

The Arts, Self-Regulation and Transfer:
Results of a Study on the Arts and Academic Performance

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Abstract

In the current climate of high-stakes testing, the arts in schools are increasingly being evaluated by their effect on academic performance. In this study of New York City elementary school students participating in a performing arts program over a three-year period, we investigated the relationship between the arts and academic performance in the areas of self-regulatory behavior, content comprehension, and performance on standardized reading and math tests. In addition, we assessed the relationship between classroom teachers' participation in an arts-based professional development program and test scores of students identified as potentially talented in dance, music, or theater. The results indicated that artistically talented students were able to apply a range of self-regulatory behaviors and effective learning strategies to academic tasks more frequently when an arts activity was included in the lesson. Significant three-year gains in standardized reading test scores were observed for low-scoring (<40th percentile) students as compared to a comparison group in the same classrooms. These students participated in weekly arts classes and received small group academic assistance building on their artistic strengths. However, students reading at or above grade level did not show significant test score improvement.

Introduction

Winner and Cooper's (2000) recent meta-analysis of arts education research highlights the challenges facing researchers seeking to show that arts learning generalizes to other academic areas. Increasingly, administrators and arts educators are asked to justify the very existence of the arts in the curriculum based on the same standardized, test-based criteria used to assess other academic subjects. Winner and Cooper, along with many arts educators, warn against falling into the trap of defending the arts based on test score evidence, reminding us that "as soon as we justify the arts by their power to affect learning in an academic area, we make the arts vulnerable" (p. 54).

This paper traces the development of six years of research at ArtsConnection, a New York City arts-in-education organization, the College of New Rochelle, and the University of Connecticut, funded by the United States Department of Education. Though the final report, completed in 1997 (ArtsConnection, 1997), has never been published in a journal it has generated a steady flow of phone calls and e-mail over the past five years. The queries generally start with, "I hear you did a study that showed that the arts improved test scores -- how can I get hold of it?" Our answer is, "Yes, indeed, our research results showed that students working in the arts made impressive progress on reading tests, but it is more complicated than that." We then proceed to tell a short version of the following story, about how a group of artistically talented students, working in a comprehensive arts program in five New York City elementary schools, demonstrated clear evidence of academic improvement including significant gains on standardized tests. Because of the small numbers of students involved and the lack of research controls, our study will not upset Winner and Cooper's gloomy conclusions that the arts have failed to make the case about transfer of artistic success to academic areas. It is, however, a

highly promising approach to the study of learning and transfer in the arts and to the development of effective program models and for future research.

Some of the challenges for researchers involve individual differences; as with any curricular or pedagogical approach, the arts will not have a uniform effect on all students. Which students -- including those already doing well in the standard classroom -- are likely to profit most (or least) from artistic approaches? Which subject areas and learning skills are most likely to be enhanced by the arts? Research design is another stumbling block; it is always difficult in school settings to compare different approaches in order to test which is superior. An arts-based method may be more enjoyable, but does it increase content learning and skill development more than some untested alternative approach? The arts also invite measurement problems. For example, what the arts teach may be inadequately captured in written form or on standardized measures. Can we find acceptable means to identify and measure the types of learning that go on in the arts? And finally, the arts face the universal problem of generalizability. It is unclear whether artistic approaches lend themselves to replication because of the level of personal, intuitive, creative input required on the part of the teacher and the lack of widespread arts-based professional development programs available to teachers. Are most teachers creative enough, or are they given the freedom to use creative, open-ended, teaching methods, and can such methods be taught on a broad scale?

These were some of the issues we faced in the development and conduct of the ArtsConnection study. A focus on transfer of learning from the arts to other curricular subjects forces arts researchers to become specific about what the arts teach. They must predict the behaviors, skills, and understandings that are transferable; the conditions under which transfer should occur; and which students who are most likely to demonstrate these effects. Further,

researchers are challenged to design studies that are simple and manageable enough to be replicable in schools.

One of the surest conclusions that can be drawn from this project is that this type of research takes time. The research team and some of the teachers were involved for six years. Even with that length of time and substantial funding from the United States Department of Education, the GE Fund, and other sources, this study was only a first step. Additional applications of the program and research design will be needed to answer our lingering questions.

