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Cognitive Behavioral Science behind the Value of Play: Leveraging Everyday Experiences to Promote Play, Learning, and Positive Interactions

Molly A. Schlesinger, PhD, Brenna Hassinger-Das, PhD, Jennifer M. Zosh, PhD, Jeremy Sawyer, PhD, Natalie Evans, BA, and Kathy Hirsh-Pasek, PhD

ABSTRACT

Participating in play affords physical, social, and cognitive benefits. Here, we review the cognitive behavioral science literature highlighting the value of play and describe the different types of play along with the evidence linking play to positive outcomes for children in areas such as social-emotional, cognitive, academic, and social-emotional development. Several case studies demonstrate how educators, caregivers, and community members can integrate low-cost, evidenced-based playful learning interventions into community settings to impact children where they live.

Play is an elusive, tricky-to-define term; it conjures up a different image for everyone. One might envision children throwing a ball, or climbing trees, or creating a new form of entertainment, or infinite others. No matter your preferred image of play, decades of cognitive behavioral science research find evidence that play can positively impact development and learning. Activities sometimes thought of as frivolous and unnecessary actually provide the next generation with academic and social advantages. The cognitive behavioral science literature shows overall positive benefits to play and for the "whole child development" represented in playful learning. Play is a conduit through which children nurture the social and cognitive skills required to learn *how to learn* (Hirsh-Pasek et al., 2009). Despite the well-documented evidence that play sparks learning opportunities (Yogman et al., 2018; Zosh et al., 2018, but see Lillard et al., 2013), play is disappearing from the lives of Western children for a variety of value-based, economic, and social-political reasons. In this manuscript, we review the cognitive behavioral science literature highlighting the value of play and describe the different types of play along with the evidence linking play to positive outcomes. Several case studies demonstrate how practitioners can integrate low-cost, evidenced-based playful learning interventions into communities ranging in socioeconomic status to yield maximum impact.

CONTACT Brenna Hassinger-Das bhassingerdas@pace.edu Psychology Department, Pace University, 41 Park Row, Fl 13, New York, NY 10038.

Molly A. Schlesinger, PhD, is a Statistician at the School District of Philadelphia supporting all aspects of the Office of Research and Evaluation. As a former Temple University Research Fellow, Molly serves as a Scientific Advisor for Playful Learning Landscapes.

Brenna Hassinger-Das, PhD, is an Assistant Professor of Psychology at Pace University. Her areas of expertise encompass executive functioning, early number sense, and vocabulary acquisition and she is particularly interested in investigating the role of play and games for learning.

Jennifer M. Zosh, PhD, is an Associate Professor of Human Development and Family Studies at Pennsylvania State University (Brandywine) where she is the Director of the Brandywine Child Development Lab. She researches playful learning, the impact of technology on children and families, and cognitive development.

Jeremy Sawyer, PhD, is an Assistant Professor of Psychology at Kingsborough Community College, CUNY, and a NY State Certified Bilingual School Psychologist. Jeremy studies sociocultural influences on child development, including play and the private speech of monolingual and bilingual children.

Natalie Evans is a Doctoral Candidate at Temple University studying playful learning and creativity.

Kathy Hirsh-Pasek, PhD, is the Stanley and Deborah Lefkowitz Professor of Psychology at Temple University in Philadelphia, where she directs the Temple University Infant Language Laboratory, and she is a Senior Fellow at the Brookings Institution's Center for Universal Education.

Modern childhood

Childhood today is facing an existential crisis. Many parents and caregivers are concerned about how much time children and adolescents spend using devices with screens. Between 2013 and 2017, the average amount of time that children aged 0–8 spent with screen media increased by 24 min, for a total of 2:19 per day (Rideout, 2017).

In the classroom, traditional rote learning lessons, in which children are taught facts without context or exploration, and *teaching to the test* once reserved for higher grades is being implemented as early as kindergarten (Bodrova et al., 2003; Brandon, 2002; Hirsh-Pasek et al., 2009; Murline, 2000; Steinhauer, 2005; Zigler & Bishop-Josef, 2004). Indeed, Bassok et al. (2016) argue that kindergarten has become the new first grade with 80% surveyed suggesting that children should read in kindergarten, a statistic that is up from 31% in 1998. A decade ago, in 2009, a study by the Alliance for Childhood found that of the 142 kindergarten teachers surveyed in New York City and the 112 in Los Angeles, 25% suggested that they had no time and 54% had less than 30 min available for free play, with much of the day devoted to testing and test preparation as well as literacy and mathematics instruction (Miller & Almon, 2009).

This change in play, both amount and type, is the result of changing political and societal priorities that emphasize starting formal teaching early and not wasting time (Hirsh-Pasek et al., 2009). These changes are meant to help children: preschools teaching academic curricula once reserved for kindergarten and elementary school are trying to close the achievement gap and prepare children for later formal schooling; however, if young children are not developmentally ready to learn and cannot process rigorous academic curricula they cannot benefit from the lessons (Brandon, 2002; Hirsh-Pasek et al., 2009; Steinhauer, 2005).

In contrast, preschools that foster whole child development, ready-to-learn skills, and concentrate on children's social-emotional, physical, and cognitive needs prepare children to learn rigorous academic curricula once they reach formal education. Overall, modern western schools limit free play, losing opportunities to foster social-emotional, physical, and cognitive development that should prepare children to learn, despite the well-documented value that child-directed, free, and playground play has on enriching the whole child.

The problem children face is laced with good intentions – if we bombard children with activities associated with positive growth and development, they should benefit. Some research, however, suggests that 2- to 5-year-old children's participation in structured and enriched activities does not necessarily predict their cognitive, social, and physical outcomes (Schiffrin et al., 2015). Children actually thrive when they are offered some balance between the freedom of unstructured time to explore and self-direct their learning and more pointed and directed activities. By removing play from the classroom, we might be contributing to growing levels of stress and anxiety (Brown et al., 2011; Melman et al., 2007). Play offers children a context in which they can apply what they have learned elsewhere in a safe environment and in a new context, thereby enabling them to develop their own agency and skills (Yogman et al., 2018; Zosh et al., 2018).

What is play?

Humans are not the only species that play. Monkeys, lizards, octopuses, some species of fish and birds, and even dart poison frogs play (Burghardt, 2014). Yet, play is notoriously difficult to define (Gray, 2017; Hassinger-Das et al., 2017; Weisberg et al., 2013). From a sociocultural perspective, play is considered a desired activity, including both rules and imagination (Vygotsky, 1978). Play purists and cognitive behavioral scientists consider play to some degree as fun or joyful, agentic or intrinsically motivated, unique or flexible, imaginative or involving the suspension of disbelief, and containing a loose structure or form of rules (Gray, 2017; Hassinger-Das et al., 2017; Weisberg et al., 2013; Yogman et al., 2018; Zosh et al., 2018). Zosh et al. (2018) recently presented five characteristics of play. For an activity to be considered playful, it should include elements of 1)

joy, 2) active engagement, 3) meaning or relevance, 4) social interaction, and 5) iteration and variety. Not all characteristics need be present for an activity to be considered playful; however, play will have the greatest benefits for child development when are integrated into an activity.

