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This paper reports a research study into the effects of rich, sustained visual arts instruction on 103 inner city 9-year-olds in two major US cities. We use the lenses of social learning theory, theories of motivation and self-efficacy, and recent research on artistic thinking to investigate the programs' effects on children's self-beliefs and creative thinking. The study enlisted a pre–post measure, treatment-comparison group design along with structured observations of participant and comparison group classrooms. The arts students made significant comparative gains on a self-efficacy scale and on an 'originality' subscale of a standard creativity test. These effects are attributed to children's engagement in art and to the social organization of instruction including reinforcing peer and student–adult relationships. Relationships between self-efficacy beliefs and tendencies to think originally are explored.

Introduction

Upon arrival at Inner City Arts, the students became engaged in a discussion of 'texture', or in Spanish, '*textura*'. Their art instructor demonstrated how to capture different textures on vellum paper by quickly rubbing her pencil at an angle, picking up the contours of an object beneath. The kids watched in awe as she made different textures appear on the paper from the floor and even the bottom of her shoes. The students were amazed, describing this process as 'magic' because of the way complex designs would simply appear on the paper. When it was their turn, the children started with rubbings of the objects on the tables and soon explored the pencil sharpeners, the iMac, and the metal room divider. The instructor opened the doors to the classroom and the kids ran out to the courtyard, which was filled with palm and lemon trees, a fountain, and several walls with ceramic tiles made by other students. They ran from trees to tiles, magically capturing the most interesting words and designs that they could find. It was a time for exploration. Students were delighted to discover patterns on walls and objects

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that they had previously assumed were smooth. Eventually the students filled the square pieces of vellum entirely with gray pencil rubbings—creating collages of found textures—and used their papers to collaboratively construct a three-dimensional cityscape. When they looked at the final product, one child said, 'I believe in art now'.

The creative process may be one in which children gain command of the brush and learn the mysteries of art making. But sustained creativity also places cognitive demands on the learner—wrestling with technique while processing elements of design and intention, facing the public nature of classroom art-making, and making meaning out of critical and supportive comments from peers and teachers. These sorts of demands may be present in other learning experiences, but children may respond more actively and deeply in the art room than in the classroom. The response may add up to what Abelson calls 'hot cognition' (1963), which theorizes that all experiences have both a cognitive and affective component and that each of these, in turn, influence and colour the other. This research explores relationships between participation in high-quality visual arts education and what children believe about themselves and their future prospects.

Preliminary observations of the programs we studied led us to hypotheses projecting positive effects on children's views of the future and their abilities to control important outcomes for themselves. In broad conception, we call these orientations the child's worldview. In measurable terms we are more modest; worldview so defined is closely aligned with children's self-beliefs about their abilities to make things happen for themselves, their capacities to conceive and carry out actions, and their general sense of agency in life. These descriptors of course point to *self-efficacy beliefs*—Albert Bandura's towering contribution to theories of motivation (1986).

We recruited third grade classrooms from public elementary schools in Los Angeles, California and St Louis, Missouri for this project—179 children in all. The schools and surroundings are impacted by poverty, crime, drug-traffic and economic hardship. Participants received regular instruction from highly skilled artists at Inner City Arts (ICA) in Los Angeles and through the Center of Contemporary Arts (COCA) in St Louis. These institutions stand out as oases in their neighbourhoods and city cultures. By public acclaim, both ICA and COCA present vivid symbols of the importance and joy of the arts—attractive physical settings adorned with children's artwork, high-quality facilities and equipment, skilled, enthusiastic teachers who understand children, and an ambiance of creativity and purpose. Apart from joy, industry, and a profusion of art works, we wondered what else these programs bring to the children who participate.

Program settings

More detailed portraits of the Los Angeles and St Louis research settings may bring to life what we call a sustained, arts-rich instructional experience. Also, the following descriptions help explain why these programs caught our interest.

Inner City Arts (ICA)

Inner City Arts is an educational institution serving 14 schools in a true 'skid row' area at the edge of downtown Los Angeles. In partnership with the Los Angeles City Schools, elementary school classes attend ICA for about 90 minutes, twice per week for 20 weeks. ICA has fine facilities and materials dedicated to each of drawing, painting, animation, ceramics, music, drama and dance. At any one time, four classes work away in their respective disciplinary zones—all day, every day. Our participating school, which is 99 percent Latino, was chosen to participate in the visual arts classes, which consisted of drawing, painting and some sculptural work. Professional artists, some volunteering, staff the classes and workshops. The classroom teachers often participate as learners—producing assigned works in ways that model the creative process. Children are encouraged to critique each other's work. A typical visual arts class culminates with a meeting on a rug next to a wall displaying the works of the day, where the instructor elicits criticism and comment; the instructor also draws students into discussions about higher order issues— symbolism, relations of form and function, aesthetics of line and colour. The facility is spacious, bright, and inviting—with 20-foot floor to ceiling windows facing north. Children's artwork inhabits every wall, railing and beam. A startlingly animated four-foot ceramic frog—assembled from the kiln-fired works of a fourth grade class 'team'—watches from one corner. All the 'good' space is for the kids; administrators and staff are tucked into small, windowless offices on a balcony. ICA stands in extreme contrast to its war-zone surroundings, including the crumbling and shuttered neighbourhoods served by participating schools. This contrast and the possible symbols children might associate with their ICA experiences encouraged our hypotheses.