Background of the Study

Since 1978, ArtsConnection has directed a program in New York Public elementary schools called the Young Talent Program (YTP). YTP identifies students with potential talent in dance, music, or theater, provides those students with professional quality arts instruction in and outside of school, and attempts to help them to build on their artistic abilities to be successful in school. At the time of the study YTP worked in 10 schools in four boroughs of New York City, primarily in high-poverty communities with limited arts resources. In 1991, ArtsConnection received the first of two grants from the Jacob Javits Gifted and Talented Students Program of the US Department of Education. The purpose of the funding was to study the effects of talent identification and development on students from economically disadvantaged, bilingual, and special education populations who would not be identified for gifted programs through traditional means such as IQ and achievement test scores. The first project, Talent Beyond Words (TBW, 1991-93, ArtsConnection, 1994), supported the development of talent assessment processes in dance (DTAP) and music (MTAP), and expanded the YTP model by involving classroom teachers in the assessment of students and in curriculum development projects with

teaching artists. TBW also involved parents and other family members in arts activities and provided support for families to find extra-school instructional opportunities for their children. The theater talent assessment process (TTAP) was subsequently developed and tested using the same procedures (ArtsConnection, 1997).

The results of TBW were promising. Data from the talent identification processes were shown to be valid, reliable and equitable to students with different cultural backgrounds and language abilities, with or without prior experience in the arts (ArtsConnection, 1994; Baum, Owen & Oreck, 1996; Kay & Subotnik, 1994). Further, it was shown that teachers, who previously had little awareness of their students' artistic abilities were able, after four observations, to identify potential talent as well as the professional arts experts did. Although test score improvement was not a specifically stated goal of the project, there were some examples of classrooms in which artistically talented low achieving students made exceptional progress on standardized reading and math tests. These results were inconsistent, however.

Some of the clearest results concerned changes in teachers' attitudes toward the arts, and their increased recognition and appreciation of their students' artistic talents (ArtsConnection, 1997; Oreck, Baum & Owen, 1999). In addition, the students' progress in rigorous advanced arts classes and their increased status with peers, teachers, and parents indicated a variety of potentially positive effects on overall school performance. It appeared likely that a combination of increased teacher awareness and higher expectations, along with changes in student behavior and attitudes, could have had an effect on academic performance. Lacking direct observation of students and teachers in the classroom, however, this hypothesis was impossible to substantiate. Thus, the second Javits-supported project, New Horizons, focused on student and teacher behaviors and practices in both the arts and academic classrooms. The New Horizons study

sought to discover the mechanisms for the apparent academic improvement on the part of artistically talented students (ArtsConnection, 1997).

The first phase in the study was to identify specific learning behaviors that students used to be successful in the arts, and then to assess the extent to which these behaviors were present in the academic classroom. In social cognitive theory, such behaviors are defined broadly as self-regulatory skills which are fundamental to generalizing learning strategies to other areas and new situations (Bandura, 1986; Bandura, & Schunk, 1981; Zimmerman, 1986). Self-regulated learning occurs to the degree that a student uses personal (i.e., self-) processes to strategically regulate behavior and the immediate learning environment (Zimmerman, 1996). According to Bandura (1986), being self-regulated depends on four subskills: self-observation, standard setting, self-reaction, and self-efficacy. For students to become self-regulated, they need to monitor what they are doing, compare their progress to some sort of standard, self-criticize or self-praise, and have confidence in their skills.

After a series of observations of dance and music classes, the researchers developed a list of ten self-regulatory behaviors, each having four or five specific, observable descriptors. These behaviors, which formed the basis for all future classroom observations are presented in Table 1.

--- table 1 about here ----

The arts classroom offered numerous opportunities for self-regulation to be displayed and developed. Many of the self-regulatory behaviors observed were initially intuitive but the arts teachers used a variety of methods to support, reinforce, and make students aware of their successful learning behaviors. Interviews with students revealed that more advanced (and older) students had a greater repertoire of successful strategies and were more aware of them. "I always practice in my head during lunch time and at home I clear some space in front of the mirror so I

can check myself,” a fourth grade dance student said. “I just [imagine] myself doing it right,” said another. A fifth grade music student said, “I practice with my hands, without the sticks, while other people are learning their parts. ” “I have learned how to keep listening to everyone else while I play my own part,” reported a student in a percussion ensemble.

Students were also aware of some of the teaching techniques that helped them succeed in the arts. A fourth grade dance student explained, “When we are learning a new step we always go back to the beginning, to the first four counts, so if you aren’t sure of something you will know you can pick it up later. And you can always ask a friend to help you if you forget.” When asked to compare dance to math, the same student said, “No, math is not like that. In math if you miss something the first day you are lost forever. And you can’t ask your friend because you can’t be sure your friend will have the right answer.” Such metacognitive disclosures provided indicators of potentially transferable self-regulatory behaviors.

In the pilot phase of the study researchers spent time in the students’ classrooms to see the extent to which the self-regulatory behaviors observed in the arts were present in the academic classroom. These classroom observations revealed little evidence of self-regulatory behaviors, primarily because they were not encouraged or even allowed in the activities observed (Baum, Owen & Oreck, 1997). Students had few opportunities to demonstrate initiative or self-regulation because most of the learning was passive and responses were highly restricted. It became obvious that the nature of the classroom tasks and the level of engagement of students could either stimulate or inhibit self-regulatory behavior. Any study of transfer would require equal attention to the pedagogy and curriculum of teachers as to the learning behaviors of students. The schematic representation in Figure 1 displays the relationship of the various program components to assist and support academic improvement.

