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The Arts as a Venue for Developmental Science: Realizing a Latent Opportunity

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Children in all cultures readily engage in artistic activities, yet the arts (dance, drama, drawing, and music) have traditionally been marginal topics in the discipline of developmental science. We argue that developmental psychologists cannot afford to ignore such naturalistic activities that involve so many basic phenomena—attention, engagement, motivation, emotion regulation, understanding of others, and so on. Despite historical issues with research methodologies and overdrawn conclusions, a current wave of methodologically rigorous studies shows the depth of arts learning, as well as how arts engagement can be harnessed for transfer to other skills. Here, we present 21 exemplary research case studies, covering an age range of 18 months to 17 years old and discuss how the arts are no more difficult to study than other real-world developmental phenomena and deserve a thorough examination.

Involvement in the arts (dance, drama, drawing, and music) is universal in childhood. Children in all cultures engage in artistic play: They draw (using twigs and dirt if paper and markers are not available), sing, act out pretend stories, and move to music (Gardner, 1973; Merriam, 1964; Winner, 1982). Music and visual arts classes are offered in elementary and secondary schools (in more than 90% of schools; Sparks, Bahr, & Zhang, 2015), even if only once a week; dance and theater classes are offered less often (in roughly 50% of schools; Parsad & Spiegelman, 2012). Many more students also participate in arts classes independently.

Historically, developmental theorists have focused on topics such as logical scientific knowledge (e.g., Piaget , 1960), parent–child relationships (Ainsworth, 1979), and moral understanding (Kohlberg, 1976). Issues of *Child Development* are likely to feature articles on factors such as temperament, vocabulary, executive function, decision making, social groups, and ethnic identity but almost never on involvement in the arts, despite *prima facie* observations that these above-mentioned factors are deeply entwined in the context of arts engagement and learning. Just to take the example of the visual arts, children involved in visual representation must decide how to transform a linguistic concept into a visual representation and how to achieve the visual effects they seek. They must learn how to focus their attention, reflect upon their work and its

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interpretation, express their personal identity, and persist in creation despite setbacks or frustration (Hetland, Winner, Veenema, & Sheridan, 2007). Indeed, recent work demonstrates not only that the arts *can be* a useful venue for studying developmental processes in "real-world" context but also that the arts *are beginning to be used in this way* (e.g., Corbett et al., 2014; Goldstein & Winner, 2012; Hetland, Winner, Veenema, & Sheridan, 2013; Kirschner & Tomasello, 2010; Lerner, White, & McPartland, 2012). This paradigm shift provides an opportunity for developmental science to achieve consonance between rigorous methods and translational application in a way heretofore unseen.

Parents and teachers have long claimed they see development and change as a result of involvement in the arts but have done so without recourse to systematic definition and measurement. Arts advocates and practitioners have focused a great deal of attention on trying to show that the arts boost academic performance in the form of grades and test scores. This focus and such claims may come from a sense that arts programming for children is constantly under threat of defunding, as the percentage of schools offering arts classes continues to decline or fully disappear (Sparks et al., 2015), and from observations that the arts are suffering from a scarcity of support and respect (Holcomb, 2007; Winner & Hetland, 2000).

Research that focuses on cognitive outcomes is not misplaced per se. However, although studies of transfer from arts to nonarts skills garner publicity and promotion when they find positive results, they are often oversold (Mehr, 2015; Winner, Goldstein, & Vincent-Lancrin, 2013). Of 10 previous meta-analyses examining transfer studies (combining over 240 studies in total), only three showed a causal effect of the arts on nonarts domains (Winner & Hetland, 2000). These three were listening to music and a brief improvement in spatial skills in adults (Hetland, 2000b), performing music and improved spatial skills in children (Hetland, 2000a), and dramatic engagement with texts and an increase in verbal skills in children (Podlozny, 2000). In seven other areas (arts and academic performance, arts and SAT scores, music and mathematics, music and reading, visual arts and reading, dance and reading, dance and spatial skills), no causal link was found. Many of the transfer studies were carried out without a clear understanding of what was taught and learned in the "parent" domain (the art form) and without any theoretical reason to expect transfer. New research based on more plausible transfer claims is now beginning to be carried out (see Winner et al., 2013, for a more complete review).

