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Playing around in School: Implications for Learning and Educational Policy

Kelly Fisher, Ph.D. Candidate [1]

Kathy Hirsh-Pasek, Ph.D. [1]

Roberta M. Golinkoff, Ph.D. [2]

Dorothy G. Singer, Ph.D. [3]

Laura Berk, Ph.D. [4]

Temple University[1]

University of Delaware[2]

Yale University[3]

Illinois State University[4]

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Abstract

A fundamental question has spawned fervent debates in classrooms and on Capitol Hill: *How* do we best educate children to be successful in a global, ever-changing world? Here we present the evidence that playful learning pedagogies not only promote important academic learning but also build the skills required for success in the 21st century. A brief review of current educational trends and their underlying philosophies is followed by introduction of the concept of "playful learning," a teaching approach that uses free-play and guided-play activities to promote academic, socio-emotional, and cognitive development. The chapter then reviews correlational, observational, and experimental literature on playing around in school and offers suggestions and future directions for research in the emerging playful learning domain.

Playing around in School: Implications for Learning and Educational Policy

> *"If education is always to be conceived along the same antiquated lines of a mere transmission of knowledge, there is little to be hoped from it in the bettering of man's future."* —Maria Montessori, The Absorbent Mind, 1995 (p. 04)

In an era marked by globalization and advancing technology, 21st century children must do more than just learn facts. They must engage in the world around them, actively seeking new knowledge and solving problems. They must persevere in the face of complex challenges and must generate solutions by synthesizing, transforming, and applying information in novel ways. They must be able to communicate, collaborate, and lead effectively. In short, the 21st century children must be creative, flexible thinkers and lifelong learners who can achieve significant change in the world (Bell-Rose & Desai, 2005; Fromberg, 2002; Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009; Resnick, 2007). In this review we present the evidence that playful learning pedagogies promote key cognitive and social skills while continuing to build the academic content knowledge required for success in what has been deemed the "knowledge age" (Edersheim, 2007; Gardner, 1999).

The Great Divide: Academics versus Play

A fundamental question has spawned fervent debates in classrooms and on Capitol Hill: *How* do we best educate children to meet these goals (Brown, 2009; Jones, 2008; Pellegrini, 2009; Rothstein, 2008)? In the wake of recent education reform (NCLB, 2001), reports show that many prekindergarten and early elementary classrooms have replaced playful experiences with scripted curricula that directly link to state education standards and assessments (e.g., Miller & Almon, 2009; Pellegrini, 2005; Sunderman et al., 2004). Children in full-day kindergartens in Los Angeles and New York, for example, commonly spend three to four hours per day in literacy and math instruction and test preparation compared to 30 minutes or less in free play (Miller & Almon, 2009). This trend extends into elementary school, where instruction and test preparation have replaced art, music, physical education, and recess (Abril & Gault, 2006; Graber, Locke, Lambdin, & Solmon, 2008; Spohn, 2008; Resnick, 2003; Wright, 2002). Many have come to believe that play and academics are polar extremes that are fundamentally incompatible: educators feel that they must choose to teach or let children play (Kochuk & Ratnaya, 2007; Viadero, 2007).

Historical reviews reveal that this represents a much deeper ideological debate about *how* children learn (Glickman, 1984; Zigler, Singer & Bishop-Josef, 2004). Arising from the essentialist and behaviorist philosophies, some believe that there is a core set of basic skills that children must learn and a carefully planned, scripted pedagogy is the ideal teaching practice. In this ‘direct instruction’ perspective, teachers become agents of transmission, identifying and communicating need-to-know facts that define academic success. Learning is compartmentalized into domain-specific lessons (mathematics, reading, language) to ensure the appropriate knowledge is being conveyed. Worksheets, memorization, and assessments often characterize this approach—with little academic value associated with play, even in preschool. As a result, this approach commonly emphasizes short-term cognitive gains (Kagan & Lowenstein, 2004; Stetcher, 2002). Some have referred to this as the “empty vessel” approach where children, void of information, are to be filled with facts by supportive teachers.

Conversely, the whole-child perspective assumes children play an active role in the learning process. Arising from experimentalism and constructivist philosophies (See Goncu & Gakins, this volume), children’s needs, interests, and immediate experiences define what is *meaningful* and *useful* to learn. For example, a child who plays with another peer’s shape sorter will learn about shapes and the social skills required for sharing. In this view, learning is not compartmentalized into separate domains; rather, cognitive, social, and motor learning are inextricably intertwined (Copple, Sigel, & Saunders, 1989; Froebel, 1897; Piaget, 1970). Furthermore, the learner is seen as an active explorer who—through interactions in the world—constructs knowledge, which continually evolves and adapts with new experiences (Bransford, Brown, & Cooking, 2000; Glickman, 1984; Hirsh-Pasek et al., 2009). Play, in particular, represents a predominant method for children to acquire information, practice skills, and engage in activities that expand their repertoire (Elkind, 2007). Here, the child defines learning processes and outcomes while teachers are seen as collaborative partners that enrich and support the learning process (Vygotsky, 1978).

Dispelling the Debate: Academic Learning through Play

A wealth of research demonstrates that play and academic learning *are* not incompatible. From dress-up to board games, from stacking blocks to art activities, research suggests that children’s free-play fosters mathematics, language, early literacy, and socio-emotional skills for children from both low- and higher income environments (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Campbell & Ramey, 1995; Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Duncan et al., 2007; Gardner, 1995; Reynolds, Ou, & Topitzes, 2004; Schweinhart, 2004; Weikart, 1998; Zigler & Bishop-Josef, 2006). The literature on guided play is also compelling. An emerging area, the findings show that play can be gently scaffolded by a teacher/adult to promote curricular goals while still maintaining critical aspects of play (Berk, 2001; Berger, 2008; Hirsh-Pasek et al., 2009; Marcon, 2002; Schweinhart, 2004).

In this paper, we argue that playful learning offers a middle ground between the warring factions in early education (pre-K – 3rd grade; Bodrova, 2008; Bogard & Takanishi, 2005). Using the best available data as our foundation, we show that children who are exposed to rich academic content through free and guided play acquire a cadre of cognitive and social skills beyond those taught via traditional, direct instruction practices. (Hirsh-Pasek & Golinkoff, 2003; Ladd, Herald, & Kochel, 2006). Moreover, when we view play as a *learning process,* we gain a broader perspective on the key skill sets that young children must develop to be successful in school and in the 21st century (e.g., Bell-Rose & Desai, 2006; Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009).