Spectrum of play

Arguably play often includes joy, agency, flexibility, active engagement, social interaction, an iterative nature, imagination, and structure of some sort (Gray, 2017; Hassinger-Das et al., 2017; Weisberg et al., 2013; Yogman et al., 2018; Zosh et al., 2018). The most appropriate way to define play, however, might be to think of play as existing on a spectrum. First, suggested by Sponseller (1974) and Bergen (1988), Zosh et al. (2018) recently developed this spectrum with free play on one end (no adult initiation or direction), guided play and games in the middle (adult-initiated or supported but child-directed) to playful direction (adult-initiated and adult-directed with playful elements). Conceptualizing play as a spectrum allows one to categorize several dimensions; who does the initiating of the play event and who does the directing within the play event. In free play, for example, the child both initiates the building of the fort and invents the rules of engagement as she becomes the knight in shining armor within the fortress under attack. In guided play, the adult initiates the play environment as in a children's museum or a Montessori school, but the child directs the movement and activity within the environment. In direct instruction, the adult both initiates and directs the experience – think standard school that is not really play at all. This style of multiple levels on a continuum provides the opportunity for cognitive behavioral research to codify how different types of play hold different values and promote unique outcomes (Zosh et al., 2018).

Free play

Free play may be the most common image of play. Picture a group of children running around a playground, trying on costumes, or doing messy science experiments with few or no adults in sight. When children engage in free play with peers, they practice social interaction, expressive communication, and behavioral regulation (Blatchford & Baines, 2010), and essentially learn how to behave appropriately in unique situations with fluid and evolving rules and friends with different perspectives. Free play can be a solo activity, with children practicing agency, independence, decision-making, and engaging their imagination as they use building blocks to create a new fantasy world, complete with dragons made out of pipe cleaners and a moat with imaginary water. Free play with objects can result in children developing a rudimentary understanding of physics or establishing a mental concept for scientific thinking, such as learning how different speeds, angles, and sizes change how quickly a ball will reach the end of a sliding board.

Guided play

Guided play is unique from free play in that children have the agency to choose the activity and to actively guide their experience within an activity, but watchful adults support the child to nudge her toward a learning goal or keep children on track when they are having difficulty being self-directed (Hassinger-Das, Schlesinger, et al., 2018). Guided play is akin to the educational research concept of enhanced discovery learning approaches, in which learners are provided with support and motivation to discover something new in a well-crafted environment (Alfieri, Brooks, Aldrich & Tenenbaum, 2011). Guided play and adult guidance take many forms and are most effective in direct response to the individual child's needs and interests, adopting scaffolding techniques, such as an adult playing like a peer, asking the child open-ended questions that can spur conversation and discovery, or complementing a child's action with relevant information. As an example, the child may choose a guided play activity, such as the tower challenge where young architects gather to build the tallest and most stable tower. Adults gently coach in support to help the children build a most stable structure and to help the children see how this tidbit of engineering can be used to support stronger skyscrapers and bridges as well. In this scenario, the adult's role is to support the child in maintaining focus on the activity (e.g., helping to eliminate

distractions and bringing the child back to the activity if they are still interested but distracted) and provide encouragement during construction or when the tower inevitably topples over, by perhaps asking questions about which blocks could be added next to strengthen the base rather than by showing the children and merely asking them to reproduce what they had demonstrated. If the tower falls over, the adult can prompt the child to think about why it fell and come up with solutions to rebuild. Failure in this model offers a chance for iterative and active learning.

Games

Games fall in the middle of the spectrum as a special case of guided play. Games integrate targeted or tangential learning goals with the characteristics of play that make games fun to support children's learning. An excellent example of a game with tangential learning goals is Simon Says. This game was not designed to develop cognitive behavioral skills but indeed, plays an important role in helping to support aspects of executive functioning such as inhibiting a response when Simon does not "say" to do something (Savina, 2014). These types of behaviors in turn relate to academic learning (McClelland & Cameron, 2011). Other games are specifically intended to build skill sets or proficiencies, such as an enhanced game of Snakes and Ladders that requires children to answer questions about new vocabulary with every turn (Hassinger-Das et al., 2016).

Playful instruction

Instruction, even if playful, is like dressing up direct instruction work in play clothes. It can provide an entertaining experience but children in these contexts have little agency or active learning (Zosh et al., 2018). Even if the child chooses to still build a tower, if the adult corrects the child's behavior each time they notice the child chooses a suboptimal place to put the next block, the child not only loses initiative, but also the confidence to produce anything but the "right answer."

Summary

Overall, play is fun and imaginative and can include rules or structure (Gray, 2017; Hassinger-Das et al., 2017; Piaget, 1952; Vygotsky, 1978; Weisberg et al., 2013). Theoretical perspectives argue that play develops self-regulation and abstract reasoning, laying the foundation for social, physical, and cognitive development (Vygotsky, 1978; Whitebread et al., 2017), and play can recharge taxed cognitive processes, promoting greater performance in academic contexts (Bjorklund & Green, 1992; Bjorklund & Pellegrini, 2000; Pellegrini & Bohn, 2005). Research on the value of play supports these theoretical perspectives and adds that play might also support "whole child development." That is, play can support social, emotional, cognitive, and physical development (Birch & Ladd, 1997; Hamre & Pianta, 2001; Hirsh-Pasek et al., 2009; Konold & Pianta, 2005; Ladd et al., 2006).

Benefits of play

Like many types of developmentally appropriate activities, play exerts its influence in a more wholistic way contributing to incremental development of multiple interrelated skills. For example, cognitive and social-emotional development are interrelated: social competence has been highlighted as a prerequisite for academic success and cognitive growth (Berk et al., 2006; Birch & Ladd, 1997; Diamond, 2016; Golinkoff & Hirsh-Pasek, 2016; Hamre & Pianta, 2001; Konold & Pianta, 2005; Ladd et al., 2006; Valiente et al., 2012). From the whole child perspective, play is a developmentally appropriate way to simultaneously foster multiple developmental skills, as play organically exercises social-emotional, physical, and cognitive processes. The following section – though divided into cognitive, socio-emotional, and physical bins with specific subsections for free play, guided play, and games – represents this more wholistic approach.

Social-emotional benefits

Free play

During child-directed play, peers collaborate in creating rules, or altering rules to games with strictly set rules, developing children's self-regulation (Foley, 2017). For example, free play can serve as a buffer against externalizing behaviors for Portuguese 4- to 6-year-old's as more time in free play was associated with fewer negative behaviors (Veiga et al., 2016). Play that requires or encourages negotiating rules and limitations, taking the perspective of other players, and collaboratively creating play worlds or frameworks with peers has been linked to greater recognition that other people have their own unique perspectives and mind-sets (Blatchford & Baines, 2010; Foley, 2017; Vygotsky, 1978).

