

# Effects of Music Therapy and Piano Lesson on Academic Achievement, Classroom Behaviors, and Self-Esteem of At-Risk Students: A Pilot Study

Hayoung Lim, Karen Miller, and Sergio Ruiz

**Abstract-** There is a need for research that explores the effects of music lesson on intellectual, behavioral, and emotional functioning of at-risk students who attend regular public school. Some students might benefit more from a direct approach utilizing therapeutic goals and interventions in music therapy while others may be more profoundly impacted by an indirect approach such as piano instruction. It is worthwhile to compare the effects of music lessons and music therapy incorporating music instruction on non-musical behaviors of at-risk students. The purpose of this study is to compare the effects of piano instruction and music therapy incorporating piano instruction on academic achievement, classroom behaviors, and self-esteem in at-risk students. Participants were 32 at-risk elementary school students (2nd, 3rd, and 4th graders). They were randomly assigned to one of 10 weeks of 30 minute, one-to-one training conditions: music therapy incorporated piano instruction (n=11), piano instruction (n=11), and no-training (n=10). Participants' language and math scores, Teacher's Ratings of Classroom Behaviors (TRCB), and Coopersmith Self-Esteem Inventory were measured. There was no statistically significant difference between the training conditions. The present study investigated the effect of two different forms of music instruction; music therapy and piano instruction for at-risk students. With the breadth of variables to be considered and the conclusions drawn by some studies that music may indeed have a significant impact on this particular population, further research is warranted.

**Key words:** *Music Lesson, At-Risk Students, Music Therapy, Self-Esteem, Academic Achievement, and Classroom Behaviors*

At-risk students can be defined as those who are unlikely to succeed in traditional school settings (Shuler; 1992). Robinson (2004) suggests that at-risk is the latest term for a familiar problem: children with learning and behavioral difficulties. According to Robinson, at risk is a label that describes a new phenomenon in current society and may include children with high ability and from middle-and-upper socioeconomic families. Children who do not have an interest in school or do not have a satisfying life including meaningful work and meaningful relationships can be considered as at risk students. It is difficult to categorize at-risk students because there are various degrees of being at risk. The degrees are based on what negative things happen to a child, how severe these things are, how often they occur, and what other influences are in the child's immediate learning environment. In order to provide positive and effective learning environments for the children, educators and researchers should examine the overall aspects of learning including children's classroom behaviors, emotional stability (i.e., self-esteem and motivation level), and academic achievement.

Effects of music instruction in young students have been reported by many research studies. Recent meta-analyses of music research have shown that carefully designed music instructions can have a positive impact on children's cognitive development and academic performance (Portowitz, Lichtenstein, Egorova & Brand, 2009). There seems to be a strong relationship between music experience through

music instruction and the various aspects of development of children. Many researchers and educators have agreed that music enhances students' ability to learn by developing a number of skills and capacities that are not only necessary for reading, writing, and arithmetic, but whose importance extends far beyond. Music also enhances students' motivation to learn and their self-esteem by making their school experience more positive (Costa-Giomo, 2004; Koutsoupidou & Hargreaves, 2009). Therefore music educators should first evaluate the value of music in human life before they can determine the benefits of music instruction for students, at risk or not (Robinson, 2004). It is suggested that music can not only help students develop important skills, but can also help them avoid the problems of frustration, alienation, and self-doubt that often place students at risk of failure (Hanson, Silver & Strong, 1991). However, a relatively small body of research studies has examined the effect of music instruction for at-risk students.

Portowitz and his college (2009) evaluated the impact of a music program designed to foster cognitive development and social esteem among high-risk elementary school children. The researchers found that both experimental group (children who participated in the music program) and control group (children who did not participate in the music program) improved their cognition levels evaluated by Raven Standard and Colored Matrixes and The Complex Figure Test, however, the improvement was greater in the experimental group (Portowitz, et.al., 2009). The researchers found no significant interaction of two groups on social self-esteem which was evaluated by the Fitts TSCS questionnaire. The findings support that music programming with coherent musical structures facilitated by multiple, intuitively accessible representations became a learning context in which basic cognitive structures were elicited and perceived in at-risk children. The researchers also concluded that children's successful musical experiences (i.e., performance) would have resulted in significantly higher scores in self-esteem; however the heightened self-esteem within a music context did not transfer to a

general, enhanced perception of themselves (Portowitz, et.al., 2009).