Humanist scholars have also long studied the arts but are naturally suspicious of scientific research on the arts as reductionist: conceptually (by framing the range of inputs and outputs that constitute "art"), methodologically (believing that quantitative measurement cannot capture the "richness" of the arts), and ethically (that the arts should not have to be "for" something at all; Currie, Kieran, Meskin, & Robson, 2014; Dickie, 1962; Liao, 2014). But the humanist resistance to arts research is now being challenged by strong research designs that strive to avoid reductionism and marry a humanist understanding of an art form with scientific methods of research.

A Latent Opportunity

Developmental psychologists cannot afford to ignore such a deeply developmentally entwined experience as the arts. Arts involvement in childhood is unequivocally out in the "real world," in schools, community activities, and parent-supported activities. It is critical to study such a central pursuit of childhood and to study it well. Such study will not only help arts advocates discover the effects of engagement in the arts (replacing anecdotes, intuition, and hope) but will also enrich our understanding of development, including the development of involvement in activities that appear to have no real reason or benefit beyond pleasure (analogous to pretend play; Fein, 1981; Power, 2000).

Important to note is that *engagement* in the arts is not monolithic. There are different levels of depth with which a child can be involved in an art form, and a variety of skills and activities that involvement with various art forms requires. Studies must take these into account and not overlook distinctions of intensity of involvement. Quality of arts programs and quality of teachers also vary within both casual and formal settings.

There is also a distinction between production and reception of the arts. All children (and adults) are *receivers* of the arts: watching drama and acting on television, seeing visual art in design and public spaces, listening to music. But here, we focus on the latent opportunity of studying children's involvement in the arts as creators of artistic products, that is, in expressive arts engagement.

Although children engage spontaneously in arts activities in the preschool years (i.e., drawing, dancing, and enacting characters as part of their daily

pretend play, when given the opportunity), and most children receive some formal training in the arts in school, only a minority of children seek out serious and intensive training in an art form. Note that here we do not consider research that asks how best to train children to reach artistic potential or how children who are gifted in an art form develop nor can we make predictions as to whether intensive, serious arts study causes qualitatively different effects than does less intensive, in-school, or at-home participation in the arts (a tangible question for future research) nor are we exploring how arts involvement affects physical health and development. Instead, we focus on research asking how arts participation affects children's cognitive and social-emotional development. We present a few specific studies of individual art forms, as there are numerous differences in the skills needed for engagement in each art form (i.e., drawing as compared with dancing) as well as skills needed for engagement in generation of new art (e.g., composing or improvising a piece of music) compared to interpretive performance of art (e.g., playing a concerto by Mozart).

Research Programs in the Arts

The recent focus on methodologically rigorous studies of the arts in child development can be classified into three broad types, distinguished by their goals: (a) Intrinsic: studies that seek to uncover the broad skills taught by each art form without regard to whether such skills transfer to other areas but as a potential first step toward better transfer studies. (b) Instrumental: studies that test the effects of engagement in an art form on some form of nonart ability such as IQ or emotion regulation (so-called transfer effects); and (c) Liminal: studies that test whether "normative" leaning experiences can be leveraged to advance development of atypical populations (rather than creating unusual learning venues for such populations).

Intrinsic: Skills Taught by the Arts

When asked what children learn in arts classes, parents or laypeople are likely to report that they learn to paint or draw in visual arts class, to act in theater class, to play an instrument in music class, and to learn a dance form in dance class. But such statements are equivalent to saying that children learn math in math class. Developmental scientists should seek to know what else children learn while they are learning the techniques of an art form. Are there general thinking dispositions instilled as students study an art form?

Before any hypothesis-based study of transfer from arts to nonarts learning can be undertaken, researchers must look at the kinds of thinking skills being taught in the "parent domain" of the art form in question. Only then does it make sense to ask whether one or more of these skills might transfer to learning in another domain of cognition outside of the arts. In order to determine the habits of mind that emerge from visual art study, Hetland et al. (2007, 2013) undertook a qualitative, ethnographic study of "serious" visual arts classrooms. They observed 38 visual arts classes at two high schools for the arts and interviewed the teachers after each class to find out what they intended to teach and why. They identified a set of *habits of mind* being taught at the same time as students were learning the techniques of painting and drawing. These were engaging and persisting, envisioning (generating mental images), expressing, observing, reflecting on process and product, and stretching and exploring (taking risks, learning from mistakes).