A synopsis of the ICA project goals might read: Teaching the students self-expression through drawing, painting and sculpture; fostering English language development through vocabulary building and use of oral language to critique and discuss student work; teaching the students to engage their senses, particularly touch and sight, to discover the colours, textures, values and shapes in everyday objects; and inspiring a keen sense of observation and focus as they express themselves through their artwork.

Center of Contemporary Arts (COCA)

COCA's visual arts programs bear many similarities to those at ICA. COCA directs programs to schools in the public housing projects of St Louis, where 99% of families qualify for public assistance. Our school site is 100% African-American. COCA's program in our case was an in-school residency program led by a professional ceramics artist once per week for one-hour, a program lasting 30 weeks. The residency goals for children were individually produced ceramic and ceramics-based sculptural works, usually created in connection with a story or poem. Early lessons included slab work in clay and hand-building simple objects. Children created objects to represent stories; children also wrote cinquains (five-line stanzas)

and illustrated them with clay works; they also wrote poems in response to others' art works. Lessons built up to the skills needed to conceive, produce, glaze, and paint more elaborate forms and objects. The culminating project was a story-pole, a large clay cylinder that displayed spiraled, multi-scene illustrations of a story. Students had formal as well as informal opportunities to reflect and comment on their own and each other's work during each session. The instructor modeled techniques of craft, processes of envisioning, problem solving, and writing as the residency went forward. The final products were placed on display in the school.

A synopsis of the COCA project goals might read: teaching the students self-expression through ceramics and design; increasing literacy as students research their ideas about the content of art works and connect poetry to artistic creations; teaching the students to work effectively and cooperatively in groups; and fostering a sense of pride among the students and their families about their own achievements, their school, and the cultural heritage of their neighborhood.

Not all arts programs are as well positioned or as well endowed as ICA and COCA to involve the dramatic contrasts and rich arts experiences we have observed. If we sum up what we thought we were seeing and what children were experiencing, the programs offered first-rate arts instruction by skilled artists using effective instructional designs and ample materials. Beyond this, and equally important, the ICA and COCA offerings seem to transcend what should be called a program—they appear also to be engaged in community building. Community building occurs within classes where artists encourage children to engage actively in each other's ideas, be critical friends and grow in respect for each other. Community building also occurs in larger spheres involving the students, participating adults, the schools, and artistic institutions.

Considering ICA and COCA together, our inquiry dovetailed with what Maxine Greene (2002) wrote for participants in a recent Ford Foundation roundtable on arts education research—a discussion that spawned this project. Professor Greene asked questions that do not typically come to mind when we think of either research in arts education or of educational research more generally—questions captured in the following:

> What can certain kinds of arts-learning experiences contribute to a child's sense of what the world has to offer? How might learning in the arts enrich the shaping of personal identity? Can arts education inspire the imagination of differing cultural realities? (Maxine Greene, pers. comm.)

Theoretical framework

This research rests on strong theoretical underpinnings. First we situate the work among contemporary theories of knowledge acquisition. As we have spoken of worldview and self-efficacy, each construct involves cognitive development and is responsive to the circumstances in which learning occurs. Then we bring the theoretical lenses of self-efficacy beliefs to the discussion. We argue that certain features of the visual arts programs we studied are case illustrations of the nurturing of self-beliefs and self-confidence. Finally, very recent research on what children

learn in high quality visual arts education (HQVAE) points to links between the habits of mind 'taught' through high quality visual arts education on the one hand and the broader views children have of their prospects in the world on the other hand.

HQVAE and learning theory

Our thoughts about learning in the visual arts begin with the basic tenets of generalized learning theory. Specifically, we attend to the core ideas of constructivist learning theory (Bruner, 1960), situated learning (Lave & Wenger, 1990), social development theory (Vygotsky, 1978) and collaborative learning (Johnson & Johnson, 1989; Bransford & Schwarz, 1999). Prominent across the resulting network of ideas is the word, *social*. Theories of knowledge acquisition cover an expansive territory. The chief objects of these theories are the processes through which people learn. Most theorists reason that learning involves social processes at many levels; another point of agreement is that learning is situated in and mediated by context and culture. And prominent theorists would agree that understanding grows through opportunities to try out, consider, and revise one's thinking. Learning in the visual arts is well suited to all of these ideas.