Alongside the strong evidence that links music instruction to enhanced cognitive and/or academic achievement and social skills, a number of studies have not found such correlations (Ho, Cheung & Chan, 2003; Portowitz, et.al., 2009; Winner & Hetland, 2000). These contradictory conclusions might reflect the effects of extra-musical factors. Several studies suggested that the quality of the teachers and level of interaction between student and teacher might be strong factors in the conclusiveness of extra-musical influences (Hallam, 2001; Rauscher, 2008; Spychiger, 2001). High levels of intrinsic motivation for music are more likely to occur when teachers support children in warm, caring and non-threatening environment (McPherson & Davidson, 2006). Music educators suggest that it is critical to allow at-risk students to develop trust for the teacher as a person. To teach at-risk students, music instructors should assess their personal situations, previous and current classroom behaviors, mental or physical difficulties, learning styles, and academic deficiencies. During the assessment phase, the importance of developing motivation, a sense of connection with school and teachers, and a sense of self-competence for at-risk students need to be emphasized.

While these studies generally support the positive impact of music instruction on cognitive and emotional development in not only normally developed students but also at-risk students, other studies investigate the impact of music therapy on similar variables related to student success. Music therapy may incorporate music instruction as a therapeutic technique but may also include other active methods such as singing, improvisation, song writing, and movement, and passive methods such as music listening, analyzing, discussion, and relaxation. Montello and Coons (1998) compared the effects of passive vs. active music therapy on teachers' ratings of attention, motivation, and hostility of pre-adolescents with emotional disturbances, learning disabilities, and/or attention deficit disorder. Findings suggest that both active and passive methods can significantly impact all three

variables and that best practice involves consideration of specific target behaviors in choosing the most appropriate method.

Chong and Kim (2010) investigated the effects of Education-oriented Music Therapy (EoMT) on the social, behavioral, and academic functioning of elementary school students with emotional and behavioral problems. Eighty-nine elementary school children participated in small group sessions; children were grouped by age, and treatment protocols were individualized according to group characteristics and needs. After 16 weeks of twice-weekly EoMT sessions, teacher ratings indicated significant improvements in the areas of social skills and problem behavior. No significant differences were found in academic competency. Authors conclude that academic gains would necessitate increased frequency and duration of treatment, along with increased focus on the transfer of skills (Chong and Kim, 2010). While research indicates that children can benefit socially and emotionally from both music instruction and music therapy, little research to date has compared the effects of the two modalities. Investigators postulate that piano instruction provides an avenue for intellectual growth, healthy emotional expression, and creativity, and that improved academic and musical performance could result in improved self-esteem and decreased deviant behaviors. Music therapy addresses specific academic, social, and emotional issues more directly by establishing individualized goals, objectives, and interventions to target non-musical domains. Commonly, music therapists deal on a day-to-day basis with students whose needs are even more diverse than at-risk students in a music class. Necessity has forced therapists to seek therapeutic techniques and instruction methods that motivate and teach students with learning and behavior difficulties (Shuler, 1992). The assessment process is also a crucial procedure of music therapy for at-risk students. Therefore, it is worthwhile to explore the effects of music instruction incorporated into music therapy as a teaching method for at-risk students.

Although numerous music research studies have shown the beneficial effects of

music experience on cognitive and social development of children including at-risk children, the findings of studies examining the effects of music lessons on students were not consistent (Costa-Giomi, 1999; 2004; Ho, Cheung, & Chan, 2003; Portowitz, et.al., 2009). In addition, no empirical study has compared music lesson alone to music therapy incorporating music instruction. There is a need for research that explores the effects of music therapy on intellectual, behavioral, and emotional functioning of at-risk students. The present study examined the effects of music therapy incorporating piano instruction on academic achievement, classroom behaviors, and self-esteem of at-risk students. This study compared the effects of piano instruction and music therapy incorporating piano instruction for elementary age students considered at-risk and explore the methods for at-risk students. The following research questions were explored: (1) Do levels of academic achievement on language and mathematics in at-risk students differ by training conditions: piano lesson versus piano lesson in music therapy versus no-training? (2) Do ratings of classroom behaviors in at-risk students differ by training conditions? (3) Do levels of self-esteem in at-risk students differ by training conditions?

