with children by giving out V-I patterns during the "Peek-a-boo" activity. Several children already knew what this activity was about and had scarves on their heads. When Miss Kelly sang, "Where is Lily?" on dominant, Lily pulled the scarf down and Miss Kelly responded to Lily by singing, "There she is" on tonic. The grandmother picked up the activity and put the scarf on Amanda's head. When Miss Kelly sang, "Where is Amanda?" the grandmother pulled down the scarf. This interaction was repeated several times, and then, when Miss Kelly sang on tonic to other child again, Amanda shook the scarf off. It was evident that the grandmother's active participation engaged Amanda and helped her to interact with the teacher.

Discussion and Implication

Amanda's musical experiences fluctuated depending on songs, activities, manipulatives and caregiver. Hornbach (2005) found that use of such materials often elicited children's musical responses. Taggart (2009) found this for children with speech and language delay. However, manipulatives did not seem to elicit much musical response from a child with CVI and CP. For Amanda, learning to use manipulatives was delayed because her motor skill development that was different from the typically developing child. Furthermore, Amanda's CVI prevented her from seeing movement and how these materials were used. In general, she mostly had non-

participatory experience with the percussion manipulatives, some exploratory experience with those that were softer, and rarely engaging experience when they were first introduced. In spite of exploratory experience and non-participatory experience with the manipulatives most of the time, as classes progressed and activities with the same materials were repeated, she showed some interest in certain ones. Manipulatives such as pompoms, streamers and beanbags, those with softer texture and bright colors, seemed to interest Amanda after repeated use.

The length of each activity seemed to be one of the factors that resulted in lack of extended exploratory experience and engaging experience with the manipulatives. In an early childhood music class, providing adequate time and appropriate tools (Berger & Cooper 2003) are important to engage children in the activities since imitation, repetition and familiarity are important factors in child learning (Jellison & Ward, 1993). Amanda might have needed a longer time to explore the manipulatives. Also, repetition of activities with the same materials might be helpful for Amanda to participate.

In an early childhood music class, movement plays a substantive role because rhythm and melody typically engender immediate response from children in the form of movement (Nash, 1995). However, children with CVI or CP face some difficulties with movement. Whereas sighted children learn how to move at least in part by watching others (Clark & McDonnell, 2008), children with visual impairment cannot. In addition, Amanda was limited in gross motor and locomotion due to her CP. She could not walk to the center of the circle to grab the manipulatives or manipulate them with the dexterity of other children. However, as her mother said, *"Amanda prefers movement,"* Amanda seemed to engage in most of the activities that involved body movement often stimulated by a caregiver.

Amanda started random and purposeful vocal responses quicker than her peers. Perhaps, this is because she was not distracted by movement and sight (Sacks, 2007). Amanda was stationed in her mother's lap and participated mostly through listening whereas other typically developing children were sometimes running around the room, looking outside through the window, and distracted by their favorite manipulatives. Even though she could not get the whole effect of the activities that involved manipulatives and structured movement, Amanda's development in music was apparent through her random and purposeful responses during class. This implies that Amanda was very "attuned" to musical sounds in the class. She was the first child

in her age group to respond vocally to V-I pattern, which was a purposeful response that matched the tonic pitch.

This study raises additional questions. Specifically, further investigation of the musical experiences of children with disabilities in an early childhood music class is recommended. Identification of experiences of these children may help early childhood music teachers to enhance their teaching of children with disabilities with typically developing children in the same music class. Because this is a case study, no generalizations can be made to other children with disabilities. However, the findings may be applied to children with similar disabilities in similar settings.

It is important that early childhood music teachers meet the needs of all children regardless of music aptitude, achievement level or physical limitations. Also, finding a common ground where children can share some musical experiences together would be needed. Though not all activities can be adapted, providing some alternate to or variation of activities will help caregivers to facilitate their children's music making and most importantly, allow children to experience the world through music.

References

Berger, A. A., & Cooper, S. (2003). Musical play: A case study of preschool children and parents. *Journal of Research in Music Education, 51*(2), 151-165.

Brodsky, M. C., Baker, R. S., & Hamed, L. M. (1996). *Pediatric neuro-ophthalmology.* New York: Springer Verlag.

Clark, C., & McDonnell, A. P. (2008). Teaching choice making to children with visual impairments and multiple disabilities in preschool and kindergarten classrooms. *Journal of Visual Impairment & Blindness, 102*(7), 397-409.

Cohen-Maitre, S. A., & Haerich, P. (2005). Visual attention to movement and color in children with cortical visual impairment. *Journal of Visual Impairment & Blindness, 99*(7), 389-402.

Creswell, J. W. (2007). *Qualitative inquiry and research design* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Evans, R. I., & Piaget, J. (1981). *Dialogue with Jean Piaget*. New York, N.Y: Praeger.

Frisque, J., Niebur, L., & Humphreys, J. T. (1994). Music mainstreaming: Practices in Arizona. *Journal of Research in Music Education, 42*(2), 94-104.

Gilbert, J. P., & Asmus, E. P. (1981). Music educators' participation and professional needs. *Journal of Research in Music Education, 29*(1), 31-37.

Gordon, E. E. (2003). *A music learning theory for newborn and young children.* (Rev. Ed.). Chicago: GIA Publications.

Hornbach, C. M. (2005). Ah-eee-ah-eee-yah.eee, bum and pop, pop, pop: Teacher initiatives, teacher silence, and children's vocal responses in early childhood music class (Doctoral dissertation, Michigan State University, 2005).

Jan, J. E., Groenveld, M., Skykanda, A. M., & Hoyt, C. S. (1987). Behavioral characteristics of children with permanent cortical visual impairment. *Developmental Medicine and Child Neurol*ogy, *29*(5) 571-576.

Jellison, J. A., & Flowers, P. J. (1991). Talking about music: Interviews with disabled and nondisabled children. *Journal of Research in Music Education*, *39*(4), 322-333.

Jellison, J. A., & Ward, D. (Compilers) (1993). *Music therapy and music education for the handicapped: Developments and limitations in practice and research.* Saint Louis, MO: MMB Music, Inc.

Michel, D. E. (1985). Music therapy. Springfield, IL. Charles C. Thomas Publisher.

Nash, G. (1995). Thoughts about musical development. *Early Childhood Connections,* 35-38.

Robb, S. L. (2003). Music interventions and group participation skills of preschoolers with visual impairments: Raising questions about music, arousal, and attention. *Journal of Music Therapy, XL*(4), 266-282.

Roman, C., Baker-Nobles, L., Dutton, G. N., Luiselli, T. E., Flener, B. S., Jan, J. M., Lantzy, A., Matsuba, D., Luisa Mayer, D., Newcomb, S., & Nielsen, A. S.

(2010). Statement on cortical visual impairment. *Journal of Visual Impairment & Blindness, (104)* 2, 69-72.

Sacks, O. W. (2007). *Musicophilia: Tales of music and the brain*. New York: Alfred A. Knopf.

Taggart, C. C. (2009). *The role of early childhood music class participation in the development of four children with speech and language delay*. College of Music, Michigan State University, MI.

Warren, D. H. (1984). *Blindness and early childhood development.* (Rev. Ed.). New York: American Foundation for the Blind.

Wheeler, B. L., & Stultz, S. (2008). Using typical infant development to inform music therapy with children with disabilities. *Early Childhood Education, 35,* 585-591.

Wilson, B., & McCrary, J. (1996). The effect of instruction on music educators' attitudes toward students with disabilities. *Journal of Research in Music Education, 44*(1), 26-33.

The assessment of the quality of relationship by people with severe disabilities in a music educational setting

Shirley Salmon
Mozarteum University Salzburg
shirley.salmon@moz.ac.at
AUSTRIA

Keywords: AQR-Instrument, Elemental Music, Expression, Instruments, Relationship

The AQR-Instrument (Assessment of the Quality of Relationship), an instrument to observe and assess the quality of relationship based on developmental-psychological knowledge, was developed for use in music therapy with children with profound developmental disorders (Schumacher/Calvet 2001, 2005, 2007). The AQR-Instrument consists of four scales that focus on differing phenomena of expression: instrumental expression, vocal pre-speech expression, physical-emotional expression, the therapist and his/her interventions. Within each scale, seven modi are used to assess the quality of the inter-personal relationship and give important indications for methodical approaches. The research presented here, the first to apply the AQR-Instrument in a music education setting, assesses the ability of three group members (adults with severe disabilities) to form relationships according to the handling of instruments. The researcher sought to (a) determine the ability of the participants to take part in group sessions; and, (b) examine the methods used by the teacher in particular whether they were appropriate for the participants. This study has important implications for music education. Examples showing the modi based on the recorded and analysed scenes of the three participants will be shown on DVD. The paper

includes information and DVD examples about the setting and the didactical considerations for the musical-education work with this group of adults with severe disabilities and finishes with thoughts and implications for future work.

Introduction

This research, which was documented in the DVD *Between Freedom and Ritual* (Salmon & Kallos 2010), revealed a number of questions related to the participants (adults with severe disabilities). These questions involved structure of the therapy sessions, the relevance of rituals, and the type of instruments offered. Part I of the DVD, *History and Developments,* provided insight into the practice of Elemental Music and Dance Education, according to Orff-Schulwerk, for people with disabilities. Part II, *Insights into Practical Work,* consisted of an *Introduction,* and chapters on *Theme Centred Activities*, *Materials and Instruments,* and *Qualities of Relationship*.

The AQR-Instrument, used in the chapter *Qualities of Relationship,* was developed by Schumacher and Calvet (Schumacher 1999, Schumacher/Calvet 2001, 2005, 2007) for use in music therapy settings. This research presents its first application in a music education setting with people with disabilities. The goal of this research was to ascertain the ability of the participant to take part in group sessions as well as to examine the methods used by the teacher and whether these were appropriate to the level of the ability to build relationships shown by the participant. Participants who are not yet ready for group work can be recognized and their ways of communicating and playing taken into consideration within group sessions. If the participant is not yet able to imitate, then, the usual educational methods make excessive demands on the participant and other methods must be found.

Setting

Over many years, a group of approximately 12 adults with various cognitive and physical disabilities from two Lebenshilfe sheltered workshops in Salzburg, met once a week for a music and movement session. This group was one of the classes in 'practical didactics' within the bachelor degree course Elemental Music and Dance Pedagogy led by one of the lecturers. Each term, a few degree students participate by observing, providing support for particular members, teaching during the sessions, and by reflecting in a group their perceptions of the session protocol. The group was

usually constant for the entire academic year. There were typically between three and four participants who required a wheel-chair and many who had no active speech.

> The fundamental assumption is supported that musical, rhythmic and artistic activities can trigger a central, emotional awareness also amongst people with different degrees of disability. Music, with its inherent expressive and interlinking possibilities, implicates an immeasurable opportunity for the development of elemental interactivity using varying levels of communication. (Pauls 2010)

The particular structure of the lessons has proven useful. Components of the lessons were as follows.

The Exploration phase. The exploration phase took place at the beginning of the session and offered a wide selection of instruments to enable experimentation, encounters, dialogues etc. The interests and the abilities of the participants were observable and some maybe incorporated into future lessons.

The Greeting song. The rituals at the beginning and the end of the sessions took place in a large circle. A greeting song was used for many weeks or months with many variations and included singing and movements/gestures so that everyone could participate in some form.

Warm-up. The warm-up intended to physically activate the participants and to support sensory sensitization.

Theme-centred activities. Particular themes provided a focal point for one or more lessons. The themes were related to the participants' world of experience and link music, movement/dance speech, and often materials. A variety of different types of instruments are necessary so that the abilities and interests of individual participants can be catered to.

Rounding off was an activity implemented at the **conclusion** of a session which was marked by a ritual involving all participants, usually in a circle, with a rhyme or song.

Didactical Considerations

The principles from the pioneering work in elemental music making by Wilhelm Keller (Keller, 1979, 1984, 1996) are particularly important in this group. These are complimented by the principles of integration/inclusion as defined by Georg Feuser (1990, 1997, 2001, 2008). There are significant parallels between Keller's thoughts and demands and Feuser's definition of integration that are relevant for the didactics and methods of elemental music making.

Feuser's principles of a 'general (integrative) pedagogy' are central to the music educational work with all groups and particularly with integrative[3] groups.

> Integrative education means that all children (without excluding anyone due to the type or severity of their disability) work, play and learn together in cooperation with each other within one theme, activity or task at their respective developmental levels (taking into consideration their present levels of competence in perception, cognition and behaviour). (Feuser 1997)

In order to realize this, two aspects are essential. The first is *cooperation* within one theme/ task or activity. The second is i*nner differentiation* whereby each person at his/her own developmental level.

Wilhelm Keller (1979, 1984, 1996) recognized the value of elemental music making which enables so-called normal, talented and disabled people to play together in one group without any participant being under or over-challenged. The music should be adapted so that tasks and roles suit the possibilities of the individuals instead of the group having to adapt to a fixed musical form.

The Application of the AQR- Instrument[4] to assess the quality of relationship.

The AQR-Instrument, in use since its development in 1990 by Karin Schumacher and Claudine Calvet, is an instrument used to observe and assess the

---

[3] Here, 'Integration' is to be understood in its widest sense and means the inclusion of people with differing abilities, age, background, language, race etc, who learn, play and work together in a group. It does not mean only working with people with and without disabilities.

[4] The application of the AQR Instrument is not possible merely by studying the literature on it. In order to apply it successfully it is necessary to have a basic training such as the Certificate Course "EBQ-INStrment und seine entwicklungspsychologischen Grundlaen" (the AQR-Instrument and its developmental basis): http://www.udk-berlin.de/sites/musiktherapie/content/zertifikatskurse/index_ger.html

quality of a relationship, and based upon developmental-psychological knowledge und was developed for music therapy with children suffering from profound developmental disorders. The AQR-Instrument objectifies the quality of the ability to form relationships. (The first publication from Schumacher appeared in 1999. Further publications with Calvet followed: 2001, 2005, 2007 as well as unpublished training films 1999 – 2002.)

"The goal is, with the help of particular characteristics, to discover how and in what form the ability for interpersonal relationships manifests itself, to assess it correctly in order to understand it and act upon it." (Schumacher et al. 2005, p. 75 transl. Salmon). The AQR- Instrument can be applied for diagnosis, methods in practical-clinical work and for research documentation. The writing of protocols and case studies can be facilitated and theoretically explained through AQR analyses. (Schumacher et al. 2005, p. 86) The results of the reliability validation of the AQR Instrument as a newly developed instrument to prove the effects of music therapy were documented by Schumacher et al. in 2005. A complete overview of the instrument is in preparation and will be published in 2011/2012.

The AQR-Instrument consists of four scales that focus on differing phenomena of expression: instrumental expression, vocal pre-speech expression, physical- emotional expression, the therapists and his/her interventions. The four scales correspond to Daniel Stern's concept of self in their structure and follow the logic of normal development (Schumacher & Calvet, 2005).

In this research, the ability to form relationships is assessed according to the handling of instruments. In instrumental expression the following aspects can be focussed upon: the choice of instrument, the relationship to the object, the musical media (sound, rhythm, melody, harmony, form and expression) and the room to play, especially the tonal space.

Schumacher/Calvet (2005) state that each scale differentiates between 7 or 8 *modi* i.e. the way contact and relationship are developed. Each *modus* is characterized by specific features. "There is not only a qualitative but also a quantitative difference between the *modi*. The length of contact and the readiness for contact increase from *modus* 0 – 6." (Schumacher, 1999, p. 248 transl. Salmon).

Examples (to be shown on DVD)

Scenes from the six filmed group sessions of three participants were chosen as they illustrate their typical behaviour. These scenes were analysed using the AQR-Instrument. The scenes chosen for the chapter in the DVD (Salmon & Kallos, 2010) illustrate the spectrum of *modi* and also the range of needs of the three group members. The scenes took place during the phase of free exploration at the beginning of the group sessions.

Modus 0. Lack of contact / contact rejection is never absolute and means a non-visible reaction to people or objects (Schumacher, 1999, p. 246). Gerda, a woman with severe cognitive and physical disabilities and without active language has been a member of the group for many years and usually attends the group together with her mother or carer.Gerda sits across from the teacher and holds a scarf and a rattle during one of the exploration phases at the beginning of the session. The teacher plays two rattles, sometimes playing on Gerda's rattle, and sings a known greeting song. Gerda's facial expression shows that she cannot accept the teacher's offer. The character of the song, as well as the playing of the teacher on Gerda's rattle, are stimulating. Gerda, however, remains in her state and cannot get involved in the teacher's offer.

Modus 1. Sensory contact, contact-reaction refers to the awareness of a stimulus that can lead to making contact. It is a question of time, whether contact emerges from a reaction. The contact-reaction is the moment which is still open as to whether the child uses the chance of a possible relationship or closes up again (Schumacher, 1999, p. 246).

Gerda holds a wristlet made of nutshells in one hand and a small rattle in the other. The teacher holds two rattles and establishes contact with Gerda's rattle by touching it with one of her own and playing on it. Gerda looks up briefly at the teacher's rattle. Gerda doesn't use the opportunity to make contact with the teacher. In a second scene Gerda takes the sleigh bell wristlet offered by the teacher and appears to be pleased about it. Gerda handles the wristlet in a sensory manner but doesn't however recognize its function as a musical instrument.

Modus 2. Functionalizing contact in the sense of destructive and aggressive handling of instruments could not be observed in the six filmed sessions. This does not mean that it never took place, but merely that it was not filmed during the six sessions.

Modus 3. Contact to oneself, leaving a non-reflexive state of self-recognition, leads to a growing perception of oneself. A secure sense of person furthers the ability to explore with one's own voice and with instruments. The player hears him/herself and the specific characteristic of the object e.g. the sound of an instrument (Schumacher, 1999, p. 247).

Simon sits next to a student teacher. They play together with a scarf. Music from a CD (new to the participants) is played as a stimulus for working with a partner. Later, Simon explores the guitar's possibilities during a group improvisation with instruments. He can join in the improvisation, listen, make pauses and play the ending. He recognizes the function of a music instrument. The typical state of *modus* 3 – calmness and attention can be clearly seen.

Modus 4. Contact to another / inter-subjectivity, when the existence of oneself is experienced as secure, leads to the need to share perceptions and feelings with the other person appear. The ability to share joint wishes and interests and observations also becomes clearly visible and can be sensed (Schumacher, 1999, p 247).

Philipp and Simon are at the piano during the exploration phase. Simon sits on the piano stool while Philipp stands on his left. Philipp plays single, usually low, notes while Simon plays several middle range notes and then watches and listens with interest. The ability to share attention can be well observed. Simon looks briefly at Philipp and shows he is happy about that which has been played. Simon shares his attention in a second scene with the student teacher who plays a slide whistle. The student plays the slide whistle while Simon holds a frame drum and watches and listens carefully. He is emotionally affected and makes eye contact with her, is happy and laughs about some of her ways of playing and is very observant.

Modus 5. Relationship to another/interactivity refers to a state in which the player hears, sees and feels the other person, reacts to him/her and answer his/her actions. Similarities in sound, rhythmic and melodic expression can be recognized. Changes in timbre, small motifs are taken up alternately and varied. Each player brings his/her own ideas and takes up those that come from the other person' (Schumacher 1999, p. 247). Werner and a student teacher play together on a conga and a frame drum during one of the exploration phases. Werner plays single sounds and short rhythms that are repeated by the student. Werner reacts to the student's playing dialogically. Taking it in turn to make pauses is characteristic as is the expectation to get an answer from the student teacher

Modus 6. Joint experience / interaffectivity refers to the encounter between two people which generates lively emotions that can lead to a jointly experienced emotion. The ability to share the developed dynamics and to take it in turns to change it leads to the ability to play with each other whereby the play may also consist of other associations (Schumacher, 1999, p. 248). Werner and the teacher play the conga together during the exploration phase. They use their voices and facial expression. Different ways of playing and physical contact develop. A joyful to-and-fro develops from this game whereby the theatrical elements take over from the instrumental playing.

Consequences for clinical work

In summary, one can say that with these three participants, the level of disability corresponds to the level of the ability to form relationships. Gerda is a woman with profound cognitive disability who can communicate only by means of a few vocal sounds. Gerda's ability to form relationships lies between *modus* 0 and *modus* 1. It is only possible to make contact with the teacher for short moments and these moments are not further developed. Gerda handles instruments but doesn't recognize their function as music instruments. She cannot take part independently in the group but can be in group sessions when she has constant support from an extra teacher who is not leading the session. The teacher must proceed from Gerda's actions and means of expression in order to make contact with her. As Gerda cannot yet imitate, she has to be supported during the sessions. Gerda's possibilities to play and make sounds must be built into the elemental music making of the group. Simon (*modus* 3 – 4) is already able to experiment with an instrument, to play it meaningfully and to play in relation to others. Once these abilities appear, then tasks such as playing in front of other, playing with others and imitating others' playing can be accomplished. Simon can listen and watch attentively. He is emotionally involved when playing with a partner but usually observes. Also, Simon recognizes the function of instruments and materials and can play with them with a partner. He is probably over-taxed when in a large group if he does not have the support at least some of the time from another teacher. Phases in small groups or with a partner are appropriate for his abilities rather than activities in a large group.

Werner (*modus* 5 – 6), who doesn't use speech actively, has, as many other people with Down's syndrome, dialogic and theatrical talents. Werner enjoys forms of contact and dialogues and can play with a partner dialogically. He shows his own ideas, reacts to his partner and brings theatrical elements into the playing. It can be assumed that he can be enthusiastic about musical activities in the large group, that he can join in and that he doesn't need extra support.

Summary

In this context, insight into the practical work of the appraisal of the qualities of relationship is especially remarkable. For the first time, music and dance teachers, as well as therapists have a research instrument available which reliably shows them the quality of personal relationship which, in its turn, empowers them to work more accurately, specifically, carefully and individually (Pauls, 2010).

The application of the AQR-Instrument gave indications as to whether participation in a group was suitable for the individual, which methodical procedures were appropriate and which musical instruments were played as means of expression. It would be of interest here to conduct long-term studies. The relevance and the application of the AQR-Instrument in other (integrative) groups in music-educational settings should be researched further.

References

Feuser, G. (1990): *Grundlagen einer integrativen Pädagogik im Kindergarten und Vorschulalter*. In: *Behinderte in Familie, Schule und Gesellschaft,* 1/1990, 13. Jg.

Feuser, G. (1997): *Inclusive Education - Education all Children and young people together in pre-school establishments and schools:* http://bidok.uibk.ac.at/library/feuser-thesis- e.html

Feuser, G. (2001). *Prinzipien einer inklusiven Pädagogik*. In: *Behinderte in Familie, Schule und Gesellschaft,* 2/2001, S. 25-29.

Feuser, G. (2008): *"All Men will Become Brothers " – Time and Rhythm as Basic Processes of Life and Understanding*. In: Salmon, S. (2008) (Ed.): *Hearing – Feeling - Playing. Music and Movement for Deaf and Hard-of- Hearing*

Children. Wiesbaden (Reihe Forum Zeitpunkt). Finkel, K. (Ed.): *Handbuch Musik und Sozialpädagogik*. Regensburg.

Keller, Wilhelm (1979): Gruppenmusizieren mit Geistig- und Mehrfachbehinderten. In: Finkel, Klaus (Ed.): Handbuch Musik und Sozialpädagogik. Regensburg.

Keller, W. (1984). *Elementare Musik von und mit Behinderten*. In: *Musik und Bildung*, 12/1984 Mainz

Keller, W. (1996). *Musikalische Lebenshilfe. Ausgewählte Berichte über sozial- und heilpädagogische Versuche mit dem Orff-Schulwerk*. Mainz.

Pauls, R. (2010) Introduction. In: Salmon, Shirley/ Kallós, Coloman: Booklet to the DVD *Between Freedom and Ritual. Means of expression with music and movement for people with disabilities.* UNIMOZ-002 Mozarteum University Salzburg. ISBN 978-3 -9502713-1-7

Salmon, S. (Ed.) (2008).*Hearing – Feeling - Playing*. *Music and Movement for Deaf and Hard- of- Hearing Children.* Wiesbaden (Reihe Forum Zeitpunkt)

Salmon, S. & Kallos, C. (2010*). Between Freedom and Ritual. Means of expression with music and movement for people with disabilities.* DVD and Booklet (German/English). UNIMOZ-002 Mozarteum University Salzburg. ISBN 978-3 -9502713-1-7

Schumacher, K., Calvet-Kruppe, C. (1999): *The AQR - an Analysis System to Evaluate the Quality of Relationship during Music Therapy*, in: *Nordisk Journal of Music Therapy*, 8 (2), pp. 18 – 192.

Schumacher, K.& Calvet, C., & Stallmann, M. (2005). *Zwischenmenschliche Beziehungsfähigkeit – Ergebnisse der Reliabilitätsprüfung eines neu entwickelten Instrumentes zum Wirkungsnachweis der Musiktherapie.* In: Müller-Oursin, Barbara (ED.): *Ich wachse, wenn ich Musik mache. Musiktherapie mit chronisch kranken und von Behinderung bedrohten Kindern*. Wiesbaden, S. 75-104.

Schumacher, K. (2004[3]). *Musiktherapie und Säuglingsforschung. Zusammenspiel. Einschätzung der Beziehungsqualität am Beispiel des instrumentalen Ausdrucks eines autistischen Kindes*. Frankfurt/Main.

Schumacher, K. & Calvet, C. (2007). *The "AQR-Instrument" (Assessment of the Quality of Relationship) - An Observation Instrument to Asses the Quality of a Relationship.* In:Wosch, Th., Wigram, T. (Ed.): *Microanalysis in Music Therapy. Methods, Techniques and Applications for Clinicians, Researchers, Educators and Students.* S. 79-91, 2007, Jessica Kingsley Publishers Ltd.: London, Philadelphia.

Schumacher, K. & Calvet, C. (2008). Synchronisation/Synchronization-Musiktherapie bei Kindern mit Autismus/ Music Therapy with Children in the Autistic Spectrum. Unter Mitarbeit von Manfred Hüneke und Petra Kugel. DVD- Box, German/English. Göttingen: Vandenhoeck & Ruprecht

Schumacher, K., Calvet C., & Reimer, S. (2011). *Das EBQ-Instrument und seine entwicklungspsychologischen Grundlagen. DVD and booklet Göttingen. Stelzhammer-Reichhart/Salmon* (2008): *Schläft ein Lied in allen Dingen. Musikwahrnehmung und Spiellieder bei Schwerhörigkeit und Gehörlosigkeit. Wesbaden.*

Adapting musical experiences for children with cerebral palsy: Dialogues between music therapy and special education

Patricia Leonor Sabbatella
University of Cadiz
laboratorio.musicoterapia@uca.es
SPAIN

Music therapy can support special education teachers by providing effective ways to incorporate music into the academic curriculum. Music therapy interventions can be used specifically to achieve musical and non-musical goals with implications for the overall development of children who have cerebral palsy. This paper describes a music therapy project developed specifically for a Special Education School accommodating pre-school children with cerebral palsy, ages 3-6. The purpose of this project was to integrate music therapy into the special education curriculum of the school in order to develop music therapy approaches and strategies for children with cerebral palsy. The results described herein reveal the contributions to special education curriculum adapted for this population. This presentation will benefit music educators, music therapists, and researchers working with individuals who have cerebral palsy.

This paper describes an Educational Music Therapy Project implemented at the Special Education School "Infanta Dª Cristina,"[1] located in San Fernando (Cadiz), Spain. The *Music Therapy Project,* which began during the 2004-2005 academic year, is ongoing. Music Therapy is offered as a direct service in the regular special education classroom. Participants are pre school children, ranging from 3 to 6 years of age who are, diagnosed with Cerebral Palsy of varying levels of severity. Since 2004, 11 students participated in the project.

The main objective of the Music Therapy Project is to explore the contributions of Educational Music Therapy to the Special Education Curriculum. Music therapy strategies and techniques are used to develop tailored-made music interventions and activities according to the Special Education Curriculum and the Individualised Education Plan (IEP) of each child. The project was financially supported by the Spanish National Confederation of Cerebral Palsy (Confederación ASPACE), the Centre for Teachers Resources of Cadiz, Andalusian Government (Centro de Profesores de la Provincia de Cádiz), the Research Group HUM-794: Music, Education and Therapy of the Andalusian Research Program, and AGAMUT, Music Therapy Association of Cadiz.

Theoretical Background: Music Therapy in Education and Cerebral Palsy

The effectiveness of Music Therapy interventions in educational environments is well documented. Music Therapy can support special education educators by providing effective ways to incorporate music in the academic curriculum (Adamek & Darrow, 2001; Wilson, 2001). Music Therapy interventions can be used with *music outcomes* such as ear training and music discrimination; singing; listening and music preference; playing instruments, movement, as well as with *non-music outcomes* such as using music as a stimulus or as a structured activity for academic, motor, social, and verbal behaviour.

Cerebral Palsy (CP) is generally defined as a chronic physical disorder of cerebral origin characterised by an inability to fully control motor function, particularly muscle control and coordination. Depending upon which areas of the brain have been damaged, one or more of the following may occur: muscle tightness or spasm, involuntary movement, disturbance in gait and mobility, abnormal

[1] This Special Education School is part of UPACE-San Fernando, a specific centre for people with Cerebral Palsy, located in San Fernando (Cadiz) Spain.

sensation and perception, impairment of sight, hearing or speech, seizures. CP is divided into three major classifications: Spastic, Ataxic, and Dyskinetic. *Spastic CP* causes stiffness or tightness of muscles, hypertonicity and motoric dysfunctionality. *Ataxic CP* affects the sense of balance and depth perception, low muscle tone and poor coordination of movements, and affects gross motor skills particularly walking, balancing, and coordination. *Dyskinetic CP* causes athetosis or uncontrolled, slow, stormy movements, dystonia, as well as, sustained or intermittent muscle contractions resulting in twisting or repetitive movement. Many children with CP will also have some type of learning disability.

Music Therapy interventions can address physical, emotional, cognitive, behavioural, and social development when working with persons diagnosed with CP. (Aguilar & Reina, 2007a, Aguilar et al., 2007b; Bean, 1995; Hanser, 1999; Krakouer et al., 2001; Kho, 2011; Lacarcel, 1999; Loureiro, 1992; Nordoff y Robbins, 1982; Poch, 1999; Sabbatella, 2003; Sabbatella & Hermida, 2008; Thaut, 2000). Music enhances the quality of life of children suffering from Cerebral Palsy resulting in a positive impact upon learning and their overall development. Music can impact the areas below in the following ways:

- *Physical development*: gait control; body balance and equilibrium; strengthen head and torso control; gain hand-movement control and coordination; gross-motor movement; improve levels of tension; relaxation
- *Emotional development*: expression of emotions and needs; emotional regulation and adjustment; self-control; reduce anxiety and levels of frustration; promote relaxation; reduce aggressive behaviours; autonomy
- *Cognitive and academic development*: focuses attention; concentration; memory process; improve motivation; listening skills; use visual cues to communicate
- *Communication and language development*: speech articulation, intonation, intelligibility, naturalness and fluently, increase vocabulary
- *Social development:* engage in group play, communication at verbal and non-verbal level, interaction with peers and adults, control of demanding attitudes

Presenting the Project: A Model for integrating Special Education Curriculum and Music Therapy Practice

The *Model for integrating Special Education Curriculum and Music Therapy Practice* is based upon a collaborative research design between experts. The research approach combines the uses of different methodologies and techniques from Action Research, Observational Methods, and Program Evaluation. The members of the team

project are a trained music therapist who works as Special Education Teacher, an assistant who is also a Special Education Teacher, and an External Music Therapy Supervisor. To explore the contributions of Educational Music Therapy to the Special Education Curriculum the model is structured in two areas:

1. *Direct Music Therapy Service offered in the regular special education classroom*: Music Therapy Interventions are planned according to the Individualised Education Plan (IEP) of each child covering his/her particular needs and the National Special Education Curriculum.
2. *External Supervision of the Music Therapy Project*: Advice and support to identify the contributions of Music Therapy to the Special Education Curriculum and develop and implement music therapy experiences and strategies adapted to the specific needs of the cerebral palsy students.

Based on the model, the project has two main objectives, one institutional and the other for direct music therapy services offered to children with cerebral palsy:

Institutional Objective

- To include Music Therapy in the Special Education Curriculum in order to introduce Music Therapy as a direct service for children diagnosed with Cerebral Palsy
- To explore the contribution of Music Therapy to the Special Education Curriculum in order to develop music therapy experiences and strategies adapted to the specific needs of children with Cerebral Palsy
- To evaluate the effectiveness of the proposed intervention

Direct Music Therapy Service Objective

- To design and implement therapeutic music experiences with musical and non-musical objectives adapted for students with cerebral palsy
- To develop tailored-made musical experiences, according to the Special Education Curriculum and the Individualised Education Plan (IEP), covering the particular needs of each child.
- To evaluate the effectiveness of the Music Therapy strategies and techniques used in the development of the tailored-made musical experiences and the music therapy intervention plan.
- To evaluate the effectiveness of the model proposed in the evolution of the students.

The *process of documentation* covered a wide range of strategies and techniques for data collection.

Table 1.

Process of documentation

MODEL FOR INTEGRATING SPECIAL EDUCATION CURRICULUM AND MUSIC THERAPY PRACTICE: PROCESS OF DOCUMENTATION	
ASSESSMENT	Individual Educational Plan (IEP) of each children Musical profile of each student: music life-history, musical preferences Music Therapy on-going assessment as part of treatment process
TREATMENT INTERVENTION	Video-recording of the music therapy sessions: Analysis focused on student responses to tailored-made musical activities; Music therapist's clinical notes taken after music therapy sessions. Specific data collected included a general overview of the session; the appropriateness of the tailored-made musical experience implemented and significant events Written reports from music therapist and the assistant after the sessions regarding the development and progress of each participant (verbal and non-verbal information of each participant) Monthly meetings for advising and supervision
EVALUATION	Progress report of each student Report of clinical notes taken by the music therapist and the assistant Report of the supervisor

Evaluative meetings were held every three months and music therapy interventions were supervised monthly. Data, obtained from video analysis, clinical notes, and bibliographical review, was analyzed via *triangulation* and *comparative analysis.*

Direct Music Therapy Intervention Design

Participants

Participants were 11 children, ages 3-6, enrolled in a pre-school education program diagnosed with Cerebral Palsy of differing levels of severity. The characteristics of the participants were as follows:

- The health state is conditioned by the level of the severity and the type of the disease (Spastic CP; Ataxic CP or Dyskinetic (CP), presenting problems of postural control, poor coordination, muscle spasm, involuntary movements, disturbance in gait and mobility, chronic epilepsy, problems with deglutition, dehydration, breath problems, impairment of speech, repetitive movement.
- All of the participants presented with some type of learning disability and most were functionally non-verbally. They used picture communication symbols to communicate.
- Most of the students had difficulties with language and communication skills development.
- All students depended upon the people around them to communicate and interact , presenting difficulties in engagement and interaction with peers and adults.

Method and Strategies

Working with children diagnosed with Cerebral Palsy, Music Therapy interventions are used to achieve musical and non-musical goals with implications for the child's overall development. According with the National Special Education Curriculum and the Individualised Education Plan (IEP), the tailored-made musical experiences were designed according to:

- *The child's baseline*. The starting point is each participant's intellectual, communicational, social-affective and motor state.
- *Age-appropriateness*. Age-related sequences of each participant's physical, emotional, social, and cognitive development.
- *Individual-appropriateness*. Accommodations made for individual differences in personality, learning styles, growth, strength, interests, experiences, and family background.
- *The student's level of musical development and interests.*

Several strategies were used to implement the tailored-made musical experiences as part of the therapeutic process – to ensure that it was success-oriented

and adapted to the child's level of development. The strategies must help them to experience the music, enhance their self-esteem, and achieve outcomes:

- The use of a multi-sensory approach (auditory, visual, and tactile). This "multi-modal approach" facilitates many developmental skills, because music stimulates all of the senses and involves the child at many levels.
- The use of gestures and cues to encourage participation and increase children to understand the activity.
- The use of repetition of guidelines and strategies for motivation to stimulate attention and increase motivation to participate.
- The use of adapted or modified equipment.

Tailored-made musical activities were based on music therapy techniques used with cerebral palsy clients (Sabbatella, 2003). Techniques included movement with music, relaxation with music, playing percussion instruments, vocal expression, and singing. The music therapy session format was designed to meet the needs of the children and involved three main moments that offer a structured setting to promote freedom, self-expression, participation and group interaction and to allow the students to express themselves with music making. Table 2 illustrates the music therapy session format.

Table 2.

Music Therapy Session Format

MUSIC THERAPY SESSION FORMAT	
WARM UP	*Good morning / Welcome song* Planning the activity with children
CORE ACTIVITY	Tailored-made Musical Experiences Based on different techniques: *Movement with music* (gait control; body balance and equilibrium; hand-movement control and coordination; gross-motor movement; rhythmic movement) *Playing percussion instruments* (exploring the sound/musical possibilities; free improvisation; musical interaction) *Musical Games* *Vocal expression and singing* (Rhymes and Singing)
ENDING	*Relaxation with music* (Listening and relaxing)

	Good-bye song

The music therapist and the assistant played an active role participating in all the musical experiences with the children.

RESULTS

Based on the model, results revealed two main areas that the institutional and direct music therapy services offered to the children with cerebral palsy. Music therapy tailor-made activities and techniques seem to be effective for the development of the target population. The study analysed data on each child's behaviour change over time, in addition to that of the group change. Overall, there were significant changes in the behaviour of all participants and in the group behaviour. For example on the individual levels, participants'anticipation of situations and routines was observed over time. Within group levels, a relaxing and happy atmosphere developed as the sessions progressed. Overall, the strategies used to adapt music therapy to Special Education Curriculum and the Individualised Education Plan (IEP) reported positive outcomes. Table 3 illustrates the findings depending on the technique used and the tailored-made activity.

Table 3.

Techniques used results

MUSIC THERAPY TECHNIQUES USED CEREBRAL PALSY: FINDINGS	
MOVEMENT WITH MUSIC	The most effective tailored-made activities were those that use spontaneous movements. Non-structured movements started to be controlled in synchronization with rhythmic stimulation and adjustment. Activities connected with moving to a rhythm encourages physical development and motor adjustment, gait control, improved equilibrium, and gross-motor movements.
PLAYING PERCUSSION INSTRUMENTS	Tailored-made musical experiences: • improved hand-movement control and coordination • developed and improved the relationship among the adults and the students in a more creative and exploratory way. • increased the control of impulsive reactions and

Table 3.

