

## How Early School Experiences Impact Creativity

### *An Ecological Perspective*<sup>1</sup>

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"Play something for me."

"What do you want me to play?"

"Anything you want! Just whatever comes into your head."

"Uh . . . without music? I dunno!"

With encouragement, some children will take the tentative steps necessary to create a song. Younger children who have never taken lessons happily poke at keys, creating an atonal, arrhythmic stream that, by Western standards, would not be considered musically pleasing. Older children take a different tact. After looking rather uncomfortable and somewhat helpless, they play a song that they have been taught by a friend or sibling (such as "Chopsticks" or "100 bottles of beer on the wall"). When I ask for something more "creative," they most often deny my request, stating that the very reason they have come for lessons is to be taught *how* to play and what did I expect?

The same task, the same setting, but the younger children are more likely to attack the creative challenge fearlessly. Unaware of harmonic rules, these children seem oblivious to tonality, allowing their creations to include atonal combinations. The older children give a safe, constrained

<sup>1</sup> In preparation for writing this chapter, we each responded independently to questions about creativity and imagination in the early years and how the increasing emphasis on the acquisition of knowledge and analytic skill as children move through schooling might affect their development. Our written responses yielded "reflections-on-practice" (Schon, 1983) and a collection of critical incidents from which we each generated personal practical knowledge (Connelly & Clandinin, 1985) in narrative forms (Bruner, 1986). In merging our responses in this chapter, we did not set out to come to consensus or to speak in one voice, nor did we presume to speak for the early childhood education community (although much of what we have to say is consistent with literature in our field). Instead, we have attempted to offer here the range of our understandings, developed through observing, stimulating, supporting, and wondering at young children's creativity, knowledge, and analytic skills in a variety of settings.

response or ask for direction. Following instruction, the results are no more encouraging. Once taught that a C chord safely goes with a group of notes in C major and then asked to create music, children will play only what they think fits within the C chord structure. They know what is "supposed" to work and the sounds that emerge are reasonably coordinated, safe, and not unpleasant or atonal. It is as if their first awareness of tonality inhibits their creative choices and the resulting creation is neither stimulating nor appealing. It is rule bound and mechanical. However, children who learn to play "by ear" seem more ready to develop songs and express themselves through creation.

What is happening here? We are coming here together to address the question of how the acquisition of knowledge and analytic skill impact the development of creativity from the vantage points of experienced teachers of young children. Together we have accumulated more than 150 years of experience teaching children between the ages of 3 and 15 in private preschools, a parent cooperative preschool, a campus-based laboratory preschool, public kindergartens and primary schools, public and private alternative schools, and in individual music instruction. Several of us are visual artists; several are musicians. All of us value creativity in the children with whom we work.

For all the many ways our experiences differ, for the most part we come to the questions of the development of creativity and the acquisition of knowledge and analytic skills from an ecological perspective. Simply put, context matters. One cannot understand or influence a child's development of creativity, knowledge, and analytic skills without taking into account the multiple, layered contexts in which they live and learn and how these contexts interact and change over time.

We begin by examining the ways in which creativity manifests itself in schools, particularly in the early childhood years (ages 3 through 8). Then we address the question of whether creativity might diminish or be deferred as children acquire knowledge and analytic skills in their subsequent schooling. Finally, we explore conditions in schools and society that might affect the development of creativity.

#### SEEING CREATIVITY IN EARLY CHILDHOOD CLASSROOMS

We recognize creativity and imagination in many guises. We are alert to the possibility of seeing it in a wide variety of times, places, tasks, and materials, in teacher-directed activity and in activity initiated and shaped by the children themselves. Obvious places to look are in creative writing activities; at the art table where children express themselves through a variety of media such as paint, paper, glue, clay, and a variety of odds and ends; in dramatic play; and in their play with blocks. But there are so many other places and times throughout the day when children respond

to problems and/or stimuli in creative ways. Throughout this chapter you will find examples of children demonstrating creativity and imagination in all the areas above as well as while on a field trip, when addressing one's own fears of being teased, while practicing handwriting, when taking a fill-in-the-bubble test, and in a variety of other situations. We see children developing and exercising creativity in the work they produce, in the processes they engage in, and in their wonderings and musings across all content areas.