## Methods

### *Participants*

Thirty two 2nd-4th graders in public elementary schools who had been called in by the school principal for their misconduct and/or behavioral problems more than twice during the previous school year and/or who did not pass successfully at least one academic area during any grading period of the previous year participated in this study. Seven girls and 25 boys participated in the study after their parents and/or caregivers signed on a parent-informed consent form. Each participant's signed informed consent form was also obtained. In this study, eight participants were 2nd graders, 12 participants were 3rd graders and 12 participants

were 4th graders. None of the participants had received any formal music instruction or training before the study.

#### *Materials and Measurement Tools*

*Treatment.* Ten weeks of 30 minute, one-to-one piano instruction was provided for one group of participants (N=11) at a music room in the elementary school. Ten weeks of 30 minute, one-to-one music therapy session was provided for another group of participants (N=11). For the music therapy group, a music therapy assessment was implemented during the first week. Individualized music therapy session protocols were developed after assessment. Investigators determined that effective music therapy protocols should be individualized according to client characteristics and preferences. The following interventions were used in the individualized music therapy protocols: singing, song writing, instrument improvisation, and musical games. Music therapy treatment targeted the same general goal areas for each individual but used individualized music therapy strategies. Sessions were generally structured as follows: (1) Opening song/ check-in, (2) Warm-up incorporating student choice of instrument improvisation, singing, song writing, or musical games, (3) Adapted piano instruction, and (4) Review, homework, and musical closing.

*Testing.* Academic achievement was evaluated by language (i.e., reading) and math scores in the participants' school reports. The language and math scores from the previous semester were used for pre-test and scores after the semester were used for post- test. The determination of classroom behavior for each participant was based on Teacher's Ratings of Classroom Behaviors (TRCB) that one of the investigators designed. Scores on the TRCB range from 1-10 and indicate problematic behavior in the evaluating teacher's classroom. A score of 1 is given when "student shows extremely difficult behaviors/conduct problems;" and a score of 10 is given when "student shows absence of problematic behaviors during his/her class." The Coopersmith Self-Esteem Inventories and Behavior Rating Form (BRF) were used to

evaluate the participants' self-esteem (Coopersmith, 1981).

#### *Procedure*

The present study received approval from an Institutional Review Board (IRB). Each participant's parents learned about the purpose of the study by reading a prewritten document, then sign the informed consent form to give permission for his/her child to be part of the study. The informed consent form gave permission to the investigators to use the participant's language and math test scores and to ask the classroom teachers about the child's classroom behavior. All screening procedures were completed by the principal of the recruiting elementary school and the primary investigator. The investigator obtained the language and math scores of each participant on the day of the pretest. During the following week, the teachers of each participant completed the TRCB and BRF. The investigator arranged to meet the participants in a room at the elementary school for all subsequent research procedures.

Each of the 32 participants was randomly assigned to one of three training conditions: piano lesson, music therapy or no-training. Each participant in the piano lesson group received 30 minutes of piano instruction for 10 weeks. The instructors for the participants in piano lessons were college students majoring in music with piano as their primary instrument. The instructors for the participants in music therapy were college students majoring in music therapy. The instructors signed the research participation agreement and volunteer contract.

On the day of the pretest, the investigator met the participants individually and administered the self-esteem inventory (SEI). In the first day of the experiment, the piano lesson instructors implemented lesson plan 1 (Appendix A), and the music therapy instructors administered the music therapy preference assessment (Appendix B). After the first day of the experiment, music therapy instructors met with two board certified music therapists (MT-BC's) to determine their participants' music therapy goals and most appropriate interventions based on their at-risk status and evaluation of the

music therapy preference assessment. Consultations with MT-BC supervisors continued throughout treatment. Therefore, the lesson plan/protocol for music therapy sessions was individualized for each participant in the music therapy condition. Beginning on the second day of the experiment, music therapy instructors implemented the individualized music therapy session protocols weekly for 9 weeks. The piano lesson instructors implemented a total of 10 weekly piano lesson plans for the 10 weeks of the experiment.

