

CEDFA Advocacy References

In 1967, Edwin Ara Movsesian sought to establish a correlation between teaching music skills to students who were acquiring basic reading skills and others who were developing advanced reading comprehension and vocabulary. In his experiment, he exposed some students to music reading skills along with regular reading instruction, while other students received the standard reading instruction. He found that the students who received instruction, as a group, performed better on standardized tests with higher scores in reading comprehension, reading vocabulary, and oral reading. From pre- and post-tests on the *California Achievement Test* (Reading), the *Gray Oral Reading Test*, and the *Survey of Primary Reading Development*, Movsesian concluded that music skills correlated positively with improved reading skills.

Additionally, Movesian found that the differences in the students who received the music instruction were specific to grade levels. First grade students had higher scores in reading comprehension. Children in second grade performed significantly better in both reading vocabulary and reading comprehension. Third grade students performed better in oral reading, but not in other areas of reading.

Movsesian, E.A. (1967). The influence of teaching music reading skills on the development of basic reading skills in the primary grades. Unpublished dissertation, University of Southern California.

According to a study conducted by OMG, Inc., a research and consulting firm in Philadelphia, Pennsylvania, when students attend a school that is focused on the arts, they generally score higher on tests than a student who attends another school in the same locality.

Thomas, J.B. (1992, October). The lost arts: why arts education is crucial for kids. *Better Homes and Gardens*.

According to the National Arts Research Center, students who had not previously studied art improved their performance in geometry through the study of the visual arts, specifically sculpture and architecture.

Thomas, J.B. (1992, October). The lost arts: why arts education is crucial for kids. *Better Homes and Gardens*.

After Elm Elementary School in Milwaukee incorporated the arts into its curriculum, the school, once in the bottom 10% of the district, scored first of 103 schools in academic performance.

Oddleifson, E. (1991, Winter). The case for the arts: by cutting back on arts to strengthen their basic core curricula, schools may be taking a giant leap backward. *The Learning Revolution*, 46.

One year after the Anza School in Los Angeles developed its visual arts curriculum, its students' reading scores increased twofold.

Oddleifson, E. (1991, Winter). The case for the arts: by cutting back on arts to strengthen their basic core curriculum, schools may be taking a giant leap backward. *The Learning Revolution*, 46.

As a result of introducing arts to the curriculum, at St. Augustine School (K-8) in Bronx, New York, which was in danger of being closed, 98% of its students' reading and math scores were at grade level. St. Augustine is one of only three public schools in metropolitan New York City to attain this level of student achievement.

Oddleifson, E. (1991, Winter). The case for the arts: by cutting back on arts to strengthen their basic core curriculum, schools may be taking a giant leap backward. *The Learning Revolution*, 46.

Eliot Elementary School in Needham, Massachusetts introduced art into its curriculum in 1983. Subsequently, the typical third grade student's test scores placed in the 97th to 99th percentile.

Oddleifson, E. (1991, Winter). The case for the arts: by cutting back on arts to strengthen their basic core curriculum, schools may be taking a giant leap backward. *The Learning Revolution*, 46.

In a dissertation (1959), Friedman found that fifth grade students who had the ability to play musical instruments had better reading comprehension skills than those students who did not play musical instruments. Music students demonstrated higher competence in predicting, memory, listening, recall, and comprehension.

Friedman, B. (1959). An evaluation of the achievement in reading and arithmetic of pupils elementary schools instrumental music classes. University Microfilms, Inc.

J. Maltester found that increased music instruction leads to increased math scores.

Maltester, J. (1986, January). Music: the social and academic edge. *Thrust*, 25-27.

The Norwegian Research Council for Science and Humanities found a correlation between high self-esteem, high cognitive competence scores, and high self-perception and an interest in music. The Council also found a relationship between musical interest and the desire to succeed in school.

Lillemyr, O.F. (1983). Achievement motivation as a factor in self-perception. The Norwegian Research Council for Science and Humanities.

Diana Long Nicholson, in 1972, sought to determine the relationship between the study of music and improved reading skills in students with developmental delays. Her study showed that the students with musical experience scored higher in areas such as letter recognition. Nicholson concluded that improved letter recognition and reading skills of late developing learners result from experience with music.

Nicholson, D.L. (1972). Music as an aid to learning. New York University.

When teaching third grade students to play stringed instruments, Pelletier noticed an increase in their abilities to read. After conducting a study, he concluded that when a student learns to play a musical instrument as he or she begins to read, that student will improve his or her reading ability.

Pelletier, H. (1965). An investigation of the relationship between training in instrumental music and selected aspects of language growth in third grade children. Arizona State University.

In 1988, Ciepluch studied the correlation of the practice of music sightreading and overall reading achievement. The study showed a significant positive correlation between a student's sightreading ability and his or her reading level.

Ciepluch, G.M. (1988). Sightreading achievement in instrumental music performance, learning gifts, and academic achievement: a correlational study. The University of Wisconsin-Madison.

In 1975, Hurwitz, Wolff, Bortnick, and Kokas studied the relationship between a Kodaly-based music curriculum and the reading ability of children at the elementary level. The researchers concluded that children who receive instruction in music score higher on reading tests than those students who do not have experience with music.

Hurwitz, I., Wolff, P.H., Bortnick, B.C., and Kokas, K. (1975). Nonmusical effects of the Kodaly Music Curriculum in primary grade children. *Journal of Learning Disabilities*, 3.

In 1967 in Athens, Georgia, Maze analyzed musical ability scores and reading achievement of first grade students. Maze noted a significant positive correlation between reading achievement and scores on a modified version of the *Seashore Test of Musical Ability*. Further, she concluded that the two skills are directly related.

Maze, N.M. (1967). A study of the correlations between musicality and reading achievement at first grade level in Athens, Georgia. University of Georgia.

In 1997, researchers at the University of California Irvine and the University of Wisconsin found that preschoolers who received piano lessons experienced significant improvements in their abilities to reason scientifically and mathematically. Also, the researchers noted that these improvements were not limited to playing the piano, but could happen with any musical experience.

Shaw, Rauscher, Levine, Wright, Dennis, and Newcomb. (1997, February). Music training causes long-term enhancement of preschool children's spatial-temporal reasoning. *Neurological Research*, volume 19.