### **A Wider Lens**

A group of kindergarten children were read *If...* by Sarah Perry (1995). The book uses M. C. Esher-like illustrations to lead children to consider surprising propositions they might not have previously imagined such as "If fish were leaves" or "If cats could fly." The book concludes by inviting the children to write and draw their own surprising propositions. Many children wrote and rendered ideas that were very similar to the ideas presented in the book: "If dogs could fly" or "If fish could fly." Beth, however, produced two ideas. The first idea, "If cars were on sidewalks," was similar to those of other children in the class. The second, "If love is God's fireworks," was rather remarkable.

In another kindergarten classroom, a large interlocking floor puzzle was used initially as intended by a group of children to count the numbers on the puzzle. Then they made it into a hopscotch grid that they used with great delight. Then they used it as a path to "crab walk" over. Then they used it to measure their long jumps as they leapt over the pieces. Following the long jump competition, they used the same puzzle pieces to create a three-dimensional box in which they hid.

In these examples, the children created products that delighted the creators and their audiences alike. In the first, few would fail to recognize Beth's creativity. But in the second, others might not have recognized or valued the children's unconventional and boisterous uses of a material that was intended for one very specific purpose. Creativity is not a value-free concept. It is colored by expectations of what a situation should require, how materials should be used, and the ways in which particular children *should* respond to both. What we regard as manifestations of creativity to be celebrated others might see as insubordination, failure to follow directions, or signs of developmental deficits.

A child taking his first fill-in-the-bubble test in kindergarten saw the answer sheet of open circles as a blank canvas and meticulously filled in circles to make a series of pictures. Needless to say, few of the circles he filled in corresponded to the right answers and he was immediately referred by his teacher for special services. He was imagining possibilities in a sheet of tiny circles – a far more intellectually challenging task

than identifying the picture of the horse. Seen through others' eyes, he was not capable of following directions. It is interesting to note that the way the child interpreted the task – as an opportunity to create pictures using a bunch of circles on a page – is quite similar to one of the tasks on the Torrance Test of Creative Thinking – Figural Test (Torrance, 1966, 1974, 1990, 1998). This child's response would have scored high on that test.

A 6-year-old child routinely produced handwriting practice sheets that resembled illuminated manuscripts with tiny figures running over and between the repeated lines of large block letters. His handwriting was merely passable. But each tiny character had a story and the plot lines were elaborate. His understanding of story structure was sophisticated. His teacher celebrated his creations. But his parents saw this "fooling around" as a sign of possible developmental delays, not as the kind of elaboration that others see as a fundamental aspect of creativity (e.g., Baer, 1997; Guilford, 1956, 1967; Guilford & Hoepfner, 1971; Torrance, 1966, 1974), and he was scheduled for psychological evaluation.

Both children saw possibilities and created intellectual challenge in the (literal and metaphorical) small spaces allowed in routine and often mind-numbing tasks. In the first case (the child taking his first bubble test), the parent saw creativity but the teacher did not. In the second (the elaborated handwriting), the opposite was true. Arguably, both children had not yet learned how to "do school." Their choice of tasks and times for expressing creativity were unfortunate. Had they only been in art class at the time, creating with the materials offered in teacher-planned activities, their efforts might have been valued differently.

In addition to narrowed constructions of what was valued as creativity, narrowed beliefs about who these children were might have been at work as well. Creativity in children can be overlooked simply because of individual characteristics or because of their membership in a group in which many see only deficiencies and fail to look for strengths. Heath (1983) documented the richly embellished narratives that a group of children from a very poor community offered during classroom "show and tell." Their teachers, working across boundaries of class and culture, held implicit values regarding norms for oral sharing. Linear descriptive narratives about real objects and events were valued. These discourse patterns, familiar to white middle-class children and their teachers, focused on information elicited by questions such as: What is this called? What color is it? What is it used for? The children living in poverty, however, were raised in a culture with a strong oral tradition. At home, they were becoming skilled participants in the social exchange of intricately woven and elaborated narratives that blended and elaborated on the real and imagined, and they offered the same (often nonlinear) kinds of responses in school. Marked as they were in their teachers' eyes by their poverty and linguistic differences,

their elaborate creative performances were perceived as indications of deficiencies.

Similarly, the answer sheet artist was viewed by his teacher as a child who could not be expected to do well because he was from what she considered a "broken" home. The creator of illuminated practice sheets was the object of his parents' deep concern because he was very small in stature. For these children and the elaborate storytellers, expressing creativity in times and tasks not conceived of by adults as permitting it may have contributed to adults overlooking its demonstration. Further, being marked by adults as at risk for failure may have supported their interpretation of these behaviors as signs of deficiency rather than creativity.