We begin with a glimpse of *constructivist learning theory* (Bruner, 1960, 1966). A central tenet of Bruner's conception of learning is that learners acquire knowledge through the interaction of new information with pre-existing understandings (or by the construction of meaning). One implication of this stance is that the effectiveness of instructional designs may benefit from the teacher's grasp and use of the learners' pre-existing understandings or cognitive structures. Visual representation can set the stage for such learning as teachers grow to comprehend their learners and as students comprehend their peers. Another case for constructivism in the visual arts lies in the learning that goes on in the processes of invention, trying-out, reflecting, and reinventing so characteristic of visual art's creative processes. We may plea to little avail for our adolescent children to pick-up and revise an essay—while in visual creation, trial, re-shaping, and considering yet again are the norm.

A central idea within Bruner's constructivist model is the critical importance of *metacognitive* activities. Metacognition refers to active self-monitoring of one's learning and thinking processes. Deep learning can only occur when the individual *steps back* periodically to review progress and learning paths. The case for metacognition in the visual arts has already been suggested. The very nature of artistic creation calls for periodically stepping back to consider any original goals, the results thus far, what might come next, or why things are working or not. Whatever students are actively learning through creating works of visual art, they are disposed by the medium to engage in reflection and revision of ideas.

Theories of *situated learning* hold that knowledge acquisition is a function of the learning activity, its context, and the culture in which the process is embedded (Lave, 1988; Lave & Wenger, 1990). Situated learning theory also holds that social interaction is fundamental to learning. In many learning situations, a 'community of

practice' reinforces values and behaviours to be learned. Players form a community of practice, with norms, values, means, and intentions. Learners stand at varying points on the novice–expert continuum. The visual arts learning at ICA and COCA showed active participation by community-like groups over concepts and representations. The attentive student, actively interested in both personal and other's ideas, is poised to learn.

Finally, we touch on Vygotsky's theory of social development (Vygotsky, 1962, 1978; Rogoff, 2003). Based on his up-close observations of infants, Vygotsky reasoned that all learning is social first, and then individual. He observed that language development, like much skill acquisition, requires interactions with more expert others and emerges first from social contact. Vygotsky's claims effectively appear in the important work of Bransford and Schwartz (1999) and others on *distributed learning* in groups. Collaboration can benefit all participants in a learning situation; the fact that expertise is distributed in various constellations throughout a group makes the process work. Collective commitment to the work at hand can keep individuals motivated and on-task. In the experiments reported by Bransford and Schwarz, attempts to teach through isolated problem solving produce many errors, whereas, 'after only a single opportunity to [publicly] 'test their mettle' and revise, students' performances improved dramatically' (1999, p. 93).

While individual pursuits occupied a majority of activities at ICA and COCA, both programs regularly involved collaborative projects. The art studio is a natural laboratory for collaborative pursuit of goals. Students and adults convening to create and present a painting, drawing, or sculpture bring differing levels of expertise and background experiences to the effort—and thus are in a position to teach and learn from each other. The process thrives on trying out and modifying—whether it is the single brush stroke or the whole canvas, the choice of a colour or the basic medium. And the individual may be disposed to learn for the group's benefit as well as his own. Since ideas in the visual arts class largely play out in a public arena, students typically have added motivation to get things right. Visual arts education tends to place responsibility for learning on the learner. The child wants to succeed in the social milieu and won't depend solely on the instructor for whether he or she learns. This may lead to healthy attributions for success involving beliefs in self-responsibility.

Self-efficacy and HQVAE

That self-beliefs are tied to human competency is a proposition embedded in most theories of learning and motivation. In the words of Bandura, self-efficacy reflects individuals' judgments 'of their capacities to organize and execute the courses of action required to attain designated types of performances' (1986, p. 391). The self-efficacious individual has a general sense of agency—confidence in the ability to succeed with plans for the future and in the ability to overcome obstacles—in short a sense of control over one's surroundings. Research on self-efficacy is carried out within specific domains (mathematics self-efficacy or interpersonal self-efficacy as

examples) as well as self-efficacy manifesting in more general confidence in controlling life events and in dealing with uncertainty. No one we are aware of has looked at how learning in the visual arts or in other forms of creative expression may contribute to self-efficacy, although a very few studies report on similar relationships in the arts. An example is the Trusty and Oliva (1994) study tying learning in music to enhancements in self-concept. We pursued this study with a modestly supported contention that it is possible (and even plausible) that the arts would impact an individual's motivation and sense of agency.