In 1981, Robitaille and O'Neal, of the Albuquerque, New Mexico school system, compared the basic skills scores of all students in the district who took musical instruction with the basic skills scores of the students who did not take music classes. The results indicated that the instrumental music students scored higher in all areas of the *Comprehensive Tests of Basic Skills*, especially in the areas of reading and language. Furthermore, the researchers found that the score increases continued to improve with additional musical training.

Robitaille, J., and O'Neil, S. (1981). Why instrumental music in elementary schools? *Phi Delta Kappan*, p. 213.

In 1990, Wood analyzed the scores of 7,500 students enrolled in a medium-sized university on the *Nelson Denny Reading Test*. When comparing the reading scores of music major students with non-music major students, Wood found that the music students had the highest reading scores of any major.

Wood, P.H. (1990). The comparative academic abilities of students in education and in other areas of a multi-focus university. Unpublished.

Turnipseed, in 1976, conducted a study in which first grade students were put in either a control group of students who received instruction in critical reading only or an experimental group in which students who received instruction in listening skills using classical music. The children in the experimental group received significantly higher scores on reading and language arts tests than the children in the control group. The students who participated in the classical music listening also received higher grades in reading in the classroom.

Turnipseed, J.P. (1976, November). The effects of participation in structured classical music education programs on the total development of first grade children. Mid-South Educational Research Conference.

According to a report by Burton, Horowitz, and Abeles, through the arts, a student improves creativity, gains a sense of balanced emotions, betters his or her problem-solving skills, gains a sense of empowerment and self, becomes a better learner, and is able to increase concentration.

Burton, J., Horowitz, R., and Abeles, H. (1999). Learning in and through the arts: curriculum implications. In E. Fiske (Ed.), *Champions of change: the impact of the arts on learning*. [Online report]. Washington, DC: The Arts Education Partnership and the President's Committee on the Arts and the Humanities.

Researchers found that when a school includes the arts in its curriculum, its students experience improvement in reading, writing, and math scores.

Milley, J., Buchen, L., Oderlund, A., and Mortarotti, J. (1983). The arts: an essential ingredient in education. California Council of Fine Arts Deans. Long Beach: the School of Fine Arts, California State University – Long Beach.

In 1993, with the aid of the Department of Education's National Center for Education Statistic's 12,000 student interviews, researchers noted a direct relationship between success in mathematics and instruction in instrumental music. Through analysis of over 1,000 students, they found that students who study music take more math classes than students who do not study music.

Manthei, M., and Smith, T.M. (1993). The effects of instrumental music participation on math achievement. The University of Kansas.

Researchers administered the *Seashore Test of Musical Talent* to 406 students enrolled in university foreign language classes. From the results, they concluded that the two most important factors on a student's ability to learn a foreign language were the student's English reading ability and tonal memory ability.

Leutenegger, R.R., Mueller, T.H., and Wershow, I. (1964). Auditory factors in foreign language acquisition. *Modern Language Journal*, 22-31.

In 1984, Karimer studied the relationship between pitch and rhythm activities and distinguishing between like initial and final phonemes. She assigned immigrants from Southeast Asia to either a control or experimental group. The experimental group received song instruction that used English words; the control group did not receive song instruction. At the end of the instruction, the experimental group increased their scores more than the control group.

Karimer, L. (1984). Can Southeast Asian students learn to discriminate between English phonemes more quickly with the aid of music and rhythm? Unpublished.

In 1961, Eterno studied the relationship between the study of instrumental music and a student's ability to learn a foreign language. In doing so, the researcher evaluated the results of the Conn Musical Aptitude Test with the scores of the Foreign Language Pronunciation Test (Spanish). Eterno's findings concluded that students who study instrumental music will be more successful in learning a foreign language.

Eterno, J.A. (1961). Foreign language pronunciation and musical aptitude. *Modern Language Journal*, 168-170.

Researchers tested the reasoning abilities of children at the age of three who had no prior musical training. They tested the same children again after three months of music lessons, finding that the children had greatly improved their reasoning abilities. The researchers accounted for this improvement by noting that the musical training triggered basic neural connections related to reasoning skills.

Rauscher, F.H., Shaw, G.L., and Levine, K.N. (1994, August 12-16). Music and spatial task performance: a causal relationship. Presented at the American Psychological Association 102nd Annual Convention.

Rauscher and Shaw found that after listening to ten minutes of Mozart's *Sonata for Two Pianos in D Major*, undergraduate students increased their scores on a spatial IQ test by eight to nine points. From this experiment, they concluded that Mozart triggers the firing patterns of neurons in the cerebral cortex. These patterns induce creative right brain activity associated with spatial-temporal reasoning.

Rauscher, F.H., Shaw, G.L., and Ky, K.N. (October 1993). Music and spatial task performance. *Nature*, 611.

Dr. Howard Gardner, a Harvard University psychologist, lays out the framework for seven different intelligences in his book *Frames of Mind: Theory of Multiple Intelligences*. Of the seven intelligences – linguistic, musical, logical/mathematical, spatial, bodily-kinesthetic, and the personal intelligences – American schools only address the linguistic and logical/mathematical intelligences. However, most educators feel that fostering a student's natural intellectual strengths and interests will, in turn, lead to the enrichment and development of the other types of intelligences.

Gardner, Howard. (March 1993). *Frames of mind: The theory of multiple intelligences*. Basic Books.

At the Institute for Experimental Audiology at the University of Münster, researchers found a relationship between a person's musical training and his or her neural activity. According to the study, the greater the person's musical background, the greater the portion of his or her brain is active during the musical process. This research proved for the first time that the brain has the ability to recognize itself; this finding allows for opportunities to research more extensively treatment for people who suffer neurological damage. The researchers also cited that the neural enhancement attached to musical training also connects to age. If a person gets involved in musical training early in life, he or she involves a larger number of brain cells in the musical process.

Pantev, C., Oostenveld, R., Engelien, A., Ross, B., Roberts, L.E., and Hoke M. (23 April 1998). Increased auditory cortical representation in musicians. *Nature*, 811-814.

The 1988 National Educational Longitudinal Survey tracked the progress of 25,000 middle and high school students over a period of ten years. James Catterall, a professor of education at the University of California at Los Angeles, used the Survey to argue that students who took at least two art classes per week and participated in the arts outside of the school curriculum outperformed other students on standardized tests, including subjects such as math, reading, and history. Furthermore, 66.8% of eighth grade students with experience in the arts scored in the top half on the standardized tests, while only 42.7% of other students scored similarly.

Catterall, J.S. (July 1998). Does experience in the arts boost academic achievement? A response to Eisner. *Art Education*, 7-15.