----- Figure 1 about here -----

Methodology

The purpose of the New Horizons study was twofold: 1) to study the use and transfer of self-regulatory behaviors from the arts to the regular classroom setting, and 2) to assess the long term effects of an arts intervention and professional development program on achievement test scores in reading and math. The first part of the study was designed to observe identified students in various learning situations and to compare the effect of different instructional strategies on student learning behaviors. The second part focused on the longer term effects of the arts intervention and a professional development program on students who were at or below grade level on reading and math tests.

Research Questions

Four primary questions guiding the research were:

1. Does an arts-infused curricular approach help artistically talented children apply self-regulation skills to regular classroom settings?
2. Does an arts-infused curricular approach enhance content knowledge as measured by written tests?
3. Is there a relationship between talent identification and development and performance on standardized reading and math tests?
4. Is the amount of arts-based professional development for teachers related to student achievement results?

Sample

For the observational study, the sample was 59 students in grades four through six within ten classrooms in five schools. Students were chosen for the classroom observation study based

on the following criteria: a) identified as potentially talented in dance, music, or theater, b) participating in the talent development program in their particular art form at the time of the study, c) in classrooms with teachers who were involved in the professional development program provided by ArtsConnection.

For the analysis of reading and math scores, complete three-year data for identified students in grades three through five were available for 132 students in reading and 90 in math (out of approximately 450 in the total Young Talent Program) representing 51 classrooms in five of the ten program schools. These students were matched with a comparison group from the same classrooms by initial standardized test scores, gender, and ethnicity. Data for other students were incomplete primarily because some schools changed standardized tests during the course of the study.

Intervention

All identified students participated in weekly arts classes over a period of two to three years. The arts classes, taught by visiting professional teaching artists, were held once during and once after school each week for a total of 135 minutes. Students with academic problems (e.g. NCE <40th %ile in reading or math scores, severe problems in one or more subject areas, behavior or attendance problems), as identified by their teachers participated in one 60-90 minute session per week for 20 weeks of small group (7 or fewer students) academic assistance. These classes, called MAGIC (Merging Artistic Gifts into the Classroom) were directed by specially trained teachers within the school and were designed to build on the students' specific artistic strengths to solve academic tasks.

Classroom teachers were involved in a range of voluntary and mandatory activities. All classroom teachers in the target grades (3-6) participated in one introductory arts workshop per

year. Fourth grade teachers ($n = 20$) acted as raters in the five-session talent assessment processes in dance, music or theater, in which all of their students participated (DTAP, MTAP, TTAP, ArtsConnection, 1997). Fifth and sixth grade teachers also had the opportunity to see their students working in the arts through a series of three to five classes with the visiting teaching artists. In addition, some teachers voluntarily attended four weekend workshops and a week-long summer institute each year for which they were paid a small stipend.

Data Sources and Analysis

Research Question 1: Does an arts-infused curricular approach help artistically talented children apply self-regulation skills to regular classroom settings?

An observational study design was used to collect evidence of transfer. A team of trained observers documented the emergence of student self-regulation under two conditions. One was a traditional academic lesson with no specific arts activity involved. This lesson was designed by the teacher using an approach that typified her or his teaching style. These lessons tended to employ a deductive approach, with an emphasis on teacher direction, verbal instruction and response, and a written test. The other lesson, in the same subject area and unit, used an artistic process or activity as an instructional strategy. Here, it was a more inductive approach, with some kind of arts activity that introduced academic content, followed by discussion, and then a written test in the same form as for the “traditional” lesson. The classes were scheduled within a few days of each other and the order of the two classes was determined by the sequence of academic content. In the lesson on descriptive language, for example, the focus of the arts-infused lesson was personification which followed the lesson on metaphor. In the lesson on clouds, the arts-infused lesson on cloud characteristics preceded the non-arts lesson on cloud

identification. A sample of the topics and activities used in the lesson pairs are presented in Table 2.

----- Table 2 about here -----

The term “arts-infused” is used here to describe a range of possible activities and processes that, in some cases, fell short of what might be called “arts integration.” Arts integration suggests a balanced intermingling of instructional objectives in the arts and academic subject area. These lessons, developed together by classroom teachers and artists, lasted a single class period (about 45 minutes) and focused primarily on the academic content. The artistic experiences were designed to actively engage students, allow them to express themselves artistically, and provide opportunities to demonstrate self-regulatory behaviors. In the single research lesson researchers were rarely able to observe the completion of or reflection on the artistic process, so it was not possible to ascertain the level of true integration of the arts into the curriculum. Many of the teachers involved in the study continued to use the arts on a regular basis and ultimately expanded the research lessons into units that more fully integrated the arts into their classroom instruction (ArtsConnection, 1997; Oreck, 2002).