A similar study was undertaken by Goldstein and Winner (2012) to determine the *habits of mind* that emerge from serious theater study. They observed seven 1-hr classes for elementary school students and six 2-hr classes for high school students. By analyzing the statements the teachers made over 19 hr of classes, they uncovered a focus on physical understanding, trusting self-impulses, and paying attention to others (in the elementary-aged classrooms), and a focus on theory of mind concepts—thinking about the intentions, motivations, feelings, and beliefs of characters, as well as trusting self-impulses and physicality of their body (in the high school classrooms.)

These studies only identified a set of domain-specific habits of mind that the teachers of each discipline intended to teach. The next step is to determine the extent to which any of these habits are learned and if so, whether they spill over (i.e., transfer) into other domains. If skills do transfer, they may only do so when teachers explicitly "teach for transfer" (Salomon & Perkins, 1989). Transfer may only occur when individuals practice extensively, and when the nonarts domain requires the identical practiced skill (Diamond & Ling, 2016). The study of transfer from one domain to another has a long and vexed history, and one should never assume that a skill that "sounds" general is in fact generalized. Only careful research can

tease apart those skills that generalize from those that do not and the circumstances under which transfer occurs.

Instrumental: Effects of Engagement in the Arts

Instrumental research on the arts asks whether learning in an art form has effects on nonarts developmental domains. Here, we examine exemplary studies of this kind in visual arts, theater, and music (and we note the shortage of research on dance; see Lobo & Winsler, 2006).

Visual Arts

In a longitudinal quasi-experimental study (students self-selected into condition), Goldsmith, Hetland, Hoyle, and Winner (2016) examined whether visual arts students grew significantly stronger in envisioning skills compared with theater students. Envisioning was one of the habits of mind documented as being intentionally taught by visual arts teachers in the study by Hetland et al. (2007, 2013). Although the measure of envisioning in art designed by the authors failed to show growth over 2 years (possibly because of its difficulty), a geometry measure—a "transfer" domain that also calls for envisioning—showed greater gains by visual arts students over 2 years than by theater students. Thus, it could be cautiously concluded that students who study the visual arts gain more in geometry than do those in theater, likely because of the envisioning skills continually challenged by drawing.

Theater

Drama theorists have proposed theater as a "school for emotions" (Levy, 1997; Verducci, 2000): a way to teach children social-emotional competencies. The proposed mechanism is safe practice: as children pretend to be a character and connect their emotional states and reactions to those of that character, they learn to engage with their own and others' emotional states. In the *habits of mind* study of theater (Goldstein & Winner, 2012), paying attention to others and theory of mind concepts were two of the central skills taught in classes. This may lead to higher levels of theory of mind, emotional empathy, emotional control, and emotion regulation skills. In a longitudinal quasi-experimental study (students self-selected into condition) with elementary and high school–aged students, a year of theater classes (compared to visual art or music classes) was associated with increased self-reported trait empathy. Over the year, high school theater students also gained more in theory of mind than music and visual arts students, and elementary school theater students decreased their use of maladaptive emotion regulation strategies over visual arts students (Goldstein & Winner, 2012; Goldstein, Tamir, & Winner, 2013). In a randomized control trial with 4-year-old children, engagement in dramatic play games (as compared to building with blocks or a guided story time) led to significantly better emotional control over time, as measured by a self-report measure and by an in-lab behavioral measure (Goldstein & Lerner, 2015). We should note that further research must consider the myriad measurable aspects of interpersonal variables such as empathy (beyond self-report) such as peer-report, behavioral observation, and physiological reactivity—and the interplay among these—when attempting to ascertain the impact of engagement in theater.

Music

Learning to play music has long been proposed to positively affect IQ, possibly due to learning the "language" of musical notation, the challenge music poses to working memory and executive functioning, and/or to acquiring the habit of daily practice (Schellenberg, 2006). A randomized experimental design with 6-year-old children showed that 1 year of music training (compared with 1 year of drama classes) increased overall IQ by three points—a small but significant gain (Schellenberg, 2004). However, recent findings report that in adult twin pairs, the relationship between music practice and IQ is explainable by genetic variance rather than environmental influence (Mosing, Madison, Pedersen, & Ullén, 2015).