Researchers found that students who, in arts education, learn self-regulation skills – asking pertinent questions, setting goals, self-observation, reaction, efficacy, standard setting, etc. – can apply those skills to academic studies and achieve improved performance. In arts environments, students are encouraged to take greater responsibility for their thinking. Educators of the arts motivate students to participate in the goal-setting process and lead students to evaluate themselves and others.

Baum, S., Owen, S., and Oreck, B. (1997.) Transferring individual self-regulation processes from arts to academics. *Arts Education Policy Review*, 32, 39.

Researchers studied preschoolers, labeled as disadvantaged, to support the incorporation of visual arts in the school curriculum. A cross-cultural study observed 215 pre-kindergartners and 228 kindergartners from Tel Aviv, Israel and Columbus, Ohio. Some of the students received art tools without art instruction; the other students received art instruction, including discussion, observation, touch, and technical training. The researchers found that instruction in the arts results in improved cognition.

Mooney, R., and Smilansky, S. (1973). An experiment in the use of drawing to promote cognitive development in disadvantaged preschool children in Israel and the United States. ERIC Document Reproduction Service No. ED408952.

In addition to improved cognition, studies also illustrate the connection between visual learning and gains in reading and creativity. As students learn to critique art, they also improve their vocabulary and language skills. The process of drawing results in students being better able to visualize and plan. Improved thinking skills and verbal skills of disabled children also results from drawing. The arts provide students the opportunity to visualize their emotions and feelings. By encouraging students' participation in the arts, students are better able to express themselves.

Eisner, E.W. (1998, January). Does experience in the arts boost academic achievement? *Art Education*, pp. 7-15.

Jing, J., Yuan, C., and Liu, J. (1999). Study of human figure drawings in learning disabilities. *Chinese Mental Health Journal*, 133-34.

Malyarenko and other researchers found that listening to music for only an hour every day can change the way in which the brain is organized. They conducted an experiment in which four year-olds listened to classical music for one hour a day. Later, the same children received testing that showed their brains had greater coherence and were in the alpha state more often.

Malyarenko, et al. (1996). Music alters children's brainwaves. *Human Physiology*, 76-81.

Researchers indicate that playing the piano leads to increased spatial awareness and the ability to think ahead (both of which are important in mathematics). One group of students played a math video game and improved their spatial-proportional skills and their math scores. However, the group that had experience with the piano scored an additional 15% above the video game group that received no musical instruction.

Graziano, A., Peterson, M., and Shaw, G. (1999). Enhanced learning of proportional math through music training and spatial-temporal training. *Neurological Research*.

Researchers suggest that the process of making music can lead to improved listening and memory skills. A study tested sixty college students for verbal memory. Of the students, those who had music training before the age of twelve recalled more information than did those who did not have early musical instruction.

Chan, A.S., Ho, Y.C., and Cheung, M.C. (1998). Music training improves verbal memory. *Nature*, 128.

Researchers from the University of North Texas studied the effects of music listening on vocabulary review. Two groups of college students reviewed twenty-five vocabulary words; one group heard no music, while the other group listened to Handel's *Water Music*. Students from the group that listened to Handel scored significantly higher than students from the other group.

Stein, B., Hardy, C. A., and Totten, H. (1984). The use of music and imagery to enhance and accelerate information retention. *Journal of the Society for Accelerative Learning & Teaching*.

James Catterall, a professor of Education at the University of California at Los Angeles, investigated the relationship between music and overall academic achievement. He compared test scores of students from lower socioeconomic status who received music instruction in high school to test scores of students, from similar backgrounds, who did not receive any music instruction. Compared with the non-music group, the music group improved their math, reading, history, geography, and social skills. The study indicates that a curriculum that supports music instruction can enhance students' learning abilities.

Catterall, J.S., Chapleau, R., and Iwanaga, J. (1999). Involvement in the arts and human development. *Champions of change: The impact of arts on learning*. <http://www.artsedge.kennedy-center.org/champions/>.

In Seattle, Washington, Gilbert observed a group of third grade students who studied language arts concepts through dance activities. Those students increased their Metropolitan Achievement Test reading scores by 13% in half a year.

Gilbert, A.G. (1977). *Teaching the 3 Rs through movement experiences*. New York: Macmillan.

During playtime, students often took part in spinning, leaping, crawling, rolling, rocking, pointing, and marching. Resulting from these activities, Lyelle Palmer with Winona State University noted significant increases in attention span and reading skills.

Palmer, L. (1980). Auditory discrimination development through vestibule-cochlear simulation. *Academic Therapy*, 55-68.

Leroux and Grossman studied a Chicago elementary school; its student body consisted of 84% of the students coming from families below the poverty line and 30% not speaking English. When the students did not receive arts instruction, only 38% of the students were reading at grade level, and only 49% in math were at grade level. Then, the school added art to its curriculum. Now, 60% of the students are reading at grade level, and 68% in math are at grade level.

Leroux, C. and Grossman, R. (1999, October 21). Arts in the schools paint masterpiece: Higher scores. *Chicago Tribune*, A-1.

Meta-analyzing seven research studies of 3,714 in the field of dance, M. Keinanen, L. Hetland, and E. Winner studied the relationship between dance instruction and reading and dance instruction and nonverbal reasoning. They found a small average correlation in the former and a much stronger one in the latter. Another important conclusion is that, overall, research in dance education research is limited, which means that their analysis was by no means exhaustive. In order to more fully study these relationships, the authors maintain, there must be more research in this field.

Keinanen, M., L. Hetland, and E. Winner (2000, Fall). Teaching cognitive skills through dance: evidence for near but not far transfer. *Journal of Aesthetic Education*, 295-306.

Seventy-eight seventh-grade, Korean girls were the subjects of a doctoral dissertation done by J. Kim. She studied the effects of both creative dance and traditional dance on creative thinking and on critical thinking. This study suggests that how dance is taught determines the impact on students' thinking skills. When dance is taught as a sequence of steps to be replicated, higher order thinking skills do not improve. However, when dance is taught as an exercise in creative problem-solving, students' creative thinking skills improve.

Kim, J. (1998). The effects of creative dance instruction on creative and critical thinking of seventh grade female students in Seoul, Korea. Unpublished dissertation, New York University.