Researchers observed an average of six students per classroom using an observation schedule on which they noted any evidence of self-regulatory behaviors observed. In addition, they briefly described the nature of each activity, and instructional cues and feedback given by the teacher. At the end of the class period, the observations were summarized and transferred onto an individual sheet for each student using a 6-point Likert-type response scale (responses ranged from “not called for” to “excellent”) for each of the 10 behaviors. In a pilot study of the methodology and instruments, interrater reliabilities for four observers averaged .92.

Research Question 2. Does an arts-infused approach to classroom learning enhance

content knowledge as measured by written tests?

Immediately after the end of each arts and non-arts lesson, students completed a written test to examine the effect of the instructional approach on content comprehension. These tests were scored by both the teacher and the research staff.

Research Question 3. Is there a relationship between talent identification and development and performance on standardized reading and math tests?

Standardized test scores in reading and math were collected to examine change over the three year period for three groups of students:

- Group 1 consisted of a comparison group of students (matched by classroom, gender, and test scores) who had not been selected to participate in the Young Talent Program. ($n = 90$ math/132 reading, in 51 classrooms)
- Group 2 consisted of Young Talent Program students scoring on or above grade level ($n = 45$ math / 61 reading).
- Group 3 consisted of Young Talent Program students considered at-risk academically, especially in reading ($n = 45$ math / 61 reading). These students also participated in MAGIC for one or more years.

The standardized tests used in the analysis were the Metropolitan Achievement Tests in Reading and Math (Prescott, Balow, Hogan, & Farr, 1985/6), which were administered every year.

Research Question 4. Is the amount of arts-based professional development for teachers related to student achievement results?

For these questions, the number of professional development workshops attended by teachers in the participating grades of three through six ($n = 51$) were correlated with three-year

change in the reading scores of Young Talent Program students in their classrooms ($n = 264$).

Reading was chosen because of the preponderance of language arts related activities in both staff development workshops and the teacher-designed lessons.

Results

Research Question 1

Students' self-regulatory behaviors were observed across two pairs of lessons. Each pair consisted of an arts-infused and non arts-infused lessons. Correlated t -tests were used to compare the ratings of students in the two lessons. Table 3 summarizes the ratings data from these observation episodes. Because different lessons focused on different content, and used different art forms, it made no sense to compare means across occasions. Within lesson pairs, though, it was clear that the ratings favored the arts-infused approach. For example, in the first arts-infused lesson the average rating was 3.64 (where five is highest – close to “good”), whereas the non-arts lesson gave an average rating of 2.14 (close to “fair”). In that first pair of lessons, for example, the effect size (a measure of practical importance; how many standard deviations apart the means are) was 1.62, which, from Cohen's (1992) guidelines, is very large.

----- insert Table 3 about here -----

Research Question 2. For this question, the same students in arts-infused and non-arts lessons were given teacher-made quizzes covering lesson content. Again, correlated t -tests were run for both lesson occasions. Tables 4 and 5 summarize these comparisons. Here, the results were not very positive. For lesson 1, there was a small difference favoring the non-arts lesson. In lesson 2, there was a very slight advantage for the arts-infused lesson. Unfortunately, the data here are weakened by the teachers' self-admitted lack of skill in developing content tests. It was also apparent that the change of symbol system in the response format from the arts to the

written activity posed special problems for some students.

Research Question 3. Achievement test scores were compared over a three- year period using normal curve equivalent (NCE) scores. Thus, there were Reading and Mathematics NCE scores for each group across three years, and for 1994, 1995, and 1996. A mixed model analysis of variance (ANOVA) was used. The between groups term consisted of the three student groups, and the within groups term was the three yearly test occasions.

For Mathematics, the Group effect ($F = 12.20, df = 2,87, p < .001$) and the Year effect ($F = 21.20, df = 2,174, p < .001$) were both significant. In the Group effect, the Math NCE (averaged across the three years) was highest for the Group 2, the Young Talent students at grade level, and lowest for the MAGIC students. In the Year effect, there was overall improvement (averaged across groups) for each of the three years. The arts-infused lessons and the MAGIC curriculum tended to emphasize language arts and improving language comprehension in the content area. Thus, it was not surprising that math improvement for the three groups was about uniform over the course of the project.

----- Table 4 & 5 about here -----

The outcome improved for Reading NCE scores. Here, significant Group and Year effects were overridden by the interaction term, shown in Figure 2.