Guided play

The most prominent social-emotional benefits stem from social play, as simply providing children opportunities to play in school facilitates meeting new friends and enhancing friendships by creating a shared play culture (Blatchford & Baines, 2010). Because play often has overarching goals, children are both collaborating to achieve those goals and learning how to work together with peers to achieve a goal (Ramani, 2012; Ramani & Brownell, 2014). Recent work has noted how play-based kindergarten curriculums, such as Tools of the Mind, support children's socio-emotional competence, with fewer behavioral problems, and greater self-regulation and positive social relationships (Blair et al., 2018; Diamond et al., 2019). The authors discuss the success of children's socio-emotional competence occurring from improvements in executive functions, supporting how play can simultaneously support socio-emotional and cognitive development.

Cognitive benefits

Cognitive behavioral research has noted a variety of cognitive, academic, and cognitive-behavioral benefits from playful curriculum, playing educational games, and having access to recess and free play during the school day. The most prominent research points to how guided play, in particular, supports children's executive functions or ready-to-learn skills. Impulse control, attention, memory, and flexibility all fall under this umbrella term (Diamond & Lee, 2011; Röthlisberger et al., 2012).

Executive functions

Executive functions comprise a suite of skills that prepare children for learning and are predictive of developmental trajectories and overall school success (Diamond et al., 2007).

Games. A number of familiar childhood games like Simon says, musical chairs, hopscotch, and Red Rover have been recruited to develop executive functions in young children (Blakey & Carroll, 2015; Diamond et al., 2007; McClelland et al., 2007; Passolunghi & Costa, 2016; Röthlisberger et al., 2012; Traverso et al., 2015). Some games have even been developed specifically to train working memory, attention, rule switching, and recall (Blakey & Carroll, 2015; Diamond et al., 2007; Passolunghi & Costa, 2016; Röthlisberger et al., 2012). These games require children to wait, switch rules, attend closely, and sustain their attention, which are the behaviors that prepare children to learn in academic settings (Leong & Bodrova, 2012; Shaheen, 2014). Arguably, any play that requires children to regulate their own behavior and behave flexibly supports these crucial cognitive skills, such as tag, duck duck goose, double Dutch, hide and seek, hopscotch, red light green light, jacks, or loosely organized sports.

Guided play. Correlational studies have reported that even symbolic play, pretense, and memory of pretend identities positively related to inhibitory control (Kelly et al., 2011), delay executive function (Carlson et al., 2014), and an executive function composite (Albertson & Shore, 2009), respectively. Experimental work reports that instilling pretense into measures of executive function improved 3-year-

old boys' rule switching (Toub, 2012) and a pretend play intervention resulted in improved working memory and attentional shift compared to non-imaginative play interventions for 3- to 5-year-olds (Thibodeau et al., 2016). School curriculum embedded in imaginative play that can be considered guided play, demonstrated by Tools of the Mind, has significantly improved kindergartner's working memory, inhibitory control, and flexibility (Blair & Raver, 2014; Diamond et al., 2007, 2019).

Free play. In addition to playful learning that explicitly provides children with direct benefits, there are also benefits to simply having access to recess or free play. This work has primarily found that children have greater attention to academic activities following recess, compared to before recess, with the authors arguing that children are more attentive after child-directed play (Pellegrini et al., 1995). These studies included participants ranging from ages 4 to 11, examined different lengths of playtime, focused on traditional recess as well as more sedentary playtimes (Harvey et al., 2017; Holmes et al., 2006; Jarrett et al., 1998; Pellegrini et al., 1995) and noted that simply providing non-academic breaks during the school day increases attention in the classroom (Bjorklund & Green, 1992; Bjorklund & Pellegrini, 2000). Similarly, research examining 6- and 7-year-olds' unstructured time revealed that the more time children spent in unstructured activities had better self-directed executive function skills (Barker et al., 2014).

Academic content

Guided play. Guided play may also help children uncover how the world works via scientific thinking (Bonawitz et al., 2008), including an understanding of cause-and-effect (Schulz & Bonawitz, 2007). In particular, a growing body of work demonstrates the power in teaching children math content and concepts via guided play. Research comparing guided play, free play, and didactic instruction revealed that 4- and 5-year-olds were most likely to learn early geometry concepts immediately and a week later while learning the geometric properties of shapes in a role play and joint exploration-guided play condition (Fisher et al., 2013).

Guided play in the context of a storybook intervention can also improve kindergartners' mathematics vocabulary for children with math difficulties (Hassinger-Das et al., 2015). Studying 3- to 5-year-olds' mathematics and literacy skills, Purpura et al. (2017) noted that mathematical language skills explain a significant portion of the connection between early mathematics and literacy skills. Research also indicates that 4- and 5-year-olds exposed to hybrid book-reading and playful learning literacy interventions, in which children's vocabulary lessons are introduced through storybooks and supported through free play, guided play, and directed play opportunities, learn more vocabulary through adult-supported play than during free play (Toub et al., 2018).

In research comparing math talk elicited by direct instruction, guided play, and free play between parents and 4- and 5-year-old children, the formal learning condition yielded the most math talk, whereas the guided play condition elicited more math talk than the unguided play condition (Eason & Ramani, 2018). It is interesting that parents considered the guided play condition more fun than the direct instruction condition; a finding that might spur parents into playing with their children more and into eliciting math talk during guided play after the experiment ended. More research is needed to determine the long-lasting effects of these play interventions.

Games

One of the driving processes connecting playful learning at home to in-school success is the amount of content-driven language children hear outside of school. For example, the type and amount of math talk children hear outside of school is related to their in-school math success (Berkowitz et al., 2015; Gunderson & Levine, 2011). A growing body of literature shows how playful contexts spur greater child-caregiver talk about content language that is critical to children's in-school learning. Research has noted that board games spur more math talk than puzzles or math-based reading activities for low-income preschoolers; however, each activity elicited a different kind of math talk and each activity is more appropriate depending on the type of math talk that is of value (Daubert

et al., 2018). For example, counting language occurred more frequently during board game play and book reading than puzzle play, number identification occurred most often during board game play and puzzle play, and cardinal value talk (e.g., symbolically linking number names to numbers of objects) occurred most often during board game play than other play, whereas, ordinal talk (e.g., number sequence) happened during puzzle play more often than other activities.

In another study, when children and caregivers played a shape and color matching game at home, pre-kindergarten children experiencing poverty showed significant improvement in shape knowledge (Ramani & Scalise, 2018). Games are not a magic bullet; however, as in the same study, the effect was not found for a numerical magnitude – or understanding which numbers are larger or smaller – game on children's numerical knowledge and that families varied widely in the ways that they played (Ramani & Scalise, 2018). This work suggests that games are useful and effective, but close attention has to be paid to the ways in which games are created and adults are scaffolded to play in ways that are child-directed, rather than adult-directed.