The Torrance Test of Creative Thinking (TTCT) says there are five factors of creativity: fluency, originality, abstractness of titles, elaboration, and resistance to premature closure. S. Minton, in an unpublished manuscript, studying two hundred and eighty-six high school students who were enrolled in both dance and non-dance classes, says that three of those five – elaboration, originality, and abstractness of titles – correlated with higher levels of dance experience. Thus, the study suggests a possible relationship between dance and the kinds of creativity assessed on the TTCT.

Minton, S (2000). Assessment of high school students' creative thinking skills: a comparison of the effects of dance and non-dance classes. Unpublished manuscript, University of Northern Colorado.

J. Ross, studying sixty at-risk and incarcerated adolescents participating in jazz and hip-hop dance classes, writes a twofold paper. First, she presents an explanation of why dance is an effective medium for fostering self-perception in these kinds of adolescents. Secondly, she demonstrates to college students, who were participant observers, how dance can be used by amalgamating the dance itself, service, and research. Through the use of a number of qualitative methods, Ross understands and depicts what happens in a dance class.

Ross, J. (2000, April). Art and community: creating knowledge through service in dance. Presented to the American Education Research Association, New Orleans, LA.

R. de la Cruz, studying how thirty-five learning disabled students, twenty-one in an experimental group and fourteen in a control group, perform in several social areas—courtesy to others, self-control, focus, and social compliance. Students engaged in twelve weekly, 35-40-minute creative drama activities, with three of the twelve focusing on each of the four areas. De la Cruz found, first of all, that the experimental group gained significantly more in all four of those performance clusters than those in the control group. Furthermore, two months later, at a follow-up, the experimental group maintained their post-measure levels of social and linguistic skill.

Cruz, R.E. de la (1995). The effects of creative drama on the social and oral language skills of children with learning disabilities. Doctoral dissertation, Illinois State University.

Three groups, each consisting of seventeen fifth-grade students who were in remedial reading courses, were placed in a structured remedial reading course for six weeks. Group One, in addition, used creative drama to support reading comprehension; Group Two was taught traditional, non-remedial methods to support reading comprehension; and Group Three only made use of the structured course. S. DuPont found that Group One scored significantly higher than Groups Two and Three on both a weekly criterion-referenced test (CRT) and the Metropolitan Achievement Test (MAT6).

DuPont, Sherry (1992). The effectiveness of creative drama as an instructional strategy to enhance the reading comprehension skills of fifth-grade remedial readers. *Reading Research and Instruction*, 41-52.

Studying thirty-six kindergarten students randomly assigned to either an adult-structured group training in imaginative play processes, a free-play activity group in the non-directive presence of the experimenter, or a control group, R.S. Fink tested the development of conservation and two kinds of perspectivism, as groups of four children met twice weekly for four weeks. Fink found that, although all three groups developed over time, the first group, the structured group engaging most heartily in imaginative play, consistently improved more than the other two.

Fink, R.S. (1976). Role of imaginative play in cognitive development. *Psychological Reports*, 895-906.

Literacy – defined as the use of reading skills, the decoding of written materials, drawing inferences, and the translation of narrative and sequence into dramatic text – is the focus of this study on five-year-olds. J.R. Goodman found that reading comprehension is enhanced when a child acts out dramatically a story he or she has read. More interesting, though, is Goodman's discovery that those same children better comprehend overall – in other words, even when they are *not* dramatically enacting the passages they are reading, they still manage to comprehend said passage.

Goodman, J.R. (1990). A naturalistic study of the relationship between literacy development and dramatic play in five-year-old children. Unpublished dissertation, Vanderbilt University.

Researchers investigated the development of artistic skills in dance and music among students identified as economically disadvantaged and who were from diverse, urban backgrounds. They found that fostering artistic development leads at-risk students to becoming "psychologically healthy" adults. Also, students who developed their artistic skills tended to be more focused and disciplined in school and other areas of their lives.

Oreck, B., Baum, S., and McCartney, H. Artistic talent development for urban youth: the promise and the challenge. National Research Center on the Gifted and Talented, University of Connecticut, Storrs.

This study researched the effects of a program that combined creative movement with poetry on two boys with behavioral disorders. Investigators found the boys developed their critical thinking skills and verbal and physical communication skills, furthered their desire to participate in activities with others, and improved their motor and spatial skills.

Mentzer, M.C. and Boswell, B.B. (1995). Effects of a movement poetry program on creativity of children with behavioral disorders. *Impulse*, 183-199.

The goal of the Basic Reading through Dance (BRD) program is to use dance and movement to further students' abilities to read. The Chicago Public Schools used the program in 1998-1999, with 176 of its students participating. In this program, students hear a sound or a word and, then, represent it, using their bodies. Researchers found that those students improved their scores on the Read America's Phono-Graphix Test more so than the control group. Test results indicated that the participants were better able to match letters and words with their sounds.

Rose, D. (1999, February). The impact of Whirlwind's Basic Reading Through Dance program on first grade students' basic reading skills: study II. Unpublished, 3-D Group.

Linnette Werner of the University of Minnesota sought the effects of integrated dance and math instruction on students' attitudes toward and aptitudes of mathematics. Classroom teachers designed a program in which students worked with a dancer once a week in order to learn math concepts. The teachers predicted that the students who participated in the dance class would be more successful in and receptive to math lessons. Indeed, the students who received the dance training were more positive than those students who did not. Also, the dance students were more completely engaged in learning math and could more readily apply math skills to different subjects and in different contexts.

Werner, L. (2001, October). Changing student attitudes toward math: using dance to teach math. The Center for Applied Research and Educational Improvement, College of Education and Human Development, University of Minnesota.

Shakespeare and Company aims to produce quality productions of Shakespeare's plays and to teach Shakespeare at all academic levels. The program sets out to make its participants confident, competent readers. Participants in the program not only noted changes in their reading levels, but the students also claimed significant results in the fields of mathematics and science. Because Shakespeare and Company challenges students to read and dissect every word of Shakespeare's texts, students learn how to read on many levels, helping them also to analyze their physics books.

Seidel, S. (1998). Stand and unfold yourself: a monograph on the Shakespeare and Company research study. Harvard Project Zero, Cambridge, MA.

Larry Kassab sought to establish the relationship between students who participated in a six-week poetry and drama workshop and their abilities to communicate orally. His study involved high school sophomores from a rural school in Pennsylvania. After taking part in the workshop, Kassab found that the students could better and more comfortably express themselves and had increased levels of self esteem and self confidence, all key factors for success in school and later in life. Also important, students in the workshop relied on their own writings, instead of those of other playwrights, leading to increased experience in writing for dramatic purposes.