On the day of the posttest following 10 weeks of piano lessons and music therapy sessions, the investigator met the participants and administered the SEI. The investigator also obtained the post-semester language and math scores of each participant on the day of the posttest. During the following week, the investigator administered the TRCB and BRF with the teachers of each participant. At the end of the semester, both participants who received piano lessons and those in music therapy were invited to perform at a special recital at the local university campus.

### Results

Results were obtained from 32 at-risk students who had not had any type of formal musical training. The mean difference and standard deviations of the participants' academic achievement, TRCB, Self-Esteem Inventory (SEI), BRF were analyzed. Univariate analysis of variance was used to examine the effect of training condition on academic achievement, ratings of classroom behaviors, and self-esteem in the participants. The results of analysis indicated no significant effect of any training condition on academic achievement, ratings of classroom behaviors, and self-esteem in at-risk students. The analysis of an independent samples t-test indicated that difference between pre and post-test scores of reading test (i.e., language) in piano lesson group versus no-training group was statistically significant ( $p = .049$ ). Analysis of two-way ANOVA showed that there is main

effect of grade on TRCB,  $F(2, 22) = 4.076$ ;  $p = .031$ . The analysis of regression showed that a positive correlation may in fact exist between TRCB designed by the principle investigator of this study and BRF from Coopersmith Self-Esteem Inventory, since the statistical results of this relationship approached significance ( $p = .057$ ). This result might support the reliability of TRCB in this study.

### Discussion

While no significant difference between the training conditions (piano lessons, music therapy, and no-training) was found on pre-post comparisons of academic achievement, classroom behavior ratings, or self-esteem, informal observations lend support to the notion that further study is warranted. Behavioral observations of both piano lesson and music therapy instructors indicate the potential impact of training conditions on social and emotional variables. Several instructors from both conditions noted that students demonstrated increased confidence as they progressed through training, as evidenced by behaviors such as: increased assertiveness when singing and playing self-composed songs; increased smiling and verbalizations as lessons progressed; decreased resistance and increased initiative in learning more songs than were required; increased positive self-statements and desire to play for others; pride taken in songs learned; improved walking posture and increased volume of speech.

The improvement in reading scores for those receiving piano lessons may be explained by the emphasis on learning to read music as a primary component of the piano curriculum. Those receiving music therapy and those in the no training condition did not have the benefit of extensive training in music reading. Future studies should isolate reading skill as a dependent variable and look more closely at the effects of piano instruction on reading competence.

Several important factors should be considered when evaluating the study results and

contemplating directions for further research. First, duration of treatment may be an essential factor. Several studies have investigated the effects of 2-4 year training programs on various outcomes (Costa-Giomi, 2004; Piro and Ortiz, 2009; Portowitz, 2007), while others, such as the present study, evaluated the effects of short-term intervention. Studies comparing the effects of treatment or training duration as a primary variable would be of benefit. Although participants in the present study initially committed to 10 weeks of 30-minute lessons or therapy sessions, attendance was not consistent, and several participants attended fewer than 10 sessions. Since inconsistent school attendance may itself be a major contributing factor to at-risk populations, it is important for studies to be designed in a manner that will maximize attendance consistency and require it for inclusion in study analysis.

While the piano protocol was relatively consistent between participants, investigators in this study chose to base music therapy treatment decisions on individual preferences and observed needs, along with the assumption that, by nature of the population, students would have academic and behavioral needs along with likely deficits in the area of self-esteem. Therefore, treatment took into consideration individual music preferences and responses as well as desired non-musical outcomes based on general characteristics of the population. Future studies should involve more detailed assessment and evaluation of baseline functioning in order to more directly and specifically inform individualized music therapy treatment decisions.

Although supervision for music therapy instructors was provided by two board certified music therapists, instructors were students majoring in music therapy with varying levels of training and clinical experience. Future studies should control for this variable, and similar factors should be considered in selecting piano lesson instructors.