----- Figure 2 about here -----

Reading NCE scores for Groups 1 and 2 showed relatively steady improvement over the three- year period. By comparison, Group 3 (MAGIC at-risk students) showed a small initial improvement, and then a large jump in Reading NCE scores. The last increase seemed to result from having both trained teachers and MAGIC tutors using arts activities to support academic growth. In short, at-risk students in this program seemed to benefit most from the integration of

art processes into the academic curriculum. Tables 6 & 7 summarize the reading results.

----- Insert Tables 6 & 7 about here -----

Research Question 4. To answer this question, correlations were examined between the amount of professional development and reading gain in NCE scores over the entire three-year period. The simple correlation between amount of training and Reading NCE for the non-Young Talent students was $-.29$ ($n = 132; p > .05$). For the Young Talent students who were not at risk, the correlation was $-.12$ ($n = 66; p > .05$). But for the Young Talent students who were at risk, the correlation was $.44$ ($n = 66; p > .05$). Professional development in integrating the arts thus appears to be beneficially connected to reading improvement for at-risk students.

Discussion

The use of the arts in the classroom in this study combined instrumental applications (i.e. teaching and developing self-regulatory behaviors) and content enhancement (e.g. using dance to better understand science processes). As teachers employed artistic processes and methods in the classroom they recreated many of the learning conditions that allowed talented students to be successful in the performing arts. As was shown in the pilot study, when students lack the opportunity to utilize their effective learning behaviors in the academic classroom they are unlikely to demonstrate evidence of transfer (Baum, Owen, & Oreck, 1997). Further, students had the opportunity to develop their artistic skills and experience success in the arts outside of the regular classroom. As Bandura (1986), Zimmerman (1996), Vygotsky (1986), and others have emphasized, effective learning behaviors must first be developed, practiced and reinforced before they can be intentionally applied to another circumstance.

The large difference in self-regulatory behavior between the arts and non-arts conditions is hardly surprising. Artistically talented students would be expected to excel in lessons that are

more active, that allow them to learn and communicate what they know in artistic forms, and to engage in group activities. It was apparent to the researchers that many other students in the class were also more engaged. The limitations of this study did not allow for a similar comparison among non-identified students, or between identified and non-identified students in terms of self-regulation and content test results. What the teachers found most valuable was the realization of the extent to which student self-regulatory behavior was tied to the mode of instruction. After brief arts activities, typically inattentive students often began contributing to discussions or risked answering a question. As they became active, enthusiastic learners and class leaders, their teachers immediately saw the benefits of the arts-infused approach and recognized the academic potential of those students.

The lack of overall improvement in the content tests at the end of the lessons is understandable on a number of levels and reinforces the results of many studies that rely solely on written tests to assess student learning in and through the arts. While there were many examples of students who performed better on content tests after the arts-infused lesson, as a group they did not show significant improvement. One obvious problem was the difficulty in translating symbol systems from the visual, spatial, kinesthetic and musical to the verbal test form. No direct assistance was provided for students to make the transition, so while teachers frequently saw evidence of learning during the arts activity, many students were unable to transform that knowledge into an acceptable test response. Despite their success in the prior arts activity, students who regularly struggled on tests were also likely to be dealing with low academic self-efficacy and verbalization problems that hamper them in other situations. This points up the need to assess students during the arts activity itself and to directly assist the articulation of knowledge gained in the arts activity into words and appropriate test answers. The

difficulty in designing valid, parallel assessments is a substantial challenge to making valid comparisons between the arts and other curricular approaches. After implementing these lessons the teachers had numerous ideas for improving the content tests to better assess the learning they observed.

The effect of individual intervention components cannot readily be assessed separately, so it is difficult to directly tie the self-regulation results to test score improvement for the lowest scoring students. We hypothesize that artistically talented, low-scoring students who have the opportunity to develop their talents, whose teachers are aware of their abilities and can utilize them in the classroom, and who are given direct academic assistance that builds upon their strengths, can make striking gains in classroom performance and on standardized reading tests. This kind of comprehensive intervention is a major undertaking, to be sure, but given that a significant number of the creative, energetic, students identified as artistically talented are considered at-risk for school failure, it is a notable goal. In the inner-city schools in which the Young Talent Program operates, 65% of the students identified as potentially talented scored below grade level on reading tests and fully 25% scored in the bottom quartile (ArtsConnection, 1997; Baum, Owen & Oreck, 1996). This is obviously an important target population for arts-based intervention.

The results of the last research question, linking teacher involvement in arts workshops to student test performance, is closely related to the ongoing national debate on teacher and school accountability based on standardized test scores. Although it is essential to evaluate the effectiveness of in-service teacher education programs based on student performance, the use of achievement test scores alone to evaluate the efficacy of arts-based teaching and learning is especially problematic. The growth and improvement observed in teachers involved in the New

Horizons professional development program primarily involved increased flexibility and creativity in teaching and facilitation of artistic processes, the results of which are poorly measured by multiple-choice tests (Oreck, 2001; Oreck, Baum & Owen, 1999).