Kassab, L. (1984, August). A poetic/dramatic approach to facilitate oral communication. Unpublished doctoral dissertation, Department of Speech Communication, Pennsylvania State University, State College, Pennsylvania.

Researchers Blaine H. Moore and Helen Caldwell studied 63 second and third graders to find whether participation in theatre and drama activities improved students' writing skills. Divided into three groups, one group participated in drama activities, another in drawing activities, and the final group as a control. The drama group focused on the students' ideas for plays; here, students engaged in pantomime, games, movement, and improvisation to strengthen their fictional writing skills. Students took part in these activities over a period of fifteen weeks. After that time, investigators found that the students who participated in the drawing and drama groups improved their narrative writing abilities.

Moore, B.H. and Caldwell, H. (1993, November/December). Drama and drawing for narrative writing in primary grades. *Journal of Educational Research*, 100-110.

Anita Page investigated the extent to which story dramatization affected students' reading comprehension. She used two groups: one in which the children listened to an adult read the story and another in which the children heard the story on tape and acted out the story. Page found that dramatizations tended to engage the students more so than did a traditional reading. Further, through dramatizations, students could better identify key elements of the story, including main idea and character development. These two things led to better reading comprehension. The research also found that younger children showed better results than older children; perhaps, because younger children had less sophisticated reading skills.

Page, A. (1983). Children's story comprehension as a result of storytelling and story dramatization: a study of the child as spectator and participant. Doctoral dissertation, University of Massachusetts.

Michaela Parks and Dale Rose investigated the connection between a reading comprehension/drama program and reading and standardized test scores. In the Whirlwind classrooms, teachers cooperated with an opera singer and an actor who worked with students over ten weeks, focusing on reading and dramatic-presentation exercises. This participation resulted in significant increases in Iowa Test of Basic Skills scores; the scores most improved when students had to “identify factual information” from readings. Also, participants were better able to express factual material nonverbally.

Parks, M. and Rose, D. (1997). The impact of Whirlwind’s Reading Comparison through Drama Program on 4th grade students’ reading skills and standardized test scores. Unpublished evaluation, 3D Group.

Researchers tested the effects of three types of stories on students’ development of reading comprehension. They examined thematic-fantasy play, teacher-led discussion, and drawing. After participating in these activities, the students in kindergarten and first grade who took part in the thematic-fantasy play produced significantly higher story comprehension scores than did the students in the discussion and drawing groups. The students in the thematic-fantasy play group also scored higher in story recall, recalling sequences of events, and answering judgmental questions.

Pellegrini, A.D. and Galda, L. (1982, Fall). The effects of thematic-fantasy play training on the development of children’s story comprehension. *American Educational Research Journal*, 443-452.

In her study, Ann Podlozny investigated the effects of classroom drama on students’ development of verbal abilities. This review of instructional practices analyzed eighty previous studies and tested whether or not three characteristics of dramatic instruction—enactment, plot, and the leader’s level of involvement—improved verbal knowledge. After performing statistical tests, she found that dramatic study improved students’ abilities to understand stories, especially for students who came from lower socioeconomic groups or who were delayed in their development of reading skills. She also discovered relationships between dramatic instruction and reading achievement, reading readiness, oral language development, and writing achievement.

Podlozny, A. (2000, Fall). Strengthening verbal skills through the use of classroom drama: a clear link. *Journal of Aesthetic Education*, 239-276.

Betty Jane Wagner studied the effects of theatre and dramatic play in the classroom on the persuasive writing abilities of both fourth and eighth graders. She divided the students into three groups—some received facilitator-guided-role-playing instruction, others received instruction in persuasive writing, while the third group did not receive either type of instruction. Following the given activities, students from each group wrote a persuasive letter to their principal. Wagner found that when students worked in pairs in role-playing activities, their persuasive writing capabilities were further developed than students who received a lecture with examples. The role play was more effective with fourth graders. Eighth graders who participated in the role play showed improvement over those eighth graders who did not receive instruction; however, they did not show a significant improvement over those who received a lecture.

Wagner, B.J. (1986, October). The effects of role playing on written persuasion: an age and channel comparison of fourth and eighth graders. Unpublished doctoral dissertation, University of Illinois at Chicago.

Researchers from the Education Department of Tasmania wanted to determine the relationship between drama in the classroom and the language development of fifth- and sixth-grade students. Teachers from nine schools participated in a two-day workshop and had constant access to speech and drama coaches. After teachers engaged their students in dramatic activities, they gathered examples of language and verbal exchanges from their students. The researchers investigated these samples and found that the language in those classrooms differed from those in other classrooms. Communication in other classes tended to be totally informational, while that of the drama-trained teachers' classes was half informational and half expressive. In addition, drama encouraged more student-to-student interaction and exchanges. Students also became more self-reflective.

Schaffner, M., Little, G., and Felton, H. (1984, August). Nadie Papers No. 1, drama, language and learning. Reports of the drama and language research project, speech and drama center. National Association for Drama in Education, Education Department of Tasmania.

This study follows a remedial class of seventeen third- and fourth-grade students. Defined as "at-risk", these students participated in typical round-robin reading lessons in which one student reads, followed by another student with minimal discussion. During the school year, the teacher introduced the students to a theatre instructor who worked with them weekly. Students read multicultural books, participated in dramatic expression activities based on the books, and discussed the books. This exposure to different reading material and a different way of reading helped the students to argue points and to interpret texts.

Wolf, S.A. (1998). The flight of reading: shifts in instruction, orchestration, and attitudes through classroom theatre. *Reading Research Quarterly*, 382-415.

Researchers studied the affects of art-based programs outside of schools on student participants. They found that these students have increased language and expression abilities. For instance, students could, within four to six weeks of participation in art activity, form more complex sentences, engage in hypothetical learning processes, and began to transform their daily experiences into art.

Heath, S.B. and Roach, A. Imaginative actuality: learning in art during the nonschool hours. Stanford University and Carnegie Foundation for the Advancement of Teaching. In E. Fiske (Ed.), *Champions of change: the impact of the arts on learning*. [Online report]. Washington, DC: The Arts Education Partnership and the President's Committee on the Arts and the Humanities.