Physical benefits

Finally, physical activity often found during play is important for gross motor development and health. Meta-analytic and experimental work indicates that gains in perceptual abilities, cognitive processing and verbal abilities, academic achievement, and school readiness are greater for children involved in physical activity interventions compared to less active control groups (Hillman et al., 2009; Sibley & Etnier, 2003). Similar research reveals children's level of aerobic fitness is related to a standard measure of executive function that captures inhibition, rule switching, and response time (Buck et al., 2008). Cognitively enhanced physical activity, such as physical activity that has rules, is social, and requires attention to detail – often found as part of physically active play – has greater benefits for academic success than physical activity or exercise without rules or social interaction (Best, 2010).

Given the multiple advantages of play for young children, it is ironic that play is no longer a favored behavior in children's educational landscapes. Indeed, Yogman et al. (2018) issued the call for all doctors to prescribe a "prescription for play" to turn the tide. This was the third publication from the prestigious American Academy of Pediatricians as they noted a serious decline in the amount of play. Several case studies suggest how we can heed to call and alter children's environments to enable more playful activities.

Case studies

There are indefinite ways to create playful learning opportunities using the spaces in which children spend time. This can be done to support rather than disrupt everyday family routines. Playful Learning Landscapes is an initiative designed to build stronger communities by creating playful learning spaces in the neighborhood where children and families spend their everyday time. Partnering with communities, nonprofit organizations, designers, and municipalities we create opportunities in streets, supermarkets, bus stops, and libraries (see Bustamante et al., 2019; Hassinger-Das, Bustamante, et al., 2018, for more examples). For each case study, we created opportunities to foster the kinds of behaviors and language known to support children's success in and out of school. For example, we measured observations of parent talk to children and their specific use of numeric terms known to build stronger mathematical competence (Hassinger-Das, Palti, et al., 2020; Ridge et al., 2015).

Parking day

Since 2005, PARK(ing) Day has been an international phenomenon where concerned citizens reclaim single-use parking spaces to create parks for public use. As PARK(ing) Day has evolved,

the parklets have grown from traditional grassy sod lots to innovative architectural designs. Our academic researchers joined a collaborative design team volunteering to construct a park in a high-poverty Southwestern Philadelphia neighborhood, with the median household income for the immediate area ranging from 18,000 to 24,000 USD. The PARK(ing) Day installation design was driven by the community with a vision of and needs articulated by the recreation center staff and youth attendees, who also participated in the design and construction.

Interviews and focus groups

To grasp the needs of the recreation center and community youth, we met with the recreation center staff and they requested the installation should support physical activity, creativity, social interaction, and "thinking fast" (e.g., executive function skills). The team proposed numerous culturally relevant ideas for active installations that would also promote social, cognitive, and physical development during play to a focus group with the recreation center youth. Children ages 8–12 were asked to help us create a *playful learning* installation designed especially for them. The youth immediately grasped the concept of playful learning, illustrated by the numerous examples of playful learning that they shouted out – including a new term, "P'LEARNING." During the focus group, they selected and explained their favorite ideas proposed by the research and design teams. They then drew their own playful learning installation ideas – iterating the ideas proposed by the design team.

Design

The design team weighed the youth's most popular, feasible suggestions against the resources available, and community needs – resulting in a bean bag toss game. The free-standing bean bag toss game is an iterative playful learning activity. The back of the 64 boxes on the board were painted with chalkboard paint, allowing players to write letter, numbers, or draw pictures in the boxes (math and literacy). The physical installation structure could be rotated at different angles, allowing for a new level of difficulty every time the angle changed and ensuring the game was mobile. Cards with game prompts were provided, ranging from simple pattern and four-in-a-row style games to more complex spelling and mathematics bean bag-toss games appropriate for teens. The installation was physically active (e.g., throwing bean bags), encouraged creativity as children made up countless new game rules, was socially interactive with bean bags of different colors that intuitively suggested forming teams or competitions, and supported executive functions – or thinking fast – while participants experimented with strategies or developing game rules.

Pilot testing and results

The bean bag game was temporarily installed on a busy street in Central Philadelphia on PARK(ing) Day 2018. Naturalistic observations were collected by trained laboratory staff of people who stopped by the parking space to play the bean bag toss game using observation protocols adapted from prior PLL research (Hassinger-Das, Bustamante, et al., 2018; Hassinger-Das, Palti, et al., 2020; Hassinger-Das, Zosh, et al. 2020; Schlesinger et al., 2020). with the goal of approximating how the installation may benefit youth at the recreation center.

The bean bag toss game spurred talk about numbers and letters, but not spatial talk or question asking. The relatively high rates of number and letter talk are not surprising, as numbers and letters were written in the boxes of the bean bag toss, and visitors made up new games by spelling words or doing math problems. However, it was surprising the physical game did not spur greater spatial talk or question asking. During this physical game, adults visiting during PARK(ing) Day demonstrated moderate physical activity, but were highly engaged, and socially interactive with staff and other visitors. Players demonstrated high levels of communication (e.g., talking, gesturing; $M = 2.52$, $SD = .60$), collaboration (e.g., teamwork, taking turns; $M = 2.67$, $SD = .67$), content (e.g., using math words or displaying self-control; $M = 2.48$, $SD = .60$), critical thinking (e.g., solving problems, comparing contrasting; $M = 1.86$, $SD = .66$), creative innovation (e.g., making up rules, adapts ideas; $M = 2.05$, $SD = .50$), and confidence (e.g., taking on a challenge, persists; $M = 2.48$, $SD = .60$) during the course of play. Pilot testing supported

that the bean bag toss gave opportunities for players to exercise creativity, social interaction, executive functions, and some active movement. This playful learning installation, guided by the community, provides opportunities for social play and skill development.

Play Wall

Supported by the LEGO Foundation, Play Wall is a chalkboard wall in a public space featuring the prompt, "When I was little, I loved to play … " Underneath the prompt, community member saw a series of lines each containing one further prompts that said, "I played … " followed by a line on which they could write their response with the chalk provided (Figure 1). Derived from artist Candy Chang's *Before I Die* social movement, our interdisciplinary team of play experts proposed that prompting people to think about how they loved to play when they were little would prompt intergenerational conversation about play, and therefore increase caregiver-child conversation (Chang, 2013). After 1 year piloting the Play Wall (Schlesinger et al., 2019), observing written response and how communities treat the structure, we partnered with a local neighborhood community action group to install a Play Wall in a West Philadelphia neighborhood with a mean household income of 14,000 USD. There, local residents were hired to observe how people interact with the installation.

Collaboration

Although the research team carried the bulk of the burden of building and maintaining the Play Wall, a strong community leader determined and championed the location in the neighborhood to install the Play Wall, keeping a local eye on the structure. The community collaborator championed this location because it was on the site of a community garden across the street from a popular corner store (one of the only stores selling groceries in a four-block radius), located on the main route that neighborhood children take as they walk home from the local elementary and middle schools.