Expounding on Playful Learning

Playful learning –defined as both free play and guided play --is a whole-child educational approach that promotes academic, socio-emotional, and cognitive development (Hirsh-Pasek et al, 2009; Resnick, 2003; Singer, Hirsh-Pasek, & Golinkoff, 2006). Representing a broad array of activities, including object play, pretend and sociodramatic play, and rough-and-tumble play, free play has been notoriously difficult to define (see Burghardt, this volume for a review). Contemporary play researchers generally agree that play activities are fun, voluntary, flexible, involve active engagement, have no extrinsic goals, involve active engagement of the child, and often contain an element of make-believe (Johnson, Christie, & Yawkey, 1999; Pellegrini, 2009; Sutton-Smith, 2001).

Guided play, on the other hand, fosters academic knowledge through play activities. Guided play itself falls on a continuum. The extent to which the adult sets up the environment and participates in the play varies according to the adults' curricular goals and the child's developmental level and needs. The dimension along which guided play varies is degree of adult guidance. For example, consider research conducted by Neuman and Roskos (1992), who provisioned a preschool classroom with literacy related materials but did not direct children in their use. Findings indicate that children's literacy play increases dramatically. In such guided play contexts, adults provide materials but children discover their affordances on their own. Eventually children will want to know how to read words and write letters to accomplish their play goals (such as making a sign for the cost of bananas during grocery-store dramatic play). Teacher guidance will be essential for this purpose. Thus, the guided play involved in teaching these concepts and skills must naturally involve more input from the teacher. It occurs in an informal and play context where children are actively engaged and involved in their literacy play while the adult is responsive to children's literacy queries and capitalizes on them to enrich children's knowledge. In Bellin and Singer's (2006) Magic Story Car work, adults lead children in playful activities to promote emergent literacy skills, such as phonological awareness, alphabet letters, print knowledge, and vocabulary. While the adult leads the activity, it is playful and engaging and offers many opportunities for child input. Children begin to play Magic Story car without adult guidance as they continue with the curriculum.

Thus, guided play has two aspects (Ashiabi, 2007; Blanc, Adrien, Roux, & Barthélémy, 2005; Christie, 2001; Fisher, 2009; Hirsh-Pasek et al., 2009; Moyles, 2001; Plowman & Stephen, 2005; Singer, Singer, Plaskon, &Schweder, 2003). First, adults enrich the environment with objects/toys that provide experiential learning opportunities infused with curricular content (Berger, 2008). In a Montessori classroom, for example, the well chosen play materials enable children to discover and practice basic principles of math and reading. Another example is the Neuman and Roskos literacy-materials study described above. Second, in guided play teachers enhance children's exploration and learning by commenting on children's discoveries; by co-playing along with the children; through asking open-ended questions about what children are finding; or exploring the materials in ways that children might not have thought to do (Ash & Wells, 2007; Berk & Winsler, 1995; Callanan & Braswell, 2006; Callanan & Oakes, 1992; Copple, Sigel, & Saunders, 1979; Rogoff, 2003). For example, although the child initiates the action on a particular toy (e.g., a farm animal), the teacher may model ways to expand the child's repertoire (e.g., make sounds, talk to other animals, use it to 'pull' a wagon). The new dimensions might then be incorporated into the child's spontaneous play activities. Importantly, Nicolopoulou (2006) argues, "although this is a structured and teacher-facilitated activity, it is simultaneously child-centered…the child is able to participate according to his or her own individual interests, pace, inclination and developmental rhythms" (p. 129). Bellin and Singer's

Magic Story Car is an excellent example of a set of adult-created activities that engage and inspire children to learn literacy information.

Teachers play a unique role in guided play experiences. They can sensitively guide learning, creating flexible, interest-driven experiences that encourage children's autonomy/control over the process. Teachers subtly intervene as play partners or curious onlookers asking questions/making suggestions to help children when they have difficulty. As a result, play *and* guided play will foster intrinsic motivation and learning in similar ways (e.g., Deci, 1992; Harter, 1992; Parker-Rees, 1997; Reiber, 1996; Renninger, 1990; Schiefele, 1991). However, guided play may transform into adult-directed experiences when teachers/parents intervene too much. Shmukler (1981) found that when adults make suggestions and then let free-play continue, children engaged in the most creative play; however, when adults become too imposing, children stopped playing altogether (see also Pellis & Pellis's work with animals, this volume; Bonawitz, Shafto, Gweon, Chang, Katz, & Schulz, 2009; Dodd, Rogers, & Wilson, 2001). This suggests that many factors will impinge on the definition of guided play. These include, among others, teachers' sensitivity to the line between child-centered learning activities and direct instruction. Teachers must continually evaluate and adapt their behaviors to foster learning yet not become overly intrusive (e.g., 'hovering' over children's play activities, interjecting too much). It also includes teacher's acceptance of variability in children's answers (rather than demanding one correct response). Finally, there are individual differences and possibly socioeconomic class differences in the nature of and opportunities of free play and guided play that can weigh on when adult presence is more or less obtrusive (e.g., Dansky, 1980 Feitelson & Ross, 1973; Rosen, 1974; Rubin, Maioni, & Horung, 1976).

How might playful learning work in the context of a classroom? A teacher may introduce a variety of shapes to promote the exploration and learning of shapes in preschool. After initial free play activities, the teacher might also encourage children to play "Dora the Explorer" and find shapes. Conceptual understanding is promoted when the teacher asks children to compare shapes in a 'show and tell' activity. Guided-play is a synergistic learning process, in which learning continually oscillates between planned, teacher-enriched contexts and self-directed, emergent learning contexts over time (Fisher, 2009). Guided play is a concept that deserves serious consideration by educators.

Playful Learning: Presenting the Evidence

According to NAEYC (2006), "…play provides a context for children to practice newly acquired skills and also to function at the edge of their developing capacities, to take on new social roles, attempt novel or challenging tasks, and solve complex problems that they would not (or could not) otherwise do" (p.1). With a focus on children in pre-k to third grade, in the following sections we explore how different playful experiences promote a cadre of knowledge and skills in math/science, literacy, social understanding, and self-regulation (Copple & Bredekamp, 2009). For the purpose of this review, we adopt the broadest sense of guided play activities, including teacher- and computer-facilitated activities that maintain play-like qualities and child-directed characteristics as described in the previous section (Plowman & Stephen, 2005; Singer & Singer, 2005).