We take the position that creativity is to be found in a wide variety of tasks and times and in all children. Valuing only those manifestations of creativity that appear when adults expect or require them and recognizing creativity only in those children who we deem capable of creativity unnecessarily narrows the lens and limits our ability to understand and support its development.

#### CREATIVITY AS A TOOL FOR LEARNING

Those of us who see learning as an act of mediated construction rather than passive reception find it difficult to consider the growth of knowledge and analytic skill as separate from or at odds with the exercise and development of creativity and imagination. We routinely see young children wield their creativity and imaginations as tools for construction of new knowledge. They invent, combine objects and ideas in novel ways to make sense of their worlds (Cuffaro, 1995; Dewey, 1934/1958), and develop and apply analytic skills as they assess their creations against standards they have set for usefulness or aesthetic pleasure. They pose and solve problems of their own making, hypothesize about the people, objects, and events they encounter, and experiment with ways to represent their new knowledge. In the examples that follow, young children use imagination, invention, construction, and creativity as well as a growing fund of knowledge and skills of analysis and critique to master and make sense of their worlds through problem solving, hypothesizing, and representing.

***Problem Posing and Problem Solving: Physical Knowledge.*** Problem solving and applying knowledge to gain some sense of control and mastery of their physical and social worlds is the focus of much of a young child's activity. In the three examples that follow, children analyze situations that they find puzzling or challenging, they imagine and test possible ways to pursue solutions to these problems, and in the process they acquire new knowledge.

Three children working in the block area of the kindergarten could barely contain their enthusiasm. "Let's make this ramp even higher so we make the ball roll all the way over there. There it goes! Waaaay over there! Now this time let's make this part longer. No, this part needs to be higher. How about this ball instead? No! No! Do it this way so the ball won't fall off." As children plan, construct, and test their inventions they are applying their current knowledge about a situation. They imagine possibilities based on their current understandings, and they test those understandings in situations of their own invention. They assess outcomes against the standards of their intentions and goals, and in the process they generate novel (to them) ideas about height, distance, gravity, and friction and about what these things might have to do with the behavior of rolling objects and inclined planes.

***Problem Reposing and Problem Solving: Logical/Mathematical Knowledge.*** A group of 6- through 8-year-olds enjoyed playing with the "elimination puzzle." The object of the game was to eliminate tokens by jumping them with any other token as in checkers and leave as few as possible on the playing board at the end of the game. After playing the game over the course of several weeks, many children were finishing the game leaving only two, three, or four tokens. Only a few times did a lucky child finish the game leaving only one token. The teacher challenged the children to think of a way to play this game and only leave one token each time. Many children continued to play the game recording the jumps they made and hoping that they would "win." One child posed the problem differently. He took the game board and tokens off to a table and for several days worked on his plan. Eventually he had recorded a series of jumps that indeed left only one token each time he played. When other children in the class asked, "How did you figure that out?" he answered, "It was easy – I played the game backwards!" Then he proceeded to show the class how he had started with one token on the board and had then recorded the series of jumps he had made while filling the rest of the board with the tokens. He had conceived of the problem in a new way and used this reconceptualization to reach his goal.

***Problem Solving: Social Knowledge.*** Figuring out human behavior – one's own and others' – can often be far more challenging than figuring out the physical world. People do not behave as predictably as balls and ramps. You can analyze past behaviors, imagine other ways of behaving, and manipulate conditions that might lead to certain behaviors and then analyze the outcomes against your hopes. But often the process is riskier and the outcomes far less predictable than in problem solving with inanimate objects. In the following example, one child did all these things – analyzed past behaviors, imagined possible ways of behaving,

manipulated conditions under which he might perform certain behaviors, and predicted likely outcomes – as he explored his own and other’s ideas of gender-appropriate behavior.