Self-efficacy is generated directly by individual accomplishment and learning, through vicarious experiences (watching peers, teachers, and adults succeed), and also through social reinforcement. (If vicarious acquisition of self-efficacy beliefs seems off-key, consider the child who sees a demonstration of how to use a fire extinguisher at school who then goes forth confident about using the device in an emergency.) The children in our high quality visual arts education settings have prime opportunities to gain artistic skills and accompanying self-regard, are able to see experts at work and gain confidence about producing expert work on their own, and have skill developments recognized and reinforced by peers and adults because accomplishments are constantly on display for classmates and teachers.

Both ICA and COCA children have their confidence in their own judgment and capacity buoyed by how children's art works are processed in each class. At ICA, one class's worth ($N=22$) of drawings or other visual creations are displayed together and discussed for 10 minutes at the end of each class. An expert artist guides children to their own critical and often novel observations concerning the works, children speak and field questions about their own drawings, and participants are honoured that their works have been the subject of class attention as well as the attention of the expert. Analogous activities characterized the ceramics/three dimensional visual art classes in St Louis. We know from our observations of ICA and COCA students in their regular classrooms that found among the children most successful in the art room were children least engaged in their academic classes—typically limited English speakers and shy or emotionally impaired students. These children had perhaps unprecedented opportunities to feel accomplished, to speak aloud about what they were learning and producing, and to take on leadership roles in the group. The ICA and COCA arts classes seemed to be about children's beliefs in themselves and their efficacy as well as cultivating artistic skills.

Extant literature is sparse on the topic of transfer of domain-specific self-efficacy belief to more generalized self-efficacy belief. And this is an important issue for this study. It stands to reason, with justification found in the literature (Pajares, 1996; Scholz *et al.*, 2002), that accumulations of accomplishments and reinforcements over multiple domains would leave a child more generally optimistic about his prospects. In our study, the ICA and COCA students had opportunities to gain mastery in creating art works, assisting peers with their efforts, speaking publicly about what they had achieved, thinking critically about the work of their peers, and developing effective relationships with the experts facilitating and leading the classes. And these potential developments took place, over the 20 to 30 weeks of their

courses, in an atmosphere of very high engagement and joy concerning the work at hand. Whatever transpires in the way of self-beliefs in a classroom of 9-year-olds, the effects are probably more pronounced when the children are happily and consistently absorbed in what they are doing.

Research on what the visual arts teach

An elusive subject in the literature on arts education has been discerning any cognitive developments associated with visual arts education. There has been no shortage of rhetoric and wishful thinking about such things, but we stand impoverished when it comes to systematic, well reasoned, and calibrated analysis of habits of mind, thinking dispositions, or self-beliefs affected by learning in the visual arts. A recent report from a long-term study by Winner and Hetland (Hetland *et al.*, 2007) provides evidence for several such developments. Some are important for our assessment of ICA and COCA learners.

Winner and Hetland document that HQVAE boosts children's general dispositions to *engage and persist* in their work (2006). If these dispositions indeed prove to be general and lead to accomplishment, then general self-efficacy beliefs may follow. We have seen suggestions of this process in the programs we studied for this research. Winner and Hetland also conclude that education in the visual arts teaches children generally to *envision* what they cannot observe directly. Envisioning events and outcomes is surely a vital part of planning and acting in advance of future situations, a central component of self-efficacy beliefs. Another teaching of HQVAE is the ability to express—to go beyond the skills of drawing, painting, or assemblage to imbue such craftworks with personal feeling and meaning. Being in touch with personal meaning and feelings is a valuable requisite to anticipating future events and their possible effects on one's psyche and well-being. Another generalized disposition taught in HQVAE is the tendency to reflect on one's work, and on one's thought processes. We referred to one offshoot of this habit of mind above— reflection permits learning from what has worked and what has not. Such learning is expected to boost confidence in solving or overcoming future problems. Finally, Winner and Hetland find that learning in the visual arts teaches children to stretch themselves, explore possibilities, and to take risks (2006). The child willing to take risks is open to a future where not everything that could be important is known.

While the visual arts class cannot claim pre-eminence as a general environment for learning, the connections between the visual arts and what we know about learning seem many and multi-dimensional. As Eisner (2005) put things, the arts teach children 'to make judgments in the absence of rules … [that] problems can have more than one solution … [and that] the goal one starts with can be changed midway in the process as unexpected opportunities arrive'. And straight to the heart of this study, 'that the forms of thinking the arts develop and refine are precisely the forms of thinking that our ever-changing world, riddled as it is with its ambiguities and uncertainties, requires in order to cope' (Eisner, 2005, B7). If Eisner is correct, the arts stand to make non-trivial contributions to the self-efficacy beliefs of children.

Moreover, this assessment hints that human creativity—here crafting one's own judgments, searching widely for solutions, and modifying goals when presented with opportunities—may go hand in hand with self-efficacy beliefs. Such connections find trace support in the empirical literature, to wit: 'There appears to be an underlying relationship between creativity and personal independence, and these qualities are in turn related to high self-regard' (Coopersmith, 1967, cited in Trusty & Oliva, 1994, p. 24). Our design and instruments support testing for gains in self-efficacy as well as gains in creativity that the ICA and COCA programs may have inspired.