The Role of Play in Mathematics and Science

> *Through the various stages of development, children at play begin to learn essential math skills such as counting, equality, addition and subtraction, estimation, planning, patterns, classification, volume and area, and measurement. Children's informal understanding provides a foundation on which formal mathematics can be built.* -- Shaklee et al., 2008 (p. 3).

A plethora of research demonstrates that early mathematical thinking undergoes substantial development during the preschool and primary years (see Clements & Sarama, 2007). Theorists suggest that the building blocks of mathematic knowledge arise from a variety of self-directed, exploratory play activities and become further developed through playful learning (Ginsburg, 2006). In particular, observational research shows that children spend substantial amounts of self-directed, free play experience in exploring and practicing math concepts.

Free Play: Math and Science

A landmark experiment conducted by Ginsburg, Pappas, and Seo (2001) examined the frequency of mathematic-related activities in four- and five- year-old children's free play period in daycare. During this time, children engaged in a variety of activities, including symbolic and object play. Regardless of gender and ethnicity, over half of children's playtime was spent in some form of mathematic or science-related activity: 25% was spent examining patterns and shapes, 13% on magnitude comparisons, 12% on enumeration, 6% on dynamic change, 5% on spatial relations (e.g., height, width, location), and 2% on classifying objects. Sarama and Clements (2009) replicated these findings, concluding that free play is a rich experience for children to practice and expand their foundational math and spatial knowledge. In the scientific reasoning domain, a series of studies have shown that children use play to disentangle ambiguities they find in the world and to test their incipient hypotheses about how things work (see Bonawitz, Chang, Clark, & Lombrozo, 2008; Bonawitz, Fischer, & Schulz, 2008; Schulz & Bonawitz, 2007) When toddlers were given toys with ambiguous causal mechanisms, they immediately engaged in exploratory play to determine how the toys worked (e.g., touching, moving levers on the object). [1]

The frequency of math-related play has been linked to increases in mathematical knowledge and achievement (e.g. Ginsburg, Lee, & Boyd, 2008). Preschool children who participate in manipulative activities (e.g., block play, model building, carpentry) or play with art materials do better in spatial visualization, visual-motor coordination, and creative use of visual materials (e.g., Caldera, McDonald, Culp, Truglio, Alvarez, & Huston, 1999; Hirsch, 1996). A longitudinal study by Wolfgang, Stannard and Jones (2001) indicated that complexity of block play in preschool was significantly related to number of math courses taken, number of honors courses, mathematics grades achieved, and weighted mathematics points' scores in junior and senior high schools. Even when controlling for IQ, and gender, the authors found that block play still accounted for significant portions of variability in math performance, suggesting that complex block play may be one mode in which children practice rudimentary math knowledge.

Guided Play: Math and Science

Research also shows that the integration of math-related materials into children's early free play environments promote math- relevant behaviors (e.g., Arnold, Fisher, Doctoroff, & Dobbs, 2002; Griffin & Case, 1996; Griffin, Whyte & Bull, 2008). For example, Cook (2000) found that when preschoolers' pretend play environments were enriched with artifacts emphasizing number symbols, children engaged in more talk and activity related to mathematical concepts. Such evidence suggests environmental enrichment with curricular content facilitates learning in a developmentally-meaningful way.

Similarly, Ness and Farenga (2007) found that children use spatial and geometric thinking during spontaneous play activities. They explore shapes through drawing, manipulation of blocks, and even through language and explanation of their constructions. The authors suggest that math teachers use a guided play approach to introduce spatial and geometric problems into children's natural free play activities. Ness and Farenga outline thirteen space-geometry-architecture codes (e.g., such as symmetry, shapes, patterns, enumeration, etc.) to help teachers determine what types of problems children can perform during the given play activity. The teacher uses questions "…to determine what the child actually knows and where the child needs guidance" (p. 218).

Few have examined how teacher commentary on children's play directly influences *developing* math knowledge (Clements & Sarama, 2007; Fisher, 2009). Fisher and colleagues explored the impact of guided play and direct instruction on preschoolers' developing shape concepts (Fisher et al., 2009; Fisher et al., 2010). Children were randomly assigned to a guided play, direct instruction, or control condition. In the guided play condition, they were encouraged to discover the 'secret of the shapes.' Experimenters facilitated children's discovery of shape properties by prompting exploration of the shapes and asking leading questions (e.g., "How many sides are there?"). They were then asked to draw newly learned shapes. In the direct instruction condition, the experimenter verbally described the secret shape properties, pointed out the properties on the shapes, and practiced drawing the shapes while children watched. In the control condition, a story was read in place of the learning activity.

Results from a shape-sorting task revealed that guided play and direct instruction appear equal in learning outcomes for simple, familiar shapes (e.g., circles). However, children in the guided play condition showed significantly superior geometric knowledge for the novel, highly complex shape (pentagon) than the other conditions. For the complex shapes, the direct instruction and control conditions performed similarly. The findings suggest discovery through engagement and teacher commentary (dialogic inquiry) are key elements that foster shape learning in guided play. These two potential mechanisms may also help children home in on the particular key learning elements of complex concepts beyond those of direct instruction. More research is needed to isolate these mechanisms and assess the generalization of these findings to other domains.

Technology is proliferating at an unprecedented rate and this too simulates the kind of guided play found in the Fisher et al. study. Although many of the claims that educational videos and games promote learning are largely unfounded (Kaiser Family Foundation, 2005) and considered inappropriate for children under the age of three (Roseberry et al., 2009), research has shown specific electronic manipulative activities may augment learning for older children. For example, Papert (1980) described a LOGO software program that allows users to type in commands on a computer keyboard that moved a robotic turtle in real life. The turtle has wheels, a dome shape, and a pen that can draw shapes when it moves. On the computer screen a child sees a “light turtle” and must think about how she wants the turtle to move. The child must then translate this to “turtle talk” and then type in the appropriate commands. Papert suggests such programs help children transfer knowledge from their own play experiences (i.e., body movement) to new contexts and situations while simultaneously learning geometric and spatial concepts.

