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ABSTRACT

A study investigated the relationship between arts education and academic achievement. Of specific interest was whether teaching the arts for their own sake influenced academic achievement in language arts and mathematics. It was hypothesized that it would influence children's self-efficacy. The sample consisted of 328 children from grades 2-5. Academic efficacy was measured with the Agency for Effort and Ability subscales of the "Student Perceptions of Control Questionnaire: Academic Domain," while artistic efficacy was measured with an adapted version of the same test. Academic achievement was assessed with teacher-assigned grades for mathematics, science, and reading. A multivariate grade analysis of variance was used to examine possible gender and age-related differences in artistic ability, artistic effort, academic ability, academic effort, and achievement. The new measure of artistic efficacy used in the study did reliably differentiate between beliefs regarding artistic effort and ability. Data clearly showed a strong relationship between academic and artistic efficacy. Findings suggest that there is significant cognitive transfer from arts education to other academic areas. (Contains 4 tables of data and 17 references.) (BT)

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Why Art Education? Academic Implications of Art in Elementary School

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Introduction & Theoretical Rationale

"Imagination is the mother of creativity and the intellectual engine that drives both the artist and the scientist to explore, to experiment, to analyze, to synthesize, to create and to destroy, to push knowledge to a new frontier"

(Papacosta & Hanson; 1998, p. 251)

We investigated the relationship between Arts Education and Academic Achievement. A review of the educational literature revealed that Arts Education has typically been examined as a delivery tool for traditional academic disciplines (e.g., Baum, Owen, & Oreck, 1997; Blandy & Cowan, 1997; Kangas, 1998). For example, how can art be used to teach math? We were interested in assessing whether teaching the Arts for their own sake influenced academic achievement in language arts, and mathematics.

We hypothesized that Arts Education would influence Academic Achievement through its relationship to children's sense of their own competencies -- i.e., their self-efficacy. The educational literature has consistently shown what children who think they can do well in school (high self-efficacy) do perform well in school (Bandura, 1994; Dweck, 1986; Little & Lopez, 1997; Lopez, Little, Oettingen, & Baltes, 1998). A similar relationship might exist for Artistic Self-Efficacy. Children who see themselves as good in the Arts, may also see themselves as good in math, science, language arts, and their sense of competence in these areas may, in turn, lead to higher overall achievement. It is important to note that all of these relationships have been shown to exist independent of relatively objective assessments of children's actual abilities or academic potentials. For example, these relationships exist independent of how smart a child may be.

Three empirical lines of research inform our reasoning: stress-buffering, social comparison, and domain transfer. The stress-buffering literature predicts that success in one area facilitates persistence in more difficult, challenging areas. Several studies have empirically investigated the relationship between social support, stress-buffering and academic competence (Herman-Stahl & Petersen, 1996; Wills & Cleary, 1996). In general, these studies show that increased social support acts as a buffer, indirectly leading to both increased academic achievement, and lower levels of depressed affect. Therefore, to the extent that Arts Education fosters cooperative learning and social support, success in the Arts may increase persistence, expended effort, and achievement in math and science. Mastery, cooperative learning, and social comparison are important components of both arts education and traditional academic curricula (Bandura, 1997; Papacosta & Hanson, 1998). The cooperative, group nature of the performing arts may facilitate mastery learning and social comparison. Both of these are central components in the development of self-efficacy (Bandura, 1997; Skinner, 1995). Finally, we proceed from the theoretical position that there are common sets of skills linking arts education and traditional academic areas. As such, the literature on cognitive transfer predicts that the specific skills learned in one academic area transfer to areas of study. Theoretically, some researchers have noted that cognitive skills, e.g., self-regulation, problem solving, and critical thinking, learned in Arts Education, may transfer to other academic domains (Hamblen, 1993; Kangas, 1988; Papacosta & Hanson, 1998).

Therefore, we expect that any potential influence of arts education should be filtered through the child's own sense of their academic strengths and weaknesses. We predict that children who high in self-efficacy for artistic ability will also tend to have high self-efficacy beliefs for academic ability. Furthermore, we predict that self-efficacy for academic ability will be positively related to actual academic achievement.

Method

Participants. The sample consisted of 328 middle school children from Grades 2-5. The sample was 45% female (Grade 2: n = 63; 46% girls; Grade 3: n = 77; 44% girls; Grade 4: n = 104; 54% girls; Grade 5: n = 93; 42% girls).