Figure 1. Play wall installation in Philadelphia, Pennsylvania.

Design

The Play Wall is a chalkboard plywood wall stretching 6 feet high and 10 feet wide resting on a chain-link fence on a community garden, in principle, the size can vary depending on availability of space. The Play Wall featured the prompt, "When I was little, I loved to play … ". On each wall 14 lines read, "I played … " and baskets of chalk were left on the chalkboard for respondents. Lined prompts created organization, but it was expected that responses would cover the entire wall.

Testing and results

The community members in the neighborhood who collected data observed interactions at the Play Wall for 5 weeks in fall 2018. A primary goal of the Play Wall project was to determine if the presence of the Play Wall encourages conversations about playful learning activities. The community data ambassadors noted the conversations visitors had in front of the Play Wall and wrote if the conversations had anything to do with what they wrote on the Play Wall.

The Play Wall spurred conversation about certain kinds of playful learning, but not others. Children talked about how play that supports social and cognitive development, but not physical or school content. Adults discussed how play supports social, social, cognitive, and physical, development, but not how to learn school content (e.g., math, science, reading) through play. Social interaction was relatively high. All adult visitors asked children questions and described something on the Play Wall, and most responded to children vying for their attention; conversely, about half of children asked questions described something on the Play Wall, or responded to adults trying to get their attention. The observers also noted the qualitative types of play people discussed and wrote on the Play Wall. Often, adults and children were talking about play together along with different ways to play. Only in one circumstance did adults and children write the same activity, describing that favorite ways to play are likely generational. Overall, the Play Wall demonstrates how a simple prompt to think about play can spur socially interactive discussion about joyful activities and help people intuitively understand the connection between play and learning.

Play captains and play streets

During the summer in Philadelphia, nearly 500 streets are closed off to cars between 10 am and -4 pm, and the city's Parks and Recreation Department provides spaces where children and families can enjoy the outdoors. Yet, there are no institutionalized resources and the streets often lack supervision, activities, materials, or even encouragement for play, games, or learning, especially on high-poverty blocks.

In 2017, a local community-based organization that focuses on youth skill building, employment, and civic-engagement for teenagers recognized the potential for making these closed streets more playful and simultaneously developing teenager's leadership and job training skills. The teens were trained to understand the concept of playful learning and became Play Captains who ran a variety of games and playful activities on certain Play Streets and in local libraries. In 2018, our academic research team provided support to the community-based organization to infuse playful learning pedagogy into an already playful program. The organization leadership sought out the academic research team for additional support in transforming their activities, and five teens were trained to run playful learning programming and collect data on the streets that were open for play (Schlesinger et al., 2020).

Design

The teens were trained on how to enhance any "playful" activity by transforming it into playful learning, how to collect data using an observational protocol for the community-based organization's program evaluation of what youth are doing on the closed streets. The training included working through some examples of how they were making the activities more playful and adding new learning dimensions. One example was "Capture the Flag," to which the teens added the idea of

making flags worth different amounts of points, keeping score, and even having teams huddle up football style before each play to devise strategic plans to capture the different-valued flags, as well as to set assignments for which team members distract opponents as a decoy, while others captured the flag. These types of rule changes encourage children to practice using numerical terms, counting, working memory, collaboration, and planning skills. The teens facilitated numerous outdoor playful learning activities for 5 weeks in summer 2018. These activities included, obstacle courses, face painting, water games, board games, and wood crafts, many of which were infused with playful learning principles with the goal of encouraging children's learning behaviors (Schlesinger et al., 2020).

Results

On average, children used about two and a half number of words and asked nearly two questions per five-minute observation. Among children, there were high levels of conversation, social interaction (e.g., competition, solving problems together), and physical activity (e.g., running, jumping). Children displayed moderate levels of communication (e.g., conversations), collaboration (e.g., teamwork), and confidence (e.g., persistence). In contrast, children showed relatively low levels of content understanding (e.g., demonstrating self-control) and creativity (e.g., developing original ideas). Children showed minimal levels of critical thinking (e.g., compares and contrasts) (Schlesinger et al., 2020).

Summary

Overall, these pilot projects were steeped in the cognitive behavioral science supporting the value of play and demonstrate that small playful learning interventions can encourage children to use the types of behaviors known to be associated with positive social-emotional, cognitive, and physical outcomes through play.

Conclusion

The concept of playful learning – an amalgamation of free and guided play (Zosh et al., 2018) is setting the stage for a comeback of play. Amidst a backdrop in which play is *in crisis* (Zigler & Bishop-Josef, 2004), researchers and societies at large are starting to recognize the value of play as a conduit for reducing stress and conferring social and academic benefits. It just might be time to rethink how play should factor into our everyday experiences. Play is not a waste of time, a frivolity – it is a behavior that embraces the very principles of how children learn, and it does so respecting the whole child rather than the trifurcated child who has a social, cognitive, and physical self.

In a changing world, there is great emphasis on teaching children specific content early so that all are prepared to compete in a technologically sophisticated global society. It is also imperative to close the persistent achievement gap that has separated the performance of children from under-resourced environments from their more affluent peers for half a century. The question is not whether we should better prepare our children – but how to best achieve that goal. Children need rich curricular opportunities that offer them experiences in reading, math, ready-to-learn skills, and social engagement, but these need to be nested in a playful pedagogy. These are not incompatible. Indeed, for young children, research suggests that this is the optimal learning environment with the biggest payoff (Fuller et al., 2017). We have just begun to scratch the surface of the potential for play to support children's learning, development, health, and wellbeing. The documented evidence for the potential of playful pedagogies in supporting children's development is simply a starting point to drive the growing movement to bring play and playful activities back to childhood to support all children.

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ORCID

Molly A. Schlesinger http://orcid.org/0000-0002-6653-5118
Brenna Hassinger-Das http://orcid.org/0000-0002-1183-0646
Jennifer M. Zosh http://orcid.org/0000-0002-1698-4708
Kathy Hirsh-Pasek http://orcid.org/0000-0003-2947-4544

References

Albertson, K., & Shore, C. (2009). Holding in mind conflicting information: Pretending, working memory, and executive control. *Journal of Cognition and Development*, *9*(4), 390–410. https://doi.org/10.1080/15248370802678240

Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of Educational Psychology*, *103*(1), 1–18. https://doi.org/10.1037/a0021017

Barker, J. E., Semenov, A. D., Michaelson, L., Provan, L. S., Snyder, H. R., & Munakata, Y. (2014). Less-structured time in children's daily lives predicts self-directed executive functioning. *Frontiers in Psychology*, *5*, 593. https://doi.org/10.3389/fpsyg.2014.00593

Bassok, D., Latham, S., & Rorem, A. (2016). Is kindergarten the new first grade? *AERA open*, *2*(1), 2332858415616358. https://doi.org/10.1177/2332858415616358

Bergen, D. (Ed.). (1988). *Play as a medium for learning and development: A handbook of theory and practice*. Heinemann Educational Books.