Using the LOGO software, Clements and Sarama (1997) also show that children learn best when they direct action in both a physical and a virtual world. Activities in which children first move their bodies (for instance, walking around a shape on the floor) and then use commands to direct an onscreen turtle to make the same motions, improve mathematical understanding and problem-solving skills. This may be due to the fact that children have additional practice with the concepts (e.g., moving bodies, walking around, and then translating it to turtle commands). Others have shown mixed results in achievement of kindergarten and elementary students using physical manipulatives, virtual manipulatives, or a combination of the two (Reimer & Moyer, 2005; Sarama & Clements, 2009). Thus, the role of guided play in multiple domains is an area that demands further research.

Researchers are also examining the use of mathematics computers games in the classroom (Sarama & Clements, 2009). According to Bitter and Hatfield (1998), use of technology for mathematics enhances “mathematical thinking, student and teacher discourse, and higher-order thinking by providing the tools for exploration and discovery” (p. 39). In one such study, the inclusion of a software program called Skills Arena in a second grade classroom showed that children enjoyed playing the game and completed three times more math problems in a 19-day period compared to what they would have using traditional worksheets (Lee, Luchini, Michael, Norris, & Soloway, 2004). Electronic games harness some of the guided play elements, such as “built-in scaffolding” as students are presented with harder material as the games progress; however, little research has explored how these influence interest in the subject and how math knowledge fostered in games transfers to other math-related experiences (Rieber, 1996; Squire, 2006).

Today, a variety of U.S. and European educators are implementing math-related playful learning practices in classroom settings (Casey, 2008; Kamii & Kato, 2006; Kindergarten heute, 2003; Friedrich, 2003). Sarama and Clements (2009), for example, designed Building Blocks, an early childhood math curriculum, that helped young children meet the new pre-K to grade 2 standards by weaving three types of math media—print, manipulatives, and computer programs—into many preschool daily activities, from building blocks to art and stories. Compared with age-mates randomly assigned to other preschool programs, low-income preschoolers experiencing Building Blocks showed substantially greater year-end gains in math concepts and skills, including counting, sequencing, arithmetic computation, and geometry (including shapes, spatial sense, measurement, and patterning) (Sarama & Clements, 2002).

Taken together, research suggests that when children engage in free play and guided play activities, they learn about core properties, spatial relations, and causal processes, priming early mathematical and scientific concepts (see Baroody, Lai, & Mix; 2006; Ginsburg, Cannon, Eisenband, & Pappas, 2005; Seo & Ginsburg, 2004). Parents, teachers, and older peers may scaffold learning in a variety of ways, including populating children's environments with math-related games and toys, labeling new concepts (e.g., shapes, counting), modeling novel ways of interacting with objects (e.g., different ways to play with a ball), fostering conceptual knowledge through exploratory talk (e.g., what makes this a triangle?), or through co-play. These newly learned skills might later be practiced and expanded while children play on their own or with peers. Such knowledge becomes the foundation on which more formal, higher-order knowledge is built (e.g., a rudimentary concept of weight facilitates learning weight systems). Additional experimental research with traditional checks for experimenter bias is necessary to provide direct links between specific elements of free and guided play activities and academic outcomes.

The Role of Play in Language and Literacy

Children naturally incorporate language into their play activities. In the toddler years, children explore and practice the fundamental components of their language system through private speech, word games, and complex language use during social play (e.g., Garvey, 1977; Hirsh-Pasek & Golinkoff, 1996; Hirsh-Pasek & Golinkoff, 2006; Roskos & Christie, 2000, 2001; Rowe, 1998; Zigler, Singer, & Bishop-Josef, 2004). During the elementary years, children engage in different forms of play compared to toddlers. Symbolic play becomes integrated into games with rules, such as competitive board games. Play also becomes more abstract, with an increasing focus on mental and language play. Eight to twelve-year-olds like to invent “riddles, puns, tongue twisters, insults, chants, rhymes, and secret codes that may involve playing with syntax and semantics of language” (Manning, 2006, p.23). Imaginative play, on the other hand, tends to become more private as children write poetry or short stories or engage in dramatic activities. A substantial body of research shows that play activities serve as contexts in which language and literacy skills advance to new heights.

Free Play: Language and Literacy

The evidence suggests that free play activities relate to the development of language and literacy. Dramatic play, in particular, consists mostly of enacted narratives that naturally require instructional discourse between play partners (Nicolopoulou et al., 2006; Pellegrini & Galda, 1990). Specifically, children must convey their thoughts to their play partners, synthesize their individual thoughts into a shared play context, and integrate these components into a coherent story (e.g., Cloran, 2005). To accomplish this task, play partners often describe *how* to act out a story through instructive dialog or ‘metacommunications’ (Fein, 1975). For example, a 4-year-old who wants to play ‘fairy princess’ must communicate this idea to her partner, negotiate roles, and describe how props may be used for the setting (e.g., the cardboard box will be the castle, the stuffed teddy bear will be the prince). The children must then synthesize their ideas into a logical storyline that can then be acted out.

Several observational studies focused on the roots of instructional discourse in symbolic play (Cloran, 2005; Lloyd & Goodwin, 1993; Tykkyläinen & Laakso, 2009). Sachs (1987) examined speech during a pretend play session among 46 same-sex dyads, ranging from 21 – 61 months of age, in a room containing doctor theme toys as well as nondescript toys (e.g., fabric, hats, styrofoam, and dolls). Children engaged in a variety of communicative styles with one another, including directive statements (e.g., “Use this for a sling”), information requests (e.g., “Are you using that toy? Are you sick?”), and attentional requests (e.g., “Lookit.”).

Theorists suggest that this form of dialogue plays a key role in developing language and literacy skills (e.g., Bruner, 1983; Dickinson, Cote, & Smith, 1993; Pellegrini & Galda, 1990). Children may be better prepared to recognize vital aspects that underlie narratives when they have engaged in activities that parallel these components, such as the identification and implementation of roles, communication styles to enhance roles, and the use of props and contextual descriptions to foster a story-related reality; however, very little research has explored the relationship between components of make-believe play and later reading and communicative activities.