The body of research investigating the effects of music on at-risk populations is quite limited. With the breadth of variables to be isolated and considered, and the conclusions

drawn by some studies that music may indeed have a significant impact under certain circumstances, further research is warranted. In conclusion, the study provides evidence that relatively short-term (10 weeks) participation in piano instruction or piano instruction in music therapy does not benefit at-risk students' academic achievement, classroom behaviors and self-esteem. However, extra musical and non-musical (i.e., emotional and social) benefits experienced by the students in this study will provide valuable resources for music educators and music therapists. In addition, the rationale of the research questions, method and procedure used in the present study will invite future research in advanced directions.

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**Dr. Hayoung Lim's** research focuses on the effect of music on children with Autism Spectrum Disorders, and the effect of musical experiences on cognition,

speech/language and physical rehabilitation. A number of her manuscripts

have been published in peer-reviewed journals, including *Journal of Music Therapy* and *Music Therapy Perspectives*. In 2011, Dr. Lim's book titled "Developmental Speech-language Training through Music for Children with Autism Spectrum Disorders" was published by Jessica Kingsley Publisher, London, UK. She also published a book chapter "Communication and Language Development: Implications for Music Therapy and Autism Spectrum Disorders" in *Early Childhood Music Therapy and*

*Autism Spectrum Disorders* (Kern & Humpal Eds., 2012). Dr. Lim has won two Sam Houston State University faculty research grant awards and numerous presented her original research in national and international conferences and workshops. In March, 2014, Dr. Lim was invited as a keynote speaker to International Conference on Developmental Disability in University of Calcutta, India. Dr. Lim is a board-certified, neurologic music therapist (NMT Fellow) and current member of the American Music Therapy Association (AMTA). She earned her bachelor's degree in Cello Performance from the Catholic University of Korea, and master's degree in both Cello Performance and Music Therapy from the Illinois State University. In 2007, she received her Ph.D. degree in music education with an emphasis on music therapy from the University of Miami. Her dissertation title was "The Effect of Developmental Speech-Language Training through Music in Speech Production in Children with Autism Spectrum Disorders." Dr. Lim's clinical background includes working with diverse population including individuals with mental illnesses, developmental disorders, medical problems, neurologic impairments, dementia, hospice, and others. She completed her music therapy internship at Lutheran General Hospital, Park ridge, IL, and worked as a full time music therapist at the Cleveland Music School Settlement. Dr. Lim also worked as music therapy director at Children's Health & Education Management, Miami, FL and specialized in music therapy for children with Autism Spectrum Disorders. In addition, Dr. Lim has worked as a concert cellist, performing numerous solo recitals and participating in internationally-recognized orchestras in Seoul, Korea and the U.S. She currently serves as artistic director of Healing Concert series in the Woodlands, TX.

of populations in Florida, South Carolina, and Texas. Areas of specialization include music therapy in the psychiatric treatment of adolescents, and Neurologic Music Therapy in the treatment of patients suffering from strokes, traumatic brain injuries, and Parkinson's Disease. She has received specialized training in Neurologic Music Therapy and is among the first fellows of the Robert F. Unkefer Academy of Neurologic Music Therapy.

She has been active in community education, presentation of clinical and research material, and research publication. Ms. Miller has presented regionally, nationally, and internationally. Her research is published in the *Journal of Music Therapy* and *Music Therapy Perspectives*. She is a Past-President of the American Music Therapy Association's Southwestern Region (SWAMTA) and currently serves as Co-Chair of the American Music Therapy Association's Academic Program Approval Committee; she is a long-standing Assembly Delegate to the American Music Therapy Association.

Professor Miller is also a singer/songwriter and has produced two CD's of original songs. Her music education and music therapy studies were completed at Oklahoma Baptist University (B.M.E.) and The Florida State University (M.M.).



**Karen Miller, MM, MT-BC**  
**Master of Music, Music**  
**Therapist-Board Certified**  
**Neurologic Music Therapist**  
**Professor, Director of Music**  
**Therapy**  
**Sam Houston State**  
**University**

**Karen Miller** is Professor and Director of Music Therapy at SHSU. Prior to joining the faculty at Sam Houston State, Professor Miller worked as a music therapy director, supervisor, and clinical practitioner, acquiring more than ten years' experience in clinical music therapy practice. Professor Miller has provided full-spectrum music therapy services to a wide variety