This brief summary describes what I consider to be the most important and interesting findings of our book -- that is, what in fact are the Critical Links reported in recent research. I will also comment on what I see as the most important implications of these Links for educators and for the future of arts education.

There are at least three ways to grasp this book -- one is obvious: the book is a guide to research on learning in the visual arts, music, drama, dance, and programs enlisting multiple art forms. Scholars summarize more than 60 studies and outline the contributions to knowledge of each. In addition, two expert researchers offer comments on each study. Each section presents an interpretive essay, and the book offers a concluding chapter on general issues surrounding the transfer of learning from the arts.

Another path through the work traces the many skills which the arts touch and cultivate -- skills that show up as outcomes in more than one art form: such as literacy, mathematics, and science skills along with student motivation and social competence.

And another take on Critical Links comes from its insights regarding for whom the links between the arts and human development are in fact the most critical. I refer here to a clear focus in many of the compendium's studies on children at risk -- the millions of children in America's urban centers and children in poverty across the nation.

The arts and children at risk. Critical Links shows two clear streams of outcomes for economically disadvantaged children. One is a set of effects related to reading skills -- basic reading comprehension for children who have in fact been left behind. An added set of effects for these children is increased achievement motivation. While motivation to achieve in school comes in various forms in the literature and across the compendium's studies, probably the most central is a tendency for the arts to promote both certain competencies for children who struggle across the curriculum as well as genuinely grounded feelings of competence and engagement. Feelings of competence and engagement can impact outlook and approach to schoolwork more generally -- and research on the arts finds impacts showing both increased attendance and fewer discipline referrals. And the limited number of studies we found addressing special needs populations show that arts activities associate with particularly important
outcomes: writing and reading skills, oral language skills, and (of great importance to struggling learners) sustained attention and focus.

Going back a step in this trilogy, the beneficial effects of the arts just outlined for children at risk -- along with additional links -- are reported for all children learning in the visual and performing arts. And school communities which infuse their curricula and orientations to teaching and learning around the arts have experienced broad-reaching outcomes. The scorecard is necessarily long -- *Critical Links* identifies no fewer than 84 separately distinguishable, valid effects of the arts when we differentiate among groups of children who benefit.

**Effects in what areas of learning and development?** The most expansive areas where the arts pay off are these: first, in basic reading skills, language development, and writing skills. Increases in general academic skills also show up and would appear to reinforce these specific literacy-related developments. Here we refer to focus and concentration, skills in expression, persistence, imagination, creativity, and inclinations to tackle problems with zeal. In addition, a wide range of social skills accompanies learning in the arts and engagement in arts activities. These are the sorts of skills and behaviors that, in their absence, parents and teachers have been seen to tear their hair out: positive social behavior, social compliance, collaboration with others, ability to express emotions, courtesy, tolerance, conflict resolution skills, and attention to moral development.

When parents are polled about what they hold most dear for their children, what do we find? The cultivation of decency, integrity, cooperation, and both leadership and followership time and again rank foremost. Similar sentiments surface in polls such as the Pew Charitable Trust's well known report, *What Employers Want*. Social development and academic advantage -- these are healthy dividends from the pursuit of lives rich in the arts.

**Specific contributions of the visual arts, music, drama and theatre, and dance.** As we might suspect, specific art forms associate with unique clusters of outcomes. This is only natural given that theoretically, the differing cognitive and social experiences tied to, say, music on the one hand and drama, on the other hand, would be expected to lead to different developments for children. And they do.

In the broadest of brushstrokes, *Critical Links* shows that comparatively large numbers of studies have trained their lenses on music and classroom drama -- and our understandings of academic and social effects in these arts are relatively mature. In contrast, there are fewer studies which inform us about the impacts of dance and, perhaps curiously most under-examined, the visual arts.

**Music's impact on human development became the object of great attention in the research and education over the past 5 or 6 years. If a generalization is permitted, Critical Links shows us that learning in music, taking varied shapes**
and forms, can have very important impacts on what can only be called a fundamental cluster of brain functions -- namely spatial reasoning and what researchers have begun to call spatial-temporal reasoning. These terms refer to understandings of relations of ideas and objects in space in time. It would be difficult to find a set of cognitive skills more important for how we humans go about our lives.

Nearly 3000 published studies involving spatial reasoning, many coming from scientific inquiries related to artificial intelligence, show unambiguously that spatial skills impact very basic human capacities -- understanding spoken and written language for example. We comprehend the words we hear and read in broad contexts which establish their meaning: this is a spatial reasoning process. Spatial reasoning is involved in many other things we value -- the ability to plan most anything, solving mathematical problems, and creative scientific processes. Albert Einstein has held forth on the vital place of spatially manipulating mental images in his world-changing revelations.

Drama in the classroom has also attracted wide attention among researchers. Here we witness a concentration of studies of very young children -- kindergartners and preschoolers to third or fourth graders. These studies track the effects of dramatizing stories or texts on children's understandings of such stories. Drama shows consistent effects on narrative understanding as well as on component skills: identifying characters, understanding character motivations, reading and writing skills, and interpersonal skills such as dealing with conflict. Drama (or theatre) at the middle school and high school levels has received scant attention from researchers.

Dance, in contrast to music and classroom drama, does not lend itself well to experimental research and has received less attention in the academic world. Available studies have leaned heavily on probing dance students and dancers to surface what they experience as the consequences or impacts of learning in dance. Dance contributes to increased self-confidence, persistence, social tolerance, and appreciation of individual and group social development -- the sorts of effects one might expect from ensemble learning. Researchers have also observed indirect links with dance in the realm of creative thinking -- originality, fluency, and flexibility. Dance also shows ties to creativity in another form of expression, namely poetry.

Visual arts. The visual arts and especially painting probably comprise the image that first pops into a listener's head when hearing about the arts and learning. But the visual arts turn out to be quite unexplored territory -- the researchers compiling Critical Links identified only four studies in the visual arts -- individually attending to quite different issues and carried out through quite different methods. Here we see only preliminary indications of impacts: that drawing is an effective communicator of learning in history and contributes to organization and persistence in writing -- training in visualization contributes to reading skills -- reasoning about visual art seems to transfer to reasoning about
science -- and instruction in visual art increases reading-readiness among preschoolers.

Implications. What seem to be the main implications of this volume? First -- the accumulated research of skilled scholars carrying out their work in a range of established methods is unambiguous: the arts contribute in many ways to academic achievement, student engagement, motivation, and social skills. Notions that the arts are frivolous add-ons to a serious curriculum couldn't be farther from the truth. While education in the arts is no magic bullet for what ails many schools, the arts warrant a place in the curriculum because of their intimate ties to most everything we want for our children and schools. *Critical Links* identifies many arrows pointing in positive developmental directions.

While it is fashionable and valid to focus on the academic and social effects of the arts (and this volume unquestionably bolsters such a fashion,) acting on the basis of the findings and conclusions of *Critical Links* could have the effect of reversing an important equation. An expansion of arts programs in the schools could lead to a generation with greater skills and interest in the arts than today's young adults who came through rather arts-starved school systems---i.e., to a society that supports the arts for many reasons, including the aesthetic. Any worries that interest in the non-arts benefits of the arts somehow undermines the "true place" of the arts in our society could prove completely wrong-headed. Expansion of the arts for some of the beneficial reasons supported in *Critical Links* could fold back and contribute to an America more widely interested in and supportive of the arts.

Note:


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