Correlational research typically examines the relationship between the frequency of specific forms of literacy-related play activities and school readiness. (Roskos & Christie, 2001; Pellegrini et al., 1991; Pellegrini & Galda, 1993). Bergen and Mauer (2000), for example, found a higher rate of literacy-related play at age four (e.g., rhyming games and pretend reading to stuffed animals) predicted language and reading readiness in kindergarten. Kindergartners with increased rhyming and phonological awareness relative to their peers also had more diverse vocabularies, used more complex sentences, and showed the extent of their competencies most often in playful environments. Additionally, Dickinson and Moreton (1991) noted that the amount of time 3-year-olds spent talking with peers while pretending was positively associated with the size of their vocabularies two years later after they had begun kindergarten.

Guided Play: Literacy Development

Intervention studies have examined how embedding literacy materials within play settings enhances children's engagement in literacy activities during free play (Christie & Enz, 1992; Christi & Roskos, 2006; Einarsdottir, 2000; Roskos & Christie, 2004; Saracho & Spodek, 2006). Neuman and Roskos (1992) for example, explored how the incorporation of literacy props in 3- to 5-year-old children's free play environments increased literacy-related activities compared to a control group. At the intervention site, three theme-based play areas (e.g., housekeeping, reading, and manipulatives) were enriched with literacy objects. Children in the intervention group showed significantly higher rates of handling and reading of literacy materials as well as writing compared to their baseline (e.g., touching materials, using materials during play activities, pretend writing). Further, they engaged in longer and more complex literacy-related activities than those in the control group.

Others have focused on how a variety of play activities influence emergent literacy skills, including story-telling, story-acting, and journal writing (Nicolopoulou, 2005). In one such study, Nicolopoulou et al. (2006) reported that Head Start preschool children who engaged in story-telling and dramatization of their stories created longer, more complex storylines and more often used the third person in their narratives over time. Children were also encouraged to "write" stories in journals so they could experience the process of converting those stories to written form. Since children have not mastered writing at this age, stories were depicted in drawings. Over the course of the intervention, children's stories became more complex. The authors also noted that interest and enthusiasm grew over time. Thus, playful learning activities build emergent literacy competencies over time.

Pellegrini and Galda (1982) examined whether different types of play enhance story comprehension and recall in K-2nd grade children. Children were read the same book and placed in one of three experimental conditions: (1) thematic-fantasy play, in which they acted out the story they had just heard, (2) discussion, in which they talked about the story, and (3) drawing, in which they drew pictures of the story. The three groups were then compared on their performance on both a story comprehension and a story recall task. Results indicated that children in the thematic-fantasy condition fared better on both tasks than children in the discussion and drawing conditions. In the thematic-fantasy condition, children who played roles calling for more active participation in the story re-enactment scored better on recall than children with less active roles, indicating that the more verbal exertion the child must put into a dramatic fantasy, the better he or she is able to retell the story. Others experimental studies found thematic-fantasy play, compared to other less active play activities (e.g., puppet thematic play, coloring), promote more complex narratives (Ilgaz & Aksu-Koç, 2005) and increased language recall (Marbach & Yawkey, 1980).

These findings lend credence to the belief that play and literacy development is inextricably intertwined. First, children's surrounding environment provides a wealth of props/materials that are naturally guide imaginative activities toward specific themes and learning outcomes (Christi & Roskos, 2006). Second, symbolic play and literacy appear to share similar mental processes (Nicolopoulou et al., 2006; Neuman & Roskos, 1992). Symbolic play, defined as make-believe play and storytelling, draw upon children's representational skills, in which "play . . . [is] story in action, just as storytelling is play put into narrative form" (Paley, 1990, p. 4).

A key question that arises from the literature is how parent and teacher training in guided play may influence academic outcomes. Singer and colleagues conducted a series of studies on the effectiveness of *Learning through Play*, an intervention program designed to teach parents and educators how to engage in learning-oriented, imaginative play games with children (Singer, Plaskon, & Schweder, 2003). In the initial evaluation of the program kindergarten children of low-SES parents who participated in the intervention showed significant gains on an academic readiness assessment than those whose parents did not participate. Modest improvements were found in subcomponents of the test, including vocabulary, knowledge about nature, general information knowledge, and knowledge about manners. Subsequent studies examined the impact of training educators, parents, and children in guided, imaginary play and found significant gains in academic measures, spontaneous imaginativeness, pro-social skills, task persistence, and positive emotions (Bellin & Singer, 2006).

Another area of research asked how adult interaction and instruction influences literacy-related free play in preschool and early elementary school (Baumer, Ferholt, & Lecusay, 2005; Christie & Enz, 1992; Christie, Enz, & Vukelich, 1997; Farran, Aydogan, Kang, & Lipsey, 2006; Kontos, 1999; Saracho, 2004). How guiding or co-playing teaching approaches positively influence the quality and longevity of dramatic play activities compared to more uninvolved or overly controlling teaching styles (Enz & Christie, 1997; Neuman & Roskos, 1992)? Some query how teachers' modeling behaviors and intermittent guidance influence literacy related play. For example, Morrow and Rand (1991) randomly assigned children to one of four conditions: adult-guided free play with paper, pencils, and books, adult-guided free play with thematic materials (e.g., veterinarian's office with pet-related books, signs, etc), free play with thematic materials without adult guidance, and traditional curriculum play centers. In the guided play activities, adults made suggestions on how the materials may be used during play. Results revealed children in the guided play conditions showed stronger gains in the use of literacy related materials during play (e.g., using literacy materials as play props, engaging in 'pretend reading and writing') than those without guidance. Importantly, the physical materials in the environments influenced what types of literacy related behaviors the children engaged in. Those given access to papers and pencils were more likely to simulate writing while those in the thematic conditions engaged in more pretend reading activities. Thus, adults who create optimal playful learning opportunities (free-enriched play & adult guidance) may foster specific literacy skills associated with curricular goals.

These studies provide an initial glimpse into how playful learning pedagogies can be integrated to support literacy, yet there is additional work to be done. Research must isolate the causal mechanisms underlying the impact of each of these practices on reading development. Teachers in these studies used *a combination* of pedagogical techniques, materials, and motivational approaches to foster learning. What are the optimal combinations for literacy development (e.g., number of literacy learning activities, length of time per activity, time devoted to free vs. guided play)?