Berk, L. E., Mann, T. D., & Ogan, A. T. (2006). Make-believe play: Wellspring for development of self-regulation. In D. G. Singer, R. M. Golinkoff, & K. Hirsh-Pasek (Eds.), *Play= learning: How play motivates and enhances children's cognitive and social-emotional growth* (pp. 74–100). Oxford University Press.

Berkowitz, T., Schaeffer, M. W., Maloney, E. A., Peterson, L., Gregor, C., Levine, S. C., & Beilock, S. L. (2015). Math at home adds up to achievement in school. *Science*, *350*(6257), 196–198. https://doi.org/10.1126/science.aac7427

Best, J. R. (2010). Effects of physical activity on children's executive function: Contributions of experimental research on aerobic exercise. *Developmental Review*, *30*(4), 331–351. https://doi.org/10.1016/j.dr.2010.08.001

Birch, S. H., & Ladd, G. W. (1997). The teacher-child relationship and children's early school adjustment. *Journal of School Psychology*, *35*(1), 61–79. https://doi.org/10.1016/S0022-4405(96)00029-5

Bjorklund, D. F., & Green, B. L. (1992). The adaptive nature of cognitive immaturity. *American Psychologist*, *47*(1), 46. https://doi.org/10.1037/0003-066X.47.1.46

Bjorklund, D. F., & Pellegrini, A. D. (2000). Child development and evolutionary psychology. *Child Development*, *71*(6), 1687–1708. https://doi.org/10.1111/1467-8624.00258

Blair, C., McKinnon, R. D., & Daneri, M. P. (2018). Effect of the tools of the mind kindergarten program on children's social and emotional development. *Early Childhood Research Quarterly*, *43*, 52–61. https://doi.org/10.1016/j.ecresq.2018.01.002

Blair, C., & Raver, C. C. (2014). Closing the achievement gap through modification of neurocognitive and neuroendocrine function: Results from a cluster randomized controlled trial of an innovative approach to the education of children in kindergarten. *PLoS One*, *9*(11), e112393. https://doi.org/10.1371/journal.pone.0112393

Blakey, E., & Carroll, D. J. (2015). A short executive function training program improves preschoolers' working memory. *Frontiers in Psychology*, *6*, 1827. https://doi.org/10.3389/fpsyg.2015.01827

Blatchford, P., & Baines, E. (2010). Peer relations in school. In K. Littleton, C. Wood, & K. Staarman (Eds.), *International handbook of psychology in education* (pp. 227–274). Emerald Group Publishing Limited.

Bodrova, E., Leong, D. J., Norford, J. S., & Paynter, D. E. (2003). It only looks like child's play. *Journal of Staff Development*, *24*(2), 47–51.

Bonawitz, E. B., Chang, I., Clark, C., & Lombrozo, T. (2008). Occam's razor as inductive bias in preschoolers' causal explanations. *Proceedings of the 7th International Conference of Development and Learning*, Monterey, CA.

Brandon, K. (2002). Kindergarten less playful as pressure to achieve grows. *Chicago Tribune*, 1.

Brown, S. L., Nobiling, B. D., Teufel, J., & Birch, D. A. (2011). Are kids too busy? Early adolescents' perceptions of discretionary activities, overscheduling, and stress. *Journal of School Health*, *81*(9), 574–580. https://doi.org/10.1111/j.1746-1561.2011.00629.x

Buck, S. M., Hillman, C. H., & Castelli, D. M. (2008). The relation of aerobic fitness to stroop task performance in preadolescent children. *Medicine and Science in Sports and Exercise*, *40*(1), 166–172. https://doi.org/10.1249/mss.0b013e318159b035

Burghardt, G. M. (2014). A brief glimpse at the long evolutionary history of play. *Animal Behavior and Cognition*, *1*(2), 90–98. https://doi.org/10.12966/abc.05.01.2014

Bustamante, A. S., Hassinger-Das, B., Hirsh-Pasek, K., & Golinkoff, R. M. (2019). Putting the science of learning to work: Designing learning landscapes for cities and families. *Child Development Perspectives*, *13*(1), 34–40. https://doi.org/10.1111/cdep.12309

Carlson, S. M., White, R. E., & Davis-Unger, A. C. (2014). Evidence for a relation between executive function and pretense representation in preschool children. *Cognitive Development*, *29*, 1–16. https://doi.org/10.1016/j.cogdev.2013.09.001

Chang, C. (2013). *Before I die*. St. Martin's Griffin.

Daubert, E., Ramani, G., Rowe, M., Eason, S., & Leech, K. (2018). Sum thing to talk about: Caregiver-preschooler math talk in low-income families from the United States. *Bordón. Revista de Pedagogía*, *70*(3), 115–130. https://doi.org/10.13042/Bordon.2018.62452

Diamond, A. (2016). Why improving and assessing executive functions early in life is critical. In P. McCardle, L. Freund, & J. A. Griffin (Eds.), *Executive function in preschool-age children: Integrating measurement, neurodevelopment, and translational research* (pp. 11–43). American Psychological Association. https://doi.org/10.13140/RG.2.1.2644.6483

Diamond, A., Barnett, W. S., Thomas, J., & Munro, S. (2007). Preschool program improves cognitive control. *Science*, *318*(5855), 1387–1388. https://doi.org/10.1126/science.1151148

Diamond, A., Lee, C., Senften, P., Lam, A., & Abbott, D. (2019). Randomized control trial of *tools of the mind*: Marked benefits to kindergarten children and their teachers. *PLoS ONE*, *14*(9), e0222447. https://doi.org/10.1371/journal.pone.0222447

Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science*, *333*(6045), 959–964. https://doi.org/10.1126/science.1204529

Eason, S. H., & Ramani, G. B. (2018). Parent–child math talk about fractions during formal learning and guided play activities. *Child Development*, *91*(2), 546–562. https://doi.org/10.1111/cdev.13199

Fisher, K. R., Hirsh-Pasek, K., Newcombe, N., & Golinkoff, R. M. (2013). Taking shape: Supporting preschoolers' acquisition of geometric knowledge through guided play. *Child Development*, *84*(6), 1872–1878. doi:10.1111/cdev.12091

Foley, G. M. (2017). Play as regulation: Promoting self-regulation through play. *Topics in Language Disorders*, *37*(3), 241–258. https://doi.org/10.1097/TLD.0000000000000129

Fuller, B., Bein, E., Bridges, M., Kim, Y., & Rabe-Hesketh, S. (2017). Do academic preschools yield stronger benefits? Cognitive emphasis, dosage, and early learning. *Journal of Applied Developmental Psychology*, *52*, 1–11. https://doi.org/10.1016/j.appdev.2017.05.001R

Golinkoff, R. M., & Hirsh-Pasek, K. (2016). *Becoming brilliant: What science tells us about raising successful children*. American Psychological Association.