Techniques used results

MUSIC THERAPY TECHNIQUES USED CEREBRAL PALSY: FINDINGS	
	behaviours and reduced aggressive behaviours. • Promoted the expression of emotions and needs, emotional regulation, and reduced anxiety and frustration • Engaged interaction with peers and adults in group play situations promoting communication at the verbal and non-verbal level, collaborative play, and sharing instruments An improvement of motor adjustment was observed regarding instrumental rhythmic activities which are used in combination with movement activities or movement games.
VOCAL EXPRESSION AND SINGING	The use of songs and rhymes improved the development of speech articulation, intonation, and increase vocabulary
MUSICAL GAMES	Musical games, designed according to student musical development and interests, promoted group interaction, interaction with peers and adults, communication at both verbal and non-verbal levels, focused attention, concentration, memory processing, listening skills, spontaneity, creativity, and flexibility
RELAXATION WITH MUSIC	Listening and relaxation activities helped students to control reactions and movements, and to reduce levels of tension and spasticity

During the process, new elements were identified as requiring further consideration when working with children diagnosed with cerebral palsy. These ideas were included as strategies in the model:

- Limiting the space in the room with a carpet to create a space where children can feel the therapeutic framework.
- Using the objects and the musical instruments for the purpose for which they were intended.
- Defining the music therapists and the assistant's role.

DISCUSSION

The results of this project provide support for the efficacy of music therapy for children with cerebral palsy and its contributions to the Special Education Curriculum development. The model for integrating Special Education Curriculum and Music Therapy Practice proposed has fulfilled the target objectives at institutional and direct service levels.

Music Therapy is compatible with the educational model and assists children with cerebral palsy in using their strengths, to minimize their disabilities, and maximize their potential. The tailored-made activities were effective at many levels of child development in musical and non-musical (physical, emotional, cognitive, academic, communication and social) ways. A relaxing and happy atmosphere has been developed as the sessions progressed. The combination of music therapy strategies and techniques, therapy skills, and interpersonal skills of the music therapist and the assistant enhanced the success of the program. At the institutional level, more support is needed for future development.

REFERENCES

Adamek, M. & Darrow, A. (2001) Music in Special Education. USA: AMTA Publications.

Aguilar Rodríguez, M. & Oliva Reina, V. (2007a). Aplicaciones de la Musicoterapia en la atención a personas con Paralisis Cerebral. *Actas I Congreso Nacional de Musicoterapia.* Asociación Catalana de Musicoterapia.

Aguilar Rodríguez, M.; Oliva Reina, V. & Sabbatella, P. (2007b). Educational Music Therapy in Cerebral Palsy: Integrating Special Education Curriculum and Music Therapy Practice. *Proceedings VII European Music Therapy Congress*.

Bean, J. (1995). Music Therapy and the Children with Cerebral Palsy: Directive and Non-Directive Interventions. In T. Wigram, B. Saperston & R. West (eds.). The Art & Science of Music Therapy: A Handbook. The Netherlands:Harwood Academic Publishers.

Bruscia, K. (1998). *Defining Music Therapy* (2nd edition), Gilsum NH, Barcelona Publishers.

Comisión de Educación de la Federación ASPACE (2002). *Atención educativa a las personas con Parálisis Cerebral y discapacidades afines. Cuadernos de parálisis cerebral.* Madrid: Confederación ASPACE.

Clarck, C. & Chadwick, D. (1980). C*linically Adapted Instruments for the Multiply Handicapped.* St. Louis, MI: Magnamusic - Baton.

Gfeller, K. (2000). Musicoterapia en el Entorno Educativo, en Davis, William; Gfeller, Kate y Thauth, Michael: *Introducción a la Musicoterapia: Teoría y Práctica*, Barcelona, Boileau.

Hanser, S. (1999). *The New Music Therapy Handbook* (2nd edition). Boston, MA, Berklee Press.

Kho, Hong Ching (2011). *Promoting communication and socialisation in music therapy for children with Cerebral Palsy.* Thesis submitted to the New Zealand School of Music in partial fulfilment of the requirements for the degree of Master of Music Therapy.

Krakouer L., Houghton. S., Douglas, G., & West J. (2001). The efficacy of music therapy in effecting behaviour changein persons with Cerebral Palsy. *International Journal of Psychosocial Rehabilitation***.** 6, 29-37.

Lacarcel, J. (1999): Fundamentos psicopedagogicos de la musicoterapia aplicada a niños y jóvenes con minusvalias fisicas, psiquicas o con problemas de conducta. En M. Chichón Pascual y col., *Música y Salud: Introducción a la Musicoterapia II.* Madrid: UNED.

Loureiro, C. (1992). Abordagem da Musicoterapia na Reabilitação da Criança Portadora de Paralisia Cerebral. *Anais do Seminário Qualidade de Vida da Pessoa Portadora de Deficiência. Programa Fellows V da Associação Brasileira dos Companheiros da América.*

Nordoff, P. & Robbins, C. (1982). *Music Therapy in Special Education.* St Louis: MMB Music.

Poch, S. (1999). *Compendio de Musicoterapia. Vol. I-II.* Barcelona: Herder

Sabbatella, P. (2003). Musicoterapia Aplicada: Metodología y Evaluación en Parálisis Cerebral. En AAVV*: Musicoterapia 2002*. Fundación Inocente Inocente, Confereración Aspace, Asodown, Autismo España. ISBN: AV-97-2003.

Sabbatella, P. (2004). Intervención Musical en el Alumnado con Necesidades Educativas Especiales: Delimitaciones conceptuales desde la Pedagogía Musical y la Musicoterapia. *Revista Tavira*, 20, 123-139.

Sabbatella, P. y Hermida, A. (2008). Musicoterapia en Adultos con Parálisis Cerebral. *Actas II Congreso Nacional de Musicoterapia*. Pag.31-33. Asociación Aragonesa de Musicoterapia.

Thaut, M. (2000). *Musicoterapia para niños con Discapacidad Física*. En W. Davis; K. Gfeller y M. Thauth, *Introducción a la Musicoterapia: Teoría y Práctica*. Barcelona: Boileau.

Wigram, T.; Nygaard Pedersen, I. y Ole Bonde, L. (eds) (2002). *A Comprehensive Guide to Music Therapy. Theory, Clinical Practice, Research and Training.* London: Jessica Kingsley.

Wilson, B. (2001). Models of Music Therapy Intervention in School Settings. 2nd edition. USA: AMTA.

Wolf, E. (2002). Uso de canciones en la enseñanza de habilidades académicas, sociales y motoras a niños. *Música y Educación*, 3 (51) 73-80.

An exploration of the effectiveness of singing on English vocabulary learning for Chinese dyslexic pupils

Yim Ting Leung
leungyti@gmail.com
Hong Kong Institute of Education
HONG KONG

Bo Wah Leung
bwleung@ied.edu.hk
Hong Kong Institute of Education
HONG KONG

Keywords: Dyslexia, singing, English vocabulary learning, phonological processing, Hong Kong

English acquisition is in high demand in a globalized society. However, learners with dyslexia often face difficulties in learning English. This study examined the impact of singing upon dyslexic Chinese pupils' English vocabulary learning, specifically on tasks involving word syllable segmentation, vocabulary pronunciation, and recognition. A purposive sample of 30 dyslexic and 30 non-dyslexic Hong Kong pupils, ages 6-10, were recruited and randomly assigned to a treatment group or control group respectively (n=15 each). Pupils in the treatment groups were introduced to English vocabulary by singing, while those in the control group were exposed to no musical activity or stimuli. Between-group and within-participant comparisons were analyzed via a Multivariate Analysis of Variance (MANOVA) and Repeated-Measure Analysis of Variance Analysis (ANOVA), respectively. Scores were also compared to non-dyslexic pupils. The implications for special education and music therapy will be discussed.

Background

English acquisition is in high demand in the *age of globalization.* In an international city such as Hong Kong (HK), learning English is not only crucial for employees in the workplace, but also for students in their academic and, later, working lives. Particularly, studies of literacy development revealed that early vocabulary acquisition could predict later language and literacy achievement (e.g., Hemphill & Tivnan, 2008; Lee, 2011*)*. Thus, vocabulary learning is generally regarded as important for academic success *(*Neuman, 2006; as cited in Sylvester, & Kragler, 2012*)*. However, while normal students may learn effectively, those with dyslexia experience great difficulties (Wolff, 2010).

Definition of Dyslexia

Dyslexia literally means "*difficulty with words*" (Gabor, 2010). It was originally derived from two Greek words: "*dys*" (meaning "difficulty or malfunction") and "*lexis*" (meaning "language") (Doyle, 1996, p. 69, cited in Schneider, & Crombie, 2003). However, this description does not provide a clear indication of how the condition manifests itself (Macintyre, 2009). In 1994, the International Dyslexia Association provided a more research-based definition (see Lyon, Shaywitz, & Shaywitz, 2003):

> *Dyslexia is a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing. These difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalized developmental disability or sensory impairment.*" (Lyon, *et al.*, 2003, p. 2).

Besides these language-based symptoms, other nonlinguistic deficits such as lack of concentration, disorganization, and poor short-term memory may accompany dyslexia (Helland & Asbjørnsen, 2000; Reid & Green, 2007a).

Prevalence

In HK, the prevalence of dyslexia in school-aged students is about 10% (Chan, Ho, Tsang, Lee, & Chung, 2007). Approximately 9.7 to 12.6% HK Chinese pupils aged between 6 and 10.5 years has dyslexia (Chan, *et al.,* 2007). Moreover, in 2012, it

has been estimated that around 80,000 primary and secondary students suffer from this disorder (The Hong Kong Federation of Youth Groups, 2012, June 1).

Theoretical Explanation of Dyslexia

One of the main explanatory frameworks for dyslexia has been the phonological deficit hypothesis (Menghini, Carlesimo, Marotta, Finzi, & Vicari, 2010; Törmänen, & Takala, 2009). It postulates that dyslexics have a specific impairment in processing phonological information, manifested by difficulties in perceiving individual sounds in words (Nicolson, & Fawcett, 2008), segmenting words into smaller phonological units (i.e., phonological awareness) (McDougall, Hulme, Ellis, & Monk, 1994; cited in Ho, Chan, Tsang, & Lee, 2002), maintaining strings of sounds or letters in short-term memory (Lundberg & Hoien, 2001, cited in Nicolson, & Fawcett, 2008), and retrieving linguistic material from memory (Ramus, *et al.,* 2003).This hypothesis was supported by evidence that dyslexic individuals performed significantly worse than normative control groups on the task requiring phonological processing (Hanly &Vandenberg, 2010; Lindgrén & Laine, *2011*).

Nevertheless, this hypothesis has not been unchallenged. In fact, it has been increasingly criticized that the phonological deficit hypothesis cannot explain other learning problems (e.g., impairment in visual processing) faced by dyslexics individuals, and thus suggested that phonological deficit is not the single contributor to dyslexia (Menghini, Carlesimo, Marotta, Finzi, & Vicari, 2010). It is also argued that each language has its own linguistic features and cognitive demands, and thus cognitive deficits faced by dyslexic individuals vary with different languages (Chung, Ho, Chan, Tsang & Lee, 2010; Lam, 2010). However, when considering English language learning, phonological deficit is still considered as a major contributor to dyslexia (Chung, *et al.,* 2010). Given that English is an alphabetic language, consisting of various letters that construct various phonological units (e.g., syllables), phonological awareness, decoding skill, and phonological memory are thus essential in English language acquisition. Impairment in these areas often results in learning problems.

Singing as a Strategy Foreign Language Learning

Facing these learning difficulties, singing may be a potential learning strategy for dyslexic English learners. For instance, Scho¨n and his colleagues (2008) proposed that "*changes in pitch* (during singing) *often accompany syllable changes*"

(Schön, *et al.,* 2008, p. 976), which may help dyslexic learners to perceive individual sounds in words and segment words' syllables**.** By maintaining verbal information in memory, singing may help rehearse the verbal materials in a more pleasurable way, in comparison to that of rote-learning. Furthermore, songs can act as a cue to retrieve verbal information (Moore et al., 2008). It is explained that through singing, the learners can continually pair verbal materials with melody, forming a link between them. Eventually, even if verbal information is forgotten, the melody may provide a cue to retrieve the verbal materials (Ginsborg, & Sloboda, 2007).

Other Issues Should Be Considered

Nevertheless, there are several issues which remained unclear. First, previous studies tended to focus on a quantitative experimental approach, without a provision of deeper insights onto how and why music helps (or does not help) children's language learning in a real-life setting (Forgeard *et al.,* 2008; Maclean, *et al.,* 1987). Second, the value placed by dyslexic children on singing as a strategy for their English learning is still largely unknown.

Research Objectives

With these considerations, the main objective of this study was to investigate how and why singing helps (or does not help) dyslexic children's English vocabulary learning. A secondary purpose was to explore how dyslexic children feel about this learning strategy.

Method

In order to find answers pertaining to the "how" and "why" questions, this study employed a case study approach (Hancock, & Algozzine, 2006; Yin, 2009). In order, to gain an in-depth understanding of the issue, data was collected using multiple methods (Denzin, & Lincoln, 1994; Stake, 1994), including individual interviews, class observation, and pre-and post-test.

Participants

Four dyslexic children from Hong Kong (3males, 1 female) participated in the study. They were 9-10 years of age and all were reported as having difficulties in English learning. All participants were informed of the general research purpose, and written consent was obtained from their parents. The instructor was a qualified music teacher in her early 20s with Bachelor's Degree in Education. She was recruited to teach the singing program.

Context of the study

The singing program included six 45-minute lessons. In the first five lessons, around 5 minutes was spent for vocal warm-up exercise, 15 minutes for song introduction, and 25 minutes for either (i) revision (e.g., through singing games and ensemble singing), or (ii) pre-test. In the last lesson, approximately 25 minutes was allotted for revision and 20 minutes for post-test. The singing program was held three days per week in May, 2012, and all lessons were delivered by the qualified teacher at the local primary school.

Materials

Eight fruit songs were composed (see Appendix A). There were two dimensions of the songs:

Melody. They are characterized by simple rhythm, repetitive structure, 4/4 time and relatively narrow pitch range of notes suitable for all untrained voices. This make them easier for the children to learn regardless of their musical training, or background. Strict tempos were not marked so that the teacher could flexibly adjust the tempo according to the children's learning progress.

Lyrics. The lyrics are related to eight English fruit vocabularies. These vocabularies were selected after a review of junior primary English textbooks (e.g., Anderson, 2010; Dionne, 2008; Jones, Gray, & Gordon, 2009), and consultations with two primary school teachers and one special educational needs teacher. As suggested by the teachers, dyslexic pupils are generally familiar with the very common words (e.g., apple), but had difficulty learning some relatively less common words such as watermelon. In order to provide a meaningful challenge for the children, the vocabulary list included both words (i) which are relatively unpopular in junior primary level (i.e. just some textbooks cover those words, e.g., watermelon and

cherry) (Dionne, 2008; Jones*, et al.,* 2009) and (ii) which are generally uncommon to teach under the junior primary English curriculum (e.g. berry, cranberry and blackberry). Finally, a list of fruit vocabularies which have 2-4 syllables was generated (see Table 1).

Table 1. *The Targeted Fruit Vocabularies*

Sessions	Targeted Vocabularies	Syllables
1	Berry & cherry	2
2	Blackberry & cranberry	3
3	Pineapple & papaya	3
4	Watermelon	4
5	Avocado	4
6	All (Revision)	2-4

Furthermore, to help children recognize the vocabularies through singing, short sentences or adjectives precede each vocabulary word in order to introduce its characteristics (e.g. papaya, a lot of babies insides), appearance [e.g. pineapple, it's like a (pineapple) bun – a local popular sweet pastry], shape (e.g., 'berry, it's like a little ball') or colour (e.g. blackberry, black and green).

Additionally, the music score for each fruit song was printed on a single white sheet of A4 paper (21cm X 29.7cm). Illustrations corresponding to the fruit vocabulary were also included as a visual aid. Additionally, to help the children read the lyrics; the text was presented in 16-28 point font size. A bold Comic Sans MS was used as the text font since it is considered to be a dyslexia-friendly font (Reid, & Green, 2007a; Reid, G., Green, 2007b) (for examples, see Figure 1)

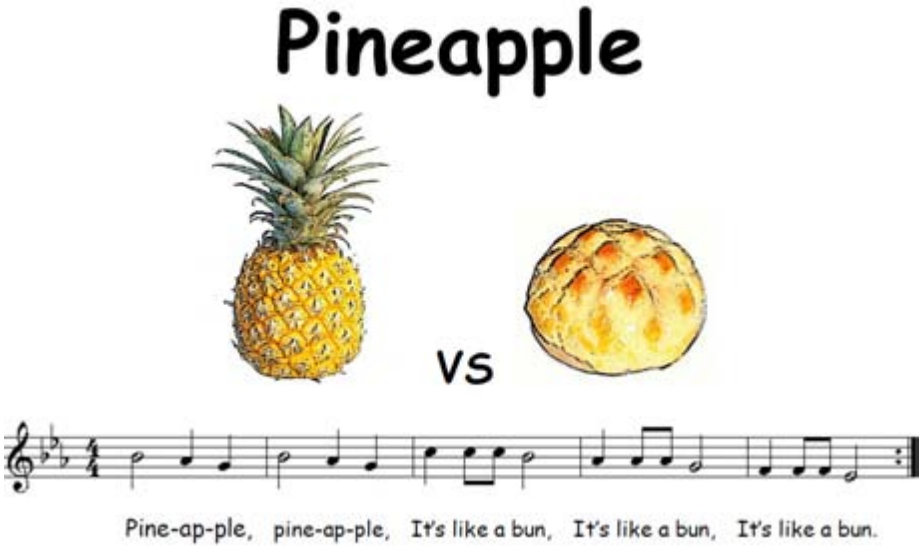


Figure 1. An Example of the Music Score: "Pineapple" Song

Design of Pre-and Post-Test

To assess the dyslexic children's learning outcomes, a pretest-posttest design was employed. In order to take the dyslexic children's reading difficulties into consideration, the tests were administrated orally and individually. The pre and posttest included two main tasks:

Pronouncing the Vocabularies. The students were introduced to the fruit vocabularies and were asked to pronounce the words one by one. Their quality of pronunciation was then assessed using a 5-point Likert-type scale ranging from 1 (poor) to 5 (excellent), with an additional option 0 (no response). The assessment criteria included the correct number of syllables, as well as the accuracy of pitch, onset, and rhythms.

Recognizing the Vocabularies' Meanings. The children were asked to match with each fruit word with its corresponding illustration. One mark was given for each correct answer. An additional part "Recalling the Fruit Songs" was added in the post-test. This task aimed to explore whether the children were familiar with the fruit songs. The children were asked to recall any musical materials of the songs such as its melody or lyrics. One mark was given when they could recall any information of each song. However, no mark was given when they just simply articulate the fruit vocabulary. The pre-test was conducted at the beginning of the first lesson, while the post-test was conducted either at the end of the last lesson or the following day.

Development of the Semi-structured Interviews

Semi-structured interviews were employed to explore (i) how singing helps children with dyslexia to learn English, and (ii) how the children feel about this learning strategy (Gall, Borg, & Gall, 1996, as cited in Merlino, & Rhodes, 2012). Both the dyslexic children (*n*=4) and the teacher (*n*=1) were interviewed individually.

Dyslexic Children's Interviews. The interview questions mainly focused on (i) how they felt about the English learning through singing activities, (ii) their preference for singing activities, (iii) song preference, and (iv) music training background (for the interview questions, see Appendix B).

Teacher's Interview. This interview mainly aimed to explore her perception of (i) the children's reaction during singing, and (ii) her teaching experience throughout the singing program (for the interview questions, see Appendix C).

All interviews were conducted either in person at the school or via phone. In order to create a psychologically safe environment, the tone of the interviews was conversational and the participants could answer the questions freely. Additionally, during the interviews, the researcher took notes to record verbal responses, and when available, aurally-recorded responses on a voice recorder. The interviews were later transcribed, and when necessary, translated into English. Finally, each transcript was a coded for identification. For example, (F/P3/1) indicates a female pupil who was studying in primary 3 and the first student being interviewed, and (F/T) indicates the female teacher.

Development of Class Observation

To gather the information more objectively, non-participant class observation was conducted throughout the program (Hancock, & Algozzine, 2006). Besides, semi-structured observation is employed. The researcher observed (i) the children's reactions such as facial expression and behavior (e.g., level of participation), and (ii) the teaching and learning processes. To facilitate further analysis, all lessons were video-recorded.

Data Analysis

The data collected was analyzed in two ways. For quantitative data, a paired sample *t*-test was used to compare the pre-and post-test scores. Descriptive statistics were evaluated to count how many fruit songs they remembered. Specifically, the Pearson correlation was employed to explore if there was a relationship between their familiarity of the fruit songs and their overall pronunciation quality. With regard to the qualitative data, content analysis was performed. The analysis focused on four themes: (i) perception on singing and English learning; (ii) the teaching and learning experience; (iii) the reaction of children with dyslexia; and (iv) music training background.

Results

Task Performances

A Sample *t*-test was used to explore whether there were significant differences in the task performances of children with dyslexia on (i) pronunciation and (ii) recognition of the targeted vocabularies before and after the singing program.

Quality of Pronunciation. Results revealed that their post-test scores for pronunciation quality (M=31.25, SD=6.40) were significantly higher than their pre-test score (M=9.25, SD=6.98), t (3) = 4.83, p<.05. Specifically, as displayed in Table 2, their pronunciation quality of the fruit vocabularies: "papaya," "pineapple," "blackberry," and "berry" were significantly improved.

Table 2.

Mean (M) Scores onPronunciation Quality (Standard Deviation, SD, in Parentheses)

Fruit Vocabularies	Score		*t*	*df*
	Pre-test	Pro-test		
Papaya	.63 (.75)	4.25 (1.50)	5.80**	3
Pineapple	1.50 (1.29)	4.50 (.58)	5.20*	3
Blackberry	1.00 (1.16)	4.25 (.96)	3.81*	3
Berry	1.25 (1.50)	4.00 (1.41)	3.67*	3
Avocado	.75 (.96)	2.25 (2.63)	.97	3
Cherry	1.75 (1.71)	4.00 (.82)	2.64	3
Cranberry	.50 (1.00)	3.50 (1.29)	2.78	3

Watermelon	1.88 (2.39)	4.50 (1.00)	2.55	3

Notes: *$p < 0.05$; **$p = 0.01$.

Recognition of the Word Meaning. Results revealed that their post-test score for the fruit vocabularies' recognition (M=7, SD=2) were significantly higher than their pre-test score (M=2, SD=1.15), t (3) = 6.12, p<.01.

Recall of the Fruit Songs. Descriptive statistics were performed to count how many fruit songs they remembered. Results showed that on average, the children could recall about three fruit songs (M=3.25, SD=.50) and they tended to recall the lyrics rather than the melody. Most of the children (n=3) were able to recall the songs of "papaya," "watermelon," and "cherry," whereas none of them memorized the songs of "cranberry," and "avocado." Additionally, Pearson's correlation revealed that the number of fruit song that they could recall was not significantly related to their general performance on pronouncing the fruit vocabularies, r=.70, n=4, p>.05, (n.s.).

Dyslexic Children's Perception on Singing and English Learning

I. Singing Activity Preference

(i) Games. Most children (n=3) express that they preferred playing singing game rather than just singing the song. All children said that it was fun to play the games; while one child expressed that it was boring to simply sing the song.

> Interviewer: Which singing activities do you like best?
> Pupil 2: Playing (singing) games.
> Interviewer: Why?
> Pupil 2: Because I can play and I will not feel bored.
> Interviewer: Do you feel bored when simply singing the song?
> Pupil 2: Yes. (M/P3/2)

Through class observation, it was also determined that the children performed off-task behaviors more frequently while singing the songs rather than playing the singing games.

> Vignette 1: The pupils sang the berry song. However, they did not show any smile on their faces. Pupil 2 displayed uninterested in singing. He just folded up the music score and daydreamed. (Lesson 1)

In contrast, they participated in the singing game more actively.

> Vignette 2: The teacher danced while singing the blackberry song. She invited the children to imitate her body movement. All children engaged in the dance actively and sang loudly. When they mastered the song and the dance movement, the teacher played the piano and increased the tempo. The children sang with big smiles. Later, the teacher joined the dance together. They sang and laughed loudly. (Lesson 2)

Moreover, as indicated by the children, not all of them loved singing. Only one child shared that he loved singing and and thought it was interesting. On the other hand, one child said that he disliked singing because singing required him to memorize lyrics, while two children expressed that they sometime disliked singing when they had to memorize many different words. In addition, none of them had joined any additional music interest class beyond the school.

II. Song preference

> **Easy to learn.** Most children (*n*=3) preferred a song that is easy to learn. For example, the lyric are repetitive, easy to sing and memorize.

> I love papaya song because the word "papaya" is easy to remember (M/P3/1)
> I like "papaya" (song) because the word is easy to sing (M/P2/4)

One child preferred a short melody (less than 4 musical phrases), pleasing to hear, and narrow pitch range.

Interviewer:	Is there any fruit song that you dislike?
Pupil 2:	No. It's because each fruit song is short. Also, the pitch is easy to sing. However, some songs are difficult to sing. For example, the song consists of four phrases and some pitches are hard to sing.
Interviewer:	Four phrases? Which one?
Pupil 2:	You do not have these songs. I sing them in the music lesson. Most songs consist of 4-5 phrases. Besides, the melodies are difficult to sing.
Interviewer:	Is the pitch too high or too low?
Pupil 2:	Very high pitch! (M/P3/2)

Interesting Theme. Furthermore, half of the children (n=2) preferred the theme of the song that was interesting for them.

> I like watermelon song because I love eating watermelon very much! (M/P3/2)

> I like papaya song because the word "papaya" is interesting. When singing this word, it is separated (into "pa-pa-pa-pa-pa-pa-ya"). (M/P3/3)

According to the class video, it was also observed that the children showed excitement when they learned a song describing an object that they are interested in and which allowed them space for imagination.

> Vignette 3: When the teacher distributed the music score of the pineapple song, pupil shouted "pineapple bun" several times. He then danced and created a song for it, while Pupil 1 held the music score and jumped. At the same time, Pupils 2 and 3 discussed the theme of that song and smiled. Pupil 2 joked "Who does the pineapple fight against?" and Pupil 3 replied, "Pineapple bun." Pupil 3 laughed and said "What? Pineapple fights against pineapple bun!" Then, they sang the pineapple song very loudly and moved their bodies naturally. (Lesson 3)

III. Feeling about English Learning through Singing Activities.

Fun. All dyslexic children (*n*=4) expressed that they liked learning English through singing activities because it is fun. Most of them (*n*=3) also explained that through singing, they could learn English vocabularies.

> Interviewer: How do you feel about English learning through singing?
> Pupil 2: Very good.
> Interviewer: Why?
> Pupil 2: Because I can learn how to pronounce the English word. (M/P3/2)

Not difficult. Although half of the children (n=2) indicated that they had negative feeling towards learning (i.e. it was hard to memorize English; the school work was quite stressful), all children (n=4) expressed that it was not difficult to learn English through singing. One child also explained that singing could help her memorize the English vocabularies more easily.

Interviewer: Do you feel difficult to learn English through singing?
Pupil 1: Not difficult.
Interviewer: Do you like learning English through singing?
Pupil 1: I like it.
Interviewer: Why?
Pupil 1: Because it is easier to memorize the words.
Interviewer: Do you like English lesson in school?
Pupil 1: (I am) not very like it because it is difficult to memorize the words. (F/P3/1)

Discussion

The purpose of this study is to explore "how" and "why" singing helps (or does not help) dyslexic children's English vocabulary learning. Results indicated that after the singing program, their pronunciation quality and recognition of the targeted fruit vocabularies was significantly improved. However, it seems that their improvement cannot be fully explained by the song only. For example, results showed that there was no significant relationship between the number of fruit songs that they could recall and their overall performance on the vocabularies' pronunciation. Although no significant relationship may be attributed to the small sample size, the relation between the song and learning performance is not clearly shown in the descriptive statistics analysis. For instance, while they showed significant improvement in pronouncing the words "pineapple" and "blackberry," only one child could remember the songs of "blackberry" and "pineapple" respectively. It may imply that the effectiveness of singing is not necessary related to the song itself. Instead, there may be other external factors affecting their learning outcomes. In this study, at least three factors were found.

Personal Interest. The study revealed that for the dyslexic child (pupil 3) who loves singing, he would engage in the singing activity more actively and performed the tasks better.

> Pupil 3 has the best performance in the lesson…he is familiar with the fruit songs. When I played the melody, he could recognize which fruit song I was playing. As for the English learning, he is also the best learner in this program. He could recall the word's pronunciation. (F/T)

Implied also was that singing can motivate the intrinsic motivation of those who are interested in. In this sense, the English song may be a drive to stimulate their interest in English learning, leading to an increased level of participation and amount of practice, and eventually, a greater improvement.

Song's Character. The study also revealed that if (a) the English song has a theme that can arouse their interest, and (b) the level of the song is matched with their abilities (i.e. the children believe that they are able to master), the song can drive them to learn and face challenges. For example, it was observed that the children would voluntarily ask about the words' spelling when singing the papaya song which they were interested in and that they thought was easy to learn. One explanation is that singing the favorite song is a pleasurable experience in which may provide a nonthreatening psychological state to confront difficulties. At the same time, the song that aligns with one's ability can provide a sense of achievement more easily, which thus positively reinforcedd the learning behavior.

Singing Activities: Games. The study revealed that the singing game was more effective for dyslexic children to learn than just simply singing the song. One reason is that they regard this activity as a play in which they tend to focus on its process rather than its outcome (Christie, 1991). Thus, they are more willing to try and take risk without fear of making mistakes (Smith, 2006). Another reason is that only singing may be boring for some children who are not interested in. Thus, they will be more likely to perform off-task behavior (e.g., daydreaming) and reduce the level of participation during learning. Additionally, it should be noted that the singing game itself should be funny and presented in different ways. As indicated by the teacher, using single approach will make the game boring.

> Now, the children will not repeat the same thing 10 times...If we use diverse approaches, they will play with you. Although we sometimes use 10 different approaches and they may feel bored about 1 or 2 approaches, they at least will play with you due to the other 8 approaches. (F/T)

Interestingly, findings suggest that the effectiveness of singing on dyslexic children's English learning varies from person to person. For example, it was observed that for some children who are not particularly interested in music, or not good at singing, the English singing game may not able to provide them a sense of enjoyment. Instead, during the process, they would compare with peers who outperform them, and have frustration when the peers pointed out their mistakes continuously. Gradually, they would give up and withdraw the learning activities.

> Vignette 4: In the sound games, one pupil drew a slip and sang out 'so-fa-me.' Pupil 2 guessed that it represented the sound of watermelon and sang out "watermelon" in Chinese. However, other pupils shouted that he was wrong. At the same them, Pupil 4 found out the answer and shouted 'pineapple' several times. Then, the teacher explained to Pupil 2 that watermelon has four syllables, not three and thus his answer was not correct. In the third round, the teacher asked Pupil 2 to draw the slip. He refused and said "I don't want to play. Let them (other pupils in class) play."

Conclusions and Implications

The researchers sought to understand how and why singing helps (or does not help) English vocabulary learning of children with Dyslexia. Results revealed that participant's personal perceptions on singing such as personal interest (e.g. whether they like singing or not), song preference, and singing activity preference will affect their motivation and willingness to try and face challenges during English learning process. Additionally, most children regarded singing activities (e.g. singing games) as a play in which they could try and take risk, and thus increase their level of participation in the learning tasks. However, not all children felt that way. For some children who are not interest in singing or good at music, peer comparison and frustration may still happen during the singing process. At this moment, encouragement and supportive environment are essential. With this consideration, parents, teachers, and practitioners may consider the following implications. First, parents should consider the interest of children with dyslexia whilst choosing the remediation approaches to meet their individual needs. Teachers and practitioners can also consider musical play when designing a singing or music intervention programs for their pupils with dyslexia. Additionally, while selecting the singing materials, teachers should consider whether the song can provide the children with a sense of achievement and whether the theme can arouse an interest in learning. However, it should be noted that the present study had some limitations. First, to gain a deeper

insight into the perception of singing and English learning of children with dyslexia, a case study approach was used, therefore, the sample size of this study was small. Thus, results may not be generalize to the whole population. Second, to gain results which were more objective, non-participant class observation was used. Since the children were not familiar with the researcher, it is not easy for them to share their personal feelings and learning difficulties during interviews. Thus, future studies should consider other approaches such as participant observation in order to provide a better balance between strangeness and familiarity for the children so that they are free to explore their inner word (Adler, & Adler, 1994).

Acknowledgements: We gratefully acknowledge Prof. Samuel Leong and Ms. Ho Ching, Lee for their advice on the fruit songs and the singing program.

References

Adler, P.A., & Adler, P. (1994). Observational techniques. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of Qualitative Research* (pp.377-392). Thousand Oaks, CA: Sage.

Anderson, A. (2010). *English to enjoy 1A (Teacher's guide)*. Hong Kong: Educational Publishing House Ltd.

Chan, D.W., Ho, C.S.H., Tsang, S.M., Lee, S.H., & Chung, K.H. (2007). Prevalence, gender ratio and gender differences in reading-related cognitive abilities among Chinese children with dyslexia in Hong Kong. *Educational Studies, 33*(2), 249–265.

Christie, J.F. (1991). Psychological research on play: connections with early literacy development. In J. Christie (Ed.), *Play and early literacy development* (pp.27-43). Albany, NY: State University of New York Press.

Chung, K.K.H., Ho, C.S.H., Chan, D.W., Tsang, S.M. & Lee, S.H. (2010). Cognitive profiles of Chinese adolescents with dyslexia. *Dyslexia, 16,* 2-23.

Denzin, N.K., & Lincoln, Y.S. (1994). Introduction: entering the field of qualitative research. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of Qualitative Research* (pp.1-18). Thousand Oaks, CA: Sage.

Dionne, J. (2008). *New magic 1B (Teacher's book).* Hong Kong: Oxford University Press.

Forgeard, M., Schlaug, G., Norton, A., Rosam, C., Iyengar, U., &. Winner, E. (2008). The relation between music and phonological processing in normal-reading children and children with dyslexia. *Music Perception, 25* (4), 383-390.

Gabor, G. (2010). Can students with dyslexia be effectively supported in the diversity of an international school setting? *Journal of Research in Special Educational Needs, 10* (1), 31–41.

Ginsborg, J. & Sloboda, J.A. (2007). Singers' recall for the words and melody of a new, unaccompanied song. *Psychology of Music,* 35(3), 421□440.

Hancock, D.R., & Algozzine, B. (2006). *Doing case study research : a practical guide for beginning researchers.* New York : Teachers College Press.

Hanly, S., & Vandenberg, B. (2010). Tip-of-the-Tongue and Word Retrieval Deficits. *Journal of Learning Disabilities, 43*(1) 15-23. *doi.* 10.1177/0022219409338744.

Helland, *T*., & *Asbjørnsen*, A. (*2000*). *Executive functions in dyslexia*. Child Neuropsychology*,* 6(*1*), *37-48*.

Hemphill, L., & Tivnan, T. (2008). The importance of early vocabulary for literacy achivement in high-poverty schools. *Journal of Education for Students Placed at Risk, 13,* 426–451.

Ho, C.S.H., Chan, D.W.O., Tsang, S.M., & Lee, S.H. (2002). The cognitive profile and multiple-deficit hypothesis in Chinese developmental dyslexia. *Developmental Psychology, 38*(4), 543-553.

Jones, R., Gray, C., & Gordon, T. (2009). *Primary Longman elect, 2A (Teacher's guide).* Hong Kong: Longman Hong Kong Education.

Lam, C.C.C. (2010). Developmental dyslexia: neurobiological perspectives. In S.Y. Ng, & C.W. Lum (Eds.), *Working together to unlock the potential of students with dyslexia* (pp.17-20). Hong Kong: The Hong Kong Institute of

Education.

Lee, J. (2011). Size matters: Early vocabulary as a predictor of language and literacy competence. *Applied Psycholinguistics, 32,* 69–92.

Lindgrén, S.A., & Laine, M. (2011). Cognitive linguistic performances of multilingual university students suspected of dyslexia. *Dyslexia, 17,* 184–200.

Lyon, G. R., Shaywitz, S. E. & Shaywitz, B. A. (2003) A definition of dyslexia, *Annals of Dyslexia, 53,* 1–14.

Macintyre, C. (2009). *Play for children with special needs: supporting children with learning differences.* (2nd ed.).Milton Park, Abingdon, Oxon; New York : Routledge.

Maclean, M., Bryant, P., & Bradley, L. (1987). Rhymes, nursery rhymes, and reading in early childhood. *Merrill-Palmer Quarterly, 33*(3), 255-281.

Merlino, N., & Rhodes, R. (2012). Technology in the 21st Century Classroom: Key Pedagogical Strategies for Millennial Students in University Business Courses. *Journal of Supply Chain and Operations Management, 10* (1), 113-130.

Moore, K.S., Peterson, D.A., O'Shea, G., McIntosh, G.C., Thaut, M.H. (2008). The Effectiveness of Music as a Mnemonic Device on Recognition Memory for People with Multiple Sclerosis. *Journal* of *Music Therapy,* 45 (3), 307-329.

Nicolson, R.I., & Fawcett, A.J. (2008). *Dyslexia, learning and the brain.* Cambridge, Mass.: MIT Press.

Ramus, F., Rosen, S., Dakin, S.C. , Day, B.L. , Castellote, J.M., White, S., and Frith, U. (2003) Theories of developmental dyslexia: insights from a multiple case study of dyslexic adults. *Brain, 126,* 841-865.

Reid, G., & Green, S. (2007a). *100 Ideas for supporting pupils with dyslexia.* London: Continuum.

Reid, G., & Green, S. (2007b). *The teaching assistant's guide to dyslexia.* New York : Continuum International Pub. Group.