Social competence and self-regulatory skills are also critical for optimal functioning in learning environments and are predictive of later school success. Through play, children recreate roles and situations that reflect their sociocultural world, where they learn how to subordinate desires to social rules, cooperate with others willingly, and engage in socially appropriate behavior (Berk, Mann, & Ogan, 2006; Hirsh-Pasek et al., 2009; Krafft & Berk, 1998; Saltz, Dixon, & Johnson, 1977; Udwin, 1983; Vygotsky, 1978). Over time, these competencies are transferred to children's everyday behaviors, which foster a positive social environment that is conducive to learning and lifelong success (Brown, Donelan-McCall, & Dunn, 1996; Hirsh-Pasek et al., 2009; Vygotsky, 1986).

Free Play: Social and Self-regulatory Skills

Theorists suggest that social play is a key factor in developing a sense of self-awareness and theory-of-mind (Ashiabi, 2007; Flavell, 1999; Lillard, 1993). Through play activities (sociodramatic play, rule-based games, imaginative play), children become aware that they have desires and intentions that may not match those of others. For example, a boy who wants to play with blocks tries to take them from a girl who reacts by crying, yelling, and pushing the boy away. Startled, the boy forms a rudimentary notion that children have different goals and desires.

Pretend play is a conduit for theory-of-mind development in several distinct ways. First, discussing feelings and emotions during play activities with peers may prime children's perspective-taking ability, which, in turn, may promote positive-peer relations (Brown, Donelan-McCall, & Dunn, 1996; Hughes & Dunn, 1998). Fabes, Eisenberg, Hanish, and Spinrad (2001), for example, found that the more preschoolers refer to feelings when interacting with playmates, the better liked they are by their peers. Second, talking about mental-states (e.g., beliefs, desires, etc) during pretend play may also advance children's theory-of-mind understanding (Rosnay & Hughes, 2006). Thus, pretend play encourages these skills as well as may indirectly promote theory-of-mind development, as it fosters both language and self-regulation, which in turn, is important in understanding another's perspective while suppressing their own (Sabbagh, Xu, Carlson, Moses, & Lee, 2006; Milligan, Astington, & Dack, 2007; Whitebread, Coltman, Jameson, & Lander, 2009). Examining children's behavior in groups, a study by Schwebel, Rosen and Singer (1999) found evidence that children's understanding of reality and fantasy and theory of mind were related to how much they engaged in spontaneous imaginative play.

Additional findings are consistent with the notion that make-believe play enhances effective management of emotion. For example, high levels of sociodramatic play and conflict resolution themes in play narratives in preschool are positively related to children's effective emotional self-regulation (Fantuzzo, Sekino, & Cohen, 2004; Lemche, Lennertz, Orthmann, Ari, Grote, Hafker, et al., 2003). During sociodramatic play, preschoolers engage in rich emotion talk with age-mates. Through these experiences, make-believe contributes to emotional understanding, which assists children greatly with positive peer relations. (Smith, 2002). As early as 3 to 5 years, knowledge about emotions is related to friendly, considerate behavior, willingness to make amends after harming another, and constructive responses to disputes with age-mates (Brown, & Dunn, 1996; Dunn, Brown, & Macquire, 1995; Garner & Estep, 2001).

Siblings appear to play a crucial role in the relationship between pretend play and perspective-taking (Volling, Youngblade, & Belsky, 1997; Youngblade & Dunn, 1995). Volling, Youngblade and Dunn (1995), for example, compared children's pretend play with peers to parents. They found that children's play at 33 months was significantly related to their developing understanding of false-beliefs seven months later. Thus, play with siblings has a more powerful impact on understanding of others' emotions and beliefs.

As children develop social relationships, they encounter conflicting desires and must discover strategies that solve those conflicts in an effort to sustain playful relationships. A variety of social skills develop from these interactions, including perspective taking to predict potential problems, turn-taking, self-restraint, negotiation, cooperation, problem-solving and even respecting others desires/roles (Smith, 2003; Thompson, Easterbrooks, & Padilla-Walker, 2003; VanderVen, 2008). Children who fail to develop these skills are more likely to exhibit behavioral misconduct in school. Indeed, several studies have demonstrated that toddlers and preschoolers who had prosocial attitudes and behaviors during play activities were more likely to make new friends, be accepted by their peers, and form secure relationships with their teachers, which was predictive of later achievement (Birch & Ladd, 1997; Ladd, Birch, & Buhs, 1999; Ladd, Kochenderfer, & Coleman, 1997).

An emerging literature also indicates that play contributes vitally to children's self-regulation—advancing mastery over their own thinking, emotions, and behavior (see Berk, Mann, & Ogan, 2006, for a recent review). Vygotsky's (1978) view of make-believe play as a paramount early childhood context for development of self-regulation has served as the springboard for this line of research. The creation of imaginary situations in play, Vygotsky explained, helps young children use symbols—most importantly, language, but also gestures and other symbols—to overcome impulse and manage their own behavior. In addition, drawing on experiences in their families and communities, children continuously devise and follow social rules in pretense, striving to bring their behavior in line with social expectations and to act in socially desirable ways.

Free-play observations in classrooms support the contribution of make-believe to self-regulating language and to social skills. In one study of 3- to 5-year-olds in two preschools, among children's free-play pursuits, fantasy play emerged as the strongest correlate of children's use of private speech, including self-directed verbalizations aimed at both working out pretend characters' actions and guiding behavior during non-pretend tasks, such as solving puzzles (Krafft & Berk, 1998). Furthermore, these two types of private speech were positively correlated, suggesting that self-regulating language, richly stimulated by make-believe, might facilitate children's use of self-guiding speech when faced with real-world challenges.

Complex sociodramatic play in the block and housekeeping areas positively predicted school-year gains in 3- and 4-year-olds' self-regulation during classroom clean-up periods (the extent to which they independently picked up materials)—a commonly used measure of socially responsible behavior (Elias & Berk, 2002). The self-regulatory benefits of sociodramatic play were greatest for least well-regulated preschoolers—those rated high in impulsivity on a parent report measure of temperament. Measured as early as 3 to 5 years of age, other research shows cognitive control predicts reading and math achievement from kindergarten through high school (Blair & Razza, 2007; Duncan, Dowsett, Claessens, Magnuson, Huston, Klebanov, et al., 2007; Gathercole, Tiffany, Briscoe, & Thorn, 2005). Thus, the self-regulatory gains that accrue from make-believe likely contribute to its academic benefits.