Design and methods

This study enlisted a treatment-comparison group design in which learning measures for arts participants were compared to learning measures for comparison students. We used pre- and post-surveys completed by all subjects. And we used regular structured classroom observation to provide reliable information about how the ICA and COCA programs operated.

Sampling

For one component of this study, we worked with a public elementary school in the neighborhood of Inner City Arts, which had existing arrangements to send whole classrooms of students at various grade levels to ICA for 10-week workshops. We chose three third grade classrooms, children generally of ages 9- and 10-years-old, scheduled to participate at ICA in the fall. We chose children of these ages because they would be able to follow a simple written survey and because their self-beliefs would be considered more malleable than those of older, more world-hardened children. We selected three non-participating third grade classrooms as a comparison group. Because of its attendance area, the school was largely homogeneous with respect to family income (with 97% of students qualifying for publicly subsidized school lunches), ethnic make up (97% Hispanic origin), and moderately low achievement levels (averaging at the 21st percentile on state-wide tests of language and mathematics).

In St Louis, the program was initiated at an elementary school serving an inner city public housing project. All three third grade classrooms at the school participated. One hundred per cent of the participants were African-American and 99% qualified for subsidized meals because of low family income. In recent years between 5 and 10% of this school's students scored at the proficient level or better on the state's language and mathematics achievement tests. Three third grade classrooms from an adjacent school serving a different housing project signed on as our comparison group.

We were not able to randomize program participation in either St Louis or Los Angeles, but treatment and comparison students had similar profiles on these and survey-based pre-measures. One of the key strengths of the study's methodology comes from our use of whole classrooms of students and not volunteers or staff

nominations for choosing participants in the arts programs. Thus, we were able to see the effect of the program on entire classrooms of students and determine the significance by comparing their scores with classrooms from the control group.

In all, we obtained usable survey-based learning measures from 179 students, 103 who attended ICA or COCA classes and 76 comparison class students. Our original pre-survey count was 216 students. Attrition from our initial sample came from student absences on the follow-up survey days and students changing schools or otherwise relocating.

Survey instrument

At the heart of the study was a survey instrument administered to program and comparison students prior to the start-up of programs and again within two weeks of when programs ended. At ICA, the intervals between pre- and post-surveys were 20–22 weeks (about five months) and at COCA, the interval was 30 weeks, matching the longer duration of this less-intensive program. Because the subjects were in third grade with generally below-average achievement levels, the survey items were worded with appropriate-level language. The scales were replicated from those used in previous studies with students as young as 9-years-old conducted by the principal investigator (Catterall, 1995) and were originally developed based on the work of Wu (1992) and Ames (1990). Because many third graders are still struggling to read, the surveys were administered with research assistants and the principal investigator reading successive items in front of the classroom while students followed along with rulers to guide their attention to respective questions at hand.

Survey items were drawn to establish multi-item scales for general self-concept, general self-efficacy beliefs and internal *vs.* external attributions for success. The 13-item global self-concept scale included statements such as, 'I am able to do things as well as most other people'. The seven-item self-efficacy scale included statements such as, 'When I make plans, I think I can make them work', 'Every time I try to get ahead, someone stops me' and 'I have control over my future'. The two-item attribution scale contained items including, 'Good luck is more important than hard work'. Children responded using four-point Likert scales indicating levels of agreement or disagreement with each statement.

The survey also contained recently created and validated four-item scales for elements of creativity. We were interested in a general exploration of creativity that these scales could support. We also reasoned that aspects of creativity might be implicated in aspects of self-efficacy belief. If a child feels she is resourceful in bringing new or creative ideas to problem situations, she may be less daunted by the possible emergence of problems in the future and thus feel more efficacious.

The creativity scales are based on the familiar Torrance test of creativity (Myers & Torrance, 1964), but were designed for elementary school age students (Auzmendi *et al.*, 1996; Abedi, 2002). The dimensions of creativity, following the lead of the Torrance test, are originality, fluency, flexibility and elaboration. To give the reader a better picture of these four dimensions, one would describe those strong in

originality as being able to produce many unique ideas, those who are fluent are able to produce a great many ideas, those who are flexible are able to produce multiple types of ideas, and those good at elaboration can take their ideas and expand upon them. *Originality* items include, 'How good would you be at creating new toys for kids?' An indicator of *fluency* is, 'How well do you express your ideas?' *Flexibility* is reflected by responses to questions such as, 'What kind of job or work would interest you?' And the following item suggests *elaboration*: 'When you look at a piece of artwork like a painting or statue, do you think about what the artist is trying to say?'