Stephen often dressed up in dresses and high heels from the dramatic play area, and he enjoyed walking around the kindergarten classroom this way and amusing his best friends Jim and Ryan. When the class performed a play about Rosa Parks, Stephen was eager to play the part of Rosa and he clearly enjoyed wearing the dress and high heels that were part of the costume. As Halloween approached, Stephen decided he would come to school as The Little Mermaid wearing a mermaid costume and a bright red wig. Stephen’s parents were very concerned and tried to convince him to dress up as Flounder the fish, but Stephen was determined to be The Little Mermaid. When asked why he wanted to be the mermaid, Stephen explained that the mermaid costume included a red shiny wig and he wanted to feel the long shiny hair on his head. Stephen’s mother said “But Stephen, everyone will make fun of you for dressing up like a girl on Halloween.” This led Stephen to worry about his friends making fun of him. The next day, Stephen told his teacher that he was still determined to be The Little Mermaid for Halloween and he had a plan. He had decided to phone Jim and Ryan all of his friends to ask them not to make fun of him. He told them that he was still a boy but he wanted to wear the Little Mermaid costume. They all promised not to make fun of him. On Halloween he came to school dressed as the Little Mermaid. The children admired his costume and no one made fun of him.

***Hypothesizing: Biological Processes.*** Hypothesizing involves imagining explanations that involve intellectual leaps from what is known to what is as yet unimagined but is soon to be known (Dewey, 1934). Imagining what is beyond one’s current understanding is a creative act. For example, on a field trip to a farm a kindergarten child stayed behind the group to continue to stare at the cow in the milking machine munching green hay. He mused to no one in particular, “This cow isn’t working right. It’s eating green stuff and the milk is coming out white.” This child had a hypothesis about how milk production works, an explanation for a most puzzling claim made by adults that cows are the source of milk, *white* milk. He demonstrated two of the “conditions” of creativity set out by Bruner (1973) – detachment or the “willingness to divorce oneself from the obvious” and a compelling need to understand something (p. 212–213). His explanation, his own mental creation, was called into question by this new experience. It would require an imaginative leap from the comfortably known to the unknown, and it would require inventing a way to make sense of this puzzling new piece of information in light of currently held knowledge. In the process of generating and testing knowledge he was deepening his understanding of the fundamental scientific concepts of processes and

transformations. An inability to imagine things other than the way they have seemed to be shuts the door to the acquisition of new knowledge.

**Representing: Signs and Symbols.** Piaget noted the cognitive achievements of being able to think about something that is not present and the ability to construct symbols to stand for something not present. Both creating symbols and using symbols to represent reality require an act of imagination and the exercise of one's creativity. Whether it involves pushing a block along the floor while making motor sounds, constructing a cardboard model of the neighborhood, or the great leap of imagination that allows children to accept that marks on a page represent words that represent ideas, "representation" is a creative achievement.

An example: A flurry of chef hats passed by on their way to the kindergarten kitchen area. The chefs were about to cook up and serve their daily menu choices. One child's father owned a restaurant and the child had enlisted friends to work in *his* restaurant. A few pieces of scrap paper discarded from label sheets for the computer were stapled together to create the chef hats. Their creative dishes included the usual available plastic play food as well as math materials enlisted to create soup ingredients. (There is nothing like counting cube and pattern block soup!)

We know that through music, art, and dramatic play children acquire, test, and make new knowledge their own. They play out experiences in their everyday lives representing the roles and artifacts of complex environments such as restaurants. They dance the shapes of letters, representing these unfamiliar symbols with their own bodies. Challenges such as "How many different ways can you make your body look like a K?" and "Can you make a K with two peoples' bodies?" require children to closely observe both letter forms and bodies, to try multiple poses, to compare, to analyze what matches and what does not, and to generate other possible solutions and check again. Representing draws on both flexible and generative thought and analysis and yields more deeply held knowledge. Followers of the Reggio Emilia approach to curriculum and teaching (and many others) see children's creative efforts of forming mental images of experiences and representing these experiences in a variety of media and forms – using what they refer to as the "100 languages of children" – as a powerful means of acquiring knowledge (Edwards, Gandini, & Forman, 1998).

So we recognize creativity in many guises and value it not only in artistic products but the processes that support the acquisition of knowledge through problem posing and solving, hypothesizing, and representing. Bringing this broad view of creativity to the questions of the impact of later schooling on its continued development raises a further question: are we looking for creativity in enough places and at enough times and across enough tasks and in all children?



**SCHOOLING AND THE DEVELOPMENT OF CREATIVITY**

Working within this broad definition of creativity, we turn now to a consideration of the question of whether the acquisition of knowledge and improvements in analytic skills account for a diminishment (or perhaps a deferral) of creativity. Again, we bring a wide lens. We look first at children's social and emotional development. Then we consider what and how children learn in schools. Finally, we examine broad societal conditions that might impact the sometimes observed decline in creativity as children grow.