The moderate correlation (+.44) between teacher participation in professional development suggests that some combination of techniques, skills, and attitudes learned in the arts workshops aided the academic performance of artistically talented, low-scoring students. However, because most of the professional development activities were voluntary, it may be that teachers who were already more interested in and sensitive to the needs of artistic students also attended more arts workshops, so a causal relationship between the training and student achievement gains cannot be concluded.

The negative correlations suggest that students scoring at or above grade level are not particularly aided in test taking by this arts-based approach to professional development. The differential effects across various-students serves to reinforce the need for differentiated instruction and variety in teaching methods to effectively reach the diverse learning needs of students. Finally, small group sizes limits the generalizability of any conclusions linking teacher training and student performance.

Research Design and Replication

As in much school-based research, experimental controls were difficult or impossible to introduce in this study. The primary goal of the Javits-funded programs was to identify and serve artistically talented students, especially those from economically disadvantaged, special education, and bilingual populations. To accomplish this goal, the program sought to create conditions within the schools in which artistic abilities of all children could be appreciated and nurtured. As such, it was not ethically possible to withhold potentially promising services from

certain students or teachers. Nor was funding adequate to provide alternate comparison interventions for other low-scoring, non-identified students. Only general comparisons can thus be made with the other existing (mostly remedial) programs for low-scoring students, and with other professional development opportunities provided for teachers.

Given those limitations, there are a number of ideas for further research that may be drawn-from this study. From a research design view, there is an obvious need for randomization. The powerful statistical effect (increasing the Type I error rate) of intra-class correlation among measurements can confound any research conducted in intact classrooms, even when the class is being compared to itself, as it was in this case. Random grouping of students within classrooms for these lessons would significantly decrease this problem.

The expansion of the observational study to include non-identified students would also improve the design and expand the range of research questions that could be studied. In the current self-regulatory behaviors study, only artistically talented students were observed, so students could only be compared to themselves. The ability to observe more students at a time, including both those identified as talented and others, representing a range of academic achievement levels, would offer valuable information about the ways in which artistic activities affect learning and self-regulation among different students. This information would also aid in understanding the content and standardized test results, and in assessing the impact of arts-infused curriculum in various subject areas.

Perhaps the most important improvement would be in the area of content assessment. The academic lessons were created with great care and creativity, but in order to directly compare assessments between the arts and non-arts lessons, the form of many of the actual questions used were drawn from the non-arts approach. To assess student knowledge fairly, and

to recognize the types of additional meaning that may be derived from the artistic experience, expanded assessments should be used for both arts and non-arts lessons. Such assessments should include opportunities to note student comments and demonstrated knowledge during the lesson itself, and offer students opportunities to express their knowledge in various forms of expression such as drawing, singing, or acting. As mentioned previously, if a strictly written format is to be used, more attention must be paid to the transition from the arts experience to the written form and students may need specific assistance in making that transition. This type of directed assistance can pose validity problems in evaluation research, but at the same time it should be noted that the arts-infused lesson has the built-in disadvantage of requiring a shift in symbol systems, which the traditional lesson does not. To make a fair comparison between arts-infused and non-arts infused lessons, some guided instruction may be necessary, but should be balanced by comparable preparation for both tests.

Conclusions

This study demonstrated the potential for a comprehensive arts intervention to enhance academic performance of low-scoring, artistically talented students. The increases observed in the use of self-regulatory behaviors in the classroom, and improvement on standardized reading tests, provide evidence that successful learning strategies and behaviors in the arts can be applied to solving academic tasks. Self-regulatory behaviors are a promising area for the study of transfer between the arts and other academic subjects because they can be developed and observed in both the arts and the regular classroom. In many cases, the behaviors can be observed directly, students can talk about their learning strategies, and teachers and researchers can assess outcomes in both environments.

Performance on standardized reading and math tests, on the other hand, should be viewed

as an indirect outcome. Identified students received no special test preparation either in the regular classroom or MAGIC program. The three-year improvement in reading scores appears to be part of a pattern of overall academic improvement for low-scoring students. Interviews with students, teachers, parents, and arts instructors; teacher and artist reports; MAGIC reports; and other anecdotal information reflect a range of positive changes in student attitudes, behaviors, and academic achievements (ArtsConnection, 1994;1997, Oreck, Baum & McCartney, 2000). Transfer, in this context, thus refers to a range of outcomes resulting from the identification and development of students' artistic talents. It is impossible to quantify how much of this improvement was the result of raised teacher expectations and changes in teaching methods, and how much can be credited to an expanded repertoire of self-regulatory behaviors and improvement in student attitude and self-efficacy. Both aspects seem essential for meaningful transfer of skills from the arts to the academic classroom.