Chicago Arts Partnerships in Education (CAPE), founded in 1992, brings local artists into Chicago schools to partner with teachers in all grades. These teacher-artist partnerships brought art into the classroom to support specific academic goals in the other academic areas like reading and science. Schools applied for grants to participate in CAPE. After students experienced visual arts learning, targeted to improve specific goals, investigators found positive trends in the standardized test scores—CAPE students began to widen the gap on non-CAPE students, especially in mathematics. Also, CAPE students exhibited positive attitudes towards art instruction in the classroom. Researchers discovered that CAPE students also develop better life skills, such as the ability to speak effectively, to motivate, and to make decisions.

Catterall, J.S. and Waldorf, L. Chicago Arts Partnerships in Education: summary evaluation. University of California, Los Angeles Graduate School of Education and Information Studies. In E. Fiske (Ed.), *Champions of change: the impact of the arts on learning*. [Online report]. Washington, DC: The Arts Education Partnership and the President's Committee on the Arts and the Humanities.

In this evaluation, researchers studied the effects of visual arts instruction on reading. Specifically, the investigators sought the answers to two questions: one, is art instruction alone enough to improve reading skills?, otherwise known as the cognitive-transfer-of-skills hypothesis; and, two, is teaching reading alone less successful in improving reading skills than teaching reading through art?, otherwise known as the motivational-entry-point hypothesis. Burger and Winner found a small effect of visual arts instruction on reading readiness scores and a positive relationship between reading improvement and a reading-through-the-arts program.

Burger, K. and Winner, E. (2000, Fall). Instruction in visual art: can it help children learn to read? *Journal of Aesthetic Education*, 277-293.

In this study, researchers randomly put sixth graders in two groups. All students studied Mesopotamia and Egypt, but each student received either a writing-only assessment or a combination-of-writing-and-drawing assessment. After one unit, the students who participated in the writing-only group switched to the writing-and-drawing group for the second unit and vice-versa. Researchers concluded that when students wrote and drew, they received higher scores than when they only wrote. Also, students showed higher interdisciplinary learning when they wrote and drew. These findings were also true of students with limited English-speaking abilities.

DeJarnette, K.G. (1997). The Arts, language, and knowing: an experimental study of the potential of the visual arts for assessing academic learning by language minority students. Unpublished dissertation, University of California, Los Angeles.

The Visual Teaching Curriculum's (VTC) trained nine- and ten-year-old students to look at and describe pieces of art. Through this process, researchers sought whether or not these skills could also apply to looking at non-art images from the field of science. Before participation, students described two artworks and were asked to do so again after a year of lessons and at least two visits to the Museum of Modern Art in New York City. Also after a year, students who participated, as well as a control group of students who were not exposed to the VTC, investigated a picture of a fossil record of animal footprints. The students in the control group performed similarly to the VTC students before they had participated in the program. After a year, the VTC students achieved higher scores in the areas of evidential reasoning and circular reasoning and were more conscious of the subjectivity of the assignment.

Tishman, S., MacGillivray, D., and Palmer, P. (1999). Investigating the educational impact and potential of the Museum of Modern Art's Visual Thinking Curriculum: final report. Unpublished report, Museum of Modern Art, New York, NY.

Jeffrey D. Wilhelm wanted to find the effects of visual arts on "reluctant learning-disabled readers" and their abilities to enjoy reading. His research centered on two seventh-grade boys, both who have identified disabilities and are reluctant readers. These boys experienced lessons over nine weeks to help them see stories through the visual arts, including finding objects that could represent characters, drawing pictures of those passages with the strongest language, illustrating books, and picture mapping stories. After the lessons, the boys became more engaged in reading; they became more sophisticated readers and took more active roles in the reading process.

Wilhelm, J.D. (1995). Reading *is* seeing: using visual response to improve the literary reading of reluctant readers. *Journal of Reading Behavior*, 467-503.

An international research team of scientists at Dartmouth College (2002), led by music psychologist Petr Janata, found that certain areas of the cortex were up to five percent larger in expert musicians than in people with little or no musical training. In musicians who started their training in early childhood, the neural bridge that links the brain's hemispheres, termed the corpus callosum, was up to fifteen percent larger. A professional musician's auditory cortex – the part of the brain associated with hearing – contains 130 percent more gray matter than that of nonmusicians. The study, published in the December 13, 2002 issue of *Science*, demonstrates that the abstract knowledge about the harmonic relationships in music inscribes itself on the human cortex, guiding expectations of how musical notes should relate to one another as they are played. The pattern in music literally becomes a pattern in the brain, showing a link between music theory and perception and brain function.

Janata, P. (2002, December). The cortical topology of tonal structures underlying Western music. *Science*, 2167-2170.

At a conference where the proceedings went to education, arts, and youth funders, Elliot Eisner presented his findings on how students learn life lessons from the fine arts. He began by noting the importance of qualitative relationships in both visual arts—do these colors go together?—and science—does this theory conflict with the information we already know? Students also learned from the arts that there is the possibility of more than one right answer and that it is important to investigate a problem, whether in a science experience or in a painting, from multiple perspectives. After receiving practice in the arts, students can better problem solve, recognizing that problems can have a variety of solutions. These findings that connect learning in the arts to learning in other disciplines are only a few among many Eisner lists.

Eisner, E. (2000, January). Ten lessons the arts teach. Learning and the arts: crossing boundaries, a conference.

Though the Annenberg Challenge aims to implement wide-ranging school reforms, one area of interest is to implement curriculum that motivates students. In order to attain this goal, some schools decided to improve their curricula with arts instruction—Transforming Education through the Arts Challenge (TETAC). Schools participating in TETAC have used the arts to reinforce learning in other disciplines, including exploring mathematical symmetries through dance, investigating M.C. Escher's works to study fractals, studying Frank Lloyd Wright's architecture to learn geometry, and examining molecules through dramatic role play. 40% of the students at this specific school—Lusher Elementary School—live in households below the poverty line. After employing TETAC, the school is one of the top fifteen in Louisiana and first in Orleans Parish.

Cervone, B. (2000, April). Students at work: a portfolio from the Annenberg Challenge. Annenberg Challenge, Annenberg Institute for School Reform.

The Center for Arts Education in New York City was founded in 1996 to enhance arts education, restoring and maintaining the arts in the City's public schools. Program analysts sought to find evidence of program effectiveness, using student learning as the main factor to judge. They found the qualitative data more telling than the quantitative data. For instance, teachers and principals saw changes in the following areas: performance in other disciplines, engagement, attendance, connecting of lessons from differing subject areas, quality of work, and behavior. Also, students who participated in the program experienced increased standardized test scores, earned more GEDs and diplomas, and improved their attentions to mathematics and science.