**Developmental Characteristics**

In kindergarten, children are beginning to develop empathy for others. Interest in other children as well as interest in other people's points of view present new social challenges. At the same time, children in kindergarten continue to develop an understanding of cause and effect relationships. They begin to understand how their own behavior impacts the behavior of others. Kindergarten children experience the joy of developing new friendships as well as the pain of rejection. They strive to be accepted by their peers and they seek approval from adults. They may begin to consider their own behavior from the point of view of others. As a result, many children become more cautious in their social interactions with peers and adults. They may begin to conform to the ideas and values of the group to gain acceptance and approval.

Children in kindergarten are also just beginning to develop moral judgment as they clarify their own ideas of what is right and what is wrong. Children who are 5 or 6 years old tend to have rigid ideas about following rules because they usually demonstrate limited understanding of the moral reasoning behind the rules. Many children in kindergarten perceive rules as arbitrary and imposed on them by adults. Because of their limited understanding of morality and their personal process of value clarification, young children tend to interpret and apply rules literally. They tend to have a narrow view of what is good and what is bad, and they are easily frustrated by self-perceived failure (Allen & Marotz, 2003). As children proceed through the normal process of social and moral development, they may be temporarily less likely to take risks in their approach to making decisions, solving problems, or thinking creatively if the outcome of those decisions would result in social rejection.

Stephen, who planned to dress as The Little Mermaid, illustrates many of these characteristics. But his story illustrates as well the mediating influences of a context that supported his choices and encouraged him to apply creative problem solving to address rather than succumb to tendencies to conformity.

### How as Well as What Children Learn

Examples above show that many, although certainly not all, children develop and demonstrate impressive levels of creativity in the years before formal schooling in their play and in their arts-related activities, and they also use that creativity as a tool that helps them in the acquisition of knowledge. As children proceed through school, the academic demands increase considerably. More complex knowledge and higher level analytic skills are required. But many, although certainly not all, children continue to learn using the same methods described in the early childhood settings. The following examples illustrate the productive interplay of creativity and knowledge acquisition and analysis in the elementary school years, suggesting that *what* children learn as they proceed through their schooling may not be the whole story. *How* they learn these things may matter considerably.

Science taught as a process of inquiry – wondering, imagining what might be, testing to see what might happen if (DeVries, Zan, Hildebrant, Edmiaston, & Sales, 2002) – uses creative and imaginative thinking as tools to acquire knowledge. By encouraging learners at all levels of their education to imagine and create rather than be lectured to about the wonders of science, inquiry approaches to science engage children in problem solving and seeing that there are many ways of arriving at a solution. All of the children's ideas are valued and developed through processes of observation and testing. Emphasis is placed as heavily on the process of coming to know as on the knowledge or product that results.

Constructivist math programs such as that described by Kamii (1985) lead children to seek patterns and to hypothesize and test patterns and relationships found in numbers and spaces. These approaches to math learning focus on "thinking about my thinking." They require children not only to get the answer but also to be able to explain how they found it. Children are encouraged to think flexibly, to generate multiple possibilities, and, as in inquiry approaches to science, to come to recognize and value the possibility that there are many ways of looking at or thinking about something.

Similarly, balanced literacy programs approach instruction in the structural features of language as an analytic task of deconstructing, comparing, and seeking patterns in the ways in which written language represents speech and thought. For example, children are encouraged to observe, hypothesize, and test their own ideas about how "-ing" changes the meaning of a word or to identify patterns in those cases in which the letter *g* has a hard sound. Children in such programs are encouraged not simply to decode but to meaningfully *respond* to texts. They construct meanings and connect and compare ideas found within a text. They also connect and compare ideas found in different texts, and they test how these ideas fit (or

contradict) ideas they may have that are based on their own experiences. In doing so children are helped to create meanings and to analyze ideas, using their abilities to imagine possibilities and create propositions, and to analyze these possibilities and propositions to test and warrant new knowledge. In doing this they are using creativity and analysis in tandem.

Critical approaches to teaching social studies put learners in the role of social critics and social problem solvers (for example, by analyzing the taken-for-granted in terms of equity and social justice and by imagining the world other than how it currently is). In the arts, the opening example of the children who learned music theory as they learned to play “by ear” stands in contrast to other ways of learning. These children, too, imagine what might happen if, and they test their hypotheses as they experiment with the sounds and patterns they can produce.