Treatment and control-group scale comparisons were carried out in a framework that makes transparent the distribution of scale changes within each group respectively. We first assessed the percentage of students in each group making meaningful gains on each scale. By meaningful, we imply significant at $p<.05$ using the pooled standard deviation of scores for each scale. Then we used tests of significant differences of proportions (Chi-square) to indicate whether or not ICA and COCA student gains were significantly higher than observed changes in the comparison group (e.g., 54% of program students gained in self-efficacy belief whereas 36% of comparison students showed gains in the self-efficacy belief scale).

Finally, the survey included a single item asking students something related to our original ideas of worldview. This addressed the children's beliefs about their future choices. 'When you think about being a grown-up, how many choices do you think you have about what you will do, for example different jobs? (Very few or no choices; some choices; a lot of choices; a very large number of choices.) And the survey also asked students to produce drawings related to their classes at ICA or COCA to help assess aspects of learning the craft of visual art—a topic we do not take up in this discussion.

Results

Table 1 shows one view of the results of our survey scale analyses. As just described, here the numbers indicate the percentages of students in the various groups who made significant scale gains. Data are shown for the St Louis site, the Los Angeles site, and for all visual arts and comparison students respectively. In the cases where group differences are noted as significant, the differences are robust, $p<.01$.

General self-concept

A high proportion of children in both groups and at both sites registered gains in our general self-concept scale. This is consistent with the widely confirmed principle that children typically develop quickly on all cognitive fronts between the ages of 5- and 10-years-old. And cognitive development underlies the shaping of self-image. The ICA and COCA children show no comparative advantage on this measure.

Attributions for success

A much smaller share of students made gains in their attributions for success (i.e., toward more internal attributions). Less than one-third of students in both the arts

Table 1. Visual Arts Program vs. Comparison Group Students: Percentages Gaining on Motivation and Creativity Scales, Overall and by Research Site.

	N=103	N=76	N=73	N=56	N=30	N=20
	All Visual Arts	All Comparison	LA Visual Arts	LA Comparison	St.L. Visual Arts	St.L. Comparison
Motivation	Students	Students	Students	Students	Students	Students
General Self-Concept	80.4	84.4	76.4	83.0	90.0	90.0
Self Efficacy	**53.9**	**35.6**	50.0	39.6	**63.3**	**25.0**
Internal Attributions for Success	31.4	31.5	37.5	26.4	16.7	45.0
Perceived N of future choices	40.2	45.2	23.6	35.8	80.0	70.0
Creativity (2):						
Originality	**54.9**	**32.9**	**56.9**	**30.2**	46.7	40.0
Elaboration	38.2	34.2	38.9	35.8	36.7	30.0
Flexibility	54.9	60.3	52.8	88.0	60.0	45.0
Fluency	42.2	45.2	44.4	52.8	36.7	25.0

Bold: Differences significant at $p<.01$ (Statistic>Chi Square (1, .01) or >6.635). Chi Square tests were conducted on raw frequency data for contrasting groups.

and comparison groups made such gains and there is no significant difference between groups.

Perceived N of future choices

This exploration of a children's 'worldview' question showed no relative growth favouring the visual arts students. None of the group differences is significant. An anomaly we cannot explain is the very high percentages of students in St Louis, in both the arts and comparison groups, who made gains in their perceptions of future choices, shares ranging from 70% to 80%.

Self-efficacy beliefs

More than half of the arts students in our experiment made significant gains in beliefs in their self-efficacy. Just over one third of comparison students made such gains. The proportion of gainers in the arts group is significantly higher than the proportion in the comparison group (Chi-square (0, .01)>6.635; $p<.01$).

Creativity

Gains in the Torrance-based creativity scales are very similar in three of the sub-scales: elaboration, flexibility, and fluency. Generally between one-third and one-half of students gained on these scales, with no significant differences between arts students and comparison students on any scale, by site or globally. The exception is

the originality scale, where the visual arts students significantly out-gained the comparison students, by about 55% to 33%.

Actual scale score gains

A more traditional display of key comparative scale score gains for our visual arts students is shown in Table 2. Here we report the mean group pre and post scale scores and highlight the score gains that are statistically significant using paired sample t-tests. The results are consistent with the results shown in Table 1. The comparative gains in self-efficacy scores were significant for all visual arts students versus all comparison students, and for the St Louis visual arts sub-sample versus the St Louis comparison students. And the comparative originality scale gains were significant for all visual arts students and for all of the Los Angeles sub-sample visual arts students.

Discussion

To describe our results globally, we found less development in the arts students than we had hypothesized at the outset. But the developments that did register aligned with our hunches and with theories about learning and about the acquisition of self-efficacy beliefs. Based on our pre- to post- comparative scales, children in the visual arts classes did not gain relatively more than comparison students in

Table 2. Visual Arts Program vs. Comparison Group Students: Changes in Key Motivation and Creativity Scales, Overall and by Research Site.