Schneider, E., Crombie, M. (2003). *Dyslexia and foreign language learning.* London : David Fulton.

Scho¨n, D., Boyer, M., Moreno, S., Besson, M., Peretz, I., & Kolinsky, R. (2008). Songs as an aid for language acquisition. *Cognition, 106,* 975–983.

Smith, H. (2006). Playing to learn: A qualitative analysis of bilingual pupil-pupil talk during board game play. *Language and Education, 20* (5), 415 — 437.

Stake, R.E. (1994). Case studies. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of Qualitative Research* (pp.236-247). Thousand Oaks, CA: Sage.

Sylvester, R., & Kragler, S. (2012). A Case Study of Children's Literacy Development in aVoluntary Pre-Kindergarten Classroom. *Journal of Research in Childhood Education*, *26,* 122–140.

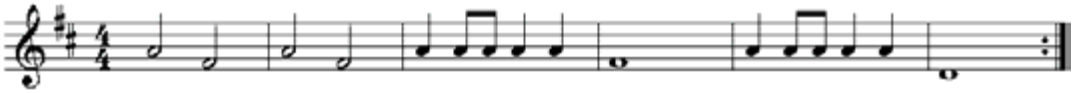
Törmänen, M.R,K., & Takala M. (2009). Auditory processing in developmental dyslexia: An exploratory study of an auditory and visual matching training program with Swedish children with developmental dyslexia. *Scandinavian Journal of Psychology, 50,* 277–285.

Wolff, U. (2010). Subgrouping of readers based on performance measures: a latent profile analysis. *Reading & Writing, 23*(2), 209–238.

Yin, R. K. (2009). *Case study research: design and methods.* Los Angeles, Calif.: Sage Publications.

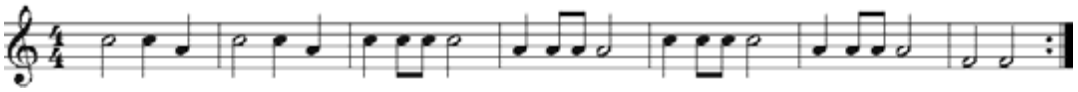
Appendix A: 8 Fruit Songs used in the Singing Program

Berry



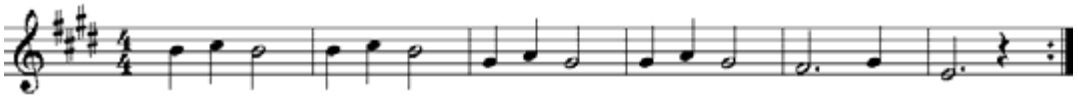
Ber-ry, ber-ry; it's like a little ball, it's like a little ball.

Cherry



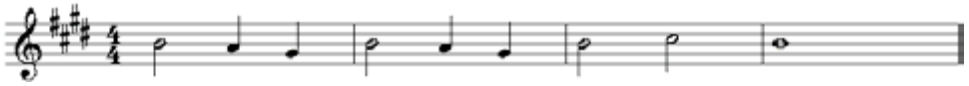
One Cherry, two Cherry; two little balls, two little balls, two little balls, two little balls, cherries.

Cranberry

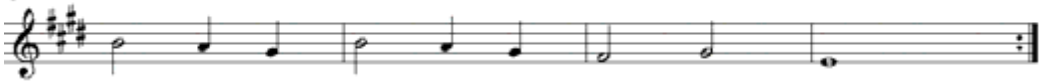


Cranberry, cranberry, cranberry, cranberry, red and green.

Blackberry

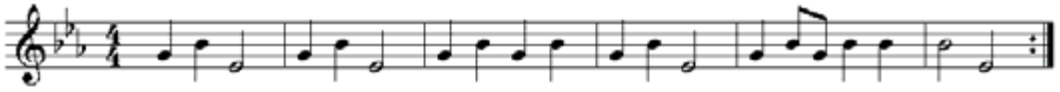


Black- ber- ry, black- ber- ry, black and green;



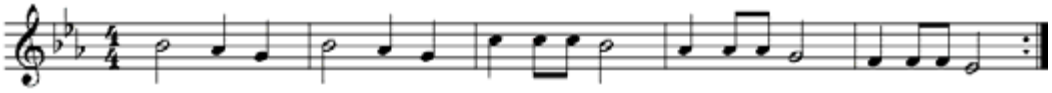
Black- ber- ry, Black- ber- ry, black and green.

Papaya



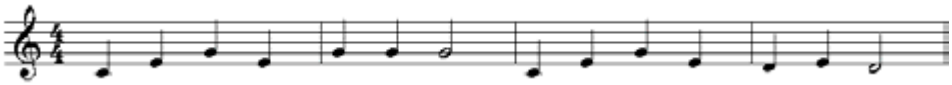
Pa- pa- ya, Pa- pa- ya; pa- pa- pa- pa- pa- pa- ya; a lot of babies in-side.

Pineapple

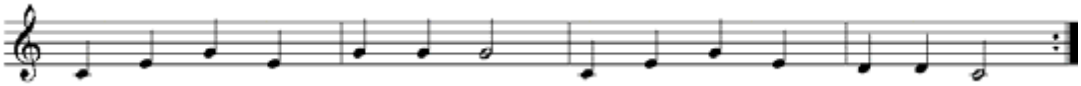


Pine- ap-ple, pine-ap-ple, it's like a bun, it's like a bun, it's like a bun.

Watermelon

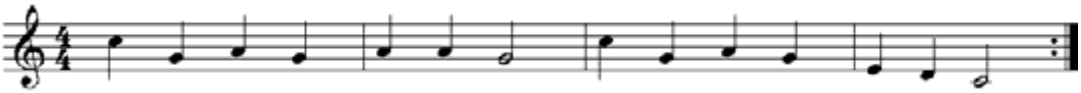


Wa- ter- mel- on, black and green, wa- ter- mel- on, red and green;



Wa- ter- mel- on, black and green, wa- ter- mel- on, white and green.

Avocado



Av- o- ca- do, big tum- my; av- o- ca- do, big tum- my.

Appendix B: Dyslexic Children's Interview Questions

1. Do you enjoy the singing activities in this program?
   - If yes, what is (are) your favorite activity(ies)? Why?
   - If no, what is (are) the reason(s)?
2. Which is (are) you favorite fruit song(s)? Why?
3. Which fruit song(s) do you dislike? Why?
4. Which fruit song do you feel difficult to learn? Why?
5. What do you feel about learning English vocabularies through singing?
6. Have you ever met any difficulty(ies) in these singing program?
   If yes, what is it (are they)?
7. What do you feel about the English lesson in school?
8. In general, do you like singing? Why?
9. Have you attended any additional music class beyond the school lesson?
   - If yes,
     - what is it (are they)?
     - How many year(s) have you received this training?

Appendix C: Teacher's Interview Questions

1. Did you enjoy these lessons? Why?
2. What do you feel about teaching English through singing activities?
3. According to your observation,
    - Did your students enjoy the singing activities during the lessons?
        - Why?
    - Did your students encounter any difficulty during the singing activities?
        - If yes, what is it (are they)?
    - After these learning sessions, did your students make any improvement (e.g., in terms of task performance, learning motivation, learning attitude towards English learning, emotion regulation and confidence)?
        - If yes, why it happened?
4. Did you encounter any problem(s) during teaching English vocabularies through singing activities?
    - How did you overcome it (them)?

Coming together: Collaborative efforts toward musical inclusion

Daphne Rickson
Massey University
Daphne.Rickson@nzsm.ac.nz
NEW ZEALAND

This paper describes research in progress which aims to capture the experience of team
members who are working to include disabled young people in a public performance with a professional orchestra. The event involves collaboration between a charitable organization (StarJam), academic staff from a tertiary-level music school, and a city orchestra. Taking a critical ethnographic perspective, the researcher aims to examine the barriers to participation that are potentially created by the social constructs of both disability, and Western art music. Preliminary findings suggest that philosophical and cultural differences between the groups, and practical barriers such as the limitations of traditional orchestral performance spaces, will prevent the fulfillment of the initial vision to have young people included *in* the orchestra. Nevertheless, unique opportunities for them to perform *with* the orchestra, interaction between the adults, and a research process which highlights and prompts reflection on the organizational and rehearsal procedure, will contribute to the development of new perspectives and potentially increase possibilities for future inclusive endeavours.

Background

Various models of 'disability' have emerged over time. The 'medical model' conceptualised disability as a problem or deficit that resides within a person; the 'social model' of disability values diversity, and focuses on enablement and inclusion; and the 'affirmative model' encourages "a non-tragic view of disability and impairment (and) positive social identities" (Swain & French, 2000, p. 569). Regardless of the terminology used, people with disabilities are frequently excluded from political, economic, and cultural life; lack authority, experience powerlessness, and are demeaned by the dominant culture's values[1]. Removing environmental and attitudinal barriers will be essential if persons or groups with distinct needs are to realise their right to participate fully in their communities.

Across a wide range of diverse cultures music making manifests itself as an inherently inclusive activity in which individuals engaged in a common purpose are drawn into larger groups and communities. As ethnographic researchers across a range of disciplines have demonstrated, humans share an intrinsic capacity and desire to respond to and make music together. Those who might be described as having profound disability are therefore also able to respond to and participate in musical activity. In music therapy, the process of making music with others is highly valued; musical improvisation as communication between therapist and participant/s is emphasised more than the musical artefacts that are produced. Nevertheless, music

[1] The term 'disabled' people will be used throughout this paper to reflect the premise that people are disabled by society.

therapists have been cautious about engaging the disabled people they work with in public performances; concerned about the possibility of harmful outcomes associated with negative public scrutiny, and the potential for them to feel exploited or patronised. More recently though, there has been a significant shift towards working with people and their communities. Community music therapists are concerned with social and cultural change; they are musicking community workers who promote social welfare in and through a community (Stige, 2004).

Participation in music is both a human right and a disability right (Lubet, 2011) yet large numbers of disabled people often have to overcome significant barriers in order to be able to engage fully with arts experiences (Creative New Zealand & Arts Access Aotearoa, 2010). Moreover, while some cultures regard music as an activity which is "accessible to and expected of nearly all" (Lubet, 2009, p. 729) in the West a strong focus on musical 'talent' has resulted in exclusion. Deprived of practical musical experience, many people are "too impaired even to attempt to learn music in 'mainstream' programmes… (and) …for students with major physical or sensory impairments, the prospects for active participation in any sort of music programme are, with few exceptions, very grim indeed" (ibid, p. 730). The social construction of what music 'should be' has led many people, with or without 'disabilities', to perceive they are unable to engage in music making without specific training or experience. Many people, not only those who experience physical, cognitive, sensory or other differences, are disempowered and effectively 'disabled' musically (Giordano, 2002; Jeanneret, 2006; Lubet, 2009).

The aim of the current project was to enable (disabled) young people to play in what is arguably the most significant artistic organisation in Western cultures today (Brodsky, 2006), a professional symphony orchestra. It was presumed that the young people would draw on, and contribute to the music that would be created. Opening the traditional orchestral space to disabled young people, some of whom are possibly uninhibited by social norms, might lead to the creation of expressive, innovative musical performances. As Powell (2010) notes, "it is immensely satisfying (not only) to make people feel included; to give the marginalised a voice and creative outlet… (but also) to seek an 'inclusive aesthetic' that feels truthful, almost painfully real - an aesthetic that provides a more accurate reflection of the wonderful spectrum of our human existence, not merely a selective or superficial one" (p.198).

Drawing on critical ethnography, the research focuses on the collaborative orchestra project to 1) examine the existence and/or management of barriers that are created by the social constructs of both disability and Western art music and 2) contribute to understanding and changes in attitude with regard to the inclusion of people with diverse abilities in music activity. Critical ethnographers stress the need for research to focus on emancipation and empowerment of individuals, and acknowledge and accept social responsibility by undertaking research that is normative, practical, and self-reflexive (Stige, 2005). I therefore choose to write in first person prose from this point.

At the time of writing, the performance is twelve days away. This paper presents tentative preliminary findings from first interviews undertaken with key informants (workshop tutor, Jim; CEO of StarJam, Julie; conductor, Marc; composer, Stephan; and soloist, Jenny) who reflected on the process thus far. Key informants

who are available, i.e. Stephan, Jenny and Jim, will also contribute to a panel discussion, facilitated by me, at a professional 'music therapy and related disciplines' conference which will be held two days after the performance[2]. With informed consent, their reflections will be included as a data source in the on-going research. Interviewees who are unable to participate in the panel discussion will be interviewed a second time. Orchestra members, parents of Jammers, and the Jammers themselves have also been invited to be interviewed, but as yet no expressions of interest have been received.

Preliminary Findings

A unique opportunity to participate

Open Waters (Prock, 2004) is an orchestral piece which invites the contribution of disabled people and gives them a unique opportunity to participate in 'high level' musical experience. The current project began with discussions between the composer and a charitable organisation, StarJam, about creating possibilities for its New Zealand premiere.

StarJam offers disabled children opportunities to build confidence and "character" through musical performance. The 'Jammers' as they are known, enroll in regular workshops to develop specific skills in singing, guitar, drumming, or dance, before coming together to perform in a relatively high profile end-of-year public show. An 'orchestral' workshop series was new to StarJam; and due to time constraints they specifically recruited a group of young people from a learning support unit at a local high school to participate in the orchestra. Staff and parents agreed that all fourteen boys who attended the unit would have the opportunity to be involved in what has become known as the 'Orsum Orchestra.'

> *What I think is important about this event is the opportunity for kids and their families to do something they never dreamt would be possible. Most people, unless they were very talented musically would never dream that they could play with an orchestra. …The Orsum Orchestra provides a particular opportunity which is not usually available even to typical kids (Julie).*

Creative Responses

The boys were transported, by staff and parents, to the NZ School of Music for five 'weekly' workshops facilitated by StarJam tutors. Workshops began eight weeks prior to the performance; but with intervening school holidays, only five workshops eventuated. During the workshops Jammers engaged in various musical activities in addition to listening and responding to a previous recording of *Open Waters*. While suggestions have been made on the orchestral score, the concept of inclusion is mirrored in the composition which aims to provide as much space as possible for improvisation and for creative engagement with the piece, without the composer dictating what would happen. He considers the piece less as a 'work' whose integrity is contained in what is written down, and more as a frame for allowing the possibility of creative expression.

[2] The researcher/author is a Registered Music Therapist.

During workshops, members of the Orsum Orchestra used simple percussion instruments, movement, and coloured cloth which they waved or wore as they danced; and at school they made a jelly-fish costume, 'shark fins' to wear or hold as props, and ribbon sticks to wave in response to the music. Jim, who is also a music graduate, believes that people's capacity for creative response is not impeded by their 'supposed' disabilities. While he was initially uncertain and somewhat sceptical about what to expect from the young people, he soon became excited by their musical responses.

> *…I am genuinely beginning to feel, in terms of the creative responses of the boys who are involved, that it will be a valid and interesting performance of artwork. I really don't think that there is necessarily any limitation. …I found one of the boy's interpretations of the musical narrative was incredibly charismatic, engaging and interesting. …I'm really fascinated by their idea of incorporating movement and dance into it for example. (They will be) really challenging the traditional ways that people conceive of an orchestra (Jim).*

Barriers to a Vision

Meanwhile, the project morphed as various philosophical and practical barriers were encountered. Firstly, while Stephan had initially envisaged children with disabilities would be collaborating with other children as well as with the orchestra, StarJam is committed to providing support for disabled children only. StarJam administrators have historically engaged in "robust conversations" about including typically developing young people in their programmes, especially siblings, but felt unable to consider doing this while they had young people with disabilities on their waiting list.

> *That's not our focus, our purpose, our vision, or our mission really. …In the past I have said if we got masses of requests from typical kids, we would have succeeded because that would suggest that it's 'cool' to be disabled. But we don't get those requests. We wouldn't consider it while we have such a huge demand from kids who don't have any other opportunities (Julie).*

Secondly, Stephan aimed to challenge the tradition of having an orchestra on stage separated from 'others'. Instead the 'audience' would be on the same level as the orchestra, invited to actively contribute improvised music as the performance unfolds. In contrast, StarJam shows aim to replicate the more traditional sorts of stage performance opportunities that disabled children normally don't have. As *Open Waters* would now be performed during a StarJam end-of-year show, the vision turned to having the orchestra, with the Jammers, on stage. The Orsum Orchestra would be part of the symphony orchestra.

However, finding a venue which had adequate back stage space for approximately 50 young people who participate in StarJam shows and their carers; a quiet space where young people with autism can wait; a preparation and storage room for orchestral instruments; and so on, was difficult. Eventually the St James theatre, built in 1912 and home to the New Zealand ballet, was agreed upon. However, while the stage is deep, StarJam's vision to have all the Jammers on stage during the finale

meant positioning the orchestra too far back, adversely affecting acoustics. The decision was made to put the orchestra in the pit, creating a more conventional performance scenario.

Nevertheless, despite the transformation of the project, participants continue to be excited about the possibilities. Marc explains:

> *"One of the exciting things really was that the kids would be performing with us on stage, playing in the orchestra, or around the orchestra. We have decided to go into the pit, because of sonic issues in the theatre. But the children are still being included by performing with the orchestra. Physical proximity is not the only indicator. I take the analogy of a dancer or opera singer… if they're on the stage and the orchestra is in the pit, they'd still be performing with the orchestra (Marc).*

Inclusive orchestras

Lin (2008) highlights the challenges that symphony orchestras have encountered over the past decades in maintaining and developing audiences and suggests adaptations to programming and marketing will be necessary, and connecting with new communities will be important.

> *….Speaking on behalf of my colleagues, we're really thrilled to be doing this. Orchestras are expensive beasts and a lot of people would argue they cater only to a very small, elite and well-off part of the population. I think that's a mistake - orchestras can be there for everyone (Marc).*

> *I was talking to (another) artistic director about what I was doing next and when I told him about this project he became really interested. He thought it was exactly the sort of thing he would like to do …finding a new way for the orchestra to reach out to new audiences (Jenny).*

The opportunity that is being afforded to the Jammers might also be afforded to typically developing young people. Stephan suggested it might be difficult for small professional orchestras to undertake community work, but larger organisations might be able to excite and invigorate communities by providing new experiences.

> *It's looking towards the long term future of how the orchestras interact with the wider community especially in terms of children (Stephan).*

Artistic Value and Potential Audiences

Interviewees believe that the project will have artistic value. Orchestra members, if they are able to disregard some of the etiquette and socio-cultural norms that they will be familiar with, will benefit through having the opportunity to connect musically with diverse musicians. The soloist expects to be excited and uplifted by the interaction, and by the 'totally honest' responses that she has experienced from children with disabilities.

However, while aiming for it to be a much wider group; interviewees also all agreed that the most likely audience for the show will be family, friends, and supporters of the performers.

> *I think this is of great artistic benefit to the kids in particular because they will be performing music, emoting through music, and doing so with a professional orchestra, which is sort of out of the ordinary experience of any amateur musician. …I suspect the children's responses might be valued in a different way, more for the community spirit of the whole thing, but that's not to negate the artistic contribution of the kids whatsoever. How the audience understands it can be quite different to the way the performers understand it. In every performance artistic content is only part of it. It's intriguing because it's unique. …Artistic value and "bums on seats", audience numbers, are quite often mutually exclusive (Marc).*

Participants had various thoughts about whether or how much the diversity of the performers might be emphasised when marketing the show. StarJam would tend to emphasise the disabled children's contribution because they want to acknowledge they have "overcome some major challenges" to perform on stage. However, they also frequently involve celebrities in their shows not only because the kids feel 'cool' working alongside them, but also to seduce audiences to come and see a show that they would otherwise never consider.

> *We're about changing people's attitudes towards people with disabilities, and we use the stage as a platform for that, in a way exploiting the kids...* (but) *it's about providing a source of inspiration and through that people's attitude changes.*

Stephan suggested it would be important to use the orchestra as a draw card also "so more people will see that there is potentially something in it for them too." However, Jenny has noticed that audiences made up predominantly of family and friends can be exciting to sing for, since they readily communicate their enjoyment and appreciation for the performance. Often, more traditional subscribed concerts can have smaller audiences.

> *It's frustrating really because those audiences don't tend to cross over as much as they could do…. I think (the StarJam concert) is the sort of thing that would be of interest to a wider audience, but there would barriers to get over perhaps, preconceptions about what the form or level of the performance might be.*

Jim agreed that audiences would, in part, be open to the performance while suggesting that there might be "a kind of caveat" to it. Because the young people are presumed to have disabilities, people might have a level of disconnection in in terms of their expectations.

> It would be really interesting if there were to be no mention of people with disabilities in the advertising material. Is that even relevant? Would it shape the way people perceive the event? I really think it would. I don't see it as

relevant. I don't see their learning impairments as important in this regard" (Jim).

Anticipated Outcomes

Having already experienced two performances of the work in the USA, Stephan, like Julie, observed the importance of involving as diverse an audience as possible so the wider community can see what is possible and worthwhile.

> *It was meaningful for all the participants. Seeing the emotional impact that the performance had on both the participants and the observers was really meaningful to me because it highlighted a significant and deep connection between everyone who was involved and that was really gratifying (Stephan).*

> *(This) has been something I've wanted to do, and I'd like it to be an annual event. In my fantasy I'd like this to be a huge success, and something that the orchestra might be able to find funding for in future (Marc).*

Summary

Disabled people are confronted with barriers created by the dominant majority who are unable or unwilling to conceptualise 1) the potential of diverse individuals and 2) different ways of thinking about or experiencing music. Differing narratives about how inclusivity might be achieved emerged in these preliminary findings. Nevertheless, the collaborators believe that the process of diverse musicians practicing and performing an orchestral work has the potential to challenge stereotyped portrayals of disability, change attitudes, and foster the on-going inclusion of people with diverse abilities. Young people with disabilities who are involved are developing their musical identities and demonstrating the potential to offer a meaningful contribution to an orchestral performance. Team members believe that innovative projects such as this have the potential to challenge the way in which people conceive of an orchestra, to encourage wider audiences to orchestra events, and to increase interaction between orchestras and all young people, not only those who identify as 'disabled'. However, traditional orchestral theatres pose limitations for such projects; innovative projects will require innovative performance spaces.

References

Brodsky, W. (2006). In the wings of British orchestras: A multi-episode interview study among symphony players. *Journal of Occupational and Organisational Psychology, 79*, 673-690.

Creative New Zealand & Arts Access Aotearoa (2010). *Arts for all: opening doors to disabled people*. Wellington: Creative New Zealand.

Lin, P. Y. (2008). *Challenges of developing audiences for symphony orchestras in the 21st century.* University of Akron.

Lubet, A. (2011). Disability Rights, Music and the Case for Inclusive Education. *International Journal of Inclusive Education, 15*(1), 57-70.

Powell, M. (2010). Inclusion: The Inclusive Aesthetic - Inclusion Is Not Just Good for Our Health, It Is Good for Our Art. *Local-Global: Identity, Security, Community, 7*, 198.

Stige, B. (2004). Community Music Therapy: Culture, Care and Welfare. In M. Pavlicevic & G. Ansdell (Eds.), *Community Music Therapy*. London: Jessica Kingsley Publishers.

Stige, B. (2005). Participatory Action Research. In B. L. Wheeler (Ed.), *Music Therapy Research* (2nd ed., pp. 404-415). Gilsum, NH: Barcelona Publishers.

Swain, J., & French, S. (2000). Towards an affirmation model of disability. *Disability and Society, 13*(4), 569-582.

Effects of age level and gender on emotional response to musical and visual stimuli using a two-dimensional mood scale

Wei-Chun Wang
National Taiwan University of Science and Technology
vgnwang@hotmail.com
TAIWAN

Keywords: Emotional response, Two-dimensional mood scale, Musical and visual stimuli, Age, Gender

Music has the marvelous power to arouse different moods and emotions that often deeply affect the development of the listener's brain, body, and feelings. With joining music with visuals, a multisensory experience can be constructed. Several recent multisensory studies have revealed the influence of aural perception on visual processing. This study was conducted to survey the effects of age level and gender on (a) emotional responses when experiencing music and videos; (b) to investigate the influence of music on visual perceptions; and, (c) to explore the relationship between musical elements and emotional responses.

Fourteen stimuli in combinations of two silent videos and four musical excerpts were used. These were evaluated by 35 seniors (6 males and 29 females) and 55 undergraduate students (12 males and 43 females). They rated their two-dimensional mood, happy-sad and calm-arousal, on five-point Likert scales and described the images evoked by or in association with the stimuli. Video 1 was about a departing train. Video 2 consisted of nature scenes. Music 1 and 2 were incidental music. The former, faster "Clear sky" was in rock style and the latter, slower "Feel the wind" was in new age style. Music 3 was the beginning of Vivaldi's 1st movement of Spring from "Four Seasons." Music 4 was the theme of the 2nd movement from Dvorak's Symphony "New World."

Emotional responses to the stimuli varied. For example, when both music and video were presented, the former dominated. The calm emotions of the videos were overwhelmed by either the strong rhythmic patterns or fast passages in Music 1 and 3. The combination of either of the videos with music 4 was rated much sadder than sorely presented with either the video or the music. Verbal comments revealed an association with homesickness. The departing train on Video 1 could be interpreted as sentimental separation or a happy trip depending on the characteristics of the music. Age or gender effect can be found in some combinations of videos and musical excerpts, in particular for happy-sad scale. For the calmer stimuli, the seniors felt happier than the undergraduate students. This might be attributed to the seniors' rich life experiences and their participating in a choir. Findings provide support for music educators, psychological counselors, and musical therapists who work with older populations.

Because of the differences in timbre, pitch, melody, and rhythm, music has the marvelous power of arousing various moods and emotions. The emotional experiences constructed when listening to music often deeply affects the developments of the listener's brain, body, and feelings. With visual joining, the multisensory experience can be constructed. Scriabin's and Kandinsky's artistic works

were based on involuntary experiences of a cross-modal association. Several recent multisensory studies show that sounds can influence visual processing. The purposes of this study were to: (1) survey the effects of age level and gender on emotional responses, happy-sad and calm-arousal, when appreciating music and videos; (2) investigate the influence of music on the visual perceptions; and (3) explore the correlation between musical elements and emotional responses aroused by the music.

Literature review

Music induce emotion

Music scholar Price (1986) defines emotion as "general affective reaction encompassing the feeling states." Fischer, Shaver, & Carnochan (1990) state the emotion as "complex functional wholes including appraisals or appreciations, patterned physiological processes, action tendencies, subjective feelings, expressions, and instrumental behaviors." (p. 85). A number of studies have examined people's subjective reports, adjective ratings, physiological responses, or nonverbal expressions as they listen to various musical compositions and found a high degree of agreement on what particular emotions are elicited by a given musical selection (Boltz *et al.*, 2009, 43). Additionally, the psychophysiologic studies of Altenmuller *et al.* (2002) and Krumhansl (1997) have proved that music is a powerful elictor of emotions by physical measurements.

The acoustical characteristics of music composition that induce particular emotions were concluded by the researchers. For example, sad melodies tend to be characterized by a slow tempo, lower amplitude, minor mode, and a narrow pitch range in the lower octaves; happy melodies tend to be characterized by faster tempo, higher amplitude, and wider pitch range (Boltz *et al.*, 2009; Gabrielsson & Lindstrom, 2001; Hevner, 1935a, 1935b; Juslin, 1997; Scherer & Oshinsky, 1977). Among the various factors specifying mood in the auditory modality, tempo appears to be the most influential (Gabrielsson & Lindstrom, 2001).

Emotional Model

There are emotional models developed to measure the emotional response. Hevner's Adjective Checklist (1935) (Figure 1) is the first model to evaluate the emotions. Russell's Circumplex Model of Affect (1980) posits emotions in a two-bipolar- dimensions of pleasure and activity (Figure 2). Thayer (1989) proposed a two-dimensional mood model, where one dimension is energy and a second dimension is stress (Figure 3).

Figure 1. Hevner's Adjective Checklist

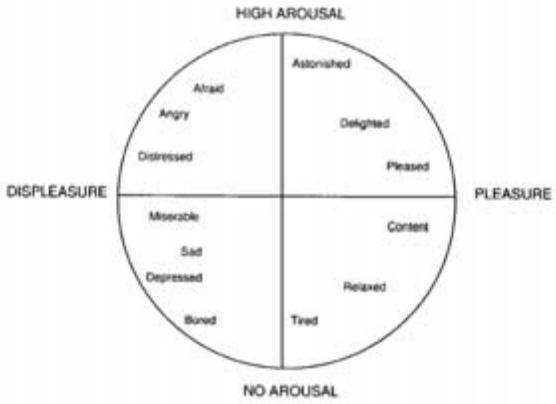


Figure 2. Russell's Circumplex Model of Affect

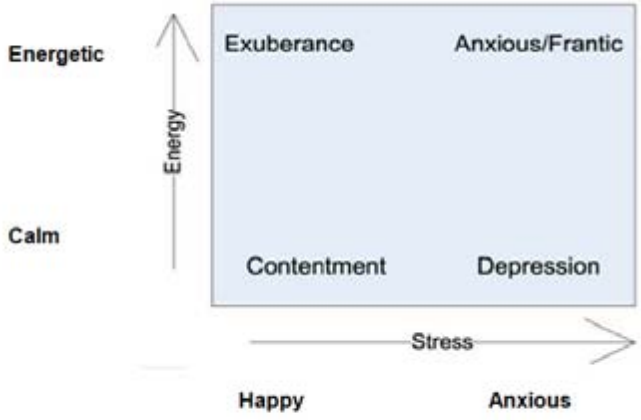


Figure 3. Thayer's two-dimensional mood model

The Influence of Music on the Experience of Visual Information

Music is widely used to enhance the emotional impact of movies. Association of music often influences the interpretation of the image of video (Baumgartner *et al*., 2006). Previous studies have demonstrated that music can influence both the perception and memory of visual scenes (Cohen, 1990; Magliono *et al.*, 1996). When viewing a film, music influences the emotional impact of scenes, and the emotive meaning of the music provides an interpretative framework for story comprehension, even to clarify the character's actions and imply his or her motivation (Boltz, 2001; Bullerjahn & Guldenring, 1994). The information highlighted by the music also integrates as memory code that enhances a later recall of the film (Boltz, 2009). The study of Baumgartner et al. (2006) which examines of visual and musical stimuli on brain processing has proved that music can enhance the emotional experience evoked by affective pictures.

The Influence of Visual Information on the Processing of Music

A debate occurred in the 1980's when music video was popular. Some scholars considered that music video would limit the listener's imagination (Zorn, 1984), while others claimed that videos would reveal the song's intended meaning (Sun & Lull, 1986). Goldberg *et al.* (1993) found videos could maintain listener's interest and open to multiple interpretation. As for the musical performance, previous studies found that the evaluation of musical performances in the audiovisual presence was rated as higher than in the presence of audio alone (Cassidy & Sims, 1991; Wapnick, Mazza, & Darrow, 1998; Ryan & Costa-Gioni, 2004). Regarding educational application, the finding of Geringer, Cassidy, & Byo's study (1997) indicates that music appreciation would be enhanced by visual information.

Audiovisual perception

According to Fahlenbrach (2005) audiovisual perception as two conditions. First, acoustic stimuli are perceived initially *temporally*, whereas visual stimuli are initially perceived *spatially* (cf. Chion 1994, 11). Second, acoustic processing is much faster than visual processing, because the gestalt patterns of acoustic stimuli are immediately recognized, whereas the visual gestalt patterns are perceived in a holistic manner, so that it takes more time to discern them (Fahlenbrach , 2005, 8). Because sound is processed faster than the image and perceived temporally, it has a big influence on the perception of temporal structures in the images shown.

Gender difference

Lacher (1994) examined the influence of gender on the creation of hedonic responses to new music. Results revealed that males tended to have a stronger analytical response and females a stronger sensorial response. Most researches examining the musical emotions by psychological measurement agree that there is no significant difference between male and female. However, in the study of Nater *et al* (2006), women tend to show hypersensitivity to aversive musical stimuli. Whereas psychological variables did not differ by gender, results of electrophysiological measures indicate significantly different reactivity patterns between men and women (Nater *et al*, 2006; Robazza *et al*, 1994; Sopchak, 1955). Koelsch, Maess, Grossmann

and Friederici (2003) investigated music processing through EEG and ERPs and discovered gender differences. Findings showed that females process music information bilaterally and males process music with a right-hemispheric predominance. Koelsch, Grossman, Gunter, Hahne, Schroger and Friederici (2003) found a developmental effect as early negativity is lateralized in the right hemisphere in men and in the left hemisphere in boys, but found a bilateral effect in girls.

Difference in various age levels

There are some findings of adults and children's emotional response to music in previous studies. Children aged 7 to 9 could accurately describe the same four emotions from musical excerpts (Dolgin and Adelson, 1990), but the ability to recognize the correct emotions increases with age (Terwogt & van Grinsven, 1991). In Wang's study (2004), children, ages 6 to 10, were similar to adults in theor ability to interpret discrete emotions by matching music to facial expressions.

One common idea is that elderly people prefer slow, quite music to more upbeat, lively music (Davis *et al,* 1999), but the findings of Gibbon's study (1977) show otherwise: elderly people enjoy stimulative music as much or more than quiet music. In addition to the music from their young adult years, older people appreciate other music of styles and periods, such as religious music, classical music, folk tune, country music, and jazz music (Gibbon, 1977; Hanson *et al*, 1996; Jonas, 1991). There is no consensus on the elders' emotional response to music. Therefore, to better understand the subjective responses to music, the population of seniors need be explored.

Method

Participants

Thirty-five seniors (6 males and 29 females) and fifty-five undergraduate students (12 males and 43 females) participated in this study. Seniors, ages 55-72, were recruited in a community choir directed by the investigator. The undergraduate students between, ages 18-21, studying integrated arts degree were recruited in the introduction of music class taught by the investigator.

Instruments

Two-dimensional Mood Rating Scale. Based on Russell's Circumplex Model of Affect (1980) and Thayer's *two-dimensional model* of mood (1989), a revised rating scale in a two-dimensional scale of happy-sad (1-5) and calm-arousal (1-5) was designed by investigator to examine the emotional response to perceived aural and visual stimuli. Except the 5-point Likert mood rating scale, there were open questions asking about participants' images evoked by or associations with the stimuli.

Stimuli

Fourteen stimuli consisted of combinations for two silent videos and four musical excerpts (V1, V2, M1, M2, M3, M4, V1+M1, V1+M2, V1+M3, V1+M4, V2+M1, V2+M2, V2+M3, V2+M4). Each stimulus was about 30 seconds. Two video were originally shot to test the color developing of monitor. Thus, they were slow-

moving scenes, and not story-telling. Video 1 (V1) was about a local train departing from a station.

Video 2

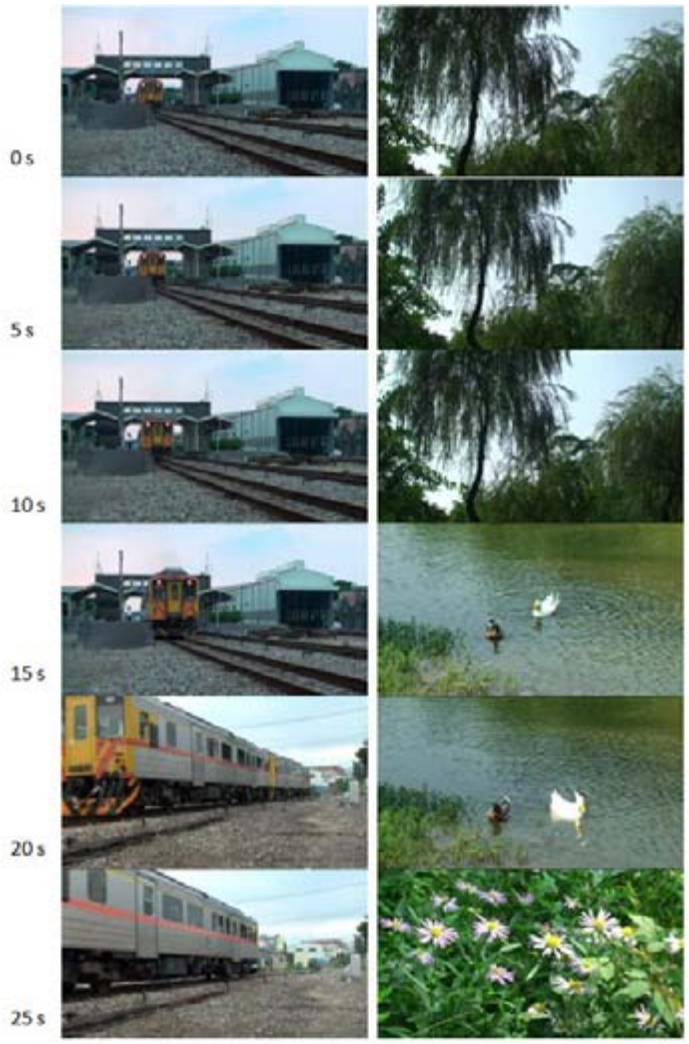


Figure 4. Snapshots taken every 5 s from the two video clips

(V2) was scenes composed of nature with dragging branches and leaves of willow, a pair of dabbling mandarin ducks, and daisies in clusters (see Figure 4). Music 1 (M1) and Music 2 (M2) were excerpted from the incidental music of Japanese television series *Change*. M1, *Clear sky,* was in rock style with a faster tempo with strong rhythmic patterns played by an electronic guitar and jazz drums. M2, *Feel the wind,* was new age style in slow speed. This melodic theme was played by solo clarinet and accompanied by piano. Music 3 (M3) and Music 4 (M4) were excerpted from classical music. M3 was the beginning part of Vivaldi's 1st movement of *Spring* from *Four Seasons.*This example had a steady tempo, lively melody, and was played by strings. M4 was the slow and sentimental theme from the 2nd movement from

Dvořák's *New World Symphony*, played by English Horn and few orchestra instruments. The features of four excerpts were shown in Table 1.