The study revealed both specific and general links between teaching and learning in the arts and in the regular classroom. The specific link concerned the development, application, and metacognitive awareness of self-regulatory behaviors developed in the arts, in MAGIC, and to a greater or lesser extent in the classroom, depending on the interest and skill of the teacher. The general link was the effect of successful and enjoyable learning experiences in an area of strength for low-scoring, high-ability students. Students in the identified groups had opportunities to experience success in the arts through hard work with similarly talented, motivated peers, and to be appreciated and valued by the entire school for their talents. Some had teachers who recognized and knew how to use their artistic abilities in other subject areas. Parents and family members were helped to take advantage of out-of-school arts opportunities (ArtsConnection, 1997). After-school ensembles performed in their communities and students

received scholarships to study in major arts institutions around the city and country (Oreck, Baum & McCartney, 2000). The Young Talent Program was a very high status activity in most of the schools in which it operated and students were expected to maintain high attendance and make good progress. For students recommended for MAGIC, participation in arts classes was predicated on attendance at after-school MAGIC classes. Ultimately, the students' motivation to take part in the program, and the success they experienced in it, appeared to be the foundation upon which their academic improvement was built. The support and assistance they received from teachers then allowed that success to be manifested in the classroom.

Table 1
Self-Regulatory Behaviors

1. Paying Attention

avoids distractions
comes back to task after interruptions
shows good concentration
listens carefully
follows directions
makes appropriate contributions and comments

2. Cooperating

works well in group activities
follows instructions
listens to, observes, and learns while interacting with peers and teachers
negotiates and compromises with others to achieve a goal

3. Using Feedback

uses criticism to improve work
maintains corrections
is open to other points of view
evaluates own work

4. Problem Solving

is able to identify the problem
comes up with unique approaches to challenges
doesn't stop with one answer
thinks for self-- is not swayed by opinions or answers of others
is able to identify missing information
relates other information and experiences to the problem

5. Being Prepared

does homework
is ready to begin the exercise or task
has supplies
remembers information and instructions
is organized

6. Taking Risks

offers opinions, even if they are unpopular
volunteers readily
will do or show something rather than just talking about it
is ready to try new things
is willing to explore difficult or vague concepts

7. Persevering

doesn't stop when it gets hard
continues even when the teacher is not looking
exerts effort throughout the activity
enjoys challenges
follows task through to completion
doesn't get stopped by criticism

8. Asking Questions

asks good questions
is not afraid to ask when instructions or information is unclear
will pursue an area of curiosity
finds solutions for unanswered questions

9. Self-Initiating

takes responsibility for learning
moves self to a productive place to learn
works on task without explicit instructions from the teacher
uses own learning strategies to become a more effective learner
starts on own

10. Setting Goals

sets up specific interim goals to solve a problem
is motivated towards the goal
recognizes the sequence of tasks needed

Table 2.
Samples of the Integration of the Arts and the Academic Curriculum

Curricular/Arts Area	Skills or Concepts
Science/Dance	Cloud Types (cumulus, stratus, cirrus, nimbus)--Exploration of shape, level, and weight in movement improvisations to build understanding of the physical properties of four cloud types.
Science/Music	Plant Structure and Function-- Creation of vocal/body sounds to identify and explain the function of the parts of a plant.
Language Arts/Dance	Descriptive Language/Poetry-- Exploration of qualities (texture, shape, etc.) of objects with dance and music. Poems written using descriptive language (personification) generated through dances.
Social Studies/Theater	Immigration-- Reinforcement and expansion of reading material through character portrayal of immigrants traveling to and arriving at Ellis Island.
Language Arts/Theater	Creative Writing-- Descriptive writing based on characters, events and settings created through theater improvisations.

Table 3.
Self-Regulation and Achievement under Two Conditions

(n = 59)	<u>Self-Regulatory Behaviors</u>		<u>Achievement</u>	
	<u>Observed</u>		<u>Measure</u>	
	<u>Lesson Pair 1</u>	<u>Lesson Pair 2</u>	<u>Lesson Pair 1</u>	<u>Lesson Pair 2</u>
	M (SD)	M (SD)	M (SD)	M (SD)
Arts	3.65 (.71)	2.84 (1.43)	5.89 (3.58)	5.54 (3.28)
Non-a arts	2.14 (1.15)	1.41 (.89)	7.02 (3.81)	5.00 (2.93)
t	8.39	7.25	-1.86	1.13
P	<.001	<.001	.07	.26
effect size (SD)	1.62 (very large)	1.22 (very large)	.27 (small)	.18 (small)

