



Active play
improves
children's
development

Benefits of Play, and **Big Body Play** in Particular

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Education of Young Children

Play seems to have been especially adapted for the period of childhood, and is what children are “intended” to do. Remembering this may cause us to think twice before modifying children’s environments to achieve one goal (e.g., more focused learning opportunities at schools) at the expense of play.

—Bjorklund and Pellegrini (2001, 331)

Children of all ages are in love with movement, action, and the selfempowerment that come from learning about, using, and gaining control over their bodies. The inherent draw to big body play only continues throughout the childhood years. It often is out of fear for children’s safety that teachers and other adults try to stop children from the most physical forms of this play. Certainly, it’s not from a blanket disregard for the benefits that physical activity provides. One study found that 90 percent of teachers and 86 percent of parents say that physically active children are better behaved and better able to learn in the classroom, and they are neither more active nor distracted in class *because* of having been physically active (Burdette & Whitaker 2005).

In other words, we adults know that physical activity in general is good for children. But maybe we just haven’t taken stock of *how* good big body play in particular is. We may know the benefits of the gentle, quiet, cooperative forms of physical activity, such as rolling a ball back and forth or taking a nature walk or climbing the ladder to the slide. But what about the loud, rough, and rowdy forms? And are big body play’s benefits primarily physical, or is development and learning of other types taking place, too?

As this chapter explains, play results in wonderful benefits across physical, social-emotional, and cognitive domains. It enhances problemsolving skills, creativity, and the ability to take another’s perspective; reduces misbehavior; enhances language skills; and improves cognitive performance and social-emotional capacities (e.g., Barros et al. 2009; Singer et al. 2006). This chapter describes some of the benefits—both those unique to big body play (especially its rough-and-tumble forms) and those overlapping with the more generally acceptable forms of play such as sociodramatic.

What kind and how much physical activity?

There are two avenues to physical activity for young children: (1) the structured, directed kind that children get in a school physical education program and (2) the unstructured free play of big body play—the rough-and-tumble activities and the exuberant and spontaneous gross motor movements that come naturally and instinctively to children. Whereas big body play is recreational and child-led, physical education programs are adult-led and include meaningful content, instruction time, and assessment components (NASPE n.d.). Both types are important and valuable for children’s health, kinesthetic intelligence, and overall development.

Both physical education programs and big body play can lead to vigorous exertion. Yet physical education programs, at least good ones, differ from play in at least two important ways: programs have goals and programs are planned, not spontaneous. The National Association for Sport and Physical Education (NASPE) provides guidance for providing both structured and unstructured physical activity, calibrated in developmentally appropriate amounts. [\(See chart.\)](#)

Although both structured and unstructured physical activity are valuable for young children, big body play typically produces greater *sustained* physical exertion, and so provides greater benefits. Children’s big body play also tends to offer more *intensity* than does a movement period for toddlers or a physical education class in school. For example, one study of school-age children found that they got only 19 minutes of merely moderate activity in a 55-minute physical education class (Coe et al. 2006). (NASPE [2009b] recommends that for grades K to 2, a physical education class last just 30 minutes; for grade 3, the maximum is 45 minutes.)

Just 19 minutes is understandable considering that physical education programs require instruction time to explain rules, perhaps group management time, time waiting for others to play or perform, and maybe assessment time. Big body play, by contrast, typically proceeds uninterrupted. In fact, children may even protect the pace and flow of their play by refusing to allow time wasting by their playmates (e.g., too much talking) to interrupt the physical game (Jarvis 2007a).

NASPE Guidelines for Physical Activity

Guidelines for Infants

1. Infants should interact with caregivers in daily physical activities that are dedicated to exploring movement and the environment.
2. Caregivers should place infants in settings that encourage and stimulate movement experiences and active play for short periods of time several times a day.
3. Infants' physical activity should promote skill development in movement.
4. Infants should be placed in an environment that meets or exceeds recommended safety standards for performing large-muscle activities.
5. Those in charge of infants' well-being are responsible for understanding the importance of physical activity and should promote movement skills by providing opportunities for structured and unstructured physical activity.