Table 1

Features of Four Musical Excerpts

	Music 1	Music 2	Music 3	Music 4
Repertoire	*Clear sky* from Japanese TV series *Change* (2008)	*Feel the wind* from *Change* (2008)	1st movement of *Spring* from *Four Seasons* (1723)	2nd movement from *New World Symphony* (1893)
Composer	Teruyuki Nobuchika	Teruyuki Nobuchika	A. Vivaldi	A. Dvořák
Tempo	♩ = 108	♩ = 96	♩ = 95	♩ = 69
Style	rock	new age	classical	classical
Timber	electronic guitar & jazz drums	solo clarinet accompanied by piano arpeggio	Strings & cembalo	English Horn with few orchestra instruments
Other musical features	strong rhythmic patterns	The duration of each note in the melody line is long.	The duration of each note in the lively melody is short.	The duration of each note in the sentimental melody is long.

Procedure

Ninety volunteered participants were invited to an audiovisual studio. This noise insulating facility used high-quality audiovisual equipment. Participants appreciated 14 excerpts with musical, visual, or combination of musical and visual stimuli. The duration of each excerpt was about 30 seconds. The broadcasting order of the 14 stimuli was M1 only, M2 only, M3 only, M4 only, V1 only, V2 only, V1+M1, V1+M2, V1+M3, V1+M4, V2+M1, V2+M2, V2+M3, V2+M4. Participants appreciated each stimulus about 30 seconds and simultaneously rated their 2-dimentional moods, happy-sad and calm-arousal, induced by the stimulus on 5-point Likert scales, and wrote their images evoked by or associations with the stimulus. The collected data was analyzed.

Results of Data Analysis and Discussion

Overall of 2-dimentional mood values

The average 2-dimentional mood values (calm-arousal, happy-sad) of 14 stimuli respectively were shown in Table 2 and Figure 5.

Table 2

The 2-dimentional mood values of 14 stimuli

	M1(4.13, 1.47)	M2(1.52, 2.84)	M3(3.50, 1.52)	M4(1.37, 3.57)
V1(2.13, 3.33)	V1+M1 (3.87, 1.73)	V1+M2 (1.77, 3.14)	V1+M3 (3.62, 1.94)	V1+M4 (1.87, 4.16)
V2(1.47, 2.22)	V2+M1 (4.11, 1.71)	V2+M2 (1.66, 2.58)	V2+M3 (3.76, 1.82)	V2+M4 (1.71, 3.84)

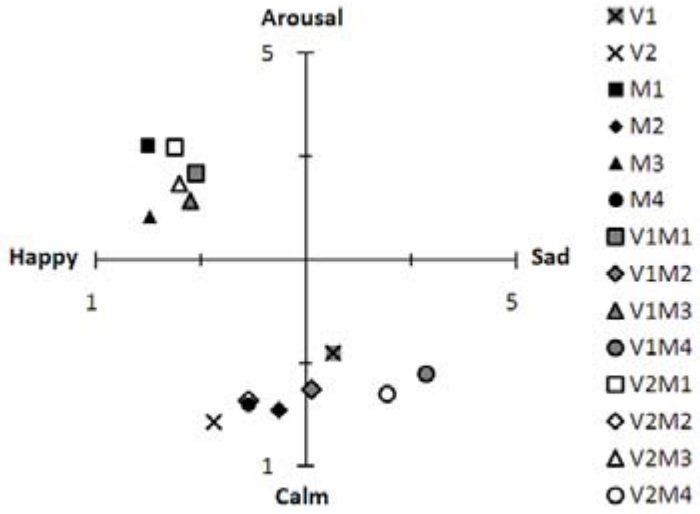


Figure 5. The 2-dimentional mood value of 14 stimuli

The emotional responses of all stimuli covered most area of the two-dimensional scales except the corner rated as sad and arousal. The responses were distributed on the happy-sad scale but were separated to two clusters on the calm-arousal scale.

When playing alone, the two videos were considered to be rather calm. This might be attributed to the static contents they conveyed. Video 2 with nature scenes was regarded as happier than Video 1 while the latter was relatively neutral on the happy-sad scale. The four music excerpts covered a broad range of responses on the calm-arousal scale. Music 2 and 4 were relatively calm while the others were strongly energetic. All of them leaned towards happy side on the happy-sad scale.

The findings of presenting both music and video were listed as follows:

1. Music had a major influence on visual perception. The influence of the visual stimuli on music perception was much smaller.

2. For the dimension of calm-arousal, the two arousal music excerpts, Music 1 and 3, dominated the participants' emotional perceptions for the combination with both

videos. The calm emotions of the videos were overwhelmed by either the stronger rhythmic pattern or fast passage of the two music excerpts. Both videos with the calm music excerpts, Music 2 and 4, were felt as calmer than video only.

3. For the dimension of happy-sad, when Video 1, the departing train, was paired with the rhythmic music, M1 and M3, happiness was induced by the projection of travel. When paired with the still and show music, Music 2 and 4, the image of departing train was interpreted as sad separation. The nature scenes in Video 2 evoked mild joyfulness. The joyfulness dramatically turned into desperation as the video was combined with the sentimental Music 4, 2nd movement of *New World Symphony*, owing to the association of doom or homesickness.

Gender Comparison. Descriptive data for the variable of gender was shown in Table 3. Similar to the finding of Nater *et al* (2006), the data in this study indicates that women tend to show hypersensitivity to musical stimuli.

Table 3

The 2-dimensional mood values of 14 stimuli by gender

	Calm-arousal		Happy-sad	
Variable	Male *M(SD)*	Female *M(SD)*	Male *M(SD)*	Female *M(SD)*
V1	2.39 (1.04)	2.07 (1.14)	3.17 (.99)	3.38 (1.30)
V2	1.67 (.84)	1.42 (.69)	2.56 (.70)	2.14 (1.10)
M1	4.28 (.75)	4.10 (.79)	1.56 (.78)	1.44 (.69)
M2	1.72 (.83)	1.47 (.67)	2.94 (1.06)	2.82 (1.09)
M3	3.22 (.88)	3.57 (1.25)	1.61 (.70)	1.50 (.87)
M4	1.33 (.59)	1.38 (.59)	3.89 (.58)	3.49 (1.34)
V1M1	3.78 (1.06)	3.89 (1.22)	1.94 (.87)	1.68 (.92)
V1M2	1.72 (.75)	1.78 (.92)	3.44 (.98)	3.07 (1.41)
V1M3	3.67 (.91)	3.61 (1.12)	2.06 (.80)	1.92 (.92)
V1M4	1.94 (1.11)	1.85 (1.08)	3.94 (.94)	4.21 (1.02)
V2M1	3.83 (.99)	4.18 (.95)	2.00 (.97)	1.64 (.92)
V2M2	1.94 (1.26)	1.58 (.71)	2.33 (1.03)	2.64 (1.24)
V2M3	3.39 (.85)	3.85 (.93)	2.00 (.91)	1.78 (.83)
V2M4	2.06 (1.00)	1.63 (.86)	3.83 (1.04)	3.85 (1.24)

Age Level Comparison. Descriptive data for the variable of age level was shown in Table 4.

Table 4.

The 2-dimensional mood values of 14 stimuli by age level

	Calm-arousal		Happy-sad	
Variable	Senior *M(SD)*	University students *M(SD)*	Senior *M(SD)*	University students *M(SD)*
V1	1.91 (1.09)	2.27 (1.13)	2.97 (1.54)	3.56 (.96)
V2	1.20 (.41)*	1.64 (.82)*	1.74 (.95)	2.53 (1.00)
M1	3.97 (.92)	4.24 (.67)	1.63 (.84)	1.36 (.59)
M2	1.66 (.94)*	1.44 (.50)*	2.31 (1.13)*	3.18 (.90)*
M3	3.06 (1.49)*	3.78 (.85)*	1.51 (1.07)	1.53 (.66)
M4	1.40 (.69)	1.35 (.52)	3.00 (1.48)*	3.93 (.90)*
V1M1	3.69 (1.35)	3. 89 (1.06)	1.86 (1.03)	1.65 (.82)
V1M2	1.66 (.80)	1.84 (.94)	2.66 (1.55)	3.45 (1.09)
V1M3	3.34 (1.37)	3.80 (.80)	1.74 (1.04)	2.07 (.77)
V1M4	1.97 (1.15)	1.80 (1.04)	4.14 (1.14)	4.16 (.92)
V2M1	3.94 (1.19)	4.22 (.79)	1.97 (1.18)	1.55 (.72)
V2M2	1.57 (.88)	1.71 (.83)	1.91 (1.10)**	3.00 (1.07)**
V2M3	3.63 (1.09)	3.84 (.81)	1.69 (.90)	1.91 (.80)
V2M4	1.63 (.97)	1.76 (.86)	3.51 (1.54)	4.05 (.87)

$p < .05$*, $p < .01$**

The seniors and undergraduate students' images evoked by or associations with the stimulus were stated on the Table 5.

Table 5.

Participants' images and associations with the stimulus

	Association or Image of undergraduate student	Association or Image of senior
Music 1: Clear sky	happy, lively, sunny, young, band,	Party, young, zealous, happy
Music 2: Feel the wind	Graceful, tranquil, sad, gentle mother, Zen master	Positive, such as tranquil, leisurely
Music 3: Spring I	Pastoral, Joyful, spring	Dancing, Pastoral, vital

Table 5.

Participants' images and associations with the stimulus

	Association or Image of undergraduate student	Association or Image of senior
Music 4: New world II	Warm, serene, sad homesick, end of the day's classes	Homesick, hometown, lullaby
Video 1: Train	Most Negative, such as sorrow of parting, lonely; Less positive such as Joyful travel	Hometown, childhood
V1+M1	Joyful, expected, travel, new life, move on	Joyful journey, leave hometown to strive
V1+M2	Leave calmly, cannot bear to part, unpredictable future	Travel serenely
V1+M3	Excited, cheerful	Excited, travel
V1+M4	The sorrow of parting, the end, sorrow	Sad separation, family member passed away
Video 2: Nature Scenes	Most positive such as leisurely, calm, relaxing; less negative, such as sad, sorrow	All Positive
V2+M1	Playful, brave, youthful	Sprouting, bustling summer, youthful
V2+M2	Positive, such as relaxing, carefree; negative, such as light sorrowful, lovelorn	Balanced, leisurely, retired placid life, sweet couple
V2+M3	Spring, vital, dance with nature	Spring, family trip, dating
V2+M4	Tranquil retired life, mourning, earth is going to be destroyed	Meditative, poetic

Findings from the synthesis of quantitative results with verbal descriptions were as follows:

1. When happiness or other positive emotions were induced, subjects often associated stimuli with nature scenes, such as seashore, sandy beach, grassland, and forest. In addition, close relationship, such as the reunion with friend and family, and returning to hometown, were stated.

2. When sadness or other negative emotions were elicited, subjects often associated stimuli with frustrated relationship with parents, son or daughter, lover. Soldiering, separation, conflict, and death were also noted.

Emotion of calm-arousal. A two-way between subjects analysis of variance (ANOVA) was performed with gender (male vs. female) and age level (senior vs. undergraduate student) factors, in order to examine the two effects and their interactions on the values of calm-arousal for each excerpt. There was a significant effect of age level on calm-arousal value for Music 2, *Feel the wind*, $F(1, 86) = 4.31$, $p = .04$. The undergraduate students felt calmer than seniors ($M_{senior} = 1.66$ and $M_{under} = 1.44$). Seniors felt comfortable with the slow tempo and long phrases of Music 2

which match the pace of their retired life. Conversely, for those young people who are used to faster pace, Music 2 seemed extraordinary calm. There was a significant effect of age level on calm-arousal value for Music 3, Vivaldi's *Spring I*, $F(1, 86) = 4.60$, $p = .04$. The seniors felt less arousal than undergraduate students ($M_{senior} = 3.06$ and $M_{under} = 3.78$). There was a significant effect of age level on calm-arousal value for Video 2, nature scenes, $F(1, 86) = 5.55$, $p = .02$. The seniors felt calmer than undergraduate students ($M_{senior} = 1.20$ and $M_{under} = 1.64$).

Two videos with various music excerpts on calm-arousal ratings are shown in Figure 6 & 7, respectively. The tendencies of four groups' ratings were similar.

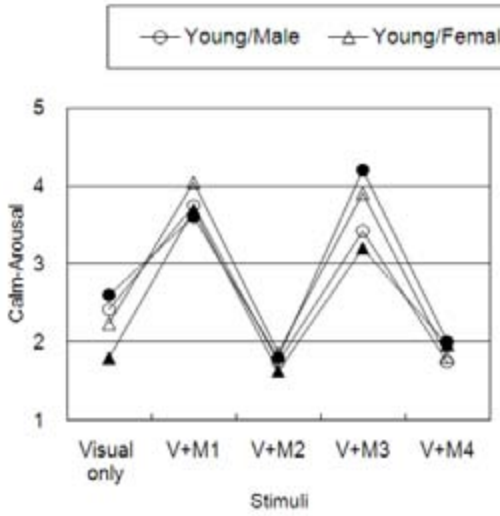


Figure 6. V1 with various music on calm-arousal ratings

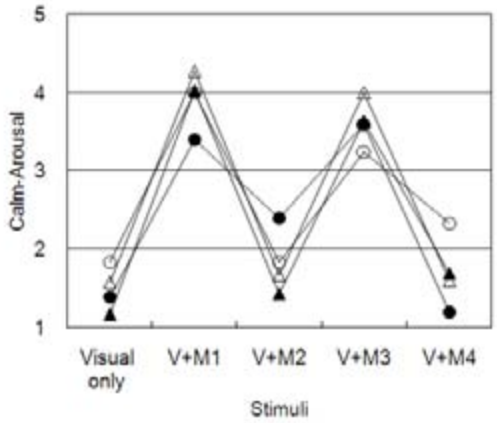


Figure 7. V2 with various music on calm-arousal ratings

There was no significant effect of gender on calm-arousal value for each stimulus. There was a significant interaction between gender and age level on calm-arousal value for Except 9 (V1M3), $F(1, 86) = 6.73$, $p = .01$. The means for calm-arousal value by gender and age level are shown in Table 6.

Table 6.

Calm-arousal Value by Gender and Age Level for Excerpt 9 (V1M3)

Variables	Senior		Undergraduate Student	
	M	*SD*	*M*	*SD*
Male	4.17	.41	3.42	1.00
Female	3.17	1.44	3.91	.72

For the combination of Vivaldi's *Spring I* and Train image, male seniors (M = 4.17) and young ladies (M = 3.91) felt rather arousal; it may due to the association with a cheerful journey they stated. Comparing with rock music, boys (M = 3.42) felt not so excited about the classical music. Most elderly ladies in the choir (M = 3.17) considered classical music solemn, thus the arousal emotion were neutralized.

Emotion of happy-sad. A two-way, between subjects analysis of variance (ANOVA) was performed with gender (male vs. female) and age level (senior vs. undergraduate student) as the factors, to examine the two effects and their interactions on the values of happy-sad for each excerpt. There was a significant effect of age level on happy-sad value for Music 2, $F(1, 86) = 6.18$, $p = .02$. The undergraduate students felt slight sad, while the seniors felt slight happy ($M_{senior} = 2.31$ and $M_{under} = 3.18$). There was a significant effect of age level on happy-sad value for Music 4, $F(1, 86) = 4.64$, $p = .03$. The undergraduate students felt slight sad, while the seniors felt neutral ($M_{senior} = 3.00$ and $M_{under} = 3.93$). There was a significant effect of age level on happy-sad value for Except 12 (V2M2), $F(1, 86) = 12.57$, $p < .01$. The seniors felt happy, while the undergraduate students felt neutral ($M_{senior} = 1.91$ and $M_{under} = 3.00$). There was no significant effect of gender and interaction between age level and gender on happy-sad value for each stimulus. Two videos with various music excerpts on happy-sad ratings were shown in Figure 8 & 9, respectively.

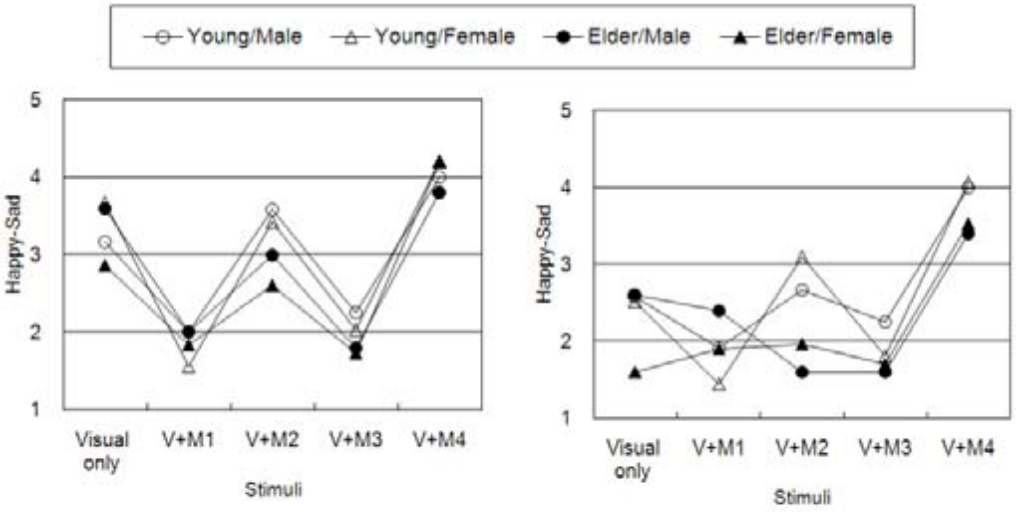


Figure 8. V1 with various music on happy-sad ratings

Figure 9. V2 with various music on happy-sad ratings

Figures 6 & 7 and Figures 8 & 9 showed the results in either calm-arousal or happy-sad scale comparing the four groups. The following findings could be derived:

1. The results of responses were generally dominated by music rather than by video when both stimuli were presented. This phenomenon can be annotated by the subjects' verbal comments. Departing train on Video 1 could be interpreted as either sentimental separation or happy trip depending on the characteristics of the music.

2. All arousal responses were related to lively rhythmic patterns or faster tempi of Music 1 and 3.

3. Elderly people generally enjoyed all music more than young people, corresponding with Hanson's findings in 1996 that elderly population appreciates all kinds of music. For the calmer stimuli, the seniors felt happier than the undergraduate students. This might be attributed to the seniors' rich life

experiences and their participating in a choir. Contrast to seniors' interest of calm music, young male students felt excited and happy whenever rock-style Music 1 displayed.

Conclusion

This study was designed to survey the effects of age level and gender on emotional responses when appreciating music and videos, and to investigate the influence of music on visual perceptions. In this study, the average emotional responses of all stimuli covered most area of the happy-sad and calm-arousal scales except the corner indicating sad and arousal. When both music and video were being presented, the former dominated the emotional responses. The relative calm emotions of both videos were overwhelmed by either the strong rhythmic pattern or fast passage of Music 1, *Clear sky* from Japanese TV series *Change*, and 3, 1st movement of *Spring* from *Four Seasons*. All arousal responses were associated with the two music excerpts. When either video was presented together with Music 4, the 2nd movement from *New World Symphony*, the response was much sadder than sorely presented with either the video or the music. This can be attributed to association with homesickness indicated by verbal descriptions, especially for Video 2 with nature scenes. Music 4 alone was, however, much joyful. Departing train on Video 1 could be interpreted as either sentimental separation or happy trip depending on the characteristics of the music. Age or gender effects can be clearly observed in some combinations of videos and musical excerpts, in particular for the happy-sad scale. For the calmer stimuli, the seniors generally felt happier than the undergraduate students. This might correlate with the seniors' rich life experiences and their participating in a choir. The findings are expected to offer references to music educators, psychological counselors, and music therapists, and to movie –makers in film production.

References

Altenmuller, E., Schurmann, K., Lim, V., & Parlitz, D. (2002). Hits to the left, flops to the right: different emotions during listening to music are reflected in cortical lateralisation patterns. *Neuropsychologia 40,* 2242– 2256.

Cassidy, J. & Sims, W. (1991). Effects of special education labels on peers' and adults' evaluations of a handicapped youth choir. *Journal of Research in Music Education, 39,* 23-34.

Cohen, A. (1990). Understanding musical soundtracks. *Empirical Studies of the Arts, 8,* 111-24.

Baumgartner, T., Esslen, M. & Jancke, L. (2006). From emotion perception to emotion experience: Emotions evoked by pictures and classical music. *International Journal of Psychophysiology, 60*(1), 34-43.

Boltz, M. (2001). Musical soundtracks as a schematic influence on the cognitive processing of filmed events. *Music Perception, 18,* 427-454.

Boltz, M. Ebendorf, B, & Field, B. (2009). Audiovisual interactions: the impact of visual information on music perception and memory. *Music Perception, 27*(1), 43-59.

Bullerjahn, C. & Guldenring, M. (1994). An empirical investigation of effects of film music using qualitative content analysis. *Psychomusicology, 13,* 99-118.

Davis, W., Gfeller, K., & Thaut, M. (1999). *An Introduction to Music. Therapy Theory and Practice*. Dubuque, IA: McGraw-Hill.

Dolgin, K., & Adelson, E. (1990). Age Changes in the Ability to Interpret Affect in Sung and Instrumentally Presented Melody. Psychology of Music, 18, 87-98.

Fahlenbrach, K. (2005). The Emotional Design of Music Videos. Approaches to Audiovisual Metaphors. *The Journal of Moving Image Studies, 4,* 11-24.

Fischer, K., Shaver, P., & Carnochan, P. (1990). How emotions develop and how they organize development. *Cognition and Emotion, 4*, 81-127.

Gabrielsson, A.,& lindstrom, E.(2001). The influence of musical structure on emotional expression. In P.Juslin & J. Sloboda (Eds.), *Music and emotion,* (pp.223-248). Oxford, UK: Oxford University Press.

Geringer, J., Cassidy, J., & Byo, J. (1997). Nonmusic majors' cognitive and affective responses to performance and programmatic music videos. *Journal of Research in Music Education,45,* 221-233.

Gibbons, A. (1997). Popular music preferences of elderly persons. *Journal of music therapy, 14,* 180-189.

Goldberg, M., Chattopadhyay, A., Gorn, G., & Rosenblatt, J. (1993). Music, music videos, and wear out. *Psychology and Marketing, 10,* 1-13.

Hanson, N., Gfeller, K., Woodworth, G., Swanson, E., & Garland, L. (1996). A comparison of the effectiveness of differing types and difficulty of music activities in programming for older adults with Alzheimer's disease and related disorders. *Journal of Music Therapy, 33,* 93-123.

Hevner, K. (1935a). The affective character of the major and minor modes in music. *American Journal of Psychology, 47,* 103-118.

Hevner, K. (1935b). Expression in music: A discussion of experimental studies and theories. *Psychological Review, 47,* 186-204.

Jonas, J. (1991). Preferences of elderly music listeners residing in nursing homes for art music, traditional jazz, popular music of today and country music. *Journal of Music Therapy, 28,* 149-160.

Juslin, P. (1997). Perceived emotional expression in synthesized performances of a short melody: Capturing the listener's judgment policy. *Musicae Scientiae, 1,* 225-256.

Koelsch, S., Grossmann, T., Gunter, T., Hahne, A., Schroger, E., & Friederici, A. (2003). Children processing music: electric brain responses reveal musical competence and gender differences. *Journal of Cognitive Neuroscience, 15*(5), 683–693.

Koelsch, S., Maess, B., Grossmann, T., & Friederici, A. (2003). Electric brain responses reveal gender differences in music processing. *Neuroreport, 14* (5), 709–713.

Krumhansl, C. (1997). An exploratory study of musical emotions and psychophysiology. *Canadian Journal of Experimental Psychology, 51,* 336– 353.

Lacher, K. (1994). An investigation of the influence of gender on the hedonic responses created by listening to music, *Advances in Consumer Research, 21,* 354-358.

Magliano, j., Dijkstra, K., & Zwaan, R. (1996). Generating predictive inferences while viewing a movie. *Discourse processes, 22,* 199-224.

Nater, U., Abbruzzese, E., Krebs, M., & Ehlert, U. (2006). Sex differences in emotional and psychophysiological responses to musical stimuli. *International Journal of Psychophysiology, 62*(2), 300-308.

Price, H. (1986). A Proposed Glossary for Use in Affective Response Literature in Music. *Journal of Research in Music Education, 34*(3), 151-159.

Robazza, Claudio, Cristina Macaluso and Valentina D'Urso (1994), Emotional reactions to music by gender, age, and expertise. *Perceptual and Motor Skills,79(*2), 939-944.

Russell, J. A. (1980). A circumplex model of affect. *Journal of personality and social psychology, 39,* 1161-1178.

Ryan, C., & Costa-giomi, E. (2004). Attractiveness bias in the evaluation of young pianists' performances. *Journal of Research in Music Education, 52,* 141-154.

Scherer, K.,& Oshinsky, J. (1977). Cue utilization in emotion attribution from auditory stimuli. *Motivation and Emotion, 1,* 331-346.

Sopchak, A. (1955). Individual differences in responses to different types of music, in relation to sex, mood, and other variables. *Psychological Monographs: General and Applied, 69*(11), 1-20.

Sun, S. & Lull, J. (1986).The adolescent audience for music videos and why they watch. *Journal of Communication, Winter,* 115-125.

Terwogt, M. , & Grinsven, F. (1991). Musical expression of moodstates. *Psychology of Music, 19*, 99-109.

Thayer, R. (1989). *The biopsychology of mood and arousal.* Oxford University Press.

Wang, W. (2004). Emotional Responses to Music: The Association of Facial Expression with Music. *Journal of St. John University, 21, 89-99.*

Wapnick, J., Mazza, J., & Darrow, A. (1998).Effects of performer attractiveness, stage behavior, and dress on violin performance evaluation. *Journal of Research in Music Education,46,* 510-521.

Zorn, E. (1984). Memories aren't made of this. *Newsweek,13,* 6.

VI. Community Music Therapy

Expressing yourself: Community building through art and music

Victoria Vega
Loyola University
vpvega@loyno.edu
USA

Keywords: community building, self-expression, socialization, quality of life

Often, words fail when we most need to express our innermost feelings. *Express Yourself Through the Arts* was a course designed to expose student to the healing potentials of the arts. Projects that combined art and music interactions that were used with undergraduate and graduate college students. The projects provided a venue to enhance life experiences, increase self expression, promote socialization, and self-exploration through art and music. Students worked cooperatively to complete each project's objectives. Some projects included home murals, poem and story creation and illustration, and musical life reviews. Students were also exposed to art galleries, and music, theatre, and dance performances. Each project began with a focal point, creative process, and closure. Students later reflectively wrote about their experiences within the creative process through journaling. They answered focus questions after each completed project and were asked to expand on their individual experiences. These entries consisted of written and visual responses on all creative projects. Themes that emerged were; working cooperatively with others, feelings of frustration and uncertainty, working through barriers to find a more clear life direction, and finding a greater understanding of self and others.

Utilizing music for community building is not a new concept. According to Andsell (2006) Community Music Therapy (CoMT) is an old theory that has seen recent activity to promote health and belonging in communities. Several researchers have investigated the use of music as a platform to promote emotional expression and group cohesion, such as childhood trauma (Austin, 2007), autism (Kern, & Aldridge, 2006), developmental disabilities (Lister, Tanguay, Snow, & D'Amico, 2009), high-risk youth (Blank, 2008) and mental health (Cadesky, 2007; Merrick, 2003). Several music therapy techniques were employed such as; song-lyric analysis, song sharing and listening, song-writing, music improvisation, and singing.

While many researchers have reported utilizing music to promote community building few have combined art and music for this purpose. Therefore, the purpose of this paper is to describe art and music interventions to promote community through project focused activities to enhance life experiences, self-expression, and to promote socialization and self-exploration.

Method

Expressing Yourself Through the Arts was a course offered to undergraduate and graduate university students across schools such as business, humanities, music and fine arts at a private university in the United States. *Express Yourself* consisted of projects that combined both art and music interactions and students were required to work cooperatively to complete each project's objectives. Several art and music

projects were used to facilitate a sense of community and the following are descriptions of some of the interventions.

The definition of home can mean different things to different people. In the home murals project, students were asked to bring in visual images or objects and music that represented home to them. Traditionally, students brought in pictures of their house and family members. Others brought in objects that had special meaning to their family, local area, or country. Large butcher-block paper was attached to a wall and paint and pastels were provided so that each student could draw and paint images of "home" onto the paper. After the drawings and paintings were completed the group worked to visually integrate the individual segments of the mural into a cohesive piece. Every student then presented their visual image and music from home and shared with their peers what "home" is to them. All students were given the opportunity to comment on each other's visual images and music and what they learned new about each group member.

The message in a poem can be overt or hidden or take on different meanings depending upon an individual's life experiences. In the poem creations project, several poems were chosen based on the visual images that could be portrayed and their relevant thematic content for the group such as new beginnings. Students were separated into small groups and each group decided on one poem to illustrate. Each group member was assigned stanzas of the poem to visually illustrate. The group also decided what visual images would support the poem and then created them. Next, the group decided how to support the emotional intent of the poem through sound, music and movement. Each group read their poem while exhibiting their visual images with supportive music and movement. Group members then verbally shared their creative experiences. Finally, each student wrote their own individual poem and traded poems with a peer. Group members illustrated their peer's poem and supported the poem through sound, music and movement. Each poem was presented and group members commented on the process of illustrating their peer's poem and the experience of seeing their own poem illustrated.

Miwa Yanagi's images are of old women in psychologically evocative, settings. These images deal with aging in a very positive, humorous, and poignant manner. In the story creation and illustration project, students researched Miwa Yanagi's photographs and choose one that appealed to them. Each student wrote a short story and provided a self-portrait of themselves as an older adult. They then matched sound, music and movements to perform their story to the class. Next, students were divided into small groups and jointly wrote a short story. They collaborated together to provide artwork to depict scenes in their story. Each group again matched sound, music and movements to perform their story to the class. Students were encouraged to share their views on the reasons for choosing the Yanagi photograph and described how the art related to their hopes and fears. Finally, students were asked to put themselves in the place of an older adult and communicate to their peers what they would like to say from that perspective.

Music can remind us of different times in our lives either because it was played often during that time or reflects that time period through the lyrics, melodic or rhythmic lines. In musical life reviews, each student selected milestones in their life that had special meaning to them and also choose music to represent each timeframe.

Most chosen music was recorded while some students chose to perform known songs or their own composed songs. Students made colleges from photographs, created art, or used magazine cutouts. Feelings associated with each time period were shared by each individual and students connected with each other as similar themes emerged.

Discussion

The goal of this course was to teach students the benefits of the arts for self expression and community building. There were several learning objectives that were the focus of each project which included; to encourage creativity through art and music, to promote socialization through cooperation in a group setting, to encourage imagination in self-expression, to promote the confidence needed to assert individual expression more freely and to provide a means of non-verbal communication. Students were given the opportunity through art and music to express themselves individuality and collectively as a group to complete a task. This gave students the opportunity to explore while sharing opinions and feelings with others in a creative venue.

Undergraduate and graduate students were not only from different academic programs and colleges but were at different levels in their programs of study. Some were just beginning to find a career path while others were graduating and about to begin their careers. Many emotions emerged as part of the creative process such as feelings of being overwhelmed by the pressures of their courses of study. The overall experience resulted in students working on cooperative art and music projects to find a better understanding of themselves and others. Students experienced first-hand the benefits of art and music and were therefore able to realize their unique gifts, to better assess what is important, and work through barriers. As an added benefit, students gained a stronger sense of community that supported them wherever they were in their education.

References

Andsell, G. (2006). Community Music Therapy – A New Old Possibility. *Musiktherapeutische Umschau, 27*(3*), 227-238.*

Austin, D. (2007). Lifesongs: Music therapy with adolescents in foster care. In Camilleri, V. (Ed.), *Healing the inner city child: Creative arts therapies with at-risk youth* (pp.92-103). London: Jessica Kingsley Publishers.

Blank, B. T. (2008). Hip-hop social work. *New Social Worker, 25*(4), 16-18.

Cadesky, N. E. (2007). Review of 'Psychiatric music therapy in the community: The legacy of Florence Tyson.' *Canadian Journal of Music Therapy, 13*(1), 57-60.

Kern, P., & Aldridge, D. (2006). Using embedded music therapy interventions to support Outdoor play of young children with autism in an inclusive community-based child care program. *Journal of Music Therapy, 43*(4), 270-294.

Lister, S., Tanguay, D., Snow, S., & D'Amico, M. (2009). Development of a creative arts therapies center for people with developmental disabilities. *Art Therapy: Journal of the American Art Therapy Association, 26*(1), 34-37.

Community Music Therapy Interchange: New Paths for Personal and Environmental Changes

Dora Psaltopoulou
Aristotle University of Thessaloniki
dora.ps@gmail.com
GREECE

Keywords: Community Music Therapy, Interchanges, Inclusion

Community Music Therapy offers people with disabilities rich experiences that facilitate meaning, identity, engagement and ultimately belonging. All can lead to significant personal, interpersonal and environmental changes in persons with disabilities that can facilitate their inclusion into society. It is very important for people with disabilities to have easy access to and to participate in multidimensional types of musical performances. This paper describes a community of young people with disabilities. The experiences of four performers with Down syndrome, autism, and Prader-Willi syndrome are described. Initially, they participated in individual music therapy sessions and when they had something to say, they shared it with significant others. Then, they performed together with the goal of building a community.

Performance has been addressed as both a personal and collaborative effort, or "unity beyond uniformity." Music making provides a equipoise between the individual's state of existence and those groups to which they belong. The aforementioned issue is reviewed in this paper through a systematic way of assessing clients as performers, the clinical issues they present for treatment, and how performance can address them. The latter was examined using a model of five dimensions: (1) connecting within to the music; (2) performers connecting with each other; (3) connecting to the audience; (4) The audience within; and, (5) the totality of experience.

Also addressed in this paper is a systematic way of assessing the parents' experiences observing their children performing. The author, inspired by Jampel's model, interviewed and recorded parents creating a questionnaire of five dimensions: (1) connecting to their child's performance; (2) connecting to other than their child performers; (3) connecting to the audience; (4) caring for the narcissistic wound due to their children's disability; and, (5) the totality of experience. This paper will also examine a systematic way of assessing the audience's responses. Recorded interviews with people from the audience reveal three dimensions: (1) positive change in the audience's perceptions about people with disabilities; (2) positive change concerning their children with or without clinically assessed disability; and, (3) inner change towards new paths for self-actualization-the totality of the experience. Finally, inclusion into society will be discussed. Through community music therapy interchange, participants are able to forge different directions in life and to be fulfilled with new meaning and energy in order to create healthier connections.

Community Music Therapy offers people with disabilities rich experiences of meaning, identity, engagement and ultimately belonging which can lead to significant changes in personal, interpersonal, and environmental areas, subsequently facilitating inclusion into society. It is very important for people with disabilities to have easy access and participate to multidimensional types of performances (Ansdel, 2002, 2004; Jampel, 2011; Stige, Ansdell, Elefant, & Pavlicevic, 2010).

This paper deals with a community of young people with disabilities, as it is discussed by Gary Ansdell (Stige et al, 2010, p. 44), as "circumstantial." It is about four performers with down syndrome, autism, Prader-Willi syndrome,who at first participated in individual music therapy sessions and, when they had something to say, shared it with significant others. They eventually moved on to performing together and building a community. Ansdell (2005, 2010) addresses performance as both a self and collaborative effort. Stige (2002) calls this "unity beyond uniformity" (p. 173). Music making provides equipoise between the individual's state of existence and those groups to which they belong (Jampel, 2011).

Community music therapy with performers with disabilities, unique in its nature in Greece, seems like an interchange where the participants, performers, their parents, audience, and the music therapist, meet and share meaningful moments. Such moments enable them to part for different directions in life and be fulfilled with new meaning and energy to create healthier connections with oneself and others. Therapeutic change occurs on personal, interpersonal, and environmental levels.

This ongoing research project has evaluated this very issue through:

A. A systematic way of assessing who those clients are as performers, what clinical issues they present for treatment and how performance can address them, using Peter Jampel's (2011) model of five dimensions:

1. Connecting within to the music.
2. Performers connecting with each other.
3. Connecting to the audience.
4. The audience within.
5. The totality of experience.

B. A systematic way of assessing the parents' experience as their children perform. The author, inspired by Peter's Jampel's model, interviewed and recorded the parents creating a questionnaire of five dimensions:

1. Connecting to their child's performance.
2. Connecting to other than their child performers.
3. Connecting to the audience.
4. Caring for the narcissistic wound due to their children's disability.
5. The totality of experience.

C. A systematic way of assessing the audience's responses. Recorded interviews with people from the audience reveal three dimensions:

1. Positive change in the audience's perceptions about people with disabilities.
2. Positive change concerning their own children with or without clinically assessed disability.
3. Inner change towards new paths for self-actualization-the totality of the experience.

D. Inclusion in to society.

Special performers make the difference in Greece

Four people with disabilities, without knowing each other at the time, participated in individual music therapy sessions. Music Therapy was an innovative treatment in Greece with no recognition at the time. After a few years of private sessions, all four had successfully dealt with their emotional issues. Each discovered new personal meaning in life and experienced significant changes in their way of living. They had something to share and something important to say. They later engaged in performances and shared what they discovered in their music therapy sessions as the meaning for their lives; in other words, a healthier way of living.

Max, an 11 year old, had Downs Syndrome, mental retardation, and suffered from stuttering. During his private music therapy sessions, Max discovered that he was able to express himself in verses without any stuttering. The result was that he became eager to read his poetry to other people. His poems, emerging in his private sessions while working through his personal issues, were published in his school newspaper. Max was not seen any longer as the "strange" pupil in the school environment but as the inspired poet.

Al, a 16 year old, had Prader Willi Syndrome, mental retardation, and severe obsessive-compulsive disorder. He also tended to want to do two things at once. Al, who was interested in classical piano, demonstrated great progress in expressing his feelings. He was also able to perform pieces in a variety of meters. He also employed the pedal and occasionally sang as he played. Al is now more flexible and tolerant in life and he can successfully control his weight. Practicing the piano gives him meaning in his everyday life.