Group		Self-Efficacy Scale				Originality Scale			
		Pre-Score	Post-Score	gain	sig	Pre-Score	Post-Score	gain	sig
All Visual Arts		**2.76**	**3.08**	**0.320**	**0.010**	**2.26**	**2.63**	**0.37**	**0.000**
	SD	0.82	0.85			0.54	0.42		
All Comparison		2.96	2.85	−0.110	0.399	2.44	2.40	−0.04	0.668
	SD	0.76	0.78			0.46	0.56		
LA Visual Arts		2.88	3.07	0.190	0.196	**2.21**	**2.63**	**0.42**	**0.000**
	SD	0.72	0.82			0.54	0.42		
LA Comparison		2.9	2.83	−0.070	0.646	2.41	2.32	−0.09	0.327
	SD	0.75	0.85			0.45	0.6		
St. Louis Visual Arts		**2.53**	**3.12**	**0.550**	**0.010**	2.35	2.63	0.28	0.051*
	SD	0.94	0.89			0.59	0.47		
St. Louis Comparison		3.13	2.92	−0.200	0.359	0.25	0.26	0.12	0.380
	SD	0.78	0.59			0.51	0.39		

Statistical significance (sig) calculated by paired sample (pre-post) t-tests.
Bold highlights denotes scale gains considered significant at $p < .05$.
★ Rounding to 0.05 is conventionally considered significant.

generalized self-concept. (We do note that we observed gains in self-concept for 80% to 90% of students in all groups; so this measure had a ceiling effect.) Nor did most participants grow toward more internal attributions for success over the course of the study. And the one question illuminating whether or not the children gained beliefs that they would have more choices as they become adults registered no advantage for the arts students.

We did see significant growth for the arts students in two important measures for this study. One was in general self-efficacy beliefs, based on questions probing perceived control over one's future and confidence about surmounting obstacles to achieving goals. In addition, we began the study with a hypothesis that creativity might stand as a component of self-efficacy beliefs. In fact, our scales indicate that in addition to gains in self-efficacy, the arts students made comparative gains in one important dimension of creativity, namely originality. Growth in original artistic expression might be expected to derive from the children's' extensive creative experiences in the ICA and COCA classrooms. But the questions in our originality scale were more general. They did not address art, but rather probed children's beliefs that they could generate novel ideas or novel solutions to problems. There may be ties between advancing originality in art and gaining originality in broader thinking patterns. This suggestion of our study is worth more focused research in its own right. In our measures, originality and self-efficacy beliefs seem closely related because of their common focus on general life competencies; and their parallel tracking in this study is not surprising.

What evidence supports the idea that ICA and COCA spawned these developments?

In addition to measuring scaled outcomes for students, we took steps to document the nature of the visual arts class experiences. We documented children's responses to arts instruction at both ICA and COCA by observing arts classes at least once per week over the 20 or 30 weeks. We also observed the arts students in their regular school classrooms (or home classrooms as we came to call them). And we observed comparison student classrooms every two–three weeks.

One purpose of our observations was to gather information that would complement our pre- and post-measures and perhaps help explain any survey-based suggestions. We also used observations to explore questions of program operations and effects directly. We used a formal observation instrument to record levels of children's engagement with and focus on their work, relations with both classmates and adults, and the types of children's questions. Our observations were tied to each significant segment or time-block over the observation period (typically two hours per observation session and 10 observations per class). We logged observations in sequential segments, defined generally by types of classroom activity including working independently, listening to lectures, or working collaboratively. We developed descriptive rubrics to guide observer ratings. As the fieldwork neared conclusion, our primary attention became directed to student focus and engagement in the work at hand and to student relationships with peers and adults.

Student engagement

Students were more engaged and were able to sustain periods of high focus and high engagement for longer periods of time during ICA and COCA activities than in their home classrooms. During arts classes, the entire class was engaged and focused 15% to 30% more of the time than in their home classrooms, depending on which participating class we observed. Participating students were able to maintain higher levels of focus and engagement in their home classrooms for longer periods of time when compared to their non-participating peers. We could venture a modest case for the transfer of increased focus and engagement from the arts classroom back to the home classroom based on these data. Previous studies have documented the transfer of 'motivation' induced by arts engagement to non-arts pursuits of students (Horowitz & Webb-Dempsey, 2002; Catterall, 1999).

Ten-year-olds' comparatively higher engagement during arts as opposed to academic classes might be expected, but its documentation is worth noting. The arts appear to involve what Abelson (1963) termed 'hot cognition'. Hot cognition is learning that involves personal goals, motivation and emotion—cognition steeped in feeling. Cold cognition refers to flow-chart thinking, or rule bound problem solving and decision-making. Learning in the arts, at least of the kind we witnessed at ICA and COCA, leans toward the hotter side of cognition. In these programs, children gain skills along with self-beliefs through value-driven and emotion-laden feedback (instead of right and wrong judgments) brought through interactions with peers and adults.