Measures

Academic Efficacy. Academic Efficacy was measured with the Agency for Effort and Ability subscales of the Student Perceptions of Control Questionnaire: Academic Domain (see Little, Oettingen, & Baltes, 1995a; Skinner, 1995; Skinner et al., 1988 for reliability and validity information). Each belief

was assessed by a set of six items (e.g., for Effort, "I can really pay attention in class." and for Ability, "I am just not very smart at school work."). The children answered each item on a 5-point scale from "1=strongly disagree to 6=strongly agree." Both scales were reliable (Academic Ability $\alpha = .84$; Academic Effort $\alpha = .83$).

Artistic Efficacy. Artistic Efficacy was measured with an adapted version of the Agency for Effort and Ability subscales of the Student Perceptions of Control Questionnaire: Academic Domain. As with the Academic Efficacy scales, each belief was assessed by a set of six items (e.g., for Effort, "When I am making art, I can really work hard on it." and for Ability, "When it comes to doing art, I am pretty good."). The children answered each item on a 5-point scale from "1=strongly disagree to 6=strongly agree." Both scales were reliable (Artistic Ability $\alpha = .83$; Artistic Effort $\alpha = .81$).

Academic Achievement. Academic Achievement was assessed with both the teacher-assigned grades for math, science, and reading. Letter grades were coded on a 13-point scale from F = 1 to A+ = 13.

Results

Gender and age-related differences. A Multivariate Grade (3, 4, 5) x Gender (boys, girls) Analysis of Variance was used to examine possible gender and age-related differences in artistic ability, artistic effort, academic ability, academic effort, and achievement.

Gender. Analyses revealed a significant multivariate main effect for Gender, $F(5, 233) = 5.92$; $p < .0001$; $\epsilon^2 = .11$. Follow-up univariate analyses revealed significant Gender main effects for Artistic Effort [$F(1,237) = 20.56$; $p < .0001$], and Artistic Ability [$F(1,237) = 11.38$; $p < .001$]. Analyses also revealed Gender trend for Academic Effort [$F(1,237) = 3.14$; $p < .07$], and a significant main effect for School Grades [$F(1,237) = 8.36$; $p < .004$]. In all main effects, girls reported significantly higher mean levels of efficacy compared to boys [see Table 1].

Table 1. Gender Main Effects.

	Boys	Girls
Arts Ability	4.52	4.93
Arts Effort	4.63	5.07
School Effort	4.81	4.96
School Grades	10.76	11.43

Grade in School. Analyses revealed a significant multivariate main effect for Grade in School Grade, $F(10, 468) = 3.92$; $p < .0001$; $\epsilon^2 = .07$. Follow-up univariate analyses revealed significant Grade in School main effects for Artistic Ability [$F(2,237) = 4.44$; $p < .01$], and School Grades [$F(2,237) = 8.70$; $p < .0001$]. Subsequent post-hoc comparisons using the Tukey-HSD revealed that Grade 5 children's reported mean levels than those in Grades 3 and 4. No other significant effects were found [see Table 2].

Table 2. Grade-in-School Main Effects.

GRADE	School Grade	Arts Ability
3	11.49(A)	4.67
4	11.24(A)	4.61
5	10.13(B)	4.21

Linking artistic and academic efficacy. Bivariate correlations were used to assess the relationship between artistic and academic efficacy. The data clearly show a link between self-efficacy for artistic ability and self efficacy for academic achievement [see Table 3]. The overall correlation between artistic and academic ability was $r = .35$ ($p < .01$). The overall correlation between artistic and academic effort was $r = .37$ ($p < .01$). Those children who saw themselves as competent and hard-working in the artistic domain also tended to see themselves as competent and hard-working in the academic domain. Within-cell correlational analyses by Grade and Gender suggest that the magnitude of these relationships may differ by both age and gender. For example, for boys artistic and academic

effort are not significantly correlated in Grades 3, and 4. However they are highly correlated in Grade 5 ($r = .69$; $p < .001$). For girls, artistic effort and ability modestly correlated in Grades 3 ($r = .39$; $p < .05$) and 4 ($r = .37$; $p < .05$), and more strongly correlated in Grade 5 ($r = .54$; $p < .01$). This suggests that Artistic Ability and Artistic Effort are conceptually distinct from Academic Ability and Academic Effort.

Table 3. Zero-Order Correlations.