Lora, a 20 year old, had Downs Syndrome, mental retardation, and experienced emotional disturbances. In her individual music therapy sessions, she used found creative ways to use percussion instruments as a way to deal with her ups and downs, as well as, to create a healthier self-organization. She indicated that she feels important and more balanced. She also indicated that she likes to play music for her friends and sharing her "secret," with them which helps her feel healthier. For example, during one of her performances, Lora was able to overcome her anger towards her younger sister. She dedicated a song to her sister and her newborn niece right during the performance where she felt it was important to express her feelings. At the interview she stated, "I am a musician. I am doing a very important job in my life. I have no time for a husband or children. I decided to talk again to them and hug them."

Panos, a 16 year old on the autism spectrum also exhibited difficulties with communication and socialization.In his individual music therapy sessions, he showed

great progress in connecting with his emotions, expressing, and sharing feelings with meaningful eye-contact. He also wanted to sing for significant others.

In 1994, I was invited to a congress, where Max could read his poetry, Lora played her drums, and Al played the piano. Each performed individually. At the very last moment, I was informed that there was time only for only one person to perform. To avoid any traumatic experience, I invited them to play all together at one time. After a 10 minute rehearsal, they were ready to perform together. It was the first time the three of them met, but the communication skills they had developed in their private sessions along with their eagerness to offer something from themselves to others, enabled them to perform together. After this, we decided to move on creating a community music therapy.
Panos joined the group later as the singer. He sang popular songs and communicated efficiently with the group and audience. To support his performance at home by watching and studying various performances on DVD. This practice has helped him to create new ideas for performance.These performances take place in famous music halls of various cities in Greece, including university auditoriums, public places (municipalities, town halls, open city squares, public schools), in congresses, and in health institutions.

Music's miracles in community music therapy

The performers, their parents, and the audience have been interviewed in an effort to assess and evaluate this initiative. The questions are usually open-ended. The answers concerning the performers reveal that music has worked "miracles" in their lives.

For the performers:

- Feeling of being important.
- Feeling of belonging, of being accepted and included in the society.
- Motivation to self-actualization process with greater and greater self-progress.
- Healthier sense of self and others.
- Identity
- Feeling of living a life of value.
- Aspirations and dreams for bigger performances and in famous Halls.
- Establishment of a community where the four of them, although very different among themselves, share a common way of life, common meaning in life, common dreams for life.

For the parents of those four performers:

- During the shows, there is some kind of healing for the narcissistic wound, which torments and occasionally leads to depressive states some of the parents. The parents say that they saw their children as "normal" for the first time at their first performance. They feel proud of their children, they get out of any depressive states they might be in and share happy and meaningful moments together.

- When they overcome the feelings of shame for their children with disabilities, they stop hiding from society. Instead, they get involved in the society in meaningful ways with pride, standing up for their children, and supporting them. They organize meetings at home to watch the performances and special television broadcasts on DVD where the performers are occasionally invited to present their work and talk about it. Socialization is enhanced.
- They are more attentive to their children's process and they report changes that they notice in everyday life, which they believe that they have to do with music therapy and community music therapy.
- They can surprisingly see that their children have feelings, dreams, and aspirations, they now listen to them more carefully and support them more vigorously.
- The intense emotions of joy and pride they experience during performances help them to find the courage to sustain and deal with the difficulties of everyday life in a more fruitful way. They also find the strength to struggle with government authorities for a better future for their children.

For the society:

- Feelings of pity and sorrow for people with disabilities are replaced with feelings of admiration for what the performers have to offer.
- There is an obvious change in the audience regarding ideas and perceptions about people with disabilities. Some of the parents in the audience were even asking why these four performers have any disability. "They did not seem to!" A mother from the audience characteristically said after having listened to Al's piano playing: "My daughter has studyed piano for the last four years and she does not play the piece Al played as well as he did. Is my daughter disabled"?
- Some of the audience, middle aged individuals from varied sociocultural backgrounds, gained inspiration and strength and took music classes for the first time in their lives in an effort to follow their childhood dreams. This is very important for Greeks who have serious inhibitions to start something new at an older age.
- More and more parents from the audience strongly encouraged their children to take music lessons after they attended the performances. These parents were able to deeply understand the healing power of music and they changed their minds about the value of the arts to society, whereas before they considered music to be of low significance for the education of their children. Especially in times of economic crisis they chose to start and/or continue funding the music education of their children.
- Parents of children with disabilities are usually concerned with their children's basic education of reading, writing, etc. After the performances, they felt deeply moved. They attained deep experiential knowledge of the "miracle" of music and they encouraged their children to get involved in music therapy process, along with other therapies. Some of them characteristically stated: "What those children learn from music therapy is the higher education they can have in their lives. They can also acquire the motive for learning at a cognitive level".

For musicians:

Musicians from the audience report significant personal changes concerning:

- Their own relationship to music: some reconnect with their genuine love and enthusiasm for music, some take the path to deeper explorations concerning their own meaning about their music and life, some are encouraged to move beyond personal inhibitions concerning their music performing and others discover new ways to connect in and through music.
- Their career development in music: more and more musicians express the desire to learn more about music psychology, music therapy and special education.

Conclusion

In this community, music therapy interchange of change, the performers offer their aliveness and light. They receive from the audience eyes and souls awakened. As Max says about the audience after the performances, "They are moved!" We touched their hearts." Max gave the name "Exchanges" to the group and he wrote a poem describing his experience in this community music therapy process.

"*Exchanges*" by Max

I give you and you give me
love and hopes.
A sparkle is on the eyes
and eyes reflect

love and hopes.
The sparkle enlightens the sea
and I hit the glass and break it
and I touch the heart I broke.

And when the glass brakes
life is recycled
and this means love.
I give you and you give me

love and hope.

References

Ansdell, G. (2002, November 5). Community music therapy and the winds of change. *Voices*, *A World Forum for Music Therapy.2(2),* Retrieved January 27, 2003,from http://www.voices.no/mainissues/Voices2(2) ansdell.html.

Ansdell, G. (2004). Rethinking music and community theoretical perspectives in support of community music therapy. In M. Pavlicevic & G. Ansdell (Eds.), *Community music therapy* (pp. 65-90). Philadelphia: Jessica Kingsley Publishers.

Ansdell, G. (2005). Being who you aren't; doing what you can't: Community music therapy & the paradoxes of performance. *Voices: A World Forum for Music Therapy*, North America, 5, Nov. 2005. Retrieved January 5, 2011, from: https://normt.uib.no/index.php/voices/article/view/229.

Jampel, P. (2011). Performance in music therapy: Experiences in five dimensions. *Voices: A World Forum for Music Therapy 11(1)*, North America. Retrieved from: https://normt.uib.no/index.php/voices/article/viewArticle/275.

Stige, B. (2002). The relentless roots of community music therapy. *Voices: A World Forum for Music Therapy*, North America, 2, Nov. 2002. Retrieved January 6, 2011, from: https://normt.uib.no/index.php/voices/article/view/98/75.

Stige, B., Ansdell, G., Elefant, C., & Pavlicevic, M. (2010). *Where music helps: Community music therapy in action and reflection*. Ashgate Publishing Co.

Music Therapy in Children with Special Needs: A Complete Therapy

Dora Psaltopoulou
Aristotle University of Thessaloniki
dora.ps@gmail.com
GREECE

Keywords: Music Therapy, Nuclear Family, Anamorphosis

Music Therapy is a tridimensional therapy with three main components: science, interpersonal relationship and art. The theoretical and philosophical background of music therapy, as well as empirical research and clinical practice provide a foundation for this paper. Science consists of a series of the phenomena, the ideas born by those phenomena, and the words that express them. Thus, science is the cornerstone of music therapy. The music therapist as a part of an interpersonal relationship creates a non-threatening atmosphere for the client; thus, taking care of the client's emotional, physical, mental and spiritual needs while abiding by the principles of any clinical psychology approach the therapist is trained in. The interpersonal relationship between therapist and client assumes a maternal-like role in music therapy practice. Music, as a form of art, promotes freedom of imagination and creativity verbally and nonverbally, and offers "possibilities unlimited" as paths for self-discovery, self-expression and self-actualization. In this sense, music plays a child-like role in music therapy. Thus, music therapy, as a nuclear family which takes care of the client in multidimensional and unlimited ways, could be a complete therapy. Science has shown that positive and negative emotions affect the neural, immune and endocrinal systems of the human being. In clinical practice, evidence reveals that the expression of negative emotions, shared and sublimated, affect all areas of the individual positively. Thus, in music therapy, every emotion is of value and of significance; whereas, lack of emotions, positive or negative, hinders the therapeutic process. The current research study was designed to determine the effectiveness of music therapy on people with disabilities in Greece. Participants were 149 individuals with disabilities. The purpose of this research was to assess the effectiveness of music-therapy. Music therapy effectiveness was assessed using the personal evaluations of parents' whose children were participating in Music Therapy. Results revealed that music therapy was: 1) effective regardless of the pathology of the participants; 2) most effective with participants who had severe pathology conditions; 3) effective regardless of co-practice of other therapies such as occupation therapy, speech therapy and psychotherapy. Questionnaires, answered by the participants' parents, were used as research instruments. The data were analyzed using the statistical instrument SPSS v.12 with that alpha level set at a=.05. The research revealed also that music therapy can serve as a main therapy for the studied populations in Greece.

Music Therapy is a tridimensional therapy in a polyphonic relation between three components: science, interpersonal process, and art. In this "fusion of music and therapy" science offers "objectivity, collectivity, replication, and truth. Interpersonal process, offers empathy, intimacy, communication, reciprocal influence, and role relationships. Art, offers subjectivity, individuality, creativity, and beauty" (Bruscia, 1989, p.8). In this sense, music therapy seems to be like a nuclear family with science playing the role of a guiding father, the interpersonal relationship playing the role of a caring mother and the art playing the role of a creative child. Thus, in its essence

music therapy is a complete therapy enabling the music therapist to orchestrate the unlimited possibilities existing to meet any of the client's needs.

The important results of the statistical research on the effectiveness of music therapy interventions in people with disabilities in Greece (Psaltopoulou, D. et al, 2011), along with the outcomes of personal and other music therapists' clinical practice, inspired me to perceive music therapy as a complete therapy. Statistic research and clinical practice evidence, as well as, theoretical and philosophical background assist with elaborating the subject.

Quantitative research contributions - Brief description

Research Background

Music therapy is a new and developing profession in Greece with very limited research conducted in relation to its effectiveness and use. The drive for this research began from the need to document areas where music therapy is known to flourish in other countries yet limited research is available to document it's successful implementation in Greece. The main assumptions were related with the types of populations and the characteristics of their pathologies, as well as, the role that is played by the combination of different therapy modalities to them, so as to show the effectiveness of music therapy in Greece.

Research Objective

The key objective was to assess the effectiveness of music therapy through the personal evaluations made by the parents of the participants. The participants' characteristics and parental environments were documented as populations who participate in the practice of music therapy in Greece.

Research Method

Quantitative research was conducted upon 149 participants with disabilities. Questionnaires, completed by participants' parents were used as research instruments. The data was processed with the statistical instrument SPSS v.12 with hypothesis validity set at a = 0.05 and twofold crosschecking.

Research Conclusions

Amongst conclusions drawn following the analysis of the findings, the following three appear to be of greatest importance:

- Music therapy is effective regardless the pathology of the participants. Music therapy sessions in Greece primarily involve children and young adults with mental disabilities such as Autism, Down syndrome, Cerebral palsy and other.

- Impressively, the research reveals that the more severe the preliminary pathology of the participants, the greatest the improvement of their condition.

- Music therapy has proven to be effective regardless of the the fact that the participants might have other therapies such as occupation therapy, speech therapy, and psychotherapy. The research reveals that music therapy can be a main therapy for the studied populations in Greece (Psaltopoulou, D. et al, 2011, p. 70-71).

Science as the guiding father

The name of the father, as it is considered in psychoanalysis, embodies elements of a given field, a status quo, which is functioning as a barrier to denote what is. As such, the name of the father and its symbolic power comes to assist every human being to enter the world as we know it by abiding by to structures, forms, cultures, biology, and all kinds of science as a preliminary function to affect our existence. Once our limits are marked as humans, then we come to connect with our void and take steps to accept our mortal nature. In this environment, normal neurosis is created and we enter the world, as we know it. This "entrance" usually takes place during the oedipal stage when the name of the father functions as a tool to open the road for the child to enter society beyond the symbiotic relationship with the mother - to whom it can always return to, without having to be "one" with her, as we often come across in autism and psychosis. Hence, the name of the father is a catalyst for opening new spaces of perception that can allow the viewing of the whole available in nature, society, relationships, and so on, through accepting the lack of being finite. Science is therefore a metaphor for the name of the father as it sets the structures, the boundaries, the norms and the codes with which we are able to build our perceptions and develop further the structures of what is.

As Lavoisier (1783) frames it, it is the series of phenomena that compose any form of science, the ideas born by those phenomena, and the words that express them. The father in music could be the set of all norms, laws, and structures that are contained in it. In music therapy, science is a father that marks the road through sound and words towards the opportunity to discover the world through creativity and expression. It is a symbolic father that comfortably enters the scene through a loving mother – the relationship with the therapist, and/or the music that they are making – that is creating space and allowing new healthy perspectives to develop. Once the client allows the reliving of his/her personal journey through music – taking care of the inner child,what is exhausted and expressed in the open can then take new form and new direction through creativity that has come to be the 'new' word expressing the phenomena of science - a science which allows the client to enter into a world close to the world neurotics experience. Thus, found is completeness through emptiness - thus opening a world of opportunity.

Interpersonal process as a caring mother

Much of literature ((Stern,1985; Lacan, 1966, 1973, 1975, 1985 ; Winnicott, 1971) is concerned with the mother-infant relationship, as well as, the non-threatening, safe and caring atmosphere created from the therapists to take care of client's emotional, physical, mental, and spiritual needs. This, while abiding by the principals of any clinical psychology approach, the therapist is trained in, allowing significant personal changes to emerge, leading to the "anamorphosis" of the self. The motherly quality is also inherent in music as it can provide comfort and embracement

to the listener and/or to the music maker. According to Jacques Lacan (1966, 1973, 1975, 1985) "the unconscious is structured as a language," "I am what I speak," "I see myself to be seen" and so I can move to the "anamorphosis" of the self.

The term 'anamorphosis,' refers to the reformation of an old form of existence to that of a new and improved one. The latter occurs without the complete loss of the old form. The preposition 'ana' expresses movement, flow into time and/or place, apportion, and repetition in time and place. The word 'morphosis' comes from the greek word 'morphi' form. Lacan's theories can be analogous to so commonly used music therapy theories such as "the music is stuctured as a language," "I am what I sound," "I hear myself being heard" (i.e. mirroring techniques in the process of forming a therapist-client trusting relationship allowing for self 'transformation'). However, 'transformation' stands for the creation of a completely new form of existence, which does not have any signs of the old form. But, creativity is an innate quality of all human beings, which means that it already exists at some form in every person. It is through the music therapy process that is coming into light and grows. According to the Nordoff-Robbins (2007) theory about the music child it is clearly stated that the music therapist is always going back to the old self as a safe place to be, using a rondo form or any other appropriate elements in the improvisation.

The term 'anamorphosis' seems more appropriate than 'transformation', since the personal change may look as if it has nothing to do with the old image of the self, yet the old image is always there. The 'anamorphosis' process occurs within the context of the interpersonal relationship, like a warm mother comforting her child to contain the harsh laws and rules of the name of the father. The client can connect with the inner desire for life and walk the path for personal change only when he/she feels safe, nurtured, and happy in a meaningful relationship.

Art as a creative child

Preoccupied by the queries of genesis, Anaximandrus (610 BC) stated: "Beginning of all beings the indefinite."The word "beginning" is not referred to a chronologically distant source of life. This refers to the guiding boost by which all living creatures emerge from the "indefinite." "Indefinite," by Anaximandrus, is the sense of a non-closure, an opening with no limits. As Georgopoulos (2010) states, this "indefinite" is the positive awareness of the "potentially unlimited," the "potentially open" as the generative source for the definite and the identification.

I believe that the positive awareness of the "potentially unlimited" is inherent to music as an art form, and is the driving force to awaken imagination and creativity in human beings. Music, as a form of art, embodies the freedom of imagination and creativity in verbal and non-verbal modes, and offers the "potentially unlimited" in paths for self-discovery, self-expression, and self-actualization. In this sense, music plays the role of a creative child.The aforementioned explanation seems to lie in the fact that on one hand, the music therapist is specially trained to focus on the pulse of that which is heard or not heard, and to respond to it musically. On the other hand, the music therapist focuses upon the fact that the client has the ability to non-verbally express that 'which cannot be said.' In other words, we are dealing with a vast reservoir of possibilities in qualitative expression of the existence and function of

coexistence. This possibility is inherent in every form of art. Besides, the indefinite, as the 'the qualitative unlimited,' 'presides in art' (Georgopoulos, 2010).

Life begins with a cry. As in mythology, where music is born from Medousa's cry when she is decapitated by Perseas, Chryssaorus and Pegasus are born from her decapitated head. Chryssaorus is represented by the golden sword, which symbolizes law, norms, and boundaries. Pegasus has the winged head as a symbol, which means freedom, creativity, art, and represents the 'potentially unlimited.' This myth could comprise a recreation of man's symbolic castration in the oedipal stage. Of all beings, only man is able to 'dilate the line which defines its species,' to extend and transcend himself beyond all 'self-confidence and sense of security' and be open to a life which is characterized by the 'alert vulnerability of insight, and the clear focus which makes the truth feasible' (Georgopoulos, 2010). Only in this way can the real self emerge through art.

Clinical Examples

Very often, I hear my music therapy clients say that it seems strange and unique as an experience the fact that while they sing and play their inner pain, they feel at the same time deep happiness. It is because they are creating songs, music, art, poetry, and stories with this pain, which before seemed to have a destructive nature. The following examples show how music therapy as a nuclear family can assist the 'anamorfosis' of the self through experiencing, expressing and sharing negative emotions.

Science has proven that positive and negative emotions affect the neural, immune, and endocrinal systems of the human being in positive and negative ways, respectively (Le Roux, 2007). In clinical practice though, when negative emotions are expressed, shared and sublimated, positive effects emerge for the individual. Thus, in music therapy as a nuclear family, every emotion is of a positive value opening the path to self 'anamorphosis,' whereas, lack of emotions, positive, or negative hinders the therapy process.

In many cases, at the same time, negative emotions are expressed, a 'hidden' positive emotion of 'secret' joy is also heard. For example, when we hear Edward's (Nordoff-Robbins, 2007) negative, destructive cry we can simultaneously hear the positive joy he experiences while expressing, sharing with the therapists, and singing his 'negative' cry.

Kalliroi, a 45 years old woman, seropositive (HIV carrier for the last 12 years), had tried verbal psychotherapy and many alternative healing methods before she came to music therapy. After one and a half months of sessions, she stated the following:

> 'I have gone through the most difficult one and a half months of my life, coming into contact with the most powerful and painful emotions, which were previously unexpressed, blocked my energy and eventually, I believe, led to my contracting the virus. During the music therapy sessions while searching for greater contact with the part of me that wants to die, I saw it, a girl with a

deathly face. I saw face to face, that which pursued me throughout my whole life. I was afraid of even be aware of my negative emotions. I was avoiding them until in music therapy I found a way to feel 'happy' to express them. I have realized that I am being healed, as I free the pain and fear which had remained unexpressed and for many years blocked inside me.'

In Kalliroi's words, I can see how her deep pain, in music therapy sessions, became a generative source for her to become the creative and alive person she is today.

Conclusion

Science and interpersonal relationship at a therapy setting have their limitations. It is music as an art that offers the unlimited possibilities for self-awareness and growth. Music, as a creative child, in the hands and voice of a trained music therapist, is what makes music therapy to be a complete therapy for those who choose it as their personal therapy. Music Therapy clients find themselves to belong in a nuclear family that can provide for them unlimited possibilities to transcend themselves and become who they really are.

References

Accordino, R., Comer, R., & Heller, W. B. (2007). Searching for music's potential: A critical examination of research on music therapy with individuals with autism. *Research in Autism Spectrum Disorders*, *1*(1), 101-115.

Aigen, K. (2005), *Music-Centered Music Therapy,* Gilsum, NH, Barcelona publishers.

Ball, C. M. (2004). Music therapy for children with autistic spectrum disorder [Electronic Version]. *Bazian Ltd (Ed) STEER: Succinct and Timely Evaluated Evidence Reviews 4* (1), 14. Retrieved November 23, 2010 from http://www.signpoststeer.org/

Boso, M., Emanuele, E., Minazzi, V., Abbamonte, M., & Politi, P. (2007). Effect of Long-Term Interactive Music Therapy on Behavior Profile and Musical Skills in Young Adults with Severe Autism. *The Journal of Alternative and Complementary Medicine, 13*(7), 709-712.

Bruscia, K.E. (1988) *Defining music therapy,* 2nd ed. Phoenixville: Barcelona.

Bruscia, K.E. (1989) *Defining music therapy.* Spring House Books: Spring City, PA.

Farmer, K. J. (2003). *The Effect of Music vs. Nonmusic Paired with Gestures on Spontaneous Verbal and Nonverbal Communication Skills of Children with Autism Ages 1-5.* The Florida State University.

Georgopoulos, N., (2010), *Retrieving the Primary*, 2nd International Psychoanalytic and Philosophy Conference: *The Original,* Publishing of Minutes in progress, Co-organisers febe, G.R.A.P.P.A.F, School of Philosophy, University of Aristotle., Institut fur Philosophie der Uuniversitat Wien, Neue Wiener Gruppe / lacan-schule.

Gold, C., Wigram, T., & Elefant, C. (2006). Music therapy for autistic spectrum disorder. *Cochrane Database of Systematic Reviews* (2).

Graham, J. (2006). If you can't beat them, join them! Long-term music therapy with an autistic savant" man. *Music Therapy Today, 7*(4), 892-912.

Kern. P. (2004) Making friends in music: Including children with autism in an interactive play setting. *Music Therapy Today (online) 5*(4), available at http://musictherapyworld.net.

Kim, J., Wigram, T., & Gold, C. (2008). The Effects of Improvisational Music Therapy on Joint Attention Behaviors in Autistic Children: A Randomized Controlled Study. *Journal of Autism and Developmental Disorders, 38*(9), 1758-1766.

Lacan, J. (1966), *Fonction et champ de la parole et du language en psychanalyse.* Paris, Seuil.

Lacan, J. (1973), *Les quatre concepts fondammentaux de la Psychanalyse.* Seminaire XI, Paris, Seuil.

Lacan, J. (1975), *Encore-le seminaire- livre XX, Paris,* Seuil.

Lacan, J. (1985), *Introduction* à *la lecture de Lacan.* Paris, Denoel.

Le Roux, F.-Bouic, P.-Bester, M. (2007). *The effect of Bach's magnificat on emotions, immune, and endocrine parameters during physiotherapy treatment of patients with infectious lung conditions.* in Journal of Music Therapy, vol. XLIV.2. p.156-168.

Nordoff, P.&Robbins, C., (2007). Creative Music Therapy: A guide to fostering clinical musicianship. Barcelona Publishers.

Oldfield, A., & Adams, M. (1990). The effects of music therapy on a group of profoundly mentally handicapped adults. *Journal of Intellectual Disability Research, 34*(2), 107-125.

Pasiali, V. (2004). The use of prescriptive therapeutic songs in a home-based environment to promote social skills acquisition by children with autism: Three case studies. *Music Therapy Perspectives, 22*(1), 11-20.

Psaltopoulou, N., & Micheli, M., (2010). *Research on the Contribution of Music Therapy in AMEA,* 2nd National Psychiatric Conference with the Title: *Art and Psychiatry,* Publishing of Minutes in progress, Organisers EPEKEINA, Hania, Crete.

Psaltopoulou, N., Micheli, M. & Kavardinas, N. (2011). The effectiveness of music therapy interventions in Greece. Proceedings of WFMT world congress of music therapy. Seoul, Korea, 70-71.

Silverman, M. J. (2008). Nonverbal Communication, Music Therapy, and Autism: A Review of Literature and Case Example. *Journal of Creativity in Mental Health, 3*(1), 3-19.

Steiner, R. (1987): *The Inner Nature of Music and the Experience of Tone*. Anthroposophic Press, New York.

Stern, D.N. (1985) "*The interpersonal world of infant: A view from psychoanalysis and developmental psychology*". New York: Basics.

Ulrich, G., Houtmans, T., & Gold, C. (2007). The additional therapeutic effect of group music therapy for schizophrenic patients: a randomized study. *Acta Psychiatrica Scandinavica, 116*(5), 362-370.

Whipple, J. (2004). Music in intervention for children and adolescents with autism: a meta-analysis. *Journal of Music Therapy, 41*(2), 90-106.

Wigram, T., & Gold, C. (2006). Music therapy in the assessment and treatment of autistic spectrum disorder: clinical application and research evidence. *Child: Care, Health & Development, 32*(5), 535.

Winnicott D. W. (1971), *Playing and reality,* London, UK: Tavistoct Publications.

VII. Music Therapy and Clients with Hearing Loss

Music perception via acoustical and electrical stimulated hearing: A descriptive meta-analysis

Alice-Ann Darrow
Florida State University
alifsu@mac.com
USA

Abstract

The purpose of this study was to compare the music perception of listeners using two different types of assistive hearing devices. Research findings suggest that the music perception performances of cochlear implant and hearing aid users vary depending on the type of task. Music is a complex sound comprised of elemental components with each perceived differently by acoustical and electrical stimulated hearing. Published reports on music perception by cochlear implant and hearing aid users were analyzed to compare participants' scores on tests of pitch and rhythm discrimination, timbre identification, melody recognition, and quality appraisal. Results revealed an overall mean *d* value of -.001 for the included studies, indicating that cochlear implants were not more effective or efficient than traditional hearing aids in transmitting sounds for the purposes of music perception. The findings of this study qualify frequent citations indicating that cochlear implantation adversely affects music perception. Results support the requisite caveat that data are mixed with the overall effect of implantation on music perception insignificant compared to that of hearing aid users.

Cochlear implantation has increased steadily over the past 25 years as an intervention for individuals who have severe to profound hearing losses, and who receive little to no benefit from traditional hearing aids. Different than hearing aids, which amplify sounds, the cochlear implant—a small, complex electronic device, bypasses damaged portions of the ear and transforms sounds into electrical energy that is used to directly stimulate surviving auditory nerve fibers in the inner ear. Signals generated by the implant are sent by way of these auditory nerve fibers to the brain, which recognizes the signals as sound (Clark, 2006). Hearing through a cochlear implant is different from normal hearing or hearing through a traditional hearing aid. The cochlear implant does not restore hearing or cure a hearing loss, but instead, provides a useful representation of sounds—an important distinction to be made when discussing the perception of music or other complex sounds. For many individuals with cochlear implants, learning to interpret sounds, particularly music, requires time and training (Gfeller, 2001).

Cochlear implants produce electrical stimulated hearing and traditional hearing aides produce acoustical stimulated hearing, with both types of hearing affecting how music is perceived. The electronics and parts of a traditional hearing aid differ from a cochlear implant in important ways. A hearing aid, which can be can be worn behind the ear, in the ear, or in the ear canal, has three basic parts: a microphone, amplifier, and speaker—that all serve to amplify sounds so they are more easily heard. The hearing aid receives sound through a microphone, which converts the sound waves to electrical signals and sends them to an amplifier. The amplifier increases the power of the signals and then sends them to the ear through a speaker. Analog hearing aids convert sound waves to electrical signals, which are amplified

and can be programmed for different listening environments depending on the loudness needed. Digital hearing aides convert sound waves into numerical codes that include information about a sound's pitch or loudness, and therefore, can be programmed to amplify some frequencies more than others. The digital circuitry allows for more flexibility in adjusting the aid to match a user's audiogram, and in adjusting the aid to listen to more complex sounds such as music (Schaub, 2008).

The cochlear implant consists of an external portion that sits behind the ear and a second portion that is surgically placed under the skin. An implant has: (a) a microphone, which picks up sound from the environment, (b) a speech processor, which selects and arranges sounds picked up by the microphone, (c) a transmitter and receiver/stimulator, which receive signals from the speech processor and convert them into electric impulses, (d) an electrode array, which is a group of electrodes that collects the impulses from the stimulator and sends them to different regions of the auditory nerve (Martin & Clark, 2005). Both hearing aids and cochlear implants send sounds to the cochlear hair cells; however, when hair cells are damaged the signal will be distorted. Cochlear implants are able to bypass the damaged hair cells and replace their function by converting sound energy into electrical energy that can directly stimulate the auditory nerve, and then be sent via the auditory nerve to the brain where meaning is attached.

The cochlear implant device was initially conceived to improve users' speech perception; however, in recent years the technology has advanced such that attention has been directed toward improving implant users' perception of non-speech sounds, particularly music (McDermott, 2004). Despite rapid advances in cochlear implant technology over the last decade, researchers have reported that implant systems are generally inadequate in conveying complex musical sounds, at least for users to fully enjoy music as they once did (Gfeller, 2009). For many cochlear implant users who once enjoyed playing or listening to music, even an imperfect musical sound is still a welcomed sound (Gfeller, Witt, Stordahl, Mehr, & Woodworth, 2000). Some researchers have found that digital hearing aids are still more efficient than cochlear implants in transmitting certain musical tasks (Looi, McDermott, McKay, & Hickson, 2008a).

In a review of the literature on music perception and hearing aid users, Darrow (2010) summarized the most significant findings of past research (pp. 258-259): (1) At all ages, and at nearly all levels of hearing loss, rhythm perception abilities tend to be stronger than pitch perception abilities; (2) Discrimination of rhythmic patterns is more difficult than the discrimination of the musical beat or pulse; (3) Music skills may be delayed rather than deviant; (4) Pitch discriminations can generally be made more easily in the lower frequency ranges; (5) Discrimination skills may be misjudged because of language problems which interfere with individuals' ability to describe what is heard; (6) Individuals with hearing losses may require greater exposure, both in duration and intensity, to music stimuli than typical hearing students in order to develop appropriate discrimination abilities; (7) Timbre can affect individuals' rhythmic and pitch discrimination abilities; (8) Individuals with hearing losses exhibit certain preferences in regard to musical sounds, sources, timbres, styles, and listening conditions.

In a review of the music perception and cochlear implant literature, McDermott (2004) summarized the most significant findings of past research (p. 49): (1) On average, implant users perceive rhythm about as well as listeners with normal hearing; (2) Even with technically sophisticated multiple-channel sound processors, recognition of melodies, especially without rhythmic or verbal cues, is poor, with performance at little better than chance levels for many implant users; (3) Perception of timbre, which is usually evaluated by experimental procedures that require subjects to identify musical instrument sounds, is generally unsatisfactory; (4) Implant users tend to rate the quality of musical sounds as less pleasant than listeners with normal hearing; (5) Auditory training programs that have been devised specifically to provide implant users with structured musical listening experience may improve the subjective acceptability of music that is heard through a prosthesis; (6) Pitch perception may be improved by designing innovative sound processors that use both temporal and spatial patterns of electric stimulation more effectively and precisely to overcome the inherent limitations of signal coding in existing implant systems; (7) For the growing population of implant recipients who have usable acoustic hearing, at least for low-frequency sounds, perception of music is likely to be much better with combined acoustic and electric stimulation than is typical for deaf people who rely solely on the hearing provided by their prostheses.

Music is a complex sound that includes various elements such as rhythm, melody, or timbre, along with accompanying changes in loudness and tempo. For some hearing aid users, this complexity may be beneficial because it provides more information to which they can attach meaning (Darrow, 2006; Darrow & Novak, 2007; Looi, McDermott, McKay, & Hickson, 2008a). More often however, researchers have found that complexity interferes with the abilities of both hearing aid and cochlear implant users to make musical discriminations (Gfeller et al., 2000). Consequently, aided listeners are generally able to make more accurate discriminations in thin-textured music than thick-textured music (Looi, McDermott, McKay, & Hickson, 2007; Darrow & Novak, 2007), and in the rhythmic rather than tonal music (Darrow, 1987, 1992; Darrow & Goll, 1989; Gfeller & Lansing, 1992).

For normal hearing listeners, music discrimination skills may be influential, but are not required for musical enjoyment. Bradley (2009) addressed whether music perception ability can predict music enjoyment in cochlear implant users and found that all correlations between performance on music perception tests and musical appraisals were weak. Bradley's findings were consistent with Gfeller et al. (2008), who found that reliable predictors of musical enjoyment for cochlear implant users are yet undetermined. Implantation itself however, may affect the musical enjoyment of individuals with hearing losses. Gfeller, Christ, Knutson, Witt, and Mehr (2003) found that 83% of the cochlear implant users they surveyed experienced diminished levels of music enjoyment after being implanted when compared with their music listening before losing their hearing. Furthermore, 33% reported that they avoided music because of its aversive sound.

Gfeller et al. (2002) have suggested that cochlear implant users' assessments of musical enjoyment are based more on the quality of the musical sound than discrimination abilities. Cochlear implant users generally find the quality of the musical sound to be less natural than those who use hearing aids, though with recent advancements in implant technology, the quality of musical sounds appears to be

improving for implant recipients (Looi, McDermott, McKay, & Hickson, 2007). Frequent citations, however, continue to suggest that the music perception and music appraisal of cochlear implant listeners remains relatively poor (Bradley, 2009; Nimmons et al., 2008). The purpose of this study, therefore, was to analyze the existing research comparing the music perception of cochlear implant and hearing aid users on tests of pitch and rhythm discrimination, timbre identification, melody recognition, and quality appraisal.

Method

Meta-analysis is a technique in which the results of two or more studies are mathematically combined in order to integrate, summarize, and review previous research. Meta-analysis has been used in a number of music studies, though it has been employed almost exclusively for aggregating the research findings of experimental studies (Bechtold et al., 2009; Koger, Chapin, & Brotons, 1999; Pelletier, 2004; Silverman, 2003; Standley, 1986, 2002; Timmerman et al., 2008; Whipple, 2004). Descriptive meta-analyses have been used previously in other fields of study, and are appropriate for integrating and summarizing comparative or correlational data sets (Cheng, Grant, & Niparko, 1999; Lipsey & Wilson, 2001; Reynolds, Timmerman, Anderson, & Stevenson, 1992). Nearly all music perception research with persons who have hearing losses is descriptive; and meta-analysis offers advantages over typical narrative reviews as a means of synthesizing this descriptive research.

Data Extraction. A search of abstracts using the following databases: Academic Search Complete, Academic Search Premier, ComDisDome, EBSCOHost, ERIC, Google Scholar, ISI, JSTOR, ProQuest, psycINFO, PubMed, RefWorks, RILM, ScienceDirect,and WorldCat, using the key words "cochlear implant," "hearing aid," "bimodal stimulation," "acoustic aid or acoustic hearing," "electrical aid or electrical hearing" and "music perception" or "music" hearing yielded 53 citations. Data were reported in 44 (83%) of the citations; however, only six published studies provided data comparing both cochlear implant and hearing aid users on tests of music perception. Two additional studies were found that provided data on the same tests of music perception—Gordon's PMMA (Gordon, 1979) by either cochlear implant users or hearing aid users; however, one study reported findings in means and standard deviations (Darrow, 1987) and the other in percentages (Gfeller & Lansing, 1991). Consequently, the initial six published articles provided the data used for analysis in the present study.

The six published studies provided data on rhythm and pitch discrimination, timbre identification, and melody recognition by cochlear implant and/or hearing users. Direct comparisons betweens studies were confounded by the use of different music perception tests, and different methods of data collection (testing protocol). However, all studies included means and standard deviations or percentage scores—the more typical measure for studies in audiology (percent of items heard or discriminated), and all studies assessed cochlear implant and/or hearing aid users, though some participants used different types of implants or hearing aids. Participants included adult listeners of varying ages. No control could be made for age at onset of hearing loss, age at implantation, or length of time with aided hearing.

Data Synthesis. The literature reported results on 14 different tests of music perception. To integrate results across studies on the 14 tests of music perception, cochlear implant and hearing aid users' mean and standard deviation scores or percentage scores for (1) pitch and rhythm discrimination, (2) timbre identification, (3) melody recognition, and (4) quality appraisal were extracted and used to determine differences between the two user groups. Of the 14 tests of music perception, 11 tests included various subtests to measure pitch discrimination, timbre identification, and melody recognition. All subtest scores were included for analysis.

Computation of Effect Sizes. Mean and standard deviation and percentage score data sets were used to compare cochlear implant and hearing aid listeners. Differences in the nature of the outcome data required two methods for computing effect sizes. The two formulas were algebraically equivalent, and yielded estimates of the standardized mean difference or common effect size index known as Cohen's *d* (Lipsey & Wilson, 2001). Although there are variations of this index, the *d* value is generally regarded as the difference between the group means divided by the standard deviation. In the present study, the means-based effect size calculations relied on the common formula:

$$d = \frac{M_1 - M_2}{SD_{\text{pooled}}}$$

where M_1 is the mean of the cochlear implant users, M_2 is the mean of the hearing aid users, and SD_{pooled} represents the pooled standard deviation of the two groups. While this index has typically been used to compare control and experimental groups in experimental studies, it can be used with descriptive research as well (e.g. to compare men and women on a variable of interest) (Hedges & Olkin, 1985; Hunter & Schmidt, 1990).

Much of the hearing research reports findings in percentages—percent of items heard or discriminated. Five of the six studies used percentages that first required conversion to proportions. Percentages and proportions are the same mathematical expressions; however, percentages can vary between 0 and 100, with 100% being the same as a proportion of 1. The following formula, based on arcsine transformations of the proportions, was then used to approximate the Cohen's *d* (Lipsey & Wilson, 2001; Poston & Hanson, 2010):

$$d = \text{arcsine}\,(p1) - \text{arcsine}\,(p2)$$

where p_1 and p_2 are the respective heard rates of the cochlear implant and hearing aid users. Study results were then compared for music perception as a function of the stimuli (rhythm, pitch, timbre, melody, or quality) and type of assistive hearing device (cochlear implant or hearing aid).