Might creative development progress along different trajectories for children who are nurtured by adults who take approaches to learning such as those described above? Might these be different from learning trajectories of children who only experienced teaching methods that require them to read, listen, and produce only right answers? And what of children (the majority) who experience some of both approaches as they progress through their schooling? Would findings of diminished creativity hold in children who have experienced learning in contexts that honor and encourage their imaginings and creations and employ generative, creative processes in learning across content areas? If differences in creativity could be reliably documented between children schooled in different settings, a closer look at the contexts and processes in classrooms might uncover other variables that might contribute to the continued growth or decline of creativity.

### **Classroom Contexts**

Classrooms using approaches such as those described above in early childhood settings and through elementary and secondary schooling share important characteristics. They cultivate the kinds of thinking and behaviors that characterize creativity – risk-taking, flexibility, fluency, deferring (but not abandoning) critical analysis – in addition to nurturing the acquisition of knowledge and analytic skills. They are settings that are safe and nurturing and respectful of children’s thinking. They provide ample time and materials and experiences to provoke and sustain questioning, wondering, exploring, and experimenting. And they do so within group settings that may both support and constrain the continued development of creativity.

***Nurture and Respect.*** Teachers and other adults can certainly stymie creativity in children, or they can help children become more creative. Adults’

responses to children's expressions of creativity run the gamut from seeing expressions of creativity as cause for concern (seeing them as a source of annoyance or inconvenience) to an accepting of such behaviors to viewing them as a cause for celebration. Teachers can be so intent on children producing only right answers and perfect products that at times they might stymie students' creativity in the process. However, they may create an atmosphere of openness and respect for children's ideas, thinking processes, and other forms of self-expression and do so without losing sight of the knowledge and skills needed for both creative and academic development.

This stance is built on a commitment to nurturing the whole child. The social, emotional, and physical development of children is seen as important in its own right as well as important in the role such development plays in cognitive development. Building on what the children bring of themselves, their experiences and background knowledge in all subject areas, they are encouraged to think and be curious and ponder. It is this process, repeated over and over in classrooms, that allows children to become confident and competent thinkers and allows children the freedom to think in creative and imaginative ways.

Such classrooms are psychologically safe. They permit the kinds of intellectual risk taking that is involved in seeing possibilities in materials and situations, imagining what is not currently known, creating hypotheses, and inventing ways to test them. And they are peopled by adults who are alert to and celebrate their explorations and imaginative leaps and conceptual constructions. They are respectful, not condescending or dismissive, in response to children's imaginings and creations. They do not regard children's ideas as merely cute ("how sweet – he thinks the cow's milk should be green!") but as legitimate, and often difficult and even quite impressive, cognitive achievements. These adults *expect* creativity and imagination in children's thinking, are alert to its possibility to show up in many areas, celebrate it when it appears, and search for ways to make the most of it as a tool for acquiring new knowledge and exercising analytic skills.

***Time and Materials.*** Classrooms that nurture creative thinking surround children with things to explore and puzzle over and question, as well as the encouragement and time to do so at length. Young children are likely to experience a school environment *designed* to encourage and stimulate curiosity and creativity. A variety of paper products are waiting for young hands to apply the creative process, which expresses itself through a variety of media. Watercolor paints, tempera, markers, colored pencils, chalk, and crayons are always on call, available to anyone with the need to express an idea. There are a plethora of materials available that include such things as aluminum foil to create silver sculpture in three dimensions; yarn to roll, curl, and heap upon objects; and tape and paper and tacky glue to form

flat paper into three-dimensional objects. Classrooms for older children can offer a wide variety of experiences for the children to experiment and explore, as has been seen in the previous section.

**Group Structure.** Living and learning together in a group is a fact of school life. For some children in some classrooms, being part of a group may contribute to the development of creativity, and in other children in other classrooms, being part of a group may suppress or halt its growth.

Shared experiences over time can contribute to the growth of creativity. Why else would there be so many “artist colonies”? Like many of the Impressionist painters congregated in cafes and shared studios, having companionship in expressing oneself builds security and frees one to be more creative and expressive.