	1	2	3	4	5	6	7
1.GENDER	1.00						
2.GRADE	-0.07	1.00					
3.ARTS_ABI	0.25**	-0.19**	1.00				
4.ARTS_EFF	0.29**	-0.07	0.72**	1.00			
5.SCH_ABI	0.02	-0.05	0.35**	0.26**	1.00		
6.SCH_EFF	0.11	0.03	0.36**	0.37**	0.75**	1.00	
7.SCHGRADE	0.19**	-0.27**	0.17**	0.15*	0.22**	0.23**	1.00
* $p < .05$	** $p < .01$						

Predicting academic achievement. Hierarchical Linear Regressions were used to assess the primary hypothesis, namely, that Academic Efficacy mediates the relationship between Artistic Efficacy and Academic Achievement. Variables were entered in three blocks (see Table 4). Block 1 included Academic Ability and Academic Effort. Block 2 included Artistic ability and Artistic Effort. Block 3 included Gender and Grade in School.

Table 4. Hierarchical Linear Regressions Predicting Final School Grades (Total $R^2 = .39$).

		β	T	p
Criterion: School Grades				
Block 1:	School Ability	---		
	School Effort	.22	3.68	.0003
	Unique $R^2 = .23$			
Block 2:	Arts Ability	---		
	Arts Effort	---		
	Unique $R^2 = .00$			
Block 3:	Gender	.15	2.57	.01
	Grade in School	-.27	-4.52	.0001
	Unique $R^2 = .16$			

Discussion

We investigated the relationship between Arts Education and Academic Achievement. We hypothesized that Arts Education would influence Academic Achievement through its relationship to children's self-efficacy. Specifically, we predicted that children who saw themselves as competent in the artistic domain would also see themselves as competent in the academic domain. Furthermore, one of the most robust and consistently replicated findings in the educational literature is that children high in academic efficacy perform better than those low in academic efficacy. Given the robustness of the link between academic efficacy and achievement, the present study's principle focus was on assessing the relationship between artistic and academic efficacy.

Action-control and the artistic domain. We used a new measure of artistic efficacy in the present study. Reliability and confirmatory factor analyses show that the new instrument did reliably differentiate between beliefs regarding artistic effort and ability. This finding itself adds to the growing body of literature using an alternative theoretical model to Bandura's self-efficacy; namely, action-control theory. Several empirical studies have supported this multidimensional model of control in several domains such as academic performance (Little & Lopez, 1997; Lopez, Little, Oettingen, & Baltes,

1998; Oettingen, Little, Lindenberger, & Baltes, 1994; Skinner, Chapman, & Baltes, 1988; Stetsenko, Little, Oettingen, & Baltes, 1995), cognitive skill (e.g., fluid and crystallized intelligence; Chapman, Skinner, & Baltes, 1990), and social relations (e.g., friendship formation; Lopez & Little, 1996). For example, these studies show, for example, that personal agency (primarily effort and ability) is most strongly associated with academic performance.

Linking artistic efficacy, academic efficacy, and achievement. The data clearly show a strong relationship between academic and artistic efficacy. Of particular interest here is our focus in the present investigation. We did not focus on using the Arts as a pedagogical tool in the service of other, more traditional disciplines. We were interested in the teaching of the Arts for their own sake. Theoretically, while researchers have noted the possible links between Arts Education and Achievement (Hamblen, 1993; Kangas, 1988; Papacosta & Hanson, 1998), they have proven to be empirically elusive. For example, Baum, Oren, and Orek (1997), found that Arts Education did foster the development of self-regulatory learning strategies. However, these skills did not necessarily carry over to other academic domains. They attributed this finding to (a) Arts Education engendering a higher level of intrinsic motivation in school compared to traditional disciplines; and, (b) Arts Education being more subjective in content compared to other disciplines. Gardiner, Fox, Knowles, and Jeffrey (1996) found a different pattern of results. In a sample of first-graders, they found that those in an art classroom emphasizing sequenced skill development (a component of mastery-learning and self-efficacy enhancing interventions) outperformed a matched control group without the arts class in standardized Math and English scores. The Gardiner et al (1996) clearly shows how Arts Education can explicitly enhance learning in other areas of study. The present study adds to this literature by showing that Arts Education may also implicitly influence achievement through teaching a common set of underlying skills.

Implications for curriculum development and teaching. School districts nation-wide are increasingly being required to justify their Arts Education programs. The criteria for justification has often been the relationship between Arts Education and Academic Achievement. The present study directly addresses this important debate within the educational community. Though clearly preliminary, we feel our results document a strong relationship between Arts Education and Academic Achievement. Arts Education may directly influence and enhance the development of several important self-regulatory learning strategies, including mastery, critical thinking, and efficacy. These self-regulatory strategies are believed to be common across academic areas. Our data supports the contention that there is significant cognitive transfer from Arts Education to other academic areas. The implications seem clear. Arts Education may be an important tool to teach self-regulatory learning, and may also be a tool of remediation for "at risk" populations. Further research should more directly assess the mechanisms and processes through which Arts Education influences Academic Achievement.

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