Results

Sample of Studies and Effect Sizes

Six published studies, with 6 independent and 32 non-independent Cohen's *d* effect size were included in the final analysis. The studies were published between 2005 and 2009 in the following journals: *Audiology and Neurotology* (*n* = 1), *Journal of the Acoustical Society of America* (*n* = 1), *Ear and Hearing* (*n* = 2), *International Journal of Audiology* (*n* = 1), and *Cochlear Implants International* (*n* = 1). A number of steps were taken to ensure the search was systematic, though these steps greatly limited the number of available studies for analysis. First, studies had to include both cochlear implant users and hearing aid users, though no distinction was made for type of implant or hearing aid. Second, four inclusion criteria were used to identify studies. In order to be included, a study had to (a) address the purpose of the study (comparison of cochlear implant users versus hearing aid users); (b) be published in English in a peer-reviewed journal; (c) utilize a design suitable for calculating one or more Cohen's effect sizes; and (d) measure some aspect of musical perception. Only six studies met these criteria (El Fata, James, Laborde, & Faysse, 2009; Kong, Stickney, & Zeng, 2005; Looi, McDermott, McKay, & Hickson, 2007, Looi, McDermott, McKay, & Hickson, 2008a; Looi, McDermott, McKay, & Hickson, 2008b; Sucher & McDermott, 2009).

Participants

Total number of participants across studies and by condition (use of cochlear implant or hearing aid) was 134, of which 67 cochlear implant users and 67 hearing aid users. In two of the studies, participants were tested pre and post implantation, and in three of the studies, participants were tested using their implanted ear and their alternate ear with a hearing aid. In these studies, participants were counted as both hearing aid and cochlear implant users depending on the listening condition. Three of the studies reported on participants' gender (23 males and 21 females). Four of the studies reported participants' age ranges, ranging from 29 to 80 years, with a mean age of 58 years. One additional study reported only a mean age of 55, making the total known mean age 56 years. One study reported no age or gender data.

Calculation of Cohen's d Effect Sizes

In order to compare results between studies, a standardized mean difference effect size was used. The standardized effect size was chosen due to the differing manner in which studies reported their data—five studies reported in percentages and one study in means and standard deviations. The transformations and formulas used for computing study effect sizes are reported in the method section.

For all of the studies, a number of Cohen's *d* effect sizes could be calculated from the subtest data (Table 1). The reported value of *d* for each music perception test is the average value of calculated effect sizes reported in the subtest column. The reported value of *d* for each study is the average value of the calculated effect sizes reported for the individual music perception tests. Although results are reported by subtests and perception tests, only one effect size per study was used in calculating the aggregate effect size. The composite effect sizes within each respective study

were used in calculating the aggregate effect size. Positive *d* values indicate greater perception benefit from cochlear implant. Table 1 shows the actual distribution of effect sizes.

Overall effect size

Initial analysis of the 6 identified studies resulted in 6 independent and 32 non-independent effect sizes comparing cochlear implant and hearing aid users on 14 tests of music perception. As shown in Table 1, the analysis of included studies produced an overall effect size of d = -.001 (CI [-0.66, 0.60]) on the basis of 134 participants. To compute the overall mean *d* value, each study effect size was multiplied by the total sample size of that study and then these products were summed and divided by the total sample size by condition across all of the studies. The overall mean *d* value (-.001) was insignificant at the .05 level (z = .13), indicating that in the included studies, cochlear implants were not significantly more effective or efficient than traditional hearing aids in transmitting sounds for the purposes of music perception (Tables 1 and 2). Though the overall effect size was insignificant, subtest data revealed implications for clinical practice and are reported in the following section.

Table 1:

Overall and Mean Effect Size Findings for Studies, and for Individual Subtests and Tests of Music Perception by Hearing Aid and Cochlear Implant Users

Study	N	Study *d*	Perception Test	Test *d*	Subtest *d*
El Fata et al., 2009	28	.11	Melody Recognition	.11	-.01
					-.23
					.62
					.08
Kong, et al., 2005	10	.10	Melody Recognition	.10	-.10
					-.13
					-.09
Looi et al., 2007	30	.14	Quality Appraisals	.14	.06
					.06
					.07
					.19
					.24
					.26
Looi et al., 2008a	30	-.24	Rhythm Discrimination	-.02	-.02
			Pitch Discrimination	-.32	-.37
					-.30
					-.30
			Timbre Identification	-.07	-.09
					-.08
					-.04

Table 1:

Overall and Mean Effect Size Findings for Studies, and for Individual Subtests and Tests of Music Perception by Hearing Aid and Cochlear Implant Users

Study	N	Study *d*	Perception Test	Test *d*	Subtest *d*
Looi et al., 2008b	18	.02	Melody Recognition	-.57	-.57
			Rhythm Discrimination	.03	.03
			Pitch Discrimination	-.09	-.16
					.00
					-.13
			Timbre Identification	.10	.14
					.04
					.12
			Melody Recognition	.07	.07
Sucher et al., 2009	18	-.09	Melody Recognition	-.35	-.35
			Timbre Identification	-.01	.01
			Quality Appraisals	.09	.09
Overall	134	-.001			

Note: Positive *d* values indicate greater perception benefit from cochlear implant. The reported value of *d* for music perception tests is the average value of calculated effect sizes reported in the subtest column. The reported value of *d* for each study is the average value of the calculated effect sizes reported for the music perception tests.

Table 2

Meta-Analysis Findings for Individual Studies

Study	N	*d*	*r*	*z*
El Fata et al., 2009	28	.11	.05	.55
Kong, et al., 2005	10	.10	.04	.05
Looi et al., 2007	30	.14	.06	.06
Looi et al., 2008a	30	-.24	.11	.11
Looi et al., 2008b	18	.02	.01	.01
Sucher et al., 2009	18	-.09	.04	.04

Note: Positive *d* values indicate greater perception benefit from cochlear implant. *r* = r-based BESD (binomial effect size display).

Discussion

In any study of individuals with hearing loss, a number of factors should be considered that may affect their perceptual abilities, whether for music or other stimuli. These factors include age at onset of hearing loss—whether it occurred prelingually or postlingually, type of assistive hearing device used, age at implantation or length of time with aided hearing (Filipo, Ballantyne, Mancini, & D'elia, 2008). Other considerations are the digital settings on the hearing aids the listeners are using, and with coclear implant users: the surviving neurons in the cochlea, the electrode's placement or insertion depth, central processing factors, and the stimulation mode used or electrical current path within the cochlea (Looi, McDermott, McKay & Hickson, 2008b; McDermott, 2004). In any test of music perception there are yet another set of factors that must be considered: an individual's music aptitude, music experiences pre and post hearing loss, and musical background or training. All of these factors make any perception test of persons with hearing losses complicated, and even more so when comparing findings across studies (Gfeller et al., 2008).

The purpose of this study was to compare the music perception of cochlear implant and hearing aid users on tests of pitch and rhythm discrimination, timbre identification, melody recognition, and quality appraisal. Results indicated that in the included studies, cochlear implants were not more effective than traditional hearing aids in transmitting sounds for the purposes of music perception. The findings of this study qualify frequent citations indicating that cochlear implantation adversely affects music perception. Results support the requisite caveat that data are mixed, with the effect of implantation on music perception insignificant compared to that of hearing aid users (Gfeller, 2009; Looi, 2008; McDermott, 2004). The distinction of "compared to hearing aid users," as opposed to normal hearing adults, is an important one to be made in regard individuals who are deaf or hard-of-hearing. When individuals lose their hearing as adults, they often use hearing aids as their hearing declines. Their hearing loss may progress to the point a cochlear implant is desirable, particularly if it will make speech more accessible. While they may remember the sound of music as normal hearing persons, it is likely their most recent experiences with music were as hearing aid users. If adults have had a hearing loss from birth or early childhood, the sound of music through a hearing aid is likely all they know. Data from the present study indicate that differences between the perception of music via hearing aids and cochlear implants are insignificant. This finding is obviously not true when comparing cochlear implant users to normal hearing adults, as most studies do (Darrow & Novak, 2007, 2009; Darrow, Novak, & Selph, 2007; Darrow, Novak, & Swedburg, 2007; Gfeller, Knutson, Woodworth, Witt, & DeBus, 1998; Gfeller et al., 2003; Gfeller & Lansing, 1992; Stordahl, 2002).

Implications for Clinical Practice

Though the overall effect size of the studies indicated no significant effect when comparing the music perception scores of cochlear implant and hearing aid users, there are some useable data within the individual tests of music perception. Cohen (1988) cautiously defined effect size as "small," d = .20, "medium," d = .50, and "large" d = .80, stating that "there is a certain risk inherent in offering conventional operational definitions for those terms" (p. 25).

Using these operational definitions and the direction of benefit data (negative numbers indicated cochlear implant users received greater benefit), the present study does provide some useful information for clinical practice. Several subtests revealed small to medium effect sizes, and some subtests revealed effects sizes in all one direction.

Pitch Discrimination. Five out of six pitch discrimination subtests indicated that hearing aids provided greater benefit to listeners than cochlear implants (Looi, et al., 2008a, 2009b). Of these five subtests, three had at least a small effect size (-.37, -.30, -.30). Study participants included both independent and dependent listeners, providing evidence to support the assumption that cochlear implants are less effective than hearing aids for transmitting pitch information.

Melody Recognition. Seven out of 10 melody recognition tests also indicated hearing aids provided greater benefit to listeners than cochlear implants (El Fata et al., 2009; Kong, et al., Looi et al., 2008a, 2009b; Sucher et al., 2009). Of these seven subtests, two had at least a small effect size (-.23, -.35), and one had a medium effect size (-.57). One subtest of melody recognition indicated cochlear implants provided greater benefit to listeners than hearing aids with an effect size of .62, indicating medium size effect. This effect size was the largest for all subtests. The subtest evaluated listeners' ability to recognize a tune with lyrics provided. These data support research findings indicating that cochlear implants are particularly beneficial for decoding speech, including vocal music (Stordahl, 2002; Vongpaisal, Trehub, & Schellenberg, 2006; Vongpaisal, Trehub, & Schellenberg, 2009). Melody recognition is an important part of musical enjoyment; consequently, researchers have investigated the effect of hearing loss on melodic perception and found that there is a large variability among listeners' abilities to perceive melodic information (Fujita, & Ito, 1999; Galvin, Fu, & Shannon, 2009; Gfeller, Witt, Stordahl, Mehr, & Woodworth, 2000).

The utility of cochlear implants are often cited as less effective for transmitting pitch information than for rhythm information (Darrow, 1987, 1992; Darrow & Goll, 1989; Gfeller & Lansing, 1992; Gfeller, Woodworth, Robin, Witt, & Knutson, 1997). In the present study, the results for rhythm perception are represented by only two tests of rhythm discrimination and the findings are mixed. Likewise, the findings on tests of timbre discrimination and quality appraisals are also mixed or of little significance; however, the findings for timbre discrimination are consistent with research indicating that single instrument identification is easier than the identification of multiple instruments or instruments with accompaniment—regardless of the assistive hearing device used (Looi, McDermott, McKay, & Hickson, 2007; Darrow & Novak, 2007).

In published studies where music perception has been assessed via tasks involving discrimination or identification, the performances of both hearing aid and cochlear implant users has usually been compared to normal hearing listeners (Darrow & Novak, 2007, 2009; Darrow, Novak, & Selph, 2007; Darrow, Novak, & Swedburg, 2007; Gfeller et al., 1998; Gfeller et al., 2002; Gfeller et al., 2003; Pijl, 1997; Stordahl, 2002). Such tasks put participants with a hearing loss in an obvious and distinct disadvantage, regardless of the assistive hearing device used. Perhaps a

more reasonable comparison is between cochlear implant users for whom electrical stimulated hearing is used and hearing aid users for whom acoustical stimulated hearing is used. Researchers have begun to investigate bimodal stimulation, whereby listeners use a cochlear implant in one ear and a hearing aid in the other, optimizing the benefits of both types of stimulated hearing, and increasing music perception as well (Cullington & Zeng, 2011). The composite findings of the present study suggest that both hearing aid and cochlear implant users perceive elements of musical sound similarly, and that potential cochlear implant recipients should be advised accordingly regarding their prospects for music listening post-implantation.

References

Bechtold, M. L., Puli, S. R., Othman, M. O., Bartalos, C. R., Marshall, J. B., & Roy, P. K. (2009). Effect of music on patients undergoing colonoscopy: A meta-analysis of randomized controlled trials. *Digestive Diseases and Sciences, 54*(1), 19-24.

Bradley, R., (2009). Predicting music enjoyment in cochlear implant users. *Independent Studies and Capstones.* Paper 197. Program in Audiology and Communication Sciences, Washington University School of Medicine. Retrieved January 15, 2011 http://digitalcommons.wustl.edu/pacs_capstones/197.

Cheng, A. K., Grant, G. D., & Niparko, J. K. (1999). Meta-analysis of pediatric cochlear implant literature. *The Annals of Otology, Rhinology & Laryngology. Supplement, 177*, 124-128.

Clark, G. M. (2006). The multiple-channel cochlear implant: The interface between sound and the central nervous system for hearing, speech, and language in deaf people: A personal perspective. *Philosophical Transactions: Biological Sciences, 361*(1469, Reviews), pp. 791-810.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd edition). Hillsdale, NJ: Erlbaum.

Cullington, H. E., & Zeng, F. G. (2011). Comparison of bimodal and bilateral cochlear implant users on speech recognition with competing talker, music perception, affective prosody discrimination, and talker identification. *Ear and Hearing, 32*(1), 16-30.

Darrow, A. A. (1987). An investigative study: The effect of hearing impairment on music aptitude. *Journal of Music Therapy, 24*, 88-96.

Darrow, A. A. (1992). The effect of vibrotactile stimuli on the recognition of pitch change by hearing impaired children. *Journal of Music Therapy, 29,* 103-112.

Darrow, A. A. (2006). The role of music in deaf culture: Deaf students' perception of emotion in music. *Journal of Music Therapy, 43*(1), 2-15.

Darrow, A. A. (2010). Teaching students with hearing loss. In M. Adamek and A. A, Darrow (Eds.), *Music in Special Education*, Silver Spring, MD: AMTA.

Darrow, A. A., & Goll, H. (1989). The effect of vibrotactile stimuli via the SOMATRON^{TM} on the identification of rhythmic concepts by hearing impaired children. *Journal of Music Therapy, 26,* 115-124.

Darrow, A. A., & Novak, J. (2007). The effect of vision and hearing loss on listener's perception of referential meaning in music. *Journal of Music Therapy, 44,* 57-73.

Darrow, A. A., & Novak, J. (2009, April). Musical gaming: Crossing the cultural divide between deaf and hearing. International Symposium on Research in Music Behavior. St. Augustine, FL.

Darrow, A. A., Novak, J., & Selph, A. (2007, November) The effect of hearing loss on students application of descriptive labels to musical listening and performance. American Music Therapy Association, Louisville, KY.

Darrow, A. A., Novak, J., & Swedburg, O. (2007). Designative meaning in music: A comparison of listeners' with typical hearing and hearing losses. MENC Society for Research in Music Education Symposium, The University of Kansas, Lawrence, KS.

El Fata, F., James, C. J., Laborde, M., & Fraysse, B. (2009). How much residual hearing is 'Useful' for music perception with cochlear implants? *Audiology & Neuro-Otology, 14*, 14-21.

Filipo, R., Ballantyne, D., Mancini, P., & D'elia, C. (2008). Music perception in cochlear implant recipients: Comparison of findings between HiRes90 and HiRes120. *Acta Oto-Laryngologica, 128*(4), 378-381.

Fujita, S., & Ito, J. (1999). Ability of nucleus cochlear implantees to recognize music. *The Annals of Otology, Rhinology, and Laryngology, 108*(7 Pt 1), 634-640.

Galvin, J. J., Fu, Q.-J., & Shannon, R. V. (2009). Melodic contour identification and music perception by cochlear implant users. *Annals of the New York Academy of Sciences, 1169*, 518-533.

Gfeller, K. (2001). Aural rehabilitation of music listening for adult cochlear implant recipients: Addressing learner characteristics. *Music Therapy Perspectives, 19*, 88-95.

Gfeller, K. (2009). Music and cochlear implants: Not in perfect harmony. *ASHA Leader, 14*(8), 12-13.

Gfeller, K., Christ, A., Knutson, J., Witt, S., & Mehr, M. (2003). The effects of familiarity and complexity on appraisal of complex songs by cochlear implant recipients and normal hearing adults. *Journal of Music Therapy, 40*(2), 78-112.

Gfeller, K., Christ, A., Knutson, J. F., Witt, S., Murray, K. T., & Tyler, R. S. (2000). Musical backgrounds, listening habits, and aesthetic enjoyment of adult cochlear implant recipients. *Journal of the American Academy of Audiology, 11*(7), 390-406.

Gfeller, K., Knutson, J. F., Woodworth, G., Witt, S., & DeBus, B. (1998). Timbral recognition and appraisal by adult cochlear implant users and normal-hearing adults. *Journal of the American Academy of Audiology, 9*(1), 1-19.

Gfeller, K., & Lansing, C. R. (1991). Melodic, rhythmic, and timbral perception of adult cochlear implant users. *Journal of Speech and Hearing Research, 34*(4), 916-920.

Gfeller, K., & Lansing, C. (1992). Musical perception of cochlear implant users as measured by the "primary measures of music audiation.": An item analysis. *Journal of Music Therapy, 29*(1), 18-39.

Gfeller, K., Oleson, J., Knutson, J. F., Breheny, P., Driscoll, V., & Olszewski, C. (2008). Multivariate predictors of music perception and appraisal by adult cochlear implant users. *Journal of the American Academy of Audiology, 19*(2), 120-134.

Gfeller, K., Turner, C., Mehr, M., Woodworth, G., Fearn, R., Knutson, J. F., Stordahl, J. (2002). Recognition of familiar melodies by adult cochlear implant recipients and normal-hearing adults. *Cochlear Implants International, 3*(1), 29-53.

Gfeller, K., Witt, S., Stordahl, J., Mehr, M., & Woodworth, G. (2000). The effects of training on melody recognition and appraisal by adult cochlear implant recipients. *Journal of the Academy of Rehabilitative Audiology, 33*, 115-138.

Gfeller, K., Woodworth, G., Robin, D. A., Witt, S., & Knutson, J. F. (1997). Perception of rhythmic and sequential pitch patterns by normally hearing adults and adult cochlear implant users. *Ear and Hearing, 18*(3), 252-260.

Gordon, E. E. (1979). *Primary measures of music audiation*. Chicago: G. I. A. Publications.

Hedges, L. V. & Olkin, I. (1985). *Statistical methods for meta-analysis*. New York: Academic Press.

Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis*. Newbury Park, CA: Sage.

Koger, S. M., Chapin, K., & Brotons, M. (1999). Is music therapy an effective intervention for dementia? A meta-analytic review of literature. *Journal of Music Therapy, 36*(1), 2-15.

Kong, Y. Y., Stickney, G. S., Aeng, F. G. (2005). Speech and melody recognition in binaurally combined acoustic and electric hearing. *Journal of the Acoustical Society of America, 117*(3), 1351-1361.

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.

Looi, V. (2008). The effect of cochlear implantation on music perception. *Otorinolaringologia, 54*(4), 169-190.

Looi, V., McDermott, H., McKay, C., & Hickson, L. (2007). Comparisons of quality ratings for music by cochlear implant and hearing aid users. *Ear and Hearing, 28*(2 Suppl), 59S-61S.

Looi, V., McDermott, H., McKay, C., & Hickson, L. (2008a). Music perception of cochlear implant users compared with that of hearing aid users. *Ear and Hearing, 29*(3), 421-434.

Looi, V., McDermott, H., McKay, C., & Hickson, L. (2008b). The effect of cochlear implantation on music perception by adults with usable pre-operative acoustic hearing. *International Journal of Audiology, 47*(5), 257-268.

Martin, F. N & Clark, J. G. (2005). *Introduction to audiology, 8th edition*. Boston: Allyn & Bacon.

McDermott, H. J. (2004). Music perception with cochlear implants: A review. *Trends in Amplification, 8*(2), 49-82.

Nimmons, G., Kang, R., Drennan, W., Longnion, J., Ruffin, C., Worman, T., Yueh, B., & Rubinstein, J. (2008). Clinical assessment of music perception in cochlear implant listeners. Otology & Neurotology, 29; 149-155.

Pelletier, C. L. (2004). The effect of music on decreasing arousal due to stress: A meta-analysis. *Journal of Music Therapy, 41*(3), 192-214.

Pijl, S. (1997). Labeling of musical interval size by cochlear implant patients and normally hearing subjects. *Ear and Hearing, 18*(5), 364-372.

Poston, J. M., & Hanson, W. E. (2010). Meta-analysis of psychological assessment as a therapeutic intervention. *Psychological Assessment, 22*, 203-212.

Reynolds, N. R., Timmerman, G., Anderson, J., & Stevenson, J. S. (1992). Meta-analysis for descriptive research. *Research in Nursing and Health, 15*, 467-475.

Schaub, A. (2008). *Digital hearing aids*. New York: Thieme Medical Publishers, Inc.

Silverman, M. J. (2003). The influence of music on the symptoms of psychosis: A meta-analysis. *Journal of Music Therapy, 40*(1), 27-40.

Standley, J. M. (1986). Music research in medical/dental treatment: Meta-analysis and clinical applications. *Journal of Music Therapy, 23*(2), 56-122.

Standley, J. M. (2002). A meta-analysis of the efficacy of music therapy for premature infants. *Journal of Pediatric Nursing, 17*(2), 107-113.

Stordahl, J. (2002). Song recognition and appraisal: A comparison of children who use cochlear implants and normally hearing children. *Journal of Music Therapy, 39*(1), 2-19.

Sucher, C. M., & McDermott, H. J. (2009). Bimodal stimulation: Benefits for music perception and sound quality. *Cochlear Implants International: An Interdisciplinary Journal, 10*, 96-99.

Timmerman, L. M., Allen, M., Jorgensen, J., Herrett-Skjellum, J., Kramer, M. R., & Ryan, D. J. (2008). A review and meta-analysis examining the relationship of music content with sex, race, priming, and attitudes. *Communication Quarterly, 56*(3), 303-324.

Vongpaisal, T., Trehub, S. E., & Schellenberg, E. G. (2006). Song recognition by children and adolescents with cochlear implants. *Journal of Speech, Language & Hearing Research, 49*(5), 1091-1103.

Vongpaisal, T., Trehub, S. E., & Schellenberg, E. G. (2009). Identification of TV tunes by children with cochlear implants. *Music Perception, 27*(1), 17-24.

Whipple, J. (2004). Music in intervention for children and adolescents with autism: A meta-analysis. *Journal of Music Therapy, 41*(2), 90-106.

Musical gaming: Crossing the cultural divide between deaf and hearing

Alice-Ann Darrow
Florida State University
alifsu@mac.com
USA

Abstract

Musical gaming has become a recent phenomenon exerting tremendous economic, social, and cultural influence. The most familiar medium for gaming is *Guitar Hero*, a rhythm-based music video game in which players must press the right key at the right time in order to 'score.' With over 14 million *Guitar Hero* units sold since 2005, and bars across the country hosting *Guitar Hero* nights, musical gaming has become a prominent feature in popular culture. *Guitar Hero,* the most widely played of the musical video games, has found a special place in deaf culture, primarily because 'musical' skill is not dependent upon one's ability to hear, but rather on one's visual processing skill and eye-hand coordination. The purpose of the present study was to examine the influence of hearing status, experience with musical gaming, and task difficulty on participants' scores for three guitar tracks of increasing complexity taken from the series, *Guitar Hero World Tour* (2008). Participants (N = 50) were persons with typical hearing (n = 25) and persons with severe to profound hearing losses (n = 25). Experimental stimuli were guitar tracks programmed for *Obstacle 1*, the second single off of Interpol's *Turn on the Bright Lights* (2002). Results revealed no significant differences between participants' scores based on hearing status; however, significant differences were found between participants' scores based on their experience with musical gaming. Participants who indicated they had played many times scored significantly higher than those who had never played or played only a few times. Significant differences were also found between participants' scores based on the difficulty of the task. Participants' scores were significantly lower on the difficult guitar track than on the easy or moderate tracks. These data indicate that for individuals who are deaf, musical gaming may be a viable means of musical expression, and to participate in music making in ways similar to and equal to persons with typical hearing.

Guitar Hero, along with *Rock Band* and *Donkey Konga*, are part of a cultural phenomenon known as musical gaming. Musical gaming has become a popular party activity, which in turn, has resulted in events such as *Guitar Hero* contests across the country, and *Rock Band* or *Guitar Hero* nights at bars which have brought in record numbers of patrons (Zezima, 2007). Music video games are not new, but the recent generation of games has found a prominent place in the mainstream of popular culture. *Guitar Hero* and *Rock Band* besieged the video game market in 2008, and accounted for nearly one- third of overall industry growth in a single year. *Guitar Hero III* became the first video game to exceed one billion dollars in total sales (Peckham, 2008). Though the economic impact is clear, there remains some question as to the social and cultural influence of musical gaming on music education. Gaming is changing a generation of youth's ideas about and attitudes toward music making. Some educators attribute a dramatic rise in guitar class enrollment to the availability

and popularity of guitar-based music video games such as *Guitar Hero* (Clements, Cody, & Gibbs, 2008).

Many of today's youth spend more time in virtual worlds than they do in the real world. Consequently, music educators have begun to examine the attraction of virtual worlds, and what can we learn from these dynamic music environments that attract so many of our youth (Clements, Cody, & Gibbs, 2008). What motivates their involvement in these worlds, both musically and socially? What are the effects of their involvement on their thoughts about music and their participation in music learning? The relevance of musical gaming to traditional music education is evident in many of the strategies that must be employed to succeed. For example, success in *Guitar Hero* requires practice techniques often used in traditional music education. In the practice mode of *Guitar Hero III*, a player can slow down the tempi of songs, repeat multiple passages in succession, and focus on a particular section of a song independent of its full context.

As a core characteristic, musical gaming is organized around doing—an important component of music learning. It is through a functional approach that gamers and musicians both learn through doing and performing. Squire (2005a) portends, however, that musical gaming is not a full representation of musical reality, and provides limited opportunities for interaction and musical incarnations. Nevertheless, he believes that video games in general are not without merits regarding an understanding of learning processes in a digital age (2005b, 2005c). His research involves applying principles of video game-based technologies to educational practices. Before going to the University of Wisconsin-Madison, he was Research Manager of the Games-to-Teach Project at MIT. His body of work indicates that participation in gaming provides a valuable lab for exploring learning principles (Squire, 2004). As a game increases in complexity, game designers must embed structures to assist players in mastering the game, and that such structures can be applied to most teaching and learning situations (Jenkins & Squire, 2004).

There are some studies in general education regarding the impact of interactive gaming as forums where learning and communication can occur (Barab, Thomas, Dodge, Carteaux, & Tüzün, 2005; Ke, 2008); however, there are few studies specific to music education, though active discussion regarding how music video games might affect traditional music learning has been a part of the literature for the past 10 years (Beckstead, 2001; Forest, 1995). Clements, Cody, and Gibbs (2008) have examined the viability of introducing *Guitar Hero* to undergraduate music education majors in order to 1) expand their knowledge and perception of video game use in the music classroom, and 2) to create sound pedagogical musical arrangements within game play in order to guide their future students from virtual guitar playing into actual guitar playing. Clements et al. (2008) have also investigated musical communities of interactive gaming in order to understand why these games have such broad appeal. They found that such gamers have much to offer music educators in terms of making music learning applicable to today's youth. Contemporary music technology may be challenging the nature of music education and what it means to participate in music learning, and it may well be influencing music therapy practices as well.

The potential of *Guitar Hero* in physical rehabilitation is being investigated, particularly in regard to patients' regaining flexibility and rotation of the arm. Pronation and supination refer to the twisting and flexing motions of limbs—motions that are heavily utilized when playing *Guitar Hero*. Apart from patients' increased willingness to participate in therapy, other possible benefits of *Guitar Hero* may be improved abdominal, lower back, and wrist strength, sitting balance, fine motor skills, and general endurance (Faylor, 2008). Similar applications have been suggested for patients who are recovering from burns to the hands and arms (Medical News Today, 2008). Musgrave (2007) writes that games such as *Guitar Hero* have also been useful for patients at Walter Reed Hospital to increase their opportunities for socialization, to reconnect them to entertainment they enjoyed before arriving at the military hospital, or to introduce new leisure skills that can replace former activities they can no longer participate in. Musical gaming may also serve as a means to include students with disabilities in music making, or to reach other youth who seek musical experiences beyond the usual band, orchestra, and choir.

One traditionally disenfranchised group of music students has been those with hearing loss. *Guitar Hero,* the most widely played of the musical video games, has found a special place in deaf culture, primarily because the 'musical' skill required is not dependent upon one's ability to hear, but rather on one's visual processing skill and eye-hand coordination. Most students are attracted to the guitar, and students who are deaf are no exception. Students who are deaf do not live in musical isolation. They have hearing siblings who listen to music, they watch TV, and consequently, they know many of the popular recording artists and the names of the songs they sing (Darrow, 2000). In traditional music classes, deaf students have reported feeling "stupid," or being "punished for not sounding right." Positive responses to music classes were because music allowed them to "express themselves," or because "it was fun." One respondent stated that she enjoyed the guitar, "not for the sound, but for the challenge of strumming and changing chords" (Darrow, 1993, p. 3). Such responses identify the positive attributes of music study for students who are deaf, and these attributes—all characteristics applicable to *Guitar Hero*, indicate that musical gaming may be a viable means for deaf students to experience music in ways similar to hearing students.

Much, if not most of the research on music and deafness has been concerned with how students with hearing loss perceive musical stimuli—their auditory perception of music; thus, examining their weakest sense. In such studies, deaf participants' auditory skills are often compared to those of their hearing peers (Darrow, 1979, 1984, 1987, 1991, 1992, 2006; Darrow & Goll, 1989; Darrow & Novak, 2007). While useful for the purposes of music programming and determining appropriate adaptations to be made, such comparative studies reveal little about what aspects of music learning interest students who are deaf, or in what music activities they might compare equal to, or even favorably to their hearing peers. Because musical gaming is not dependent upon one's ability to hear, but rather on one's visual processing skill and eye-hand coordination, the purpose of this study was to examine the influence of hearing status, experience with musical gaming, and task difficulty on participants' scores for three tracks taken from the series, *Guitar Hero World Tour* (2008).

Method

Participants

Volunteer participants (N = 50) were persons with typical hearing (n = 25) and persons with severe to profound hearing losses (n = 25). Deaf participants were recruited from the Colorado School for the Deaf and Blind, and from the deaf community in Colorado Springs, Colorado. Hearing participants were recruited from the general community and matched to deaf participants on age and gender as closely as possible. Girls' and boys' game-playing habits have been addressed by many researcheers, which have consistently found that boys play video games more than girls (Buchman & Funk, 1996). Eighteen males and 32 females participated in the study. Participants ranged in age from 12 to 40 years with a mean age of 22 years.

Musical Task

Harmonix, a company that creates musical-theme video games, developed the original version of *Guitar Hero*. The software company *RedOctane* first released it for *Play Station 2* in 2005; however, it was not until the release of *Guitar Hero 2* in late 2006—which featured a larger catalog of songs, that the game became widely popular with those outside the musical gaming community.

Guitar Hero requires players to press keys on a synthetic guitar in time to a song chosen from a library of familiar rock tunes from the 1960s to present. As the player watches colored 'notes' scroll down a screen, the objective is to press the corresponding colored keys on the guitar—along with a second strum key. In order to score points, keys must be pressed in time to the 'notes' as they scroll down the screen. The more difficult the level, the faster the 'notes' scroll and the more complicated the chords—represented by multiple colored 'notes.'

The experimental stimuli used for the present study were taken from the *Guitar Hero World Tour* (2008). The guitar tracks used were the easy, moderate, and difficult tracks programmed for *Obstacle 1*, the second single off of Interpol's *Turn on the Bright Lights* (2002). This particular tune was chosen because it is less familiar than many of the other tunes included in the series, and because all three levels of difficulty were programmed for the same tune.

Procedures

All participants were tested in the music room at the Colorado School for the Deaf and Blind. After demographic data were recorded on participants' age, level of hearing loss, gender, experience with *Guitar Hero*, participants were given 5 minutes of instruction and 5 minutes to experiment with the equipment. Participants were allowed to set the television monitor to their most comfortable listening level (MCL). At the end of the instructional period, participants' scores were recorded for the three tracks of the experimental piece, *Obstacle 1*. All participants were tested using the same track sequence: easy, moderate, and difficult. Scores were taken from the game's digital read out. Scores were the frequency of participants' 'hits' for each of the three guitar tracks. A 'hit' or point was calculated each time a participant player

pressed the correct guitar key—or combination of keys, along with the 'strum' key at the appropriate time.

Results

Results of an MANOVA with repeated measures was used to determine differences in scores based on participants' hearing status, experience with musical gaming, gender, and the difficulty of the guitar track. Within-subject factors were scores on the three guitar tracks: easy, moderate, and difficult. Between-subject factors were hearing status, gender, and experience with musical gaming.

No significant effects were found for hearing status or gender, or for any interactions ($p < .05$). However, significant differences were found for the factor 'experience with musical gaming' [$F(2, 47) = 6.72$, $p < .00$]. Multiple comparisons revealed that participants who had played *Guitar Hero* 'many times' scored significantly higher than those who had 'never played' or those who had 'played only a few times.' No significant differences in scores were found between those who had 'never played' or 'played only a few times' ($p < .05$).

Significant differences were also found between participants' scores based on the difficulty of the guitar track [$F(2, 47) = 7.66$, $p < .00$]. Multiple comparisons revealed that participants' scores were significantly lower on the 'difficult' guitar track than on the 'easy' or 'moderate' guitar tracks. No significant differences were found between participants' scores on the 'easy' or 'moderate' guitar tracks ($p < .05$).

Post hoc qualitative data were also gathered from participants regarding their impressions of *Guitar Hero* as a musical experience. After completing the testing period, participants were posed the following questions: Did you enjoy playing *Guitar Hero*? What was attractive to you about the game? Would you purchase such a musical game? If you have played before, how did you learn about *Guitar Hero*?

Many participants who are deaf responded that they enjoyed the visual aspects of the *Guitar Hero* ("I can see how music sounds"), though a number of participants also mentioned that they missed feeling the vibrations they usually experience with acoustic instruments ("It is fun, but no sounds to feel"). Nearly all participants who are deaf stated that they enjoyed the challenge of the game and saw it as way to connect to music ("I enjoyed the challenge." "I love to be able to connect to music." "*Guitar Hero* is very visual—a strength for the deaf"). Some participants mentioned the possibility that playing was good practice at eye-hand coordination ("Challenging! Helps improve my eyes / hands coordination"). Most deaf participants who had played *Guitar Hero* before, learned about the game from siblings ("I've seen my brother play it before"), and nearly all reported that they would purchase the game if they could ("I would buy it, but I can't afford it on my allowance").

Discussion

The primary purpose of the present study was to determine the effect of hearing, gender and experience on participants' ability to perform a musical game. The data indicated no significant differences between the performances of males and females, or between those of hearing and deaf participants. These data indicate that

typical gender differences that have been reported in the literature are fading. Females are more evident in the virtual gaming communities than in the past, but there are differences in the types of games females and males prefer. Men prefer games that are competitive. Females tend to play the same games, but not against each other. Instead, they prefer pursuing the same game objective, but discussing the game and strategies with each other as they play. Group activity or social interaction—not teams or direct competition—forms the basis for the female gaming community (Center for Information Technology and Management, 2009).

Unlike many previous studies, deaf participants in the present study performed as well as hearing participants. Reasons for their favorable performance were likely the visual nature of *Guitar Hero,* and perhaps the general popularity of video games in both deaf and hearing cultures. Qualitative data indicate that most deaf participants enjoyed playing the game, believed they could be a 'guitar hero,' and that the experience was a valid representation of musical performance. There has been considerable discussion among music educators as to the legitimacy of music gaming and its role in music education (Clements, Cody, & Gibbs, 2008, Lasko, 2009).

Instrument playing and musical gaming share many performance attributes; however, the extent to which performing musical video games is similar to real life musical interactions is yet to be defined. Miller and Shahriari (2006) portend that while music is in a literal sense only a type of sound vibration; it is distinguishable from other sounds that are not considered to be music based on the meanings assigned to it. If the meaning of music resides in the thoughts and cultural conventions assigned to it, then it stands to reason that how music is defined will vary depending on the groups, and ages of persons associated with it (Clements, Cody, & Gibbs, 2008). Such a supposition supports deaf participants' and contemporary youth's interpretation of musical gaming as legitimate music making.

Musical games are attractive to both deaf and hearing persons because of the "fun factor," but also because they provide opportunities for socialization. *Guitar Hero* is a musical game that both deaf and hearing students can play without deaf students being severely disadvantaged by their hearing loss. Serious gamers have created social networks where they can interact in small and large groups. In such venues, musical gamers can dialogue about practice procedures, or about musical passages in specific tunes. Such 'musical discussions' have been traditionally inaccessible to deaf performers. Executing synchronization of pitch fretting contours and rhythmic proportions instills a sense of accomplishment that may allow the deaf performer to enter into such discussions. These performance characteristics are not so different than those cited by Turner and Bartlett in 1848 when they discussed the role of music in the education of the deaf (Darrow & Heller, 1985, p. 10):

> "In estimating the pleasure that can be derived from music, it must not be forgotten that the sensation or perception of sound is not the whole of pleasure produced by music. A considerable part of this pleasure results from the rhythmical character of the movement, which can be perceived by the sense of sight alone to a considerable extent, and yet more perfectly with sight and feeling together…What benefit is ever derived from music? It is a source of intellectual gratification. It is a means of intellectual cultivation."

Understanding why musical games such as *Guitar Hero* have such broad appeal may inform music educators regarding ways to reach other students who seek musical experiences beyond the usual band, orchestra, and choir. Musical gaming can have benefits for the typical music student as well. If one perceives musical gaming to be a true music interaction, then the experience will likely have an impact on the individual's musical practice both inside and outside the virtual environment (Clements, Cody & Gibbs, 2008). It seems intuitive too that the extent to which players believe they are experiencing true music making will also influence their perceptions of music in general. It may be too that practice and performance in a virtual musical environment will contribute to students' sense of self and what they are capable of doing musically. Executing synchronization of pitch fretting contours and rhythmic proportions instills a sense of accomplishment that may be generalized to other more traditional forms of music making. Executing a musical game is as complex as playing some acoustic music instruments, and thus, success in musical gaming may lead to both traditional and nontraditional music students' willingness to explore new avenues of music making (Clements, Cody, & Gibbs, 2008).