Students' relations with peers and with adults

We recognized the importance of peer and adult interactions in children's learning processes at several turns above. Our observation measures show generally positive student-adult interactions for all third graders across the study, arts students as well as comparison groups. While engaged in the ICA and COCA classes, students consistently had more positive interactions with their peers and adults than they evidenced in their home classrooms, but the differences were nonetheless small. An overriding point is that children in the arts classes had the benefit of adults and peers as they learned and developed along the paths that the arts opened up, including some that caused the art students to diverge from their comparison counterparts.

Case observations

We identified two students in each observed arts class ($N=12$) who in initial classroom observations appeared to be reluctant participants for a variety of possible reasons (e.g., language barriers or shyness). We documented the evolution of these children's behaviours and engagement over time, and watched for impacts the arts classes may have been having on their socialization and interest in school. We were interested in if and how peer and teacher relations might change and develop for these students over the course of the program.

In general, our case study students successfully integrated themselves into classroom life while in arts classes—they showed tendencies to join-in that were not evident in their home classrooms. These students interacted with other children, received attention from the artists and teachers, and engaged themselves in class projects. Their visual expressions and the interpersonal interactions enveloping them became vehicles for establishing identity. Our case students were not necessarily 'good' artists, but students and classroom teachers in the arts classes grew to see potential and accomplishment in these students. We observed that while these students lacked efficacy in their home classrooms, they seemed to find some efficacy at ICA and COCA, which perhaps led to changed beliefs about themselves. Towards the end of the study, we also observed something exciting beginning to happen. These case students were invited to be central participants back in the home classrooms. Initially placed at the periphery, students were called upon more frequently in class, their desks were placed more centrally, and they began to receive more positive attention from both their peers and the classroom teacher. This finding has important implications for classroom learning and the distribution of classroom learning outcomes.

Teacher behaviour

An interesting and important observation registered by teachers was that they began viewing students in their classes differently after seeing them work in the arts classes and after observing their artworks. This finding mirrors our classroom observations. The art classes offered some students a chance to succeed and open up in ways that regular classes had not. In addition, teachers perceived an increase in collegiality within their classes and enjoyed connecting with their students in an informal fashion.

Teachers are crucial models for children. The experience of having a teacher grow to recognize one's skill and worth is critical for the child's self-perception. For some children, their artwork stimulated welcomed recognition. Positive teacher feedback during this study was generally matched or exceeded by the artist–teachers and their peers in the arts classes.

Conclusion

Several aspects of this study should be considered important. Two relate to the study's design. First, this work adds to a sparse array of extant studies examining cognitive or motivation-related effects of participation in the visual arts. And second, this study explored changes in participating students over a significant, five-month time span. While this is not a long period of time when it comes to prompting firm or lasting developments of self-belief or perceptions of the world, the time span of the arts-learning experiences we studied far exceeds the duration of many studies in learning and development; we wanted a program of sufficient heft to give hope for significant impacts.

There are two main findings of this work. The primary finding is that participation in a sustained program of high quality visual arts instruction associated significantly with growth in our indicators of general self-efficacy. The mechanism seems to involve feelings of accomplishment in visual art and diverse positive interactions with peers and expert instructors surrounding the work; our conclusions and observations support a social view of cognitive development. Self-efficacious children believe they can be agents in creating their own futures and are more optimistic about what the world has in store for them. The second finding is that the program had effects not only on self-efficacy beliefs, but also on children's originality as measured on a children's version of the Torrance Test of Creative Thinking (Auzmendi *et al.*, 1996; Abedi, 2002). We argue that original thinking and self-efficacy may go hand-in-hand, and perhaps just as important that tendencies toward original thinking spawned by artistic learning may spill over or transfer to original thinking more generally. Confidence about the ability to generate novel solutions to problems or conceiving original pathways when facing a roadblock is a workable definition of self-efficacy. Original thinkers might be thought to have expansive as opposed to restrictive views of the world ahead.

What more does this suggest? We conclude that high quality visual arts education encourages sense of self-efficacy as well as creative, original thinking. Such outcomes befit all children. But they are particularly important when considering the lives of underprivileged children for whom educational and social advantages are scarce. These were the children we studied and the children to which our findings most readily apply. Participating in what we called high quality visual arts education allowed these children to feel more confident about their abilities and to have a greater sense of agency—these outcomes entwined with any artistic skills that ICA and COCA cultivated. This begins to sound like an impact on the child's worldview, the ambitious notion with which we began this project. We do not claim to have captured worldview in all of its genesis and nuance, but our work does suggest that high quality arts education may provide children positive views of themselves and the worlds they will face.

Acknowledgements

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