Guidelines for Toddlers

1. Toddlers should engage in a total of at least 30 minutes of structured physical activity each day.
2. Toddlers should engage in at least 60 minutes—and up to several hours—per day of unstructured physical activity and should not be sedentary for more than 60 minutes at a time, except when sleeping.
3. Toddlers should be given ample opportunities to develop movement skills that will serve as the building blocks for future motor skillfulness and physical activity.
4. Toddlers should have access to indoor and outdoor areas that meet or exceed recommended safety standards for performing large-muscle activities.
5. Those in charge of toddlers' well-being are responsible for understanding the importance of physical activity and promoting movement skills by providing opportunities for structured and unstructured physical activity and movement experiences.

Guidelines for Preschoolers

1. Preschoolers should accumulate at least 60 minutes of structured physical activity each day.
2. Preschoolers should engage in at least 60 minutes—and up to several hours—of unstructured physical activity each day, and should not be sedentary for more than 60 minutes at a time, except when sleeping.
3. Preschoolers should be encouraged to develop competence in fundamental motor skills that will serve as the building blocks for future motor skillfulness and physical activity.
4. Preschoolers should have access to indoor and outdoor areas that meet or exceed recommended safety standards for performing large-muscle activities.
5. Caregivers and parents in charge of preschoolers' health and well-being are responsible for understanding the importance of physical activity and for promoting movement skills by providing opportunities for structured and unstructured physical activity.

Guidelines for Children Ages 5–8 (and older)

1. Children should accumulate at least 60 minutes, and up to several hours, of age-appropriate physical activity on all, or most days of the week. This daily accumulation should include moderate and vigorous physical activity with the majority of the time being spent in activity that is intermittent in nature.
2. Children should participate in several bouts of physical activity lasting 15 minutes or more each day.
3. Children should participate each day in a variety of age-appropriate physical activities designed to achieve optimal health, wellness fitness, and performance benefits.
4. Extended periods (periods of 2 hours or more) of inactivity are discouraged for children, especially during the daytime hours.

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There is a known connection between the development of movement and the development of cognition.

Perhaps children know instinctively that they need uninterrupted time for intense activity to accrue the benefits associated with physical exertion. As NASPE (n.d.) notes, “Similar health benefits to those received during a physical education class are possible during physical activity bouts when the participant is active at an intensity that increases heart rate and produces heavier than normal breathing.” What matters is the intensity and duration of the physical exertion; the result includes greater physical fitness and improved cognitive performance, among other benefits (Stevens et al. 2008).

Evolution and brain development

From the United States to Kenya to the Philippines to Mexico, from ancient times to the Dark Ages to the present, in rats, orangutans, and humans, there is both anecdotal and empirical evidence of rough, rowdy physical play (e.g., Fry 1987, 2005; Groos 1901; Pellis et al. 1999).



Many theorize about why children universally engage in this type of

play. Some feel the tumbling and rolling around is simply to let off steam. From an evolutionary developmental perspective, there is a notion that

play-fighting allows for the practice of adult roles; in part, in genderspecific ways. That is, big body play may help prepare children for the complex social aspects of what has been, evolutionarily speaking, adult life (Bjorklund & Pellegrini 2001). Others speculate that it is practice for future self-defense, that it supports the development of critical pathways in the brain vital for adaptive responses to aggression and dominance (Pellis & Pellis 2007).

Speculation aside, there is a known connection between the development of movement and the development of cognition (Diamond 2000), and researchers believe there is a connection between the very physical, rowdy play style and critical periods of brain development (Byers 1998). The rough play between peers appears to be critical for individuals to learn how to calibrate their movements and orient themselves physically in appropriate and adaptive ways (Pellis et al. 1999).

There also is evidence that rough-and-tumble play leads to the release of chemicals affecting the mid-brain, lower forebrain, and the cortex, including areas responsible for decision making and social discrimination; growth chemicals positively affect development of these brain areas. Furthermore, there is evidence that severe deprivation of such play (or damage to related areas of the brain) is associated with a failure to adjust behavior to idiosyncrasies of a partner's social status and movements (Pellis & Pellis 2007). In other words, rough-and-tumble play, this universal activity of all children throughout history and in all parts of the world, is adaptive