Gray, P. (2017). What exactly is play, and why is it such a powerful vehicle for learning? *Topics in Language Disorders*, *37*(3), 217–228. https://doi.org/10.1097/TLD.0000000000000130

Gunderson, E. A., & Levine, S. C. (2011). Some types of parent number talk count more than others: Relations between parents' input and children's cardinal-number knowledge. *Developmental Science*, *14*(5), 1021–1032. https://doi.org/10.1111/j.1467-7687.2011.01050.x

Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, *72*(2), 625–638. https://doi.org/10.1111/1467-8624.00301

Harvey, S. P., Lambourne, K., Greene, J. L., Gibson, C. A., Lee, J., & Donnelly, J. E. (2017). The effects of physical activity on learning behaviors in elementary school children: A randomized controlled trial. *Contemporary School Psychology*, *22*, 303–312. https://doi.org/10.1007/s40688-017-0143-0

Hassinger-Das, B., Bustamante, A., Hirsh-Pasek, K., & Golinkoff, R. M. (2018). Learning landscapes: Playing the way to learning in public spaces. *Education Sciences: (Special Issue) Early Childhood Education*, *8*(2), 74. https://doi.org/10.3390/educsci8020074

Hassinger-Das, B., Jordan, N. C., & Dyson, N. (2015). Reading stories to learn math: Mathematics vocabulary instruction for children with early numeracy difficulties. *The Elementary School Journal*, *116*(2), 242–264. https://doi.org/10.1086/683986

Hassinger-Das, B., Palti, I., Golinkoff, R. M., & Hirsh-Pasek, K. (2020). Urban thinkscape: Infusing public spaces with STEM conversation and interaction opportunities. *Journal of Cognition and Development*, *21*(1), 125–147. https://doi.org/10.1080/15248372.2019.1673753

Hassinger-Das, B., Ridge, K., Parker, A., Golinkoff, R. M., Hirsh-Pasek, K., & Dickinson, D. K. (2016). Building vocabulary knowledge in preschoolers through shared book reading and gameplay. *Mind, Brain, and Education*, *10*(2), 71–80. https://doi.org/10.1111/mbe.12103

Hassinger-Das, B., Schlesinger, M. A., Sawyer, J., Hirsh-Pasek, K., & Golinkoff, R. (2018). Playing to learn: Supporting kids both inside and outside of school. *Parents' League Review*.

Hassinger-Das, B., Toub, T. S., Zosh, J. M., Michnick, J., Golinkoff, R., & Hirsh-Pasek, K. (2017). More than just fun: A place for games in playful learning/Más que diversión: El lugar de los juegos reglados en el aprendizaje lúdico. *Infancia y Aprendizaje*, *40*(2), 191–218. https://doi.org/10.1080/02103702.2017.1292684

Hassinger-Das, B., Zosh, J. M., Hansen, N., Talarowski, M., Zmich, K., Golinkoff, R. M., & Hirsh-Pasek, K. (2020). Play-and-learn spaces: leveraging library spaces to promote caregiver and child interac- tion. *Library & Information Science Research*, *42*(1), 101002. doi: 10.1016/j.lisr.2020.101002

Hillman, C. H., Pontifex, M. B., Raine, L. B., Castelli, D. M., Hall, E. E., & Kramer, A. F. (2009). The effect of acute treadmill walking on cognitive control and academic achievement in preadolescent children. *Neuroscience*, *159*(3), 1044–1054. https://doi.org/10.1016/j.neuroscience.2009.01.057

Hirsh-Pasek, K., Golinkoff, R., Berk, L., & Singer, D. (2009). *A mandate for playful learning in preschool: Presenting the evidence*. Oxford University Press.

Holmes, R. M., Pellegrini, A. D., & Schmidt, S. L. (2006). The effects of different recess timing regimens on preschoolers' classroom attention. *Early Child Development and Care*, *176*(7), 735–743. https://doi.org/10.1080/03004430500207179

Jarrett, O. S., Maxwell, D. M., Dickerson, C., Hoge, P., Davies, G., & Yetley, A. (1998). Impact of recess on classroom behavior: Group effects and individual differences. *The Journal of Educational Research*, *92*(2), 121–126. https://doi.org/10.1080/00220679809597584

Kelly, R., Hammond, S., Dissanayake, C., & Ihsen, E. (2011). The relationship between symbolic play and executive function in young children. *Australasian Journal of Early Childhood*, *36*(2), 21–27. https://doi.org/10.1177/183693911103600204

Konold, T. R., & Pianta, R. C. (2005). Empirically-derived, person-oriented patterns of school readiness in typically-developing children: Description and prediction to first-grade achievement. *Applied Developmental Science*, *9*(4), 174–187. https://doi.org/10.1207/s1532480xads0904_1

Ladd, G. W., Herald, S. L., & Kochel, K. P. (2006). School readiness: Are there social prerequisites? *Early Education and Development*, *17*(1), 115–150. https://doi.org/10.1207/s15566935eed1701_6

Leong, D. J., & Bodrova, E. (2012). Assessing and scaffolding: Make-believe play. *YC Young Children*, *67*(1), 28–34.

Lillard, A. S., Lerner, M. D., Hopkins, E. J., Dore, R. A., Smith, E. D., & Palmquist, C. M. (2013). The impact of pretend play on children's development: A review of the evidence. *Psychological Bulletin*, *139*(1), 1.

McClelland, M. M., & Cameron, C. E. (2011). Self-regulation and academic achievement in elementary school children. *New Directions for Child and Adolescent Development*, *2011*(133), 29–44. https://doi.org/10.1002/cd.302

McClelland, M. M., Cameron, C. E., Wanless, S. B., Murray, A., Saracho, O., & Spodek, B. (2007). Executive function, behavioral self-regulation, and social-emotional competence. *Contemporary Perspectives on Social Learning in Early Childhood Education*, *1*, 113–137.

Melman, S., Little, S. G., & Akin-Little, K. A. (2007). Adolescent overscheduling: The relationship between levels of participation in scheduled activities and self-reported clinical symptomology. *The High School Journal*, *90*(3), 18–30. https://doi.org/10.1353/hsj.2007.0011

Miller, E., & Almon, J. (2009). *Crisis in the kindergarten: Why children need to play in school*. Alliance for Childhood (NJ3a).

Murline, A. (2000). What's your favorite class? Most kids would say recess. Yet many schools are cutting back on unstructured schoolyard play. *US News and World Report*, *128*(17), 50–52.

Passolunghi, M. C., & Costa, H. M. (2016). Working memory and early numeracy training in preschool children. *Child Neuropsychology*, *22*(1), 81–98. https://doi.org/10.1080/09297049.2014.971726

Pellegrini, A. D., & Bohn, C. M. (2005). The role of recess in children's cognitive performance and school adjustment. *Educational Researcher*, *34*(1), 13–19. https://doi.org/10.3102/0013189x034001013

Pellegrini, A. D., Huberty, P. D., & Jones, I. (1995). The effects of recess timing on children's playground and classroom behaviors. *American Educational Research Journal*, *32*(4), 845–864. https://doi.org/10.3102/00028312032004845

Piaget, J. (1952). *Play, dreams and imitation in childhood*. W W Norton & Co.