Guided Play: Social and Self-regulatory Skills

What role do adults take in playful social learning? Ashiabi (2007) examined the role of teacher interaction in sociodramatic play and developing social skills. Findings suggest successful preschool practices for promoting social learning through play embrace a combination of free- and guided-play. Sociodramatic play in the classroom requires a range of teacher observation of play, encouragement/support of appropriate social skills and mediation of conflicts to guide these developing skills. Others have found a higher frequency of adult-initiated play activities with preschool children was associated with higher levels of prosocial behavior, lower levels of nonsocial behavior, and, among boys, greater peer acceptance in preschool (Ladd & Hart, 1992).

A recent intervention study examined the effect of socio-emotional skills training on social and academic outcomes. The Emotional Literacy in the Classroom (ELC) program (Brackett, Rivers & Salovey, in press) teaches children (grades 5th – 6th) to recognize, understand, label, and regulate emotions and to express their emotions using diverse playful self-directed *and* guided learning activities (e.g., self-reflection, critical analysis of academic material and current events, interactions with family members, divergent thinking tasks, and creative writing). Children were randomly assigned to the ELC program or a control group. During the program, children engage in directed role-play that involves a particular emotion.

Results showed that students in classrooms in which ELC was implemented for a period of seven months had higher end-of-year grades and higher ratings in some areas of social and emotional competence compared to the control group. Specifically, their grades in writing, reading, social studies, listening, and work habits/social development were significantly higher than were the control group. The ELC group also had fewer school problems, such as those related to learning and paying attention, and had more adaptability, including showing more skills related to social relationships, leadership, and studying.

Importantly, it is difficult to ascertain whether the observed outcomes in play training studies are due to adult tuition or to increased frequencies of play activities (e.g., Christie & Johnsen, 1983). Some evidence suggests play and adult tutoring result in similar cognitive gains (e.g., Pellegrini, 1984) while others have found adult tuition is more beneficial for young children (Dansky, 1980) and those from disadvantaged backgrounds (e.g., Saltz, Dixon, & Johnson, 1977). Additional research is necessary to tease apart the differential impact of these two constructs.

To learn in a formal school environment, children must be able to regulate their behaviors and emotions and communicate and engage with others in socially appropriate ways (e.g., Blair & Razza, 2007; Duncan et al., 2007; Gathercole et al., 2005). The current research clearly highlights a relationship between playful learning experiences, social and self-regulatory skills, and academic achievement. Future experimental research is necessary to explore the *mechanisms* that underlie these relations.

Harris (2000) demonstrated how 6-year-old children can regulate their emotions after hearing a story under varied instructions. He divided the children into three groups. One group was given instructions likely to increase emotional absorption: They were asked to be come involved with the story, and to feel sad along with the main character. Another group was given instructions likely to diminish absorption: They were asked to remain detached, to listen to the story in such a way "that they won't become sad yourself." Finally, a third, control group, was given no instructions, except "to listen carefully" to the story. Results indicated that the children were differentially influenced by these instructions. Those asked to involve themselves more reported a sadder mood afterwards. They also emphasized more sadness details in their subsequent report of the story and did not do as well as the other groups on a standard memory test. In effect, the children in the absorption group imagined the situation as actually happening to themselves while those with detachment instructions were capable of inhibiting emotional identification. Children's ability to control their emotional state is impressive.

The Big Picture: Research Comparing Pedagogies

Real measures of learning come not only from immediate mastery of information but also from long term retention and transfer. Specifically, comparative education program research shows that playful learning programs promote academic knowledge and cognitive and socio-emotional competencies beyond those attained in traditional, academically focused programs. The majority of this research uses random assignment designs and compares child-centered, playful learning preschool and kindergarten models to traditional, academically regimented programs.

Montessori schools are characteristically known for creating classrooms in which children choose from a number of playful, hands-on activities that have been prearranged by adults. Importantly, there may be substantial variations in how instructors interpret and implement the philosophical tenets of the program; some are more play-oriented while others are less so (e.g., inclusion of free-play, fantasy-play, or lessons during the day; Daoust, 2004). In the optimal Montessori approach, teachers use a variety of free play and guided play techniques to promote holistic development. In particular, teaching materials are specially designed to promote exploration and discovery, long time periods are given for individual and small-group learning in child-chosen activities, and educators place equal emphasis on academic and social development. Importantly, the children might not even know that there was a learning goal in mind.

Lillard and Else-Quest (2006) examined the differential impact of a Montessori and state-funded education programs on children's social development and academic achievement. Montessori kindergarten children were significantly more likely (43% versus 18% of responses) to use a higher level of reasoning by referring to justice or fairness to convince another child to relinquish an object. Playground observations indicated that Montessori children were significantly more likely to be involved in positive shared peer play and significantly less likely to be involved in rough play that was ambiguous in intent, such as wrestling where there was no evidence of positive emotion. By the end of kindergarten, the Montessori children performed better on standardized tests of reading and math, engaged in more positive interaction on the playground, and showed more advanced social cognition and executive control.

Similarly, Marcon (1993; 1999; 2002) demonstrated that children who were exposed to playful, child-centered preschool environments at age four showed enhanced academic performance in mathematics, reading, language, spelling, handwriting, and science compared to children who experienced more direct instruction. Other researchers documented similar gains in academic knowledge *and* social skills in play-based learners over traditional instruction learners (Burts et al., 1990; Burts et al., 1992; Hirsh-Pasek et al., 1991). A key question that remains is whether certain components of the education experience (e.g., the materials, or the opportunities for collaborative work) are associated with particular outcomes. Montessori and other guided play education systems have a fundamentally different structure from traditional education. Experimental research is necessary to identify what mechanisms in these approaches facilitate the robust learning observed in these studies (i.e., long-term retention, transfer of knowledge, etc.).

Support for playful learning also comes from a rigorously conducted field experiment evaluating Tools of the Mind, an innovative preschool to second grade program inspired by Vygotsky (Barnett et al., 2008; Bodrova & Leong, 1996; Bodrova & Leong, 2007; Bodrova & Leong, 2001; Diamond et al., 2007). A central feature of the Tools curriculum is teacher encouragement of complex socio-dramatic play and games. Scaffolding of cognitive control is woven into virtually all classroom activities. For example, teachers encourage complex make-believe play, guiding children in jointly planning of play scenarios before enacting them.