Baker, T., Bevan, B., and Admon, N. (2001, November). Final evaluation on the Center for Arts Education's New York City Partnerships for Arts and Education Program. Education Development Center/Center for Children and Technology.

Coming Up Taller documents the implementation of arts and humanities teachings throughout the country and the impact, including student achievement, the programs had on students. One finding involved schools with integrated educational models, such as the Duke Ellington School of the Arts. In schools such as this one, students have experienced increased student achievement. Also, educators who hypothesized the benefits of the arts and used the arts to supplement learning in more traditional subject areas like history and science found increased student interest and performance. In addition, the report cited numerous studies that support the idea that student participation in the arts leads to the development of higher-order thinking skills and increased problem-solving abilities. Other such studies found relationships between arts education and higher standardized test scores and improved abilities to think across disciplines.

Weitz, J.H. (1996, April). *Coming up taller: arts and humanities programs for children and youth at risk*. President's Committee on the Arts and Humanities with the Americans for the Arts.

SPECTRA+ is a program in some elementary schools in Ohio. The program utilizes a curriculum that places equal emphasis on the fine arts and other traditional subject areas. Students receive one hour of fine arts instruction daily from artists in-residence for music, drama, visual arts, dance, and media art. Teachers also receive professional development in the arts. Researchers evaluated SPECTRA+, comparing its participants to a full control group that had a traditional curriculum and a modified control group that had a whole language program but not arts. Based on pretests and posttests, researchers found that SPECTRA+ students made more advances in the areas of creative thinking, arts appreciation, and math comprehension. Results for reading comprehension were mixed. A longitudinal study showed that students who had made gains in creativity, self esteem, arts appreciation, and some reading and math maintained those gains and continued to show improvement.

Luftig, R. T. (1994). *The schooled mind: Do the arts make a difference? An empirical evaluation of the Hamilton Fairfield SPECTRA+ Program, 1992-93*. Oxford, OH: Miami University.

The Galef Institute in Los Angeles, California, instituted the Different Ways of Knowing program that aimed to integrate arts instruction with social studies and other core subject instruction. The program includes a professional development component with a summer training institute and on-site coaching that shows teachers connections among the arts and the traditional disciplines. Researchers identified four urban partnerships with high at-risk student populations that had implemented the program for three years. The study looked at 920 elementary school students in 52 classrooms. Students who had participated in the program showed significant gains in the language arts and social studies, especially in the areas of writing and drawing assessments. Students also exhibited gains in positive attitude and motivation. Different Ways of Knowing classrooms were more interactive, and students initiated more discussion topics than in classrooms that did not use the program.

Catteral, J. S. (1995). *Different ways of knowing: 1991-94 national longitudinal study final report*. Los Angeles, CA: The Galef Institute.

The Music Center of Los Angeles County, Education Division (MCED) sponsors artists in-residence in the areas of dance, drama, music, visual arts, and creative writing. Program components include a minimum of twelve arts activities in three months, teacher training on integrating the arts, family involvement, a student performance or event at the end of the program, and cooperation between teachers and artists to plan extended lessons. Students reported better higher-order thinking, communication, and socialization skills. Teachers and artists also reported observing these improvements. Report grades showed significant improvement following participation in the program.

Redfield, D. L. (1990). *Evaluating the broad educational impact of an arts education program: The case of the Music Center of Los Angeles County's Artists in-residence program*. Los Angeles, CA: Center for the Study of Evaluation, University of California at Los Angeles.

Learning to Read Through the Arts (LTRTA) is a program funded by New York City Public Schools and the Guggenheim Museum that began in 1971. Program evaluations since its introduction have shown significant academic improvement for participating students. LTRTA encourages collaboratives of reading teachers and arts teachers to develop integrated lesson plans and units to use in regular classroom instruction. The program also utilizes the visual, aural, tactile, and kinesthetic learning modalities. Teachers reported improvements in student academic, artistic, personal, and social skills. Research shows improved reading scores on the Degrees of Reading Power assessment and that 89% of limited English proficient (LEP) students who participated mastered the targeted reading skills.

Office of Educational Research, New York City Board of Education. (1993). *Chapter 1 Developer/Demonstration Program: Learning to Read through the Arts 1992-93*. New York, NY: author.

The Los Angeles Unified School District's Humanitas program began in 1986 and had included 3,500 students in 29 high schools by 1990. Because of teacher interest, Humanitas was also expanded to include middle schools. Humanitas, an arts component, emphasizes in-depth study of art as related to other subject areas like social studies and literature. The program also provides students with direct arts experiences, including concerts, theatre performances, and museum visits. Another important aspect is professional development, including a one-week training program and teacher centers that provide on-going services and support. Research shows that students who participated in Humanitas wrote more sophisticated essays with low-achieving students making gains similar to high-achieving students. Humanitas students exhibited higher class attendance and lower drop-out rates than students who did not participate. Teachers also felt better prepared to meet the needs of diverse students, including high achievers and limited English proficient students.

Aschbaker, P., & Herman, J. (1991). *The Humanitas program evaluation, 1990-91*. Los Angeles, CA: Center for the Study of Evaluation, University of California at Los Angeles.

The Arts Partners program began in New York City in 1984 and provides artists to work in schools for ten weeks. Districts develop program goals, identify target schools, and are committed to continue arts education after the ten-week program. To be successful, the program suggests that the resident artist must have artistic expertise and effective instructional strategies, present students with challenging tasks, and receive adequate time for planning and art making. Students used the knowledge they had obtained in traditional subjects and applied it to the content of their art works, which indicated that students were able to transfer knowledge from other subject areas to art. This transfer allowed students to solidify their content knowledge in the traditional subject areas through the practice of art.

Fineberg, C. (1991). *Arts and cognition: A study of the relationship between Arts Partners programs and the development of higher level thinking processes in elementary and junior high school students*. New York, NY: C.F. Associates and the Arts Partners Council.

Tucson's Arts Integration Program utilizes a mentor teacher model in which teachers who have been successful in integrating arts into the curriculum mentor other teachers to do the same. Key components include emphasis on one arts area, onsite mentor observations, planning meetings, and recording and reviewing arts lessons. The program concentrated on theatre instruction with

activities that featured mime, character and voice building, and improvisation. Students reported positive effects, and teachers learned and implemented more effective classroom practices.

Betts, J. D. (1994). *Arts Integration Program II: A final report*. Tucson, AZ: Arizona Arts Education Research Institute, Tucson/Pima Arts Council.