There has also recently been a renewed focus on the social implications of creating music in social groups. Making music together calls for shared intentionality and close attention to the mental, physical, and emotional states of the group, as well as synchronous movements (see Cirelli, Einarson, & Trainor, 2014). As a result, ensemble music playing (such as that espoused by the "El Sistema" method adopted by many schools, after school, and community programs; https://www.elsistemausa.org/) may lead to increased social affiliation with fellow music makers. One study showed that when 4-year-olds make music in a group (compared with physically similar group activity without music), they then act more prosocially toward other members of that group (Kirschner & Tomasello, 2010). Similarly, when engaged in an emotion training program with

or without music, 18-month-old infants who had engaged in the music program had better knowledge of emotional expression and the intention-action link (i.e., theory of mind) than infants who had participated without music (Siu & Cheung, 2015).

Research on how engagement in the arts affects nonarts areas must be based on a plausible transfer hypothesis and must avoid overstating findings. The discussed examples meet these twin challenges. They begin with a deep knowledge of the art form in question; hence, the outcomes tested are related theoretically to what is learned in the art form.

Liminal: Arts as Normative Learning Experience

The arts are often used as a way for atypically developing children to learn or show abilities that they might not otherwise be able to demonstrate. An emerging scientific literature has focused on using arts-based approaches to address core social deficits among youth with autism spectrum disorders (ASD). Although such approaches have included music (Hillier, Greher, Poto, & Dougherty, 2011; Kim, Wigram, & Gold, 2008; Kim, Wigram, & Gold, 2009) and visual arts (Epp, 2008), the most empirically robust domain of investigation has been the use of drama and theater-related activities (Corbett et al., 2014; Gabriel, Angevin, Rosen, & Lerner, 2015). This development has an analog in "real-world" practice, as reflected in recent documentaries (e.g., Burnham-Murray Productions [BMP]) & Regan, 2007) and books (e.g., Davies, 2004; Guli, Wilkinson, & Semrud-Clikeman, 2008; Hunter, 2014) discussing how theater may help children with ASD.

A theatrical "stance" toward social interaction is consonant with the social needs of those with ASD (Corbett et al., 2011, 2015; Davies, 2004; Gabriel et al., 2015): theater provides distance from a responsive interlocutor, permits practice of variation in social response in a safe space, and allows participants to highlight and practice individual elements of social interactions (e.g., eye contact and social referencing) in a naturalistic way without becoming overwhelmed by the attendant responsibilities of "real-world" social interaction (Lerner & Levine, 2007).

There are a number of programs developed by theater artists specifically for special needs populations (e.g., ArtStream, Daytime Moon Creations; Sense Theatre; Brown, 2011; Gabriel, 2014). Yet empirical research on the effects of such programs is rare. However, several investigators have recently developed rigorous research programs that seek to address this limitation. Lerner, Mikami, and Levine (2011), Lerner et al. (2012), and Lerner (2013), for instance, have aimed to identify whether improvisation and tightly targeted theater "games" improve social behavior and perspective taking in youth with ASD. In a sequence of studies, they first found evidence of generalization and maintenance of skill improvement several months posttreatment (Lerner et al., 2011). They then sought to use a "dismantling" approach to isolate "active ingredients," suggesting that these activities may provide a "fast-acting" route to emotion recognition, prosocial behavior, and friendship making in ASD (Lerner & Mikami, 2012).

Concurrently, Corbett et al. (2011, 2014, 2015) have examined the impact of participation in the actual production of a play on similar sets of skills in these youth while also examining the impact of including typically developing peer models. In an elegantly sequenced series of increasingly well-controlled trials, they found evidence that peer interaction quality and quantity, social cognitive variables, and (potentially) cortisol response to peer interaction improve in youth with ASD who participate in plays. These findings suggest the tantalizing possibility that the "safe space" and controlled social environment of theater activities may indeed offer a "rarified air" for youth with ASD to practice and develop social competence in ways that are unavailable to them in typical interaction or in traditional instruction. With additional recent evidence (Gabriel et al., 2015; D'Amico, Lalonde, & Snow, 2015), these studies provide a model for how the study of the arts by developmental scientists can test assumptions—and lead to optimal intervention environments—for atypical populations and provide direction in the face of otherwise intractable developmental trajectories.