Teachers also lead rule-switching games in which regular movement patterns shift often, requiring flexibility of attention. In addition, Tools teachers model and encourage use of private speech as a means of regulating behavior.

Diamond et al. (2007) randomly assigned 150 preschoolers from low-income families to either Tools classrooms or comparison classrooms with similar content and activities, but without addressing cognitive control. Children from the Tools classrooms differed in end-of-year performance on a battery of laboratory tasks designed to measure cognitive control, a construct that subsumes three core self-regulatory abilities: inhibiting irrelevant thought and action, effortfully holding and operating on information in working memory, and flexibly adjusting attention to changes in task requirements. Tools children were especially advantaged on the more demanding tasks—ones taxing all three aspects of cognitive control—which also correlated significantly with their scores on standardized academic measures. The authors concluded, “Although play is often thought frivolous, it may be essential… yet preschools are under pressure to limit play” (p. 1388). For a more thorough review of the Tools of the Mind research, see chapter 23.

Comparative research also shows not only the benefits of guided play, but possible dampening effects for children in direct instruction programs. Hart, Yang, Charlesworth, and Burts (2003) confirmed these findings in a longitudinal study that compared children who received direct instruction with those who received developmentally appropriate pedagogical practices--which included playful experiences. Results indicated that those children who received direct instruction experienced more stress than children who received developmentally appropriate curricula. Stress seemed to play a causal role in Hart et al.’s model as it predicted the appearance of hyperactive and distractible behaviors as well as greater hostility and aggression. These findings emerged regardless of gender, race, and socio-economic status. Boys who were in a direct instruction classroom had lower achievement, mediated by the stress of being in such a classroom. These children grew more slowly in reading (vocabulary and comprehension) and language expression than did their peers in more developmentally appropriate classrooms. Thus, instructional practices consistent with the “empty vessel” view may have aversive socio-emotional effects that, in turn, undermine learning, motivation, and achievement (Hart et al., 1998; Ruckman, Burts, & Pierce, 1999; Burts et al., 1992; Rescorla, Hyson, & Hirsh-Pasek, 1991).

Lastly, a landmark longitudinal study presents a telling account of early education program's impact on socio-emotional factors. In the 1960's a large-scale study compared a direct instruction program (Direct Instruction System for Teaching Arithmetic and Reading, DISTAR) to two playful learning programs (High/Scope and another child-centered nursery school). High-risk children were randomly assigned to one of the three preschool models and followed until they were 23 (Schweinhart, Weikart, & Larner, 1986; Schweinhart, 2004). During the primary years, no significant differences were found between groups in intellectual and academic performance; however, the direct instruction group reported increasing numbers of misconduct, delinquent behavior, and emotional disturbances from ages 15 to 23. Specifically, the direct instruction group had three times as many felony arrests per person, and 47% of the group was treated for emotional impairment or disturbance during their schooling. The findings suggest that the emphasis on planning, reasoning, and social competencies in the play-based programs may be key factors contributing to positive social outcomes (Bodrova & Leong, 2001; Mills, Cole, Jenkin, & Dale, 2002).

Concluding Thoughts

> *"The power of play as the engine of learning in early childhood and as a vital force for young children's physical, social, and emotional development is beyond question. Children in play-based kindergartens have a double advantage over those who are denied play: they end up equally good or better at reading and other intellectual skills, and they are more likely to become well-adjusted healthy people"* (Miller & Almon, 2009, p. 8).

Playful learning, defined as a combination of free play and guided play, offers a very promising pedagogy for learning academic and social outcomes (Broadhead, & van der Aalsvoort, 2009; Copple, Sigel, & Saunders, 1979; Korat, 2002; Seo & Ginsburg, 2004; Singer & Singer, 2004). The value of playful pedagogy emerges in observational and correlational studies and in studies that use the gold standard of random assignment. The value of this pedagogical approach emerges in preschool settings and in elementary school settings.[2] Play supports both short term and long- term mastery. While there is an accumulating body of research, this area is ripe for future research.

In the so-called "knowledge age," a variety of skills are necessary for success. (Cavanagh, Klein, Kay, & Meisinger, 2006). Children must learn content in math, literacy and science (Duncan et al, 2007). They must also learn to synthesize information and to use it creatively, persevere in the face of challenge, and work in a culturally diverse world (Bell-Rose & Desai, 2005; Hirsh-Pasek et al., 2009). The question before us is how to best instill these competencies in our educational settings. The data strongly suggest that playful learning offers one way to achieve these ends. Play and learning are not incompatible. It is not play *versus* learning, but rather play *via* learning for which we must strive.

Future Directions

There are further areas of play research that need to be addressed:

1. What are the defining features of guided play? More specifically, what elements differentiate guided play, directed play, and direct instruction and do such distinctions influence learning outcomes?
2. What mechanisms drive the association between play and learning?
3. How do playful learning experiences change over time? In other words, as children get older how does the nature of their playful learning change?
4. How do playful learning experiences foster lifelong learning approaches?
5. How might different experimental approaches, such as microgenetic analysis of learning (Van der Aalsvoort, van Geert, & Steenbeek, 2009), shed light on playful learning processes?

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Footnotes

[1] There is a substantial literature debating whether exploratory behavior is "play" (e.g., Hutt, Tyler, Hutt, & Christopherson, 1989; Keller & Boigs, 1991; Weisler & McCall, 1976). While exploration and play share some common attributes (e.g., intrinsic motivation, interest; Weisler & McCall, 1976), some scholars argue there are significant differences between the two. Hutt (1970) suggests exploration is concerned with understanding the object's featural properties and characteristics (i.e., "What is this object?") whereas play focuses on how the object can be used (i.e., "What can I do with the object?"). Thus, children's exploration and play behaviors may be driven by fundamentally different goals (discovery-oriented versus interest-oriented) and likely operate through different learning processes (e.g., explicit learning versus implicit, unconscious learning or incidental learning). This may be a key element in differentiating forms of play, including guided play, and requires additional exploration.

[2] We must be careful not to adopt the "play ethos," in which all play is deemed positive (Smith, 1995). Play often has a dark side, including bullying and compulsory "play" (i.e.., forced participation in a game/activity), which may negate the potential benefits reviewed here.