In the present study, experience with musical gaming was the only factor that was significant. The role of music educators is to provide musical experiences to students, and to make these musical experiences accessible to all students. It is also their role to provide the tools and encouragement students need to be creative. Music educators today will need to decide if they consider musical gaming to be a legitimate musical experience, and if 'virtual music making' is appropriate for their classrooms. Musical gaming may be a reinvention of musical interactions for the youth of today, as well as a musical activity that deserves a place in the traditional music classroom.

References

Barab, S., & Squire, K. (2004). Design-based research: Putting a stake in the ground. *The Journal of the Learning Sciences, 13*(1), 1-14.

Barab, S. A., Thomas, M. K., Dodge, T., Carteaux, B., & Tüzün, H. (2005). Making learning fun: Quest Atlantis, a game without guns. *Educational Technology Research and Development, 53*(1), 86-107.

Beckstead, D. (2001). Will technology transform music education? *Music Educators Journal*, *87*(6), 44-49.

Buchman, Debra D., & Funk, Jeanne B. (1996). Video and computer games in the '90s: Children's time commitment & game preference. *Children Today, 24*(1), 12-15, 31. EJ 544 891.

Center for Information Technology and Management (2009). Retrieved January 11, 2009 at < http://citm.utdallas.edu/research/current_research/girls_gaming.html>

Clements, A., Cody, T. & Gibbs, B. (2008, March). *Imagined and virtual musical communities*. DVD presented at the Cultural Diversity in Music Education International Symposium, Seattle, WA.

Clements, A., Cody, T. & Gibbs, B. (2008, April). *Virtual and imagined worlds: The musical communities of interactive gaming and their implications for the music classroom.* Paper presented at the Pennsylvania Music Educators Conference, Hershey, PA.

Clements, A., Cody, T. & Stubbs, C. (2008, April). *Virtual to actual: The use of music gaming as a means to broaden pre-service music educators' perspective on musical engagement.* Research poster presented at the Pennsylvania Music Educators Conference, Hershey, PA.

Darrow, A. A. (2006). The perception of emotion in music by deaf and hard-of-hearing children. *Journal of Music Therapy*. *43*(1), 2-15.

Darrow, A. A. (2000, November). Conversations with deaf children about music. Paper presented at the conference of the American Music Therapy Association, St. Louis, MO.

Darrow, A. A. (1993). The role of music in deaf culture: Implications for music educators. *Journal of Research in Music Education, 41,* 93-110.

Darrow, A. A. (1992). The effect of vibrotactile stimuli on the recognition of pitch change by hearing impaired children. *Journal of Music Therapy, 29,* 103-112.

Darrow, A. A. (1991). An assessment and comparison of hearing impaired children's preference for timbre and musical instruments. *Journal of Music Therapy, 28,* 48-59.

Darrow, A. A. (1987). An investigative study: The effect of hearing impairment on music aptitude. *Journal of Music Therapy, 24,* 88-96.

Darrow, A. A. (1984). A comparison of rhythmic responsiveness in normal and hearing impaired children and an investigation of the relationship of rhythmic responsiveness to the suprasegmental aspects of speech perception. *Journal of Music Therapy, 21,* 48-66.

Darrow, A. A. (1979). The beat reproduction response of subjects with normal and impaired hearing: An empirical comparison. *Journal of Music Therapy, 16,* 6-11.

Darrow, A. A., & Goll, H. (1989). The effect of vibrotactile stimuli via the SOMATRON^{TM} on the identification of rhythmic concepts by hearing impaired children. *Journal of Music Therapy, 26,* 115-124.

Darrow, A. A. & Heller, G. N. (1985). Early advocates of music education for the hearing impaired: William Wolcott Turner and David Ely Bartlett. *Journal of Research in Music Education, 33,* 269-279.

Darrow, A. A., & Novak, J. (2007). The effect of vision and hearing loss on listener's perception of referential meaning in music. *Journal of Music Therapy, 44,* 57-

73.

Faylor, C. (2008, January 23). The healing power of *Guitar Hero*. ShackNews. Retrieved March 15, 2008.

Lasko, J. (2009). MENC teachers test Nintendo Wii Music™ in the classroom. MENC News January 22, 2009.

Medical News Today (2008, July 16). Wii-habilitation: Using video games to heal burns. www.medicalnewstoday.com

Miller, T., & Shahriari A. (2006). *World music: A global journey*. New York, NY: Routledge.

Musgrave, M. (2007, May 27). Games as therapy for Walter Reed's wounded. *Washington Post*, p. F01.

Peckham, M. (2008, December 22). Music sales rejuvenated by *Rock Band, Guitar Hero*. *Washington Post*. Retrieved March 15, 2008.

Squire, K.D. (2005a). Toward a theory of games literacy. *Telemedium 52* (1-2), 9-15.

Squire, K.D. (2005b). Resuscitating educational technology research: Design-based research as a new research paradigm. *Educational Technology 45*(1), 8-14.

Squire, K.D. (2005c). Changing the game: What happens when video games enter the classroom?. *Innovate 1(6).*

Squire, K.D. (2004). Sid Meier's Civilization III. *Simulations and Gaming*, *35*(1), 135-140.

Forest, J. (1995). Music technology helps students succeed. *Music Educators Journal*, *81*(5) 35-38.

Jenkins, H. & Squire, K (2004). Harnessing the power of games in education. *Insight (3)*1, 5-33.

Ke, F.F. (2008). A case study of computer gaming for math: Engaged learning from gameplay?. *Computers & Education, 51*(4), 1609-1620.

Zezima, K. (2007, July 14). Virtual frets, actual sweat: The new Karaoke. *The New York Times*. Retrieved March 15, 2008.

The development of a cochlear implant music training program

Lyn E. Schraer-Joiner
Kean University
lschraer@kean.edu
Union, NJ, USA

Alan Gertner
Kean University
agertner@kean.edu
Union, NJ, USA

Carol Goodman
Kean University
cgoodman@kean.edu
Union, NJ, USA

Florence Arking
Kean University
USA

Rachel Beleski
Kean University
USA

Carolyn Mullay
Kean University
USA

Keywords: Cochlear implant; prelingual and postlingual deafness; music training

Researchers have suggested that pre and postlingually deafened adults may benefit from intensive aural rehabilitation programs emphasizing auditory training as well as strategies necessary to enhance understanding. However, access to such services is limited as a result of inadequate reimbursement by public insurance providers. Furthermore, questions regarding the impact of structured training protocols on pre or postlingual implant users' music and speech perception abound. This paper will first describe the researchers' initial study (PHASE I) examining music and speech perception of adult cochlear implant users as well as the resulting web-based music training protocol. PHASE I of this study examined music and speech perception skills of adult cochlear implant (CI) users. The researchers found that prelingual CI users' scores on the Primary Measures of Music Audiation (PMMA) were lower than postlingual CI users' scores (Alpha level = .005). An analysis of the pitch discrimination measures of the Clinical Assessment of Music Perception (CAMP) revealed no significant differences between pre and postlingual participants' scores at either 262 or 330HZ. Prelingual CI user responses' at 391HZ were significantly lower than postlingual CI users (alpha level = .05), however. Also, no significant differences were found between pre and postlingual CI users' CAMP melody recognition scores, however, timbre subtest scores were significantly lower for prelingual CI users (alpha level = .05). Also revealed was that test scores were lower for participants implanted at a later age. Speech perception data revealed wide individual variations. Results demonstrated that fine-grained spectral discrimination tasks required for phoneme, word, and sentence discrimination is impaired in these cochlear implant participants and worse in the prelingual deafened late implanted cochlear implant participants than in the postlingual late implanted deafened adults. The finding that there are deficits in discriminating fine grained spectral aspects of speech is consistent with previous reports of phonemic and individual word perception being more difficult to perceive than environmental sounds and certain temporal aspects of speech. Speech perception measures mirrored those of music perception, finding that post-lingually implanted adults performed worse than those who had been pre-lingually implanted. Findings from PHASE I resulted in the development of a web-based training protocol (PHASE II) which includes separate training tracks for the pre and postlingual deafened CI recipient (to be piloted in Fall 2012). An overview of the follow-up study (PHASE III) investigating the impact of three types of music training (web-based, in-person, mixed) will also be provided. Such research may provide music therapists, speech

language pathologists, and audiologists with a habilitative/ rehabilitative starting point for incorporating music listening into their clients' therapy protocols.

The cochlear implant (CI) is a biomedical electronic device implanted under the skin, in the temporal region of the skull, which contains electrodes positioned within the cochlea to stimulate the remaining auditory nerve fibers of the inner ear. The device, designed to aid in the auditory rehabilitation of children and adults diagnosed with severe or profound hearing losses and unable to hear or comprehend speech with conventional hearing aids, transmits those elements of acoustical signals believed to be the most important in speech (Beiter & Brimacombe, 1993).

Postlingual deafened individuals experience hearing loss after language acquisition. Experiencing a hearing loss later in life can be traumatic, often affecting social and emotional faculties, vocational success, or educational development (Boothroyd, 1993). As music, environmental sounds, and spoken words become unattainable, a sense of aesthetic loss may also be experienced. Factors affecting the adaptation of late deafened adults include a lack of accessibility to the environment, increased isolation, perceived negative reactions from others, loss of independence, and interpersonal communication (Scadden, 1987).

Individuals with prelingual deafness acquire a hearing loss prior to speech and language acquisition. Hearing loss, in these instances, may be present at birth –a genetically determined abnormality or disease, premature birth, or an intrauterine event such as drug toxicity (Ramsden & Axon, 2009, p. 355). Postnatal illnesses include meningitis or viral damage to the cochlea and usual occur within the first two years of life. According to Gelfand, the earlier the onset of hearing loss and longer the individual is deprived of auditory stimulation, the more the loss will interfere with speech and language development (Gelfand, 2009, p 157). Those with postlingual deafness have usually experienced and/or enjoyed music prior to hearing loss onset (Gfeller, Christ, Knutson, Witt, Murray, & Tyler, 2000a; Gfeller, Witt, Stordahl, Merh, &Woodworth, 2000b; Schraer-Joiner, 2003). Such experience can be advantageous during postimplantation by serving as a reference point when trying to comprehend sounds perceived via the implant. Individuals with prelingual deafness have had limited exposure to the pitch and timbral characteristics of music. Their musical experiences are limited to what they know of music with the implant (Gfeller et al., 2000a; Gfeller et al., 2000b).

Pre-and postlingually deafened adult cochlear implant users may benefit from intensive aural rehabilitation programs which emphasize auditory training as well as the development of those strategies necessary to enhance their understanding (Bodmer, Shipp, Ostroff, Ng, Stewart, Chen, & Nedzelski, 2007; Heydebrand, Mauze, Tye-Murray, Binzer, & Skinner, 2005; Hawkins, 2005). There is greater urgency for those who are prelingually deafened as they struggled with deafness for most of their lives. Several computer training programs involving speech and language development are currently in use with populations including adults and children with cochlear implants and hearing aids; elderly with cognitive deficits; child language learners; and second language learners, (Oleson & Canada, 2011; Merzenich, Pandya, & Tremblay, 2005; Sweetow & Palmer, 2005). Software training programs designed to aid cochlear implant users in developing their music listening skills are also available (Driscoll, Oleson, Jiang, & Gfeller, 2009; Fu & Galvin, 2007; Masia,

Rogers, Olszewski, & Gfeller, 2002; Gfeller et al. 2000a; Gfeller et al., 2000b; Gfeller, Witt, Adamek, Mehr, Rogers, Stordahl, Ringgenberg 2002b; Gfeller, Turner, Woodworth, Mehr, Fearn, Witt, & Stordahl 2002a; Gfeller, Jiang, Oleson, Driscoll, & Knutson, 2010). Unfortunately, access to such services and training is limited as a result of inadequate reimbursement by public insurance providers (Garber, Ridgely, Bradley, & Chin, 2002). Also, it is unclear whether these protocols address pre- or post-lingual backgrounds.

This paper will describe the researchers' initial study (PHASE I) examining music and speech perception of adult cochlear implant users. An overview of a resulting web-based music training protocol designed for the prelingual and postlingual cochlear implant user as well as a follow-up study (PHASE II) planned for Fall 2012 investigating the impact of three different types of music training (web-based, in-person, mixed) will also be provided. Objectives for PHASE I of the study were to:

a. examine perception of pitch, timbre, and melody recognition in adults (ages 43-82) implanted with the CI

b. examine frequency, intensity and temporal resolution in adult CI users

c. examine auditory discrimination abilities for environmental sounds, isolated speech sounds, words, and high probability sentences of adult CI users

Method

Subjects

PHASE I involved 14 adult cochlear implant users, ranging in age from 43-82 years, who responded to a call for participants posted in a state newsletter for individuals with hearing loss. Three of the eleven participants were prelingually deafened with known etiologies of hearing loss reported as heredity nerve deafness, illness such as meningitis, pneumonia, Coxsackie Virus, and noise induced hearing loss - the result of military service or from factory work. The average duration of deafness for the participants in this study was 47 years and the average age of implantation was 51 years. Additionally, participants had an average of 9 years of experience with the device. Five participants were bilateral implant users, six were unilateral users, and three used both a cochlear implant and a hearing aid in the contralateral ear.

Test Measures

Music perception measures included the Clinical Assessment of Music Perception in Cochlear Implant Listeners (CAMP) (Nimmons, Kang, Drennan, Longnion, Ruffin, Worman, Yueh, & Rubinstein, 2008) and the Primary Measures of Music Audiation (PMMA) (Gordon, 1982). The Clinical Assessment of Music Perception in Cochlear Implant Listeners (CAMP) (Nimmons et al., 2008) is a computerized test comprised of three subtests specifically pitch direction discrimination, melody identification, and timbre identification. The pitch subtest utilizes a "2-alternative forced-choice adaptive system" so as to determine cochlear

implant users' threshold intervals for the discrimination of complex pitch direction change" (Nimmons et al, 2008). The melody and timbre subtests assess cochlear implant users' ability to recognize 12 isochronous melodies and 8 musical instruments, respectively. The Primary Measures of Music Audiation (PMMA) (Gordon, 1982) is a standardized music perception test which assesses ones' ability to discriminate between rhythm and tonal patterns. The PMMA is comprised of two subtests (rhythm and tonal) each of which is comprised of 40 pairs of simulated melodic or rhythmic patterns. Test takers are to indicate if the pairs of stimuli presented are the "same" or "different." The PMMA was selected for this research due to its use in previous studies involving adult cochlear implant users (Gfeller & Lansing, 1991, 1992) and because of the test requires no formal music training. The musical listening and background questionnaire included questions pertaining to participants hearing history, pre and postimplantation musical listening experiences and interests. Audiometric measures were selected to assess participants' implanted hearing thresholds as well as their perception and responses to environmental sounds, phonemes, low predictability monosyllabic words, higher predictability spondee words, typical (Everyday) sentences, and high predictability sentences and words. The specific assessment tools included pure tones, the Central Institute for the Deaf (CID) W 22 word lists, the CID W 1 word lists, the CID Everyday Speech test, The Sound Effects Recognition Test (SERT), and the Minimal Auditory Capabilities Test battery.

Procedures

PHASE I involved a total of four visits. Visit one served as the introduction to the research study and included a review of the consent form and a questionnaire which addressed participants' musical listening and hearing backgrounds. The second visit was comprised of audiometric testing. The auditory stimuli of the testing measures incorporates pure tone and speech auditory stimuli that is not noise hazardous and did not exceed the limits of the participants' cochlear implants. Audiometric measures were administered in the sound treated test suite of the university audiology clinic. Prior to testing participants' performance with their cochlear implants, the hearing of the non-implanted ear of participants with unilateral cochlear implants was performed under headphones. Headphone testing of non-implanted ears was performed to assure that hearing acuity in the non-implanted ears would not interfere with detecting stimuli that would be presented via the sound field speaker. It was decided that if the hearing in the non-implanted ear was sufficient to interfere with testing, that ear would be plugged during sound field testing of the cochlear implant. Headphone hearing test results, obtained with Telephonics TDH 50 P headphones, proved that hearing in the non-implanted ears of participants with unilateral implants would not interfere with testing of the implanted ear. To assess the cochlear implants, participants were seated 1 meter from the test speaker at 0o azimuth. Auditory stimuli were presented in a sound field setting at an intensity level, measured with a Radio Shack 33-2050 sound pressure level meter, of 70dB SPL which is recognized as perceptually mildly louder than conversational speech (60dB SPL) and is a standard level used to present speech stimuli when studying cochlear implant function (Strait, Kraus, Parbery-Clark, Ashley, 2010). Stimuli were generated (pure tones) or played through (environmental and speech stimuli) a Grason Stadler GSI 1761 clinical audiometer. Environmental and speech stimuli were pre-recorded, published compact discs that were played through a Technics SL-PD9 Digital Audio compact disc player and routed through the GSI 1761 audiometer. All

stimuli were delivered via a Grason Stadler 1761 sound field speaker system, model number 1761-9630. Participants were required to perform simple motor responses (hand raising) when pure tones are heard and to repeat numbers, speech sounds (phonemes), syllables, words, and sentences that are presented with pre-recorded sound and speech stimuli. Clear instructions were provided prior to each test being administered and practice items preceded test items.

Visit three, involved the administration of music perception measures. All music meaures were administered in a sound field or free field setting on Dell Inspiron laptop computers Test stimuli were presented at most comfortable level of loudness (65dB) via external speakers. External speakers and external mice were used to ensure consistency of equipment from one computer to the. Participants were seated 1 meter from the test speaker at 0o azimuth. Speakers were placed 1meter from Tables elongated for 1 meter measurements and comfort of participants in terms of reach to mice and keyboard. Computer speakers set to max and external speakers were calibrated to 65 dB (mean) as measured by a Radio Shack 33-2050 Sound Pressure Level Meter. To ensure that speaker volume controls were not moved, they were taped down orientation. Participants were able to modify their device volume control settings. The acoustic stimuli were received through participants' cochlear implants versus more traditional headphone hearing testing in which stimuli are presented to each ear individually via headphones or ear inserts. Participants were presented with four large buttons on their computer screen from which to choose - making their selection by using the computer mouse. Visit four, was 30 minutes in length was a debriefing of the study during which the researchers met with participants individually to discuss their results and the future directions of the study.

Results and Discussion

On the CAMP, mean pitch discrimination threshold for participants was 4.137 semitones (SD= 2.6317 semitones) and their range of performance on this subtest ranged from 0.5-9.56 semitones. The mean threshold in semitones for each base frequency was as follows: 262 Hz: 5.107 (SD=2.428); 330 Hz: 4.111 (SD=2.533); 391 Hz: 3.194 (SD=2.748). On the melody recognition subtest of the CAMP, CI users correctly identified 17.640% of the melodies presented (SD=19.3809) and their range of performance was between 2.78-77.78%. On the timbre recognition subtest, CI users recognized 37.663% of music instruments presented (SD=21.693) with a range of performance was between 2.28%-70.83%.

PMMA tonal subtest results revealed that participants on average answered 30 of the 40 items correctly (SD: 4.879) Performance range on this subtest was 19-38. PMMA rhythm subtests revealed that participants on average answered 32 of the 40 items correctly (SD: 4.506). The range of performance on this subtest was 23-37.

Participants' ability to perceive pitch patterns on the CAMP and PMMA subtests 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; Schraer-Joiner 2003; Gfeller et al., 2002a; Gfeller et al., 2002b). Current findings also reinforce other studies which have revealed that CI users require considerably larger frequency

differences for detecting pitch change and direction of pitch change (Gfeller et al, 2007; Kong, Cruz, Jones, & Zeng, 2004; Looi, 2008; McDermott, 2004). Furthermore, current findings also support previous research findings which revealed that cochlear implants are more effective in transmitting and subsequently facilitating the perception of rhythm in a musical context (Dorman et al., 1991; Gfeller & Lansing, 1991, 1992; Gfeller, Woodworth, Robin, Witt , & Knutson, 1997; Leal, Shin, Laborde, Calmels, Verges, Lugardon, Andrieu, Deguine, & Fraysse, 2003; Schraer-Joiner, 2003).

In order to examine the relationships between adult CI users' musical listening skills and speech perception skills, CAMP and PMMA scores were correlated with scores on the Central Institute for the Deaf (CID) W 22 word lists, the CID W1 word lists, the CID Everyday Speech test; The Sound Effects Recognition Test (SERT); and the Minimal Auditory Capabilities Test. Furthermore, music test scores were correlated with years of deafness, years of experience, as well as prelingual/postlingual background. Data gathered from the tonal and rhythm subtests of the PMMA were analyzed using a one way ANOVA. The researchers found that prelingual implant users' tonal scores were lower than that of the postlingual implant users (Alpha level = .005). Revealed also was that prelingual implant recipient rhythm subtest scores were lower than that of the postlingual implant users (Alpha level = .0005). Data from the Pitch Discrimination, Melody Recognition, and Timbre subtests of the CAMP were also analyzed using a one way ANOVA. No significant differences were found between pre and postlingual implant recipients' pitch discrimination scores at frequencies of 262or 330HZ. However, prelingual implant recipients' scores at 391HZ were significantly lower than the postlingual implant recipients (alpha level = .05). No significant differences were found between pre and postlingual implant recipients' melody recognition scores, however, timbre subtest scores were significantly lower for the prelingual cochlear implant users (alpha level = .05). Moreover, negative correlations were found between test scores and years of deafness specifically, the longer the participants were deaf, the lower their test scores tended to be. Negative correlations were found between test scores and experience with the device. Specifically, that the more experience the participants had with the device, the lower their scores also tended to be.

An analysis of the audiologic test data revealed that prelingual cochlear implant users' scores were lower than the postlingual participants across all measures. For example, sentence recognition results revealed that two prelingual participants earned a score of 0% while the third earned a score of 33% as compared to the overall study mean of 59%. Results of the word understanding task revealed that the prelingually deafened participants earned scores of 0, 4, and 20% as compared to the overall study mean of 30%. Scores on the environmental sounds recognition test revealed that prelingual participants earned scores of 65, 75, and 85% as compared to the overall study mean of 89%. Tests measuring intonation pattern recognition, vowel identification, consonant recognition, high predictability sentences, stressed words, spondee word recognition as well as same versus different spondee words yielded similar results. As mentioned, on a whole, post-lingual participants scored lower than pre-lingual participants and on many measures the post-lingual participants performed significantly worse than the pre-lingual participants. T tests for groups of unequal variance were performed to compare results for pre-lingual versus post-lingual participants. Significant differences between pre-lingual and post-lingual deafened

adults are seen on several of the auditory measures. Those tasks that do not reveal significant group differences include recognizing environmental sounds (p .068), discriminating inflectional pattern differences between questions and statements (p 0.12), recognizing whether two spondee (two syllable) words, presented one after the other, are the same or different (p 0.427), and recognizing which word in a sentence is stressed (p 0.020).

Those auditory tasks that do demonstrate significant group differences between pre-linguistic and post-linguistic recipients include the ability to recognize individual monosyllabic words (p 0.015), sentence recognition (p 0.012), recognition of vowel sounds (p 0.007), recognition of spondee words (p 0.0003), consonant recognition (p 0.0002), and identifying high predictability words in sentences (p 0.00007).

The findings indicate that tasks requiring fine grained spectral discrimination (phoneme and word recognition tasks) are significantly more difficult for post-lingual implanted cochlear implant recipients to perceive than tasks requiring gross spectral discrimination (identifying environmental sounds) and gross pattern changes over time (inflectional pattern discrimination, identifying sameness in spondee words, and recognizing sentence stress). These results are consistent with previous research (Ganz, et. al., 2005; Henry et al., 2005; Kong, et. al., 2011; Oxenham, 2008) as well as the music perception findings in this study, as fine grained spectral information is necessary to identify pitch and melody. Also, apparent from study data is that those who were pre-lingually deafened and implanted at a later age performed well below the study means and, in fact, were among the lowest scoring participants.

The differences found between pre and postlingual implant users on the music, hearing, and hearing perception measures suggests the need for a prelingual training track and a postlingual training track. Also revealed were the areas most in need of training. For example, melody recognition scores were the lowest for all cochlear implant participants' indicating that this is an area of weakness for all users despite background and device experience. Other areas in need of training include pitch and rhythm discrimination, as well as timbre recognition.

Future directions

Findings from PHASE I led to the development of a web-based music training protocol designed with two tracks – one for the pre and one for the postlingual cochlear implant user. The training protocols were designed to accommodate both their communication and learning styles. Listening goals were developed based upon participant responses to the musical listening and background questionnaire. Goals included the detection and discrimination of rhythm and pitch; melody and timbre recognition. The training protocol was piloted in January 2012. Each training protocol is comprised of four levels and aligning with the levels of auditory development specifically detection, discrimination, identification, and comprehension (Erber, 1982; Estabrooks, 1994, 1998). Detection, Level 1, was defined as the ability to respond to the presence or absence of rhythmic and melodic (pitch) stimuli. Training focuses upon the detection of rhythm and melody in order to provide a musical foundation. Tutorials will present concepts and terms introduced to support the definition of rhythm including time, divisions of time into steady beats,

combinations of patterns of rhythm, and varying accents or meter. Tutorials will also reinforce the concept of pitch such as the treble clef, as well as the series of letter names associated with the lines, spaces, and ledger lines above and below the treble clef**.** Discrimination, Level 2, was defined as the ability to perceive similarities and differences between two or more rhythmic and melodic (pitch) patterns. Training will include the comparison of closely related durational values while pitch activities will involve, discriminating between various pitch patterns such as low-low-high, high-high-low, low-medium-high, high-medium-low, as well as ascending and descending patterns with intervals ranging from a 2^{nd} to a 13^{th}. Identification, Level 3, is defined as the ability to identify and acknowledge (verbally), within the context of a melody, rhythmic and melodic (pitch) stimuli. During this level, melodies will be presented in their entirety. Emphasis will be placed upon single element identification as well as upon combined elements (i.e. duration and pitch relationships) within the selected melodies. Comprehension, Level 4**,** is defined as the ability to demonstrate understanding of the rhythmic, melodic (pitch) stimuli, dynamic, and tempo cues within a melody as well timbre recognition. Training will also emphasize dynamics, tempo, and timbre individually as well as in two and three element combinations including the elemental focuses of rhythm and pitch from previous levels. Short instructional video timbre tutorials also comprise the training protocols. PHASE II will begin in Fall 2012 during which researchers will examine various approaches to structured music training for CI users (i.e. synchronous, in person; asynchronous, web-based; mixed, both) to determine impact upon implant users' music perception and enjoyment as well as speech perception.

In addition to the benefits of improved music and speech perception as well as music appreciation for CI users, this research may identify training protocols which will best aid the CI user in developing the above skills. Such research will be of benefit to music therapists, speech language pathologists, and audiologists as findings may provide them with a habilitative/ rehabilitative starting point with regard to incorporating music listening into their clients' therapy protocols

References

Beiter, A., & Brimacombe, J. (1993). "Cochlear Implants," In J. Alpiner, & P. McCarthy (Eds.), *Rehabilitative audiology: Children and adults* (pp. 417-444). Baltimore: Williams and Wilkins.

Bodmer, D., Shipp, D. B., Ostroff, J. M., Ng, A. H., Stewart, S., Chen, J. M., & Nedzelski, J. M. (2007). A comparison of postcochlear implantation speech scores in an adult population. *Laryngoscope*, *117*, 1408–1411.

Boothroyd, A. (1993). "Profound deafness," In R. Tyler (Ed.), *Cochlear implants: Audiological foundations* (pp. 1-33). San Diego: Singular Publishing Group, Inc.

Dorman M., Basham K., McCandless G., & Dove H. (1991). Speech understanding and music appreciation with the Ineraid cochlear implant. *Hearing Journal,* 44:32- 37.

Driscoll VD, Oleson J, Jiang D, Gfeller K. (2009). Effects of training on recognition of musical instruments presented through cochlear implant simulations. *Journal of the American Academy of Audiology*, *21*: 71.

Erber, N. (1982). *Auditory training*. Washington, DC: Alexander Graham Bell Association for the Deaf.

Estabrooks, W. (1994). *Auditory-verbal therapy for parents and professionals*. Washington, DC: A. G. Bell Association for the Deaf.

Estabrooks, W. (1998). "Learning to listen with a cochlear Implant: A model for children" In W. Estabrooks (Ed), *Cochlear implants for kids* (pp. 72-88). Washington, DC: Alexander Graham Bell Association for the Deaf.

Fu, Q. & Galvin, J. (2007). Perceptual Learning and Auditory Training in Cochlear Implant Recipients. *Trends in Amplification*, 11(3), 193-205.

Gantz, B., Turner, C., Gfeller, K., & Lowder, M. (2005). Preservation of hearing in cochlear implant surgery: Advantages of combined electrical and acoustical speech processing. *Laryngoscope,* 115: 706-802.

Garber, S., Ridgely, M. S., Bradley, M., & Chin, K. W. (2002). Payment under public and private insurance and access to cochlear implants. *Archives of Otolaryngology—Head & Neck Surgery*, *128*, 1145–1152.

Gelfand, S. (2009). *The essentials of audiology*, 3rd Ed. NY: Thieme Publishers. [National Institute on Deafness and Other Communication Disorders, 2010].

Gfeller, K., & Lansing, C. (1991). Melodic, rhythmic, and timbral perception of adult cochlear implant users. *Journal of Speech and Hearing Research,* 34(4): 916-920.

Gfeller K. & Lansing C. (1992). Musical perception of cochlear implant users as measured by the *Primary measures of music audiation:* An item analysis. *Journal of Music Therapy,* 29:18-39.

Gfeller K., Christ A., Knutson J. F., Witt S., Murray K. T., Tyler R. S. (2000a). Musical backgrounds, listening habits and aesthetic enjoyment of adult cochlear implant recipients. *Journal of the American Academy of Audiology*, *11*:390.

Gfeller, K., Jiang, D., Oleson, J. J., Driscoll, V., & Knutson, J. F. (2010). Temporal stability of music perception and appraisal scores of adult cochlear implant recipients. *Journal of the American Academy of Audiology*, 21: 28-34.

Gfeller K., Turner C., Oleson J., Zhang X., Gantz B., Froman R., Olszewski C. (2007). Accuracy of cochlear implant recipients on pitch perception, melody recognition and speech reception in noise, *Ear and Hearing,* 28(3): 412-423.

Gfeller K., Turner C., Woodworth G., Mehr M., Fearn R., Witt S., Stordahl J. (2002a) Recognition of familiar melodies by adult cochlear implant recipients and normal-hearing adults. *Cochlear Implants International*, *3*:31–55.

Gfeller K., Witt S., Adamek M., Mehr M., Rogers J., Stordahl J., Ringgenberg S. (2002b) Effects of training on timbre recognition and appraisal by postlingually deafened cochlear implant recipients. *J Am Acad Audiol*, 13:132–145.

Gfeller, K., Witt, S., Stordahl, J., Merh, M. &Woodworth, G. (2000b). The effects of training on melody recognition and appraisal by adult cochlear implant recipients. *Journal of the Academy of Rehabilitative Audiology*, 33: 115.

Gfeller K., Woodworth G., Robin D. A. , Witt S, Knutson J. F. (1997). Perception of rhythmic and sequential pitch patterns by normally hearing adults and adult cochlear implant users. *Ear and Hearing,* 18(3): 252-260.

Gordon, E. (1982). *Primary Measures if Music Audiation (PMMA).* New York: GIA Publications.

Hawkins, D. B. (2005). Effectiveness of counseling-based adult group aural rehabilitation programs: A systematic review of the evidence. *Journal of the American Academy of Audiology*, *16*, 485–493.

Henry, B.A., Turner, C.W., & Behrens, A. (2005). Spectral peak resolution and speech recognition in quiet: Normal hearing, hearing impaired, and cochlear implant listeners. *Journal of the Acoustical Society of America, 118*, 1111–1121.

Heydebrand, G., Mauze, E., Tye-Murray, N., Binzer, S., & Skinner M. (2005). The efficacy of a structured group therapy intervention in improving communication and coping skills for adult cochlear implant recipients. *International Journal of Audiology*, 44, 272–280.

Kong, Y., Mullangi, A., Marozeau, J., & Epstein, M. (2011). Temporal and spectral cues for musical timbre. *Journal of Speech Language and Hearing Research*, 54: 981-994.

Kong Y.Y., Cruz R., Jones J.A., Zeng F.G., (2004) Music perception with temporal cues in acoustic and electric hearing. *Ear and Hearing, 25*(2):173-185.

Leal M. C, Shin Y. J, Laborde M. L., Calmels, M., Verges, S., Lugardon, S., Andrieu, S., Deguine, O., Fraysse, B. (2003) Music perception in adult cochlear implant recipients. *Acta Otolaryngolica, 123*(7): 826-835.

Looi V, (2008) The effect of cochlear implantation on music perception: a review, *Otorhinolaryngolica, 58*:169-190.

Masia M., Sena K., Kruse J., Olszewski C., Gfeller K. (2002) 'Music enjoyment and participation for children with implants', *Contact 15*(1-2): 11-14.

McDermott HJ, (2004) Music perception with cochlear implants: a review. *Trends in Amplification, 8*(2):49-82.

Merzenich, M., Pandya, P., & Tremblay, K. (2005). Roundtable discussion: Plasticity and auditory training. *Seminars in Hearing*, *26*, 144–148.

Nimmons, G. L., Kang, R. S., Drennan, W. R., Longnion, J., Ruffin, C., Worman, T., Yueh, B., Rubinstein, J. T. (2008). *Music perception measures: Clinical Assessment of Music Perception in Cochlear Implant Listeners (CAMP).* Seattle: University of Washington.

Oleson, A. D. & Canada, B. (2011). *Using Computerized Auditory Training Clinically for Adults With Cochlear Implants*. American Speech-Language-Hearing Association Retrieved, September 13, 2011.

Oxenham, O. (2008). Pitch perception and auditory stream segregation: Implications for hearing loss and cochlear implants. *Trends in Amplification*, 12: 316-331.

Ramsden R. T. & Axon, P. (2009). "Cochlear implants in children," In. V. Newton (Ed.), *Paediatric Audiological Medicine* (pp. 355-371). Chichester, West Sussex, United Kingdom: John Wiley & Sons Ltd.

Scadden, L. A. (1987). "Psychosocial implications of technological advances for sensorially disabled persons," In B. Heller, L. Flohr, L. Zegans (Eds.), *Psychosocial interventions with sensorially disabled persons* (pp. 231-241). Orlando: Grune and Stratton Inc.

Schraer-Joiner, L. (2003). *The effects of training on a cochlear implant user's musical listening skills and hearing behaviors: A case study*. (Doctoral dissertation, The University of North Carolina at Greensboro 2003) UMI Dissertation Services.

Strait D. L., Kraus N., Parbery-Clark A., & Ashley R. (2010). Musical experience shapes top-down auditory mechanisms: evidence from masking and auditory attention performance. *Hearing Research*. 261: 22-29.

Sweetow, R., & Palmer, C. V. (2005). Efficacy of individual auditory training in adults: A systematic review of the evidence. *Journal of the American Academy of Audiology*, *16*, 494–504.

Yucel, E., Sennaroglu, G., & Belgin, E., (2009). The family oriented musical training for children with cochlear implants: Speech and musical perception results of two year follow-up. *International Journal of Pediatric Otorhinolaryngology*, *73*(7), 1043-1052 2008; 45(5):779-89.

Songs of young deaf children using cochlear implants: From mimesis to invention

Maria Yennari
Cyprus Ministry of Education and Culture
myennari@hotmail.com
CYPRUS

Keywords: song, deaf children, cochlear implants, improvisation, creativity

This paper describes and analyses the spontaneous singing inventions of deaf children, ages 3.5 to 4,5 years, in preschool settings in Cyprus. The paper focuses on two dimensions of deaf children's singing activity: a) children's improvised singing happening during music sessions, and b) all spontaneous vocalisation taking place in other situations (indoor and outdoor play and class circle time). Apart from documenting deaf children's singing the study aims to identify the conditions that stimulate both imitation of song and improvised singing in the children and offer pedagogical insights for practice. The participants were five congenital prelingually deafened children with profound hearing loss who attended the School for the Deaf in Nicosia, Cyprus. The children were also mainstreamed into the community nursery that shares lodgings with the School for the Deaf. The children (three boys and two girls) were all implanted with the cochlear prosthesis between the ages of 10-12 months. The children participated in 30 minute music sessions twice weekly over a period of seven months. Sessions included a variety of musical activities some of which were designed to promote creative vocal activity and song. The sessions were video-recorded using a static camera in order to maintain contextual detail. Seven recordings of individual children were planned at the end of each calendar month in order to analyse their vocalisations longitudinally. The researcher was interested in investigating aspects of the children's lives playfully interwoven into the sessions in playful ways (play scenarios) as well as those objects which might be effective stimuli for song inventions. Singing episodes were analysed contextually (emphasis on process) and songs (invented and/or imitated) were analysed as 'objects' (emphasis on product). Data is supported by researcher's field notes and interviews with the parents and the children's mainstream class teachers.

The idea of deaf children participating in musical activities or even enjoying music, has often been regarded as paradoxical. This misunderstanding has its roots in the conviction that deaf individuals cannot hear. Moreover, because the sense of hearing is usually associated with musical involvement it seemed reasonable to assume that a significant hearing loss precludes musical enjoyment or achievement resulting in unfortunate underestimations of deaf children's ability to perceive and enjoy music.

Research in the 1970's and 80's, which investigated the musical abilities of deaf and hard-of-hearing children, revealed that these abilities as well as musical aptitude are not impaired but delayed (Rileigh & Odom, 1972; Darrow, 1987;1989). Other researchers also argued at the time that focusing on deaf children's ability to enjoy music, only through the tactile sense by feeling the vibrations of percussion instruments, was limiting and that deaf individuals should have a balanced music instruction (Ford, 1988).