Purpura, D. J., Logan, J. A., Hassinger-Das, B., & Napoli, A. R. (2017). Why do early mathematics skills predict later reading? The role of mathematical language. *Developmental Psychology*, *53*(9), 1633. https://doi.org/10.1037/dev0000375

Ramani, G. B. (2012). Influence of a playful, child-directed context on preschool children's peer cooperation. *Merrill-Palmer Quarterly*, *58*(2), 159–190. https://doi.org/10.1353/mpq.2012.0011

Ramani, G. B., & Brownell, C. A. (2014). Preschoolers' cooperative problem solving: Integrating play and problem solving. *Journal of Early Childhood Research*, *12*(1), 92–108. https://doi.org/10.1177/1476718x13498337

Ramani, G. B., & Scalise, N. R. (2018). It's more than just fun and games: Play-based mathematics activities for head start families. *Early Childhood Research Quarterly*.

Rideout, V. (2017). *The common sense census: Media use by kids age zero to eight*. Common Sense Media.

Ridge, K. E., Weisberg, D. S., Ilgaz, H., Hirsh-Pasek, K. A., & Golinkoff, R. M. (2015). Supermarket speak: Increasing talk among low-socioeconomic status families. *Mind, Brain, and Education*, *9*(3), 127–135. https://doi.org/10.1111/mbe.2015.9.issue-3

Röthlisberger, M., Neuenschwander, R., Cimeli, P., Michel, E., & Roebers, C. M. (2012). Improving executive functions in 5-and 6-year-olds: Evaluation of a small group intervention in prekindergarten and kindergarten children. *Infant and Child Development*, *21*(4), 411–429. https://doi.org/10.1002/icd.752

Savina, E. (2014). Does play promote self-regulation in children? *Early Child Development and Care*, *184*(11), 1692–1705. https://doi.org/10.1080/03004430.2013.875541

Schiffrin, H. H., Godfrey, H., Liss, M., & Erchull, M. J. (2015). Intensive parenting: Does it have the desired impact on child outcomes? *Journal of Child and Family Studies*, *24*(8), 2322–2331. https://doi.org/10.1007/s10826-014-0035-0

Schlesinger, M. A., Hassinger-Das, B., Zosh, J. M., Golinkoff, R. M., & Hirsh-Pasek, K. (2019). "When I was little, I loved to play": Describing play experiences using a community-based lens. *Scottish Educational Review*, *51*(2), 90–107.

Schlesinger, M. A., Sawyer, J., Hirsh-Pasek, K., & Fabiano, R. (2020). Play captains on play streets: A community-university playful learning and teen leadership collaboration. *Collaborations: A Journal of Community-Based Research and Practice*, *3*(1), 1–13. https://doi.org/10.33596/coll.54

Schulz, L., & Bonawitz, E. B. (2007). Serious fun: Preschoolers engage in more exploratory play when evidence in confounded. *Developmental Psychology*, *43*(4), 1045–1050. https://doi.org/10.1037/0012-1649.43.4.1045

Shaheen, S. (2014). How child's play impacts executive function–related behaviors. *Applied Neuropsychology: Child*, *3*(3), 182–187. https://doi.org/10.1080/21622965.2013.839612

Sibley, B. A., & Etnier, J. L. (2003). The relationship between physical activity and cognition in children: A meta-analysis. *Pediatric Exercise Science*, *15*(3), 243–256. https://doi.org/10.1123/pes.15.3.243

Sponseller, D. (Ed.). (1974). *Play as a learning medium*. National Association for the Education of Young Children.

Steinhauer, J. (2005). Maybe preschool is the problem. *New York Times* (pp. 1–4).

Thibodeau, R. B., Gilpin, A. T., Brown, M. M., & Meyer, B. A. (2016). The effects of fantastical pretend-play on the development of executive functions: An intervention study. *Journal of Experimental Child Psychology*, *145*, 120–138. https://doi.org/10.1016/j.jecp.2016.01.001

Toub, T. S. (2012). *What good is pretending? Adding a pretense context to the dimensional change card sort* [Dissertation]. University of Washington.

Toub, T. S., Hassinger-Das, B., Nesbitt, K. T., Ilgaz, H., Weisberg, D. S., Hirsh-Pasek, K., Golinkoff, R. M., Nicolopoulou, A., & Dickinson, D. K. (2018). The language of play: Developing preschool vocabulary through play following shared book-reading. *Early Childhood Research Quarterly*, *45*, 1–17. https://doi.org/10.1016/j.ecresq.2018.01.010

Traverso, L., Viterbori, P., & Usai, M. C. (2015). Improving executive function in childhood: Evaluation of a training intervention for 5-year-old children. *Frontiers in Psychology*, *6*, 525. https://doi.org/10.3389/fpsyg.2015.00525

Valiente, C., Swanson, J., & Eisenberg, N. (2012). Linking students' emotions and academic achievement: When and why emotions matter. *Child Development Perspectives*, *6*(2), 129–135. https://doi.org/10.1111/j.1750-8606.2011.00192.x

Veiga, G., Neto, C., & Rieffe, C. (2016). Preschoolers' free play-connections with emotional and social functioning. *International Journal of Emotional Education*, *8*(1), 48–62.

Vygotsky, L. (1978). Interaction between learning and development. In *Mind and society* (pp. 79–91). Cambridge, MA: Harvard University Press.

Weisberg, D. S., Zosh, J. M., Hirsh-Pasek, K., & Golinkoff, R. M. (2013). Talking it up: Play, language development, and the role of adult support. *American Journal of Play*, *6*(1), 39.

Whitebread, D., Neale, D., Jensen, H., Liu, C., Solis, S. L., Hopkins, E., Hirsh-Pasek, K., & Zosh, J. M. (2017). *The role of play in children's development: A review of the evidence (research summary)*. The LEGO Foundation, DK.

Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., & Golinkoff, R. M., & Committee on Psychosocial Aspects of Child and Family Health. (2018). The power of play: A pediatric role in enhancing development in young children. *Pediatrics*, *142*(3), e20182058. https://doi.org/10.1542/peds.2018-2058

Zigler, E. F., & Bishop-Josef, S. J. (2004). Play under siege. *Yale's Center in Child Development and Social Policy*, *21*, 1–4.

Zosh, J. M., Hirsh-Pasek, K., Hopkins, E. J., Jensen, H., Liu, C., Neale, D., Solis, L. S., & Whitebread, D. (2018). Accessing the inaccessible: Redefining play as a spectrum. *Frontiers in Psychology*, *9*, 1124. https://doi.org/10.3389/fpsyg.2018.01124