In the beginning of a kindergarten school year there is an obvious distinction between the children who are practiced in doing “arts and crafts” and those who lack that experience or interest. The arts and craft children are more likely to employ the materials available to create projects on their own. However as the year progresses the other children watch, imitate, and also begin to create. The creativity in the classroom expands. Similarly, a young and free-spirited interpretative dancer in the classroom, by her example and modeling, inspires some of the other children to express themselves using movement.

We observed one kindergarten class that had just a few children at the beginning of the school year who expressed creativity using art materials, but all of the children had developed impressive creative abilities by the end of the year. They created sculptural objects out of everything they could find – scraps of paper, yarn, string, clay, and project leftovers available to them in the art center. They imagined alternate uses for materials found throughout the classroom. Materials crossed over from the buckets of math supplies into the kitchen area as well as to the art center. Colored math manipulatives that could be linked together became spaghetti, a jump rope, a dog leash, or a pile of rocks needed to go with the dinosaur play or whatever prop their imaginative play required. As the year progressed, the creativity level of the whole class and each individual child increased as they shared experiences, traded ideas, and observed and imitated others.

However, the fact that children are educated within the context of peer groups requires some degree of conformity. Organization of curriculum, the physical environment, the schedule, and expectations for behavior provide a predictable, consistent learning environment in which children can feel safe enough to take risks and experiment with ideas, and at the same time these regularities and rules establish a context that requires all children to conform to expectations.

In early childhood and elementary classrooms, children are encouraged to cooperate with others and become a part of a classroom community.

In the process of conforming to and cooperating with the needs of others, most children look for models to learn about how to behave in appropriate ways. They try to imitate behaviors that are rewarded with acceptance and approval from peers and adults. In early primary grades children can be very uninhibited as they share their ideas and very rarely will others react negatively to their ideas or those of their classmates. Is this a function of their age and stage of development? Is it because they are so egocentric that they do not really care what others say and are totally self-involved? Is it that they have not yet internalized others' expectations of them? Or that perhaps others are not (yet) communicating an expectation that they conform?

By the time they reach intermediate school, however, children understand "how school works." Children who risk creative responses that do not conform to expectations or that stray from the one "right answer" – that is, the one in the book – risk other students rolling their eyes and shooting looks at one another. In the intermediate grades children are very aware of others and what others think of them. Students hesitant to think "out of the box" and share interesting ideas for fear of being looked at as different by their peers.

### **Social and Political Environment**

Beyond the classroom, children's development of creativity may be influenced by families, the material culture (especially toys), the media, and politics.

Families' values and life styles may nurture or impede the development of creativity. We all know children who are academically gifted students who have been extremely creative and imaginative and those equally talented academically who have struggled to be creative and imaginative. In many cases, the first group of children came from families who encouraged creative expression and creative thinking and the second came from families who encouraged only academics.

Children's experiences outside of school are too often characterized by overscheduling and overly regimented activities that allow children too little time to think and explore the world around them. Play dates, camps, clubs, and teams are arranged and planned by adults and leave children no opportunity for imaginative play that feeds creative development.

What little unscheduled time a child may have could very well be dominated by television, video games, and computer games. The average American child spends more time watching television than pursuing any other activity (including attending school), except sleeping (American Psychological Association, 1993). They average 35 hr per week of screen time, either watching TV or playing video games. Before entering kindergarten children are likely to have spent 4,000 hr watching television. When

they are not actually watching TV, children may well be playing video games or with toys linked to movies or TV programs (Levin, 1998).

Media saturation of children's time impacts both the content of children's play and how children play. Much of children's play has become scripted. It is highly repetitive in nature and includes very few original thoughts or ideas, as when children play with toys linked to movies or TV programs to reenact the stories they watch in the movies and on television. (And because so many children own the movies and programs on video tape or DVD's, children often have watched the stories many times prior to play.) Children rarely diverge from the TV or movie script in their play. Their ability to improvise is limited, so to continue their play, they repeat the same stories over and over. And although there continue to be alternative multipurpose toys and materials available to children (such as blocks, paper, paint, clay, and plastic fine-motor-skill-building manipulative toys), technology- and media-related toys have a powerful grip on most young children.

Toys not related to the media have become increasingly more specialized and realistic. A child wanting to play doctor may now be using realistic toy props such as plastic needles, a stethoscope, child-sized blue or green scrubs, or even an electric X-ray machine that lights up to show images of realistic skeletons. Another child may want to play chef in a toy kitchen complete with light-up stovetop, whistling teapot, and microwave oven with cooking timers. Each child may even be equipped with a toy cell phone clipped to her belt loop. Although these toys are appealing to adults and children, at least initially, they too may dictate a child's play rather than invite creative and imaginative play.