Learning in and From the Arts: When, How, and Where to Go Next

Taken together, the evidence that involvement in the arts is associated with broader, nonarts-specific skills is building. The studies described here demonstrate that research on the arts can be conducted rigorously and can shed light on more traditionally researched topics in child development. Going forward, it is important to recognize that studies of the role of the arts in development should involve not only formalized arts programs and arts informed-intervention and treatment programs but also artistic activities that occur spontaneously as part of play (e.g., drawing, singing songs, making up plays). Studies should also look separately at stand-alone arts classes versus arts-integrated curricula (which bring artistic activities into academic lesson plans). These ways of engaging with the arts are often

conflated, but each have differing goals and methodologies of engagement—and, as such, are amenable to differing approaches to empirical evaluation and may have different outcomes. Research must also distinguish temporary effects of engagement in an art form (such as immediate mood changes) from long-term transfer effects to performance in other art forms or nonarts areas. Future work must also look to how arts-specific skills in areas such as creativity (i.e., musical or dance creativity) does or does not transfer to other creative domains. More theoretical distinctions between what counts as an "art ability" and what as a "transfer" ability must be made.

At the same time, it is important to note that fundamental capacities developmental psychologists care about, such as self-control and executive function, are not only important for general psychological functioning but are also important for artistic ability itself (e.g., without executive function, a musician cannot avoid distractions and transform reading notes on a page to playing notes on a violin). These basic abilities, social-emotional effects, and cognitive effects of engagement in the arts may also interact and positively build on each other. To this point, most research on transfer effects focuses on one domain of psychological abilities. Work on the interactive effects between social-emotional outcomes and more basic academic cognitive outcomes is welcome and needed. Research on the arts can, of course, be conducted more often and more powerfully, but is already being done well.

Methodological and Collaborative Concerns

Every area of developmental psychology requires a deep and ecologically valid understanding of the phenomenon under study. The study of children's abilities should begin in real-world settings in their naturally occurring forms and then lead to more specificity and carefully controlled laboratory studies. Engagement in the arts is no different and is no more difficult to study in this way than are other developmental phenomena.

There are long-standing arguments in the arts world on whether and how arts learning can be measured. Many artists and artists-teachers believe they know how the arts work in development, although perhaps not in systematic ways. The arts have their own long-standing traditions of impact and measurement. Rich narratives of a single child or a group of children's transformation as a result of engagement in an arts class are commonplace in evaluations of arts programming. In fact, there is an argument made by many arts researchers that they should only focus on qualitative work that is richly descriptive of the arts themselves, believing quantitative work threatens research and work in the arts (e.g., Omasta & Snyder-Young, 2014). That said, learning from observations and writings by artists and practitioners is vital as a way to better inform which *domains* may be affected in childhood; thus, it is critical to form real partnerships, which honor the knowledge of artists. Much of this partnership takes place in the language use and vocabulary—where an actor may talk about "finding the objective," a psychologist can find clear connections to understanding the mental state of others. In short, partnering with artists and teachers to find a common vocabulary and to find connections between what artists and teachers see in the classroom, and what developmental researchers seek to study, is critical.

Whereas humanist criticisms of psychological study of the arts have focused on their reductionist nature (Currie et al., 2014; Dickie, 1962), work that is based on a deep understanding of arts engagement itself does not do damage to the arts. Just as those who study language acquisition must have knowledge of linguistics, those who study arts must have more than a passing knowledge of the art form they are studying (e.g., McCarthy et al., 2006). In the same vein, researchers must understand what aspects of participation in a given art form may be intrinsically motivating to the practitioners, both to (qualitatively) capture the richness of the experience and to quantitatively ascertain (and methodologically control for) such motivation as a potentially vital "nonspecific factor" that may play a key role in the effects of arts on development. Developmental psychologists must also bring study of the effects of engagement in the arts squarely into the current knowledge of developmental science, defining whether and what changes can be considered relevant and appropriate.

A balance must be struck between the richness of qualitative studies of arts programs and the reduction necessary to conduct experimental work on these programs. But the latent opportunity to discover truths about child development in the arts classroom should not be overlooked. Arts classes become more complex and developmentally appropriate to the growing child's ability over time—a progression developmental scientists can well take advantage of.

Conclusion

Many children are naturally drawn to the arts and engage in drawing, singing, dancing, and dramatic

play happily and readily throughout childhood. Current work is beginning to bridge this critically understudied activity with developmental science. Developmental psychologists and artists can create rich and diverse partnerships with which to investigate these issues in the real world. Any activity as universal and engaging as the arts is likely to have important cognitive and social and emotional functions. Developmental scientists cannot afford to ignore such central real-world behavior.

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