Table 4.
Mathematics Comparisons

MATH NCE	Group 1	Group 2	Group 3	Marginal
	M (SD)	M (SD)	M (SD)	M (SD)
1994	44.76 (16.88)	57.67 (19.96)	36.56 (12.57)	48.03 (16.47)
1995	48.34 (18.22)	61.06 (17.52)	5.06 (11.81)	50.64 (15.85)
1996	56.80 (17.23)	64.61 (16.66)	46.69 (12.57)	57.87 (15.49)
Marginal	49.97 (17.44)	61.11 (17.96)	39.44 (12.32)	52.18 (15.94)

Group 1 = Non-YTP students, Group 2 = YTP at grade level, Group 3 = YTP below grade level

Table 5.
ANOVA Source Table for Math NCE

Source	SS	df	MS	F	p	eta
<u>Between</u>						
Group	16292.65	2	8146.32	12.20	<.001	.22
Error	58090.79	87	667.71			
<u>Within</u>						
Year	4084.87	2	2042.43	21.20	<.001	.19
Year x Grp	542.65	4	135.66	1.41	.233	.03
Error	16759.83	174	96.32			

Table 6
Reading Comparisons

Reading NCE	Group 1	Group 2	Group 3	Marginal
	M (SD)	M (SD)	M (SD)	M (SD)
1994	50.01 (25.22)	55.00 (22.62)	33.71 (18.16)	49.45 (22.00)
1995	53.62 (19.87)	60.55 (18.30)	38.93 (16.51)	53.69 (18.23)
1996	52.74 (14.90)	58.74 (15.52)	50.14 (17.84)	53.86 (16.09)
Marginal	52.12 (20.11)	58.10 (18.81)	40.93 (17.50)	52.34 (18.77)

Group 1 = Non-YTP students, Group 2 = YTP at grade level, Group 3 = YTP below grade level

Table 7
ANOVA Source Table for Reading NCE

Source	SS	df	MS	F	p	eta
<u>Between</u>						
Group	8564.10	2	4282.05	4.59	.012	.07
Error	120340.90	129	932.88			
<u>Within</u>						
Year	2322.81	2	1161.41	10.46	<.001	.08
Year x Grp	1438.48	4	359.62	3.24	.013	.05
Error	28641.06	258	111.01			

Figure 1
Graphic Representation of Transfer in the Young Talent Program

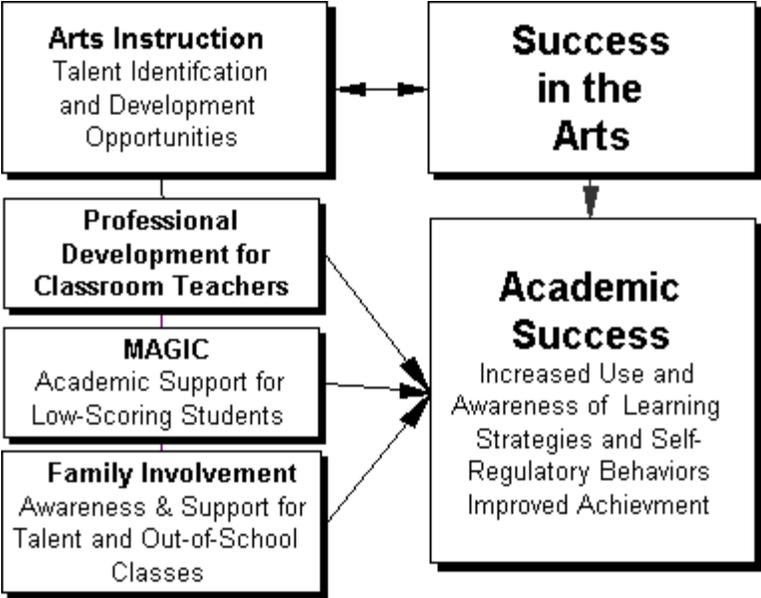
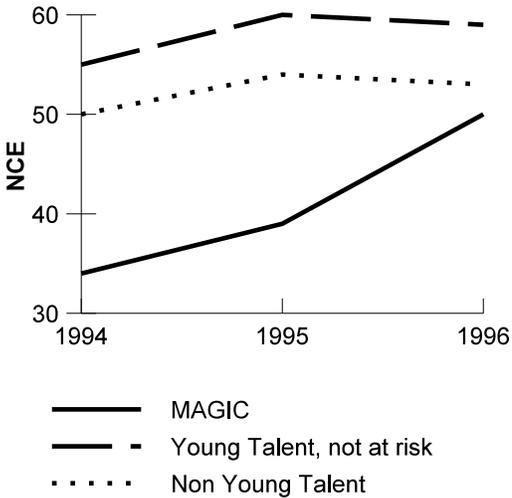


Figure 2
Plot of Interaction of Three-year Reading NCE Percentile Score Results



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