In the political arena, the implementation of No Child Left Behind legislation and its resultant pressure for students to be successful on numerous tests is now driving the curriculum and narrowing its focus to training children to produce single right answers. Time for creative and imaginative experiences in the arts is being reduced to make time for more attention to academics. Teachers' use of teaching methods that develop and apply children's creativity in service of knowledge acquisition is being discouraged, and teachers are expected instead to use instructional scripts with little room for developing flexible and creative thinking. Even preschool programs are not immune to the pressures for producing high test scores, and too many have adopted direct academic instruction to the exclusion of exploration and play.

Have we forgotten the importance of attending to the whole child? We need to focus on the development of knowledge, reasoning, and logical thinking and *also* provide opportunities for children be imaginative and creative. Are we, by example, teaching our students that there is only one right answer, only one way to think? Are we sacrificing creativity in children and their teachers for test scores? We could very well be creating

a generation of students who will be good convergent thinkers and test takers rather than the thoughtful, creative, and imaginative thinkers the 21st century will need.

#### CONCLUSION: IT DEPENDS

Returning to the question how the acquisition of knowledge and analytic skill impact the development of creativity, our answer, in short, is, "It depends." It depends on what counts as creativity and when it is measured, and it depends on the contexts and the methods by which knowledge and analytic skills are acquired. We do *not* conclude that creativity on one hand and the acquisition of skills and knowledge on the other are (or should be) viewed as fundamentally in opposition. If anything, it is just the opposite – they go hand in hand. Creative thinking is a powerful tool in the development of reasoning skills and the acquisition of knowledge, and knowledge and reasoning skills are important tools in extending creative thinking.

In coming to these answers, we have taken a broad view of creativity, a constructivist view of knowledge and skill acquisition, and an ecological view of both. We hold a broad view of creativity that requires being alert and open to its many manifestations in unanticipated contexts and tasks – and in all children. Teacher-designed and -directed tasks may or may not capitalize on children's abilities to imagine alternatives and construct new possibilities and otherwise reveal their creativity. Child-initiated tasks – either those promoted in many child-centered constructivist classrooms (where, for example, the child was granted the time and respect to pursue his own strategy in the Elimination Game or the children explored multiple uses for a floor puzzle) or those inserted by children in the small spaces permitted in routine tasks (recall the illuminated handwriting practice sheets and dot creations on an answer sheet) – may or may not call for creative responses, but they hold great potential for doing so.

We see creativity not only as a skill or disposition to be learned but also as a tool for acquiring knowledge and analytic skills. A constructivist view of learning not only permits but *requires* imaginative leaps to entertain new ideas and to make possible creative combination and recombination of new knowledge with the old. It recognizes the significance of children's representation of their knowledge in play and views the use of signs and symbols and the arts as creative acts. We also recognize and encourage the application of children's analytic skills as they evaluate the quality of their new ideas and representations, modify them, and evaluate again or, as they take apart a problem, hypothesize possible solutions and then test them and evaluate the outcomes. This perspective on learning leads us to believe that it is not *what* children are expected to learn as they move through the grades that appears to defer or diminish creativity, but *how* they are expected to learn these things.



We acknowledge that what may be happening within the child as she encounters new knowledge and skills includes the very real possibility that energies devoted to acquiring increasingly more complex knowledge and skills might temporarily drain resources once available for other activities. We also recognize that children grow into new social awareness and sensitivity to the opinions of others, which may impact the expression of their creative ideas. And we recognize as well that these various kinds of growth are taking place in very particular contexts that may or may not recognize and celebrate creativity or encourage its employment as a tool for acquiring new knowledge and skill.

Getting past “it depends” could therefore require research questions and methods that focus widely on the contexts in which children grow and learn – research methods that use rich documentation of children’s thinking, behaviors, and products in a wide range of contexts and tasks, such as the documentation and interpretation processes used by those affiliated with the Prospect Center (Himley & Carini, 2000) and the schools of Reggio Emilia (Edwards et al., 1998). These programs and others like them provide challenging ways of thinking about ways to study children’s growth in all developmental domains and academic content areas, including the development of reason, the acquisition of knowledge, and the growth and expression of creativity.

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