With cochlear implants becoming the prostheses of choice for deaf children and adults[1], research into music and deafness has taken a new perspective with a heightened interest in how music is perceived through the device. Cochlear implants have had a significant impact on prelingually deaf children's speech and language skills, especially when the implant is received at a young age (Hammes *et al* 2002; Miyamoto *et al*., 2008; Mellon, 2009). However, as the cochlear implant (CI) was designed to assist speech, research with adults has indicated that users tend to rate musical sounds as less pleasant compared to normal hearing listeners (Gfeller et al. 2000). This seems to be related to difficulties in the perception of timbre and consequently identification of musical instruments (Gfeller et al. 2002). Research has also shown that the perception of pitch (Kong et al. 2005) and recognition of melodies (Singh *et al*, 2010), especially in the absence of verbal or rhythmic cues, is also unsatisfactory (Fujita and Ito 1999). The only aspect of music that seems to be perceived equally as well in comparison with normal hearing listeners is rhythm (Leal et al. 2003).

It is interesting, however, that despite the difficulties they are presented with, when processing pitch and timbre through their implants, children with CIs gave favourable evaluations of music and demonstrated high levels of participation and engagement in musical activities (Gfeller, 1998; Chen-Haftek & Schraer-Joiner, 2011). Moreover, they demonstrated high levels of musical organisation in their free play or partnered play using instruments or their voice (Yennari, 2008) and an awareness of others during musical activity.

Qualitative studies such as the above support that deaf children like their hearing peers are interested in musical activity respond to music and have musical abilities (Chen-Haftek & Schraer-Joiner, 2011; Schraer-Joiner & Chen-Hafteck, 2009; Yennari, 2008). Within this paradigm it has been suggested that teaching and research should alter focus from skill level orientation to engagement and learning. Chen-Haftek & Schraer-Joiner (2011) propose that educators and researchers use flow indicators (Custodero, 1998) as criteria for young deaf children's evaluations during musical activities. They also suggest maintaining a good balance of teacher-directed and child self-initiated activities in music sessions.

Encouragingly, recent CI technology takes music perception into account in the design of devices, with CI companies maintaining that they are working towards sound processing strategies that are sensitive to pitch perception. Bilateral implant receivers have advantages over unilateral users in terms of music perception but enjoyment of music has not been shown to reach that of normal hearing listeners (Veekmans et al. 2009). The recent development of the hybrid CI which transmits the sound signal with both electric and acoustic stimulation appears to be improving the perception of music (Gfeller et al. 2006). It has also been shown that training can have positive effects on the perception of timbre, the recognition of musical instruments, the recognition of melodies in adults (Gfeller *et al* 2002; Driscoll *et al*, 2009; Gfeller et al, 2010) and pitch perception in prelingually deaf children (Chen *et al* 2010).

[1] The Deaf Community has often expressed a strong opposition to cochlear implants as they assert that they are content with their unique culture and do not regard deafness as a disorder to be cured

Singing and deaf children using cochlear implants

Despite the fact that interest in young children's singing activity has traditionally taken the lion's share in music education research, the singing world of young deaf children has been relatively neglected by researchers. A naturalistic study from the 1980s investigated the singing of nursery-aged deaf children who were hearing aid users (Tait 1984, 1986a, 1986b). Tait compared the children's performance in conversation and singing with reference to the following: visual regard; vocalisation; turn-taking; auditory awareness; memory and autonomy. Her findings indicated that during singing, vocalisation was seven times as much as during conversation, of better quality and more rhythmic; with more pitch variation and more sustained. The researcher also observed that visual regard during singing was longer and more sustained. Tait notes that many children who were reluctant vocalisers in conversation were very eager to take turns in singing. She also suggested that some auditory information that does not get through in speech gets through in singing. Finally, among the other benefits of singing observed in the study was better memory for 'plots' of songs and indications of enhanced autonomy during singing (taking control of teacher, parent or classmates) by children who were otherwise passive in conversation.

To date, there are a limited number of studies that look into the music listening experiences of children with CIs that relate to singing. The latest studies with child CI users have based their findings on experimental methods and most of them assess the ability of deaf children to identify known popular songs (Vongpraisal et al., 2004; Nakata *et al.,* 2005) and tunes from their favourite TV programmes (Vongpraisal et al., 2009) comparing them to peer groups of hearing children. These studies have indicated that deaf children cannot identify melodies that are familiar to them based on pitch cues alone but are able to do so when they are presented with the original recordings or original instrumental renditions (Vongpraisal *et al*, 2006). In their singing, deaf children have been shown to preserve the rhythms but not the pitch contours of songs, a problem that is common with adult users. A study comparing the pitch and timing in the songs deaf CI children sang from memory (Nakata *et al*, 2006) revealed that despite the similarities in timing between deaf and hearing children, deaf children's pitch range was smaller than that of hearing children and that their pitch changes were unrelated to the direction of pitch in the target songs. It has therefore been suggested that for young deaf CI users pleasure from music may arise primarily from rhythm.

Background and purpose of the study

The development of musical creativity within the young deaf child with CIs is an area that has not received attention, due to the fact that research has focused on how music is perceived or not perceived through the cochlear implant. I would like to propose that deaf children, ages 3-4 years, can vocalize meaningfully, they can chant and imitate songs or parts of songs that they rework in their own space and time and that this follows a developmental path that is similar to the development of song in hearing children (Yennari, 2008; 2010) but delayed rather than impaired, as previously thought. Under certain educational circumstances and emotional conditions that promote song singing, deaf children can invent their own songs. I

aimed to study the nature of these songs and chants, the pitch contour and melodic lines and their rhythmic structure as well as their relation to language and imagination. I was also interested in vocalisations that arise during play on instruments and other incidental play and the ways in which these playful situations enhance singing.

The study draws on the findings of research that accepts that children's invented song-making emerges from their early communicative experiences with their mothers and carers, namely 'communicative musicality' (Trevarthen, 1999; Malloch, 1999) and 'infant directed speech' (Papoušek, 1996). It is informed by the findings of researchers of young children's music who have suggested that children's invented songs are constructed by adapting and adopting musical structures they encounter as they grow up as singers and listeners (Moorhead and Pond, 1941/1978, Moog, 1976; Davies, 1992; Davidson, 1994). Research that has analysed the developmental trajectory of the singing development of children as reproducers of set songs (Welch, 2000; Rutkowsky & Snell Miller, 2003) has provided the developmental frame for the observations; however, no comparisons were made to hearing children's song development to avoid deficit models. Instead, deaf children were observed in terms of what they could do at the specific time in their development. The views of scholars who recognise children's own musical expression as valid and worth of attention in school curricula (Campbell, 1998) and the work of Scandinavian researchers who have advised towards breaking away from traditional parameters of musicality (mastery of pitch and rhythm) and placed emphasis on creativity, improvisation and valued children's culture for its particularity (Sundin, 1998; Bjørkvold, 1989) have greatly assisted in breaking away from the deficit model of deafness in relation to music. Children's improvised vocalisations are appreciated as comprising a valuable phenomenon in itself (Young, 2004; 2006) and understood as learning, communication, and mechanisms of self-regulation and stabilization of self-identity (Knudsen, 2008). Finally, I adopted the thesis that children's invented songs are foundational in the development of creative thought and activity in music (Barrett, 2006: 202).

Methodologically, the study draws from research practices that leave space to the child to express freely by asking them to sing songs that they know or to 'make up their own music' (Barrett, 2006) and studies that collect children's spontaneous vocalisations in natural settings using non-intrusive ways usually in the home or school whilst children are immersed in play activity (Young, 2006; Burton, 2002).

The studies mentioned above have indicated that a wealth of children's spontaneous vocalisations occur when children are immersed in play activity usually involving some kind of movement, objects and toys. A conscious decision was made to enhance the setting with objects and toys in order to create optimal situations of joint attention (de l'Etoile, 2006) and provide potential stimuli for creative singing processes. In a study that investigated deaf children's singing activity- amongst other music-making- it was found that props, toys and other objects played an important part in encouraging deaf children to use their voices (Yennari, 2008).

The main methodological quandary of the study was to maintain the balance between providing quality musical experiences in musical environments rich in opportunity, thus supporting creativity (Velez, 2010) but at the same time being

careful not to hinder children's natural propensity for improvisation. I decided that it would not be appropriate to break the natural course of the music sessions by 'silencing' my own input (singing, playing instruments etc). Therefore, I created an environment where children would be initially immersed (see Dansereau, 2010) in song experiences by listening to set songs (some of which were action songs) that they would be encouraged to sing along. Additionally, I offered a variety of acoustic experiences by singing improvised songs (mostly *a capella*) on all occasions allowing to be directed by the children's interests, in the beginning of sessions (e.g. singing about our socks, my earrings, a child's scratched knee, G's spiderman watch etc) in a variety of tonalities and meters without necessarily insisting that the children join in, unless they wanted to.

Three of the principles of the Reggio-Emilia approach have assisted in creating the play environments in which spontaneous song would flourish, similarly to other research endeavors in music education (Page-Smith, 2010):

1. *The child as creator of their own learning:* song material was driven and directed mostly by the children's interests

2. The environment as the third teacher: the classroom environment and its contents (existing and imported) should provide elements of surprise and opportunities for multisensory play.

3. *Dialogue between adult and child:* children were allowed to interact with the researcher and talk about experiences before and during the session with both researcher and children having input in the session. These conversations are used by the teacher to provide ideas for children's needs and interests to be accommodated in the following sessions.

Finally, spontaneous vocalisations and invented songs were viewed longitudinally and analysed as musical products (pitch, rhythm, contour, and language) in order to establish a developmental model of deaf children's spontaneous singing activity.

Research questions

Research questions for the study were formed as follows:

Song as process

1) What are the environmental conditions and teacher-researcher actions that promote the spontaneous singing and/or chanting of young deaf children in classroom environment?

- Reflection on teaching: Where is the teacher, what is the teacher doing, where is the teacher looking? What are the teacher's planned or spontaneous actions that promote or hinder singing inventions?

- Environmental conditions: (space, weather, seating, objects, props and toys)

- Social-emotional conditions and physical state conditions (humour, relationships, incidents that affect emotional and social states, physical state-illness etc) that affect or hinder spontaneous singing.

2) What are the effects of different types of play scenarios and play objects imported into the music session in the amount and type of spontaneous vocalisations, songs. and chants of deaf children this age?

Song as product

1) In relation to the above, what is the nature of the children's singing inventions in terms of use of musical elements and language? (aspects of mimesis of songs already learned, using and manipulating parts of set songs, melodic aspects and frequency range, rhythmic structure, relation to language and imagination)

Method

The participants are five congenitally/prelingually deaf children (three boys and two girls) with deafness of the profound degree who attend the School for the Deaf in Nicosia, Cyprus. All children are between 3 and 5 years of age at the onset of the study. They have all been implanted between 10-12 months of age. Two of the children use the MED-EL™ Maestro cochlear implant system (bilateral CIs) and three use the COCHLEA™ Freedom implant system.

The children are mainstreamed in the community nursery that is housed within the School for the Deaf. When not in their group at the School for the Deaf, the children are attending their age group classes at the mainstream nursery. The group has lessons with a specialist teacher of the deaf in the morning and music sessions twice a week with the researcher who is working at the School for the Deaf as a music teacher. It is important to note that the researcher has worked with three of the children for two years in the past and with two of the children for three consecutive years in weekly afternoon sessions. One child was attending music therapy sessions in the afternoon and another had attended such sessions for two years in the past.

The children participate in ongoing 30 minute music sessions with the researcher as a participant-observer, twice a week. Sessions span over a period of seven months and include a variety of musical activities some of which are designed in ways that promote vocal activity and song. Singing usually happens in the beginning of sessions. We begin with a routine 'Hello Song' and end with a Goodbye chant during which the children gather in a small circle, 'stack up' their hands and throw them in the air at the end of the chant. Set songs that the children know are sung and new songs are introduced. Some songs without words are attempted. The initial routines involve puppets: *Ndago* the elephant, *Ellie* the elephant's baby sister and *Tigris* the tiger appear from inside a portable puppet-house-bag and 'participate' in the session by bringing in objects (See Table 1) asking the children to use the objects, singing a song about them or alternatively 'creating' situations that the children need to resolve or be encouraged to sing about (See Table 2).

Table 1

Examples of object play materials

Object play materials			
Interrelated objects (e.g. Toothbrush, water, towel and soap/ Pebbles, water, sea shells and sand)	Unrelated objects (e.g. a banana, a toy telephone, a toy cat)	Objects that afford movement or other manipulation (e.g. feathers, bubbles, building blocks, toy cars or trains, big marbles etc)	Personal objects (e.g. our watches, our socks, our shoes)

Table 2

Examples of play scenario situations

Play scenarios	
Positive emotions	Negative and complex emotions
e.g. birthday, surprise present, lulling elephant to sleep	e.g. going to the doctor, hurting leg, tiger and elephant argue over toy, elephant has a new baby brother, elephant has stayed on the beach too long and feeling ill, elephant is scared

Consent from parents was obtained prior to the study and sessions are video recorded with a static camera in order to maintain contextual detail. Children are allowed to view parts of the video where they appear to be singing or vocalising and their reactions are recorded in form of notes. Parts of the video where children are judged to be using their voice spontaneously or in response to stimuli intended to encourage singing will be isolated and microanalysed. Analysis will focus on contextual detail in relation to children's inventions (i.e. the vocalisations/chants or songs). Inventions will be analysed using both conventional notation to document rhythm regularities and give some indication of melodic contour and pitch variation, in combination with thick description of contextual detail, aiming to reveal the effects of the environment and play-scenarios and objects in the process. The total data from all children will be subject to categorisation and comparison in order for commonalities to emerge. Two independent peers will be asked to triangulate the data by analysing parts of it following the research protocol.

Recordings of individual children in sessions with the researcher took place two different times during which the children were involved in play situations similar to those contained in the sessions and encouraged to sing into a microphone connected to a computer while simultaneously watching the sine wave on screen, using Audacity® free recording and editing software. The purpose of individual recordings was to acquire a clearer picture of individual responses to opportunities for invention and the creation of a developmental profile for each child. Results will be analysed for the nature of the response, use of the singing voice, pitch contour, and control. The *voice assessment scale* proposed by Leighton and Lamont (2006) will be used to assess singing/vocalising behaviour and results will be tested by two independent observers.

In order to increase the information provided by the data collected based on aural human perception, individual recordings and parts of the audio from the group sessions that are clear from noise will then be imported into Praat 5.3.01® software (Boersma & Weenink, 2011) for estimations of the dominant frequency of the musical signal and calculation of the mean frequency.

Data will be triangulated with anecdotal reports of parents and class teachers collected during individual semistructured interviews, regarding the children's vocal and other musical activity at home and in the mainstream classroom. This study aspires to provide some insights for practice, related to ways in which deaf children using cochlear implants can be supported to make creative use of their voices.

The research project is ongoing. Collection of data is expected to finish in June 2012.

Acknowledgements

I would like to thank the children, parents and teachers participating in this study for making the project possible.

References

Barrett, M. (2006). Inventing songs, inventing worlds: the 'genesis' of creative thought and activity in young children's lives. *International Journal of Early Years Education*, *14*(3), 201-220.

Boersma, P. & Weenink, D. (2011). *Praat 5.3.01*http://www.fon.hum.uva.nl/praat/, Amsterdam, Institute of Phonetic Sciences, University of Amsterdam.

Bjørkvold, J. R. (1989). *The Muse within: Creativity and Communication, Song and Play from Childhood through Maturity.* New York: Harper Collins.

Burton, S. (2002). An exploration of preschool children's spontaneous songs and chants, *Visions of Research in Music Education*, *2*, 7-16.

Campbell, P. S. (1998). *Songs in their Heads: Music and its meaning in Children's Lives.* Oxford: Oxford University Press.

Chen, J. K-C., Chuang, A. Y-C. McMahon, C. Hsieh, J-C., Tung, T-H. and Li, L., P-H. (2008). Music training improves pitch perception in prelingually deafened children with cochlear implants. *Pediatrics*, *125*(4), 793-800.

Chen-Hafteck, L. & Schraer-Joiner, L. (2011). The engagement in musical activities of young children with varying hearing abilities. *Music Education Research*, *13*(1), 93-106.

Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience.* New York: Harper & Row.

Custodero, L. (1998). Odserving flow in young children's music learning. *General Music Today*, *12*(1), 21-27.

Dansereau, D. (2010). The role of musical engagement in the musicality of three-year-old children. In In S. L. Burton and C. Crump Taggart (eds), *Learning from young children,* pp. 39-59*,* Plymouth: Rowman & Littlefield.

Darrow, A. A. (1987). An investigative Study: The Effect of Hearing Impairment on the Musical Aptitude of Young Children. *Journal of Music Therapy, 24*(2), 88-96.

Darrow, A. A. (1989). Music and the Hearing Impaired: A Review of the Research with Implications for Music Educators. *Update: Applications of Research in Music Education*, *7*(2), 10-12.

Davidson, L. (1994). Songsinging by Young and Old: A Developmental Approach to Music. In R. Aiello and A. J. Sloboda (Eds). *Musical Perceptions.* Oxford University Press.

Davies, C. (1992). Listen to my Song: A Study of Songs Invented by Children aged 5 to 7 years. *British Journal of Music Education*, *9*(1), 19-48.

De l' Etoile, S. K. (2006). Infant behavioral responses to infant-directed singing and other maternal interactions. *Infant behavior and development*, *29*(3), 456-470.

Driscoll, V. D., Oleson, J., Jiang, D., & Gfeller, K. (2009). Effects of training on recognition of musical instruments presented through cochlear implant Simulations. *Journal of the American Academy of Audiology*, *20*(1), 71-82.

Ford, T. A. (1988). The Effect of Musical Experiences and Age on the Ability of Deaf Children to Discriminate Pitch of Complex Tones. *Journal of Music Therapy, 25*(1), 2-16.

Fujita, S. & Ito, J. (1999). Ability of Nucleus Cochlear implantees to recognise music. *Annals of Otology, Rhinology and Laryngology, 108*(7), 634-640.

Gfeller K, Witt S, Adamek M, Mehr M, Rogers J, Stordahl J, et al. (2002). Effects of training on timbre recognition and appraisal by postlingually deafened cochlear implant recipients. *Journal of the American Academy of Audiology*, *13*, 132-45.

Gfeller, K. E., Olszewski, C. Turner, C., & Gantz, B. (2006). Music perception with cochlear implants and residual hearing. *Audiology and Neurotology*, *11*(suppl. 1), 12-15.

Gfeller, K., A. Christ, J.F. Knutson, S. Witt, K.T. Murray, & Tyler, R.S. (2000). Musical backgrounds, listening habits and aesthetic enjoyment of adult cochlear Implant recipients. *Journal of the American Academy of Audiology, 11*, 390-406.

Gfeller, K., C. Turner, M., Mehr, G. Woodworth, R. Fearn, J.F. Knutson, S. Witt, & Stordahl, S. (2002). Recognition of familiar melodies by adult cochlear implant recipients and normal hearing adults. *Cochlear Implants International, 3*(1), 29-53.

Gfeller, K., Jiang, D. Oleson, J., Driscoll, V. & Knutson, J. F. (2010). Temporal stability of music perception and appraisal scores of adult cochlear implant recipients. *Journal of the American Academy of Audiology*, *21*(1), 28-34.

Gfeller, K., S. Witt, Spencer, L.J.,Stordahl, J. & Tomblin, B. (1998). Musical involvement and enjoyment of children who use cochlear implants. *The Volta Review, 100*(4), 213-233.

Gfeller, K., Witt, S. Spencer, L. J., Stordahl, J. & Tomblin, B. (1998). Musical Involvement and Enjoyment of Children who use Cochlear Implants. *The Volta Review, 100*(4), 213-233.

Hammes, D.M., Novak, M., Rotz, L., Willis, M. & Edmondson, D. (2002). Early identification and cochlear implantation: Critical factors for spoken language development. *Annals of Otology, Rhinology and Laryngology*, *189* (Suppl.), 74-78.

Kong, Y., Stickney, G. & Zeng, F. (2005). Speech and melody recognition in binaurally combined acoustic and electric hearing. *Journal of the Acoustic Society of America*, *117*, 1351-1361.

Leal, M.C., Shin, Y.J., Laborde, M.L., Calmels, M.N., Verges, S., Lugardon, S., Adrieu, S., Deguine O. & Fraysse, B. (2003). Music perception in adult cochlear implant recipients. *Acta Otorhinolaryngologica, 123*, 826-835.

Leighton, G. and Lamont, A. (2006). Exploring children's singing development: do experiences in early schooling help or hinder?. *Music Education Research, 8*(3), 311-330.

Malloch, S. (1999). Mothers and Infants and Communicative Musicality. In *Rhythms, Musical Narrative and the Origins of Human Communication. (Musicæ Scientiæ Special Issue 1999-2000),* Liege: European Society for the Cognitive Sciences of Music, 13-18.

Mellon, N. K. (2009). Language and Speech Acquisition. In J. K. Niparko (Ed.), *Cochlear Implants Principles and Practices*, Lippincot Williams & Wilkins: London.

Miyamoto, R. T., Hay-McCutcheon, M. J., Iler Kirk, K., Houston, D. M. and Bergeson-Dana' T.. (2008). Language skills of profoundly deaf children who received cochlear implants under 12-months of age: A preliminary study. *Acta Otolaryngologica*, *128*(4), 373-377.

Moog, H. (1976). *The Musical Experience of the Preschool Child.* (trans. C. Clarke). London: Schott.

Moorhead, G. E. and Pond, D. (1941/repr. 1978). *Music of Young Children: I. Chant*. Pillsbury Foundation Studies, Santa Barbara: Pillsbury Foundation for Advancement of Music Education.

Nakata T., S.E. Trehub, C. Mitani, Y. Kanda, A. Shibasaki, & E.G. Schellenberg (2005). Music recognition by Japanese children with cochlear implants. *Journal of Physiology and Anthropology of Applied Human Sciences*, *24*, 29-32.

Nakata, T., Trehub, S., Mitani, C. & Kanda, Y. (2006). Pitch and timing in the songs of deaf children with cochlear implants. *Music Perception*, *24*(2), 147-154.

Page-Smith, A. (2010). The incorporation of principles of the Reggio Emilia approach in a North American preschool music curriculum. In S. L. Burton and C. Crump Taggart (eds), *Learning from young children,* pp. 79-93*,* Plymouth: Rowman & Littlefield.

Rileigh, K. K. & Odom, P. B. (1972). Perception of Rhythm by Subjects with Normal and Deficient Hearing. *Developmental Psychology, 7*(1), 54-61.

Rutkowsky, J. & Snell Miller, M. (2003). A longitudinal study of elementary children's acquisition of their singing voices. *Update: Applications of Research in Music Education*, *22* (Fall-Winter 2003), 5-14.

Schraer-Joiner, L. & Chen-Hafteck, L. (2009). The responses of preschoolers with cochlear implants to musical activities: a multiple case study. *Early Child Development and Care*, *179*(6), 785-798.

Singh, S., Kong, Y-Y. and Zeng, F-G. (2010). Cochlear implant melody recognition as a function o melody frequency range, harmonicity and number of electrodes. *Ear Hear*, *30*(2), 160-168.

Sundin, B. (1998). Musical Creativity in the First Six Years. In B. Sundin, G. McPherson, G. Folkestad (Eds). *Children Composing*. Malmö: Malmö Academy of Music, Lunds University.

Tait, M. (1984). The Role of Singing in the Social and Linguistic Development of Nursery-Aged Deaf children. Unpublished PhD Thesis: University of Nottingham.

Tait, M. (1986a). Using Singing to Facilitate Linguistic Development in Hearing-Impaired Pre-schoolers. *Journal of British Association of Teachers of the Deaf*, *10*(4), 103-108.

Tait, M. (1986b). Reaching Young Deaf Children through Song. In *Deafness – No handicap to music, Report on One-Day Course.* Manchester: Disabled Living Foundation- Music Advisory Service (15th November, 1986).

Trevarthen, C. (1999). Musicality and the Intrinsic Motive Pulse: Evidence from Human Psychobiology and Infant Communication. In *Rhythms, Musical Narrative and the Origins of Human Communication. (Musicæ Scientiæ Special Issue 1999-2000),* Liege: European Society for the Cognitive Sciences of Music, 155-215.

Veekmans, K., Ressel, L., Mueller, J., Vischer, M., and Brockmeier, S.J. (2009). Comparison of music perception in bilateral and unilateral cochlear implant users and normal-hearing subjects. *Audiology and Neurotology*, *14*(5), 315-326.

Velez, K. N. (2010). Tonal patterns: providing the vocabulary for comprehensive vocal improvisation. In S. L. Burton and C. Crump Taggart (eds), *Learning from young children,* pp. 141-158, Plymouth: Rowman & Littlefield.

Vongpaisal, T., Trehub, S.E., & Schellenberg, E.G. (2006). Song recognition by children and adolescents with cochlear implants. *Journal of Speech, Language and Hearing Research, 49*, 1091-1103.

Vongpraisal, T., Trehub, S.E., and G.E. Schellenberg (2009). Identification of TV tunes by children with cochlear implants. *Music Perception*, *27*(1), 17-24.

Welch, G. F. (2000). Singing Development in Early Childhood: The Effects of Culture on the Realisation of Potential. In P. White (Ed.). *Child Voice.* Stockholm: TMH-KTH Voice Recearch Centre.

Yennari, M. (2008). Musical activity in deaf children under four years of age who are using cochlear implants. Unpublished PhD Thesis: University of Birmingham.

Yennari, M. (2010). Beginnings of song in young deaf children using cochlear implants: the song they move, the song they feel, the song they share. *Music Education Research*, *12*(3), 281-297.

Young, S. (2004). Young Children's Spontaneous Vocalising: Insights into Play and Pathways into Singing. *International Journal of Early Childhood, 36*(2), 59-74.

Young, S. (2006). Seen but not heard: young children, improvised singing and educational practice. *Contemporary Issues in Early Childhood Education*, *7*(3), 270-280.

Presenters for the 2012
Commission on Music in Special Education,
Music Therapy, and Music Medicine Seminar Meeting

Dr. Mary Adamek is the Director of the Music Therapy Program at The University of Iowa in Iowa City, IA. Her teaching and clinical research interests include music therapy in special education settings, music therapy with children with autism, music and pain management, and clinical supervision. She is a co-author of *Music in Special Education* and has contributed to numerous music therapy publications. She is a past president of the American Music Therapy Association.

Dr. Melita Belgrave is currently Assistant Professor of Music Therapy at the University of Missouri-Kansas City. She has worked as a music therapist in special education, mental health, rehabilitation, hospice, geriatric, and intergenerational settings throughout Texas and Florida. Her research interests are music therapy with older adults and intergenerational programming. She is co-author of *Music Therapy and Geriatric Populations: A Handbook for Practicing Music Therapists and Healthcare Professionals.*

Dr. Jessie Chen is professor of music at National Taichung University of Education in Taiwan, and also executive director of Taiwan Kodaly Society. She is specialized in music teacher training from early childhood to elementary levels. Her teaching and research interests are applications of Kodaly and Orff approaches in all levels and populations.

Cindy Colwell is the Director of Music Therapy at the University of Kansas. She has presented workshops at and published in the professional journals of the American Music Therapy Association, NafME: Music Educators National Conference, and American Orff-Schulwerk Association. Her primary areas of clinical research are using Orff-based Music Therapy with various clinical populations and impacting the attitudes of individuals toward children with special needs.

Dr. Alice-Ann Darrow is Irvin Cooper Professor of Music Therapy and Music Education at Florida State University. Her teaching and research interests are teaching music to special populations, the role of music in deaf culture, and nonverbal communication in the classroom. She is co-author of *Music in Special Education* and *Music and Geriatric Populations: A Handbook for Music Therapists and Healthcare Professionals;* and editor of the text, *Introduction to Approaches in Music Therapy.* Darrow presently serves on the editorial boards of the *Bulletin for the Council on Research in Music Education*, *Music Therapy Perspectives, Update: Applications of Research in Music Education, Reviews of Research in Human Learning and Music, and the Florida Music Director.*

Shirley Day-Salmon (Mphil., BA, PGCE) is lecturer at the Carl Orff Institute, University Mozarteum Salzburg, Austria. Her main teaching and research interests are music and movement with hearing impaired children, in mixed ability groups and with severely disabled adults. She is the editor of *Hearing Feeling Playing. Music and Movement for deaf and hard-of-hearing children,* author of *Hello Children. A*

collection of songs and related activities as well as the DVD *Between Freedom and Ritual, Means of expression through music and movement for people with disabilities.*

Yoshiko Fukuda works as a music therapist with patients suffering from asthma and respiratory problems at the Fukuda Clinic in Tokyo. She is also director of the Japanese Research Union of Music Therapy. Since 1982, Yoshiko has worked for the Japanese Environment and Health Ministries and spent 11 years researching music therapy for asthma patients at the Gunma Cancer Centre in "Tomou Hospital." She published the book *Music Therapy for Young Asthma Patients* (available in Japanese and Spanish), and produced six educational videos on the same topic.

Amelia Greenwald Furman (Amy) is a music therapist/music specialist with the Minneapolis Public Schools. Her clinical specialties include early childhood, autism spectrum disorder, English language learners, and inclusion/mainstreaming in the music education classroom. She has worked with Minnesota Music Educators Association as a state mentor in the areas of urban education and special needs students. Amy has written articles for a variety of professional journals and several music therapy monographs. Amy is the President Elect of the American Music Therapy Association.

Dr. Alan B. Gertner is an Associate Professor in the School of Communication Disorders and Deafness at Kean University, Union, NJ, USA. He received his Ph.D. in Speech and Hearing Science from Columbia University as a Joanne Schwartz Scholarship recipient. He has published in peer reviewed journals about otoacoustic emissions, diagnostic medical audiology, and auditory processing disorders. He research interests include auditory processing disorders, reading and literacy, and speech and music perception with cochlear implants.

Dr. Lori Gooding is the Director of Music Therapy at the University of Kentucky. She currently serves on the editorial board of the *Journal of Music Therapy* and has published in several journals including the *Journal of Music Therapy*, *Music Therapy Perspectives,* and *Update: Applications of Research in Music Education.* Her current research focuses on hearing loss in musicians, the effect of musical training on cognitive reserve, and the use of music therapy interventions to reduce anxiety and alleviate symptoms in the medical arena.

Dr. Michelle J. Hairston is Professor and Chair of the Music Education and Music Therapy Department at East Carolina University, Greenville, North Carolina. Her specific interests for research and teaching are in special populations, specifically Autism and Behavior Disorders, the Neonatal Intensive Care Unit, and why students become teachers in music education. She is a past president of the American Music Therapy Association and serves on the editorial board of *Music Therapy Perspectives.*

Julia Heath is a graduate teaching assistant and doctoral student in music education at Florida State University. She completed as Master's Degree in Music Education and holds a certificate in Special Music Education from Florida State University. Her research focuses on music for special learners in schools and for adults with developmental disabilities.

Mr Markku Kaikkonen (Master of Music – Music teacher and therapist) works as a director in Special Music Centre Resonaari (Finland). He is the author of several Music Education and Special Music Education books and articles. Markku is also a guest lecturer for continuing education programs and conferences in Finland and abroad. He is also a board member of the Finnish Society for Music Education – FiSME ry and Paukepiiri – DrumCircle Finland.

Liza Lee is an Associate Professor in the department of early childhood development and education at Chaoyang University of Technology in Taichung, Taiwan. She is a graduate of Teacher's College, Columbia University where she received her doctoral degree in music and music education. She conducts research in early childhood music education as well as music and sound therapy.

Yim Ting Leung is a MA student studying Music Education at the Hong Kong Institute of Education. She received her Bachelor's degree in Psychology with First Class Honours from the City University of Hong Kong. Her research interests include therapeutic arts and educational psychology. She is currently a member of the Hong Kong Psychological Society and the Hong Kong Association for Music Educator. She is also a volunteer instructor of 'Art in Hospital' organization.

Kimberly McCord is Professor of Music Education at Illinois State University. She is the past chair of the ISME Commission on Music in Special Education, Music Therapy and Music Medicine and the founder and past chair of the National Association for Music Education Special Research Interest Group on Children with Exceptionalities. Her research focuses on music assistive technology, collaboration between music and special educators, jazz and improvisational thinking in children.

Dr. Bo Nilsson received his doctorate in Music Education at Malmö Academy of Music, Lund University, and is Senior Lecturer in Education at Kristianstad University, Sweden. His teaching and research interests are children's musical creativity, popular culture in the classroom, and ICT in music education and special education. Bo was a member of the expert group that wrote the new music curriculum for Swedish compulsory school.

Dr. Varvara Pasiali, is an assistant professor of music therapy at Queens University of Charlotte, in Charlotte, North Carolina. Her research interests are early intervention, prevention, resilience, and parent-child attachment/reciprocity. Dr. Pasiali is a regular presenter at conferences and has published in various journals. She also serves on the editorial board of the *Journal of Music Therapy,* and *Approaches: Music Therapy & Special Music Education.*

Dr. Dora Psaltopoulou-Kamini is a CMT (AMTA), holds a Ph.D (A.U.Th-GR) and a MA (NYU, NY-USA). Dora completed her psychoanalytic training in Lacan's approach. Since 1992, she has pioneered Music Therapy in Greece particularly clinical work with a variety of exceptionalities including neurosis, psychosis, and autism. She is currently a lecturer at Aristotle University of Thessaloniki (A.U.Th-GR) and also serves as administrator for a private master's level Music Therapy training program.

Dr. Daphne Rickson is a senior lecturer of music therapy at the New Zealand School of Music. She has practiced music therapy with a range of client populations, but specialises in working with children and adolescents. Daphne is particularly interested in music therapists in inclusive education settings and as school consultants. She is currently working on a text, with Dr Katrina McFerran, focusing on the development of collaborative partnerships between music therapists and key players in educational settings in order to establish sustainable music school communities.

Dr. Patricia L. Sabbatella is Senior Lecturer in Music at the University of Cádiz (Spain) and Course Director Master of Music Therapy. She is also lead researcher for the Andalusian Research Programme - University Research Group HUM-794: *Music and Movement in Education and Therapy*. Her teaching and research interests span both Music Therapy and Music Education with children, teenagers and adults. She has also published journal articles and book chapters in the fields of Music Education and Music Therapy.

Dr. Maritza Mascarenhas Sadowsky has a DMA, MA, BA, and BS from universities in the United States and Brazil. She teaches music at Jamestown Elementary School (Arlington Public Schools), Virginia, where she has been teaching music to children with severe autism for five years. She has organized recitals and workshops for musicians in the United States and Brazil and has also presented lectures throughout Europe, South America, and the United States. In 2004, she was awarded the *Bettie Keiger Best Music Educator Award* for Northern Virginia.

Dr. Lyn Schraer-Joiner is Music Education Coordinator and Assistant Professor at Kean University, NJ. Her research interests include the musical rehabilitation of adult cochlear implant recipients, musicians and hearing loss, and the musical responsiveness of prelingually deafened children. Lyn's research has been published in Music Education Research, Music Educators Journal, and Early Childhood Development and Care. She is the founder of PROJECT REACH: The KU Concert Series for the Deaf, a student-faculty group which performs for Deaf schools throughout New Jersey.

Giorgos Tsiris is a MPhil/PhD candidate at Nordoff Robbins, City University, London. He works as a music therapist at St. Christopher's Hospice and is a research assistant at Nordoff Robbins. He is the editor of *Approaches: Music Therapy & Special Music Education*, and is the coordinator of the Research Network of the British Association for Music Therapy. He is also co-author of "*Towards Ethical Research: A Guide for Music Therapy and Music & Health Practitioners, Researchers and Students."*

Dr. Kimberly VanWeelden is an Associate Professor of Music Education at Florida State University. Her research is in the areas of students with special needs in music education and geriatric vocal pedagogy, repertoire, and wellness in choral ensembles. She serves on the editorial board of *Update: Applications for Research in Music Education* and is the Chair of the Children with Exceptionalities Special Research Interest Group of the National Association for Music Education.

Dr. Victoria Policastro Vega is an accomplished music therapy clinician, educator, and researcher. She received her bachelor's degree in music education from West Virginia University, her master's in music therapy from Loyola University, and completed her doctorate at Temple University. Dr. Vega's research interests are music therapy with neurological disorders, professional burnout and personality, and distance learning. She has been Coordinator of the Music Therapy Program at Loyola University, New Orleans since 2000 and Division Coordinator of Music Therapy and Education since 2011.

Dr. Wei-Chun Wang is the director of the Arts and Culture Center and assistant professor at the Graduate Institute of Applied Science and Technology, National Taiwan University of Science and Technology. She conducts the Vivid University Choir and also teaches undergraduate courses in Musical Theater and graduate courses in Musical Perception and Soundscape Creation, Film Music, and Music Therapy. Dr. Wang currently serves as Director for the Association of Music Education R.O.C. the Taiwan Kodaly Society, and Taipei Women Awakening Association.

Dr. Jennifer Whipple is Professor and Director of Music Therapy at Charleston Southern University in South Carolina and is a Fellow of the National Institute for Infant and Child Medical Music Therapy housed within the Florida State University. Her primary research and teaching interests are developmental intervention for preterm infants, establishment of research-based interventions for young children with autism, and teacher training for successful integration of students with special needs.

Yen-Hsuan Yang is a doctoral candidate in music therapy at Florida State University. Yang is a board-certified music therapist and current member of the American Music Therapy Association. She was on the Board of Directors for the Music Therapy Association of Taiwan from 2006~2010 and worked at Chang Gung Memorial Hospital in Taiwan. Her research interests include music therapy in early intervention, special education, long-term care, as well as hospice care.

Dr. Maria Yennari is music education advisor at the Cyprus Ministry of Education and Culture and coordinator of the support group for the New Curriculum for Music at the Cyprus Pegagogical Institute. She works as a music teacher at the School for the Deaf in Nicosia and Makedonitissa B Primary School. Her research interests are music education of children ages 2 to 12, the development of musical activity and singing in children with cochlear implants, teaching music to preschoolers with cochlear implants, and professional development for preschool and elementary music teachers.

Gina Jisun Yi is a doctoral student at Michigan State University in East Lansing, MI. Her teaching and research interests are early childhood music, elementary general music, teaching music to children with special needs, and performance psychology. She served as adjunct faculty at Yonsei University Extension, and Baekseok College of Cultural Studies in South Korea. Her publications include *Let's Make Music Fun! Four Seasons*, and *English Musical Learning Method for Children.*