The Dallas ArtsPartners (AP) program gives all elementary students in Dallas Independent School District schools the chance to participate in programs that integrate the arts and culture into the curriculum. Teachers in AP classrooms receive training on how to integrate the arts programs. Researchers from the Annenberg Institute designed a study that uses multiple measures—the Iowa Test of Basic Skills, the Texas Assessment of Knowledge and Skills (TAKS), writing samples, and student interview and observation data—and is longitudinal, following two cohorts over multiple years. Findings indicate that disadvantaged and at-risk students show significant improvements in reading comprehension over the control group. When arts are integrated into writing experiences, the overall quality of the writing improves, including better organization, ideas, fluency, word choice, and distinctive style. Asian, Hispanic, and African American students demonstrated comparable achievement in writing skills as compared to all students. Student behavior also improved, especially among low-achieving students.

Dallas ArtsPartners. (2004). *Arts and cultural learning: Changing achievement and expectation*. Dallas, TX: author.

Classroom Theatre, a program that involved remedial readers in the third and fourth grades, consisted of ten sessions of drama activity with instruction from a theatre director. The program allowed students who disliked reading to perform dramatic interpretations of scenes from texts, using various theatrical techniques such as script meetings, rehearsals, and performances. The researcher collected qualitative data, including videotaped performances for review, student records and journals, and student interviews about character and scene exploration. Participants began to appreciate the written text and chose their own scenes to interpret from self-selected books. Students also began to understand the need for rules in dramatic play. Through their interpretation, they analyzed situations from characters' perspectives and made connections between themselves and the characters.

Wolf, S. (1994). Learning to act/acting to learn: Children as actors, critics, and characters in classroom theatre. *Research in teaching English*, 28, 7-44.

Researchers investigated the effects on literacy of the Arts Alternative Program for at-risk urban elementary school students. The Arts Alternative Program provided participants with the opportunity to explore role play and story writing. The study used inner-city schools in Newark, New Jersey and documented the experiences of fourth through sixth graders who were largely from minority populations. These students worked closely with a teacher in small groups on drama lessons from October to May. When compared to a control group, the participants had significantly higher scores in vocabulary and reading comprehension on the Comprehensive Test of Basic Skills. Students also reported attitudinal gains in self expression, trust, self acceptance, awareness/acceptance of others, and self empowerment.

Gourgey, A. F., Bosseau, J., & Delgado, J. (1985). The impact of an improvisational dramatics program on student attitudes and achievement. *Children's theatre review*, 34, 9-14.

The researcher, Carolyn Hudspeth, designed a model language arts curriculum that integrated music. The Suggested Activities of Music and Poetry for Language Enrichment (SAMPLE) was used with low-achieving fourth graders. The SAMPLE group differed from the control group

insofar as the participants received additional poetry and prose and participated in choral reading, singing, moving, rhyming, and dramatizing. The control group received instruction in the traditional manner. When given the California Achievement Test, the SAMPLE students scored significantly higher in the areas of language mechanics and total language. SAMPLE students also showed significant improvements on a writing test. Observers saw that as students became more engaged with the instructional material, their overall behavior improved. Parents also seemed happy with the SAMPLE program and felt that the integrated curriculum had provided positive experiences for their children.

Hudspeth, C. C. (1986). The cognitive and behavioral consequences of using music and poetry in a fourth grade language arts classroom. *Dissertation abstracts international*, 47 (08), 2884. (UMI No. 8626486)

The College Entrance Examination Board indicates that there is a current trend in the SAT scores of students with a fine arts background: they consistently receive higher scores than students who do not have arts experiences. The scores show that as students receive more arts coursework, their scores continue to increase. In 2002, a student who had less than half a year of arts courses averaged a score of 484 on the verbal section and a 502 on the math section—a composite score of 986; students who had studied the arts for more than four years averaged a score of 535 on the verbal section and a 541 on the math section—a composite score of 1076.

The National Association for Music Education. (2002). *Scores of students in the arts*. Retrieved April 22, 2004, from <http://www.menc.org/information/advocate/sat.html>.

Researchers from the Mind Institute evaluated the effects on second grade students of the Music Spatial-temporal (MST) Math Program. Listening to music produced activity in the right frontal and left temporal lobes of the brain, which resulted in increased abilities to perform spatial-temporal functions used in mathematics. MST allowed students to improve their mathematics skills through music, which helped students to use the brain's ability to make mental images and "[think] ahead in space and time." Students who participated in the program, especially economically disadvantaged students, showed dramatic increases in mathematics scores. Participants in the second grade could perform fourth grade mathematics problems after one year in the program.

The Mind Institute. (2002). *Data from 1,283 2nd graders in our Music Spatial-temporal (MST) Math Program during school year 2000-2001 provide insights leading to powerful new features and opportunities for future research*. Retrieved April 26, 2004 from <http://www.mindinstitute.net/MIND3/downloads/2002%20Results%20Special%20Report.pdf>.

From 1995-1999 researchers evaluated North Carolina's A+ Program, an arts based school reform model implemented in 25 schools across the state in 1995. Key findings included increased attendance by students as well as improved attitudes and behavior resulting from enriched academic environments created by the program. Parents also demonstrated more involvement with the pilot schools and increased awareness of curriculum.

North Carolina A+ Schools and the Thomas S. Kenan Institute for the Arts at the North Carolina School of the Arts. (2001). *North Carolina A+ Schools Program: Schools that work for everyone; Executive summary*. Winston-Salem, NC: North Carolina A+ Schools Program, 2001.

Researcher Danielle Jay studied the impact of introducing a dance program to preschool children with disabilities. Grounding her study in Parson's theory of aesthetic development, the researcher hoped to prove that 12 weeks of dance studies with this age group would measurably enhance

each child's creativity. Studying students' scores on both pre- and post-instruction assessments, using the Torrence's Thinking Creatively in Action and Movement test (TCAM), Jay found the post-test scores to be significantly higher for children participating in the dance program versus the control group of children who participated in an adapted physical education program. Students in the dance program scored higher on the imagination subscale, and this score was responsible for the difference between the two totals. The researcher concluded that dance programs built on theoretical models such as Parson's theory of aesthetic development and Laban and Lawrence's theories on motor elements could enhance creativity in preschool children with disabilities.

Jay, D. (1991). Effect of a dance program on the creativity of preschool handicapped children. *Adapted physical activity quarterly*. v. 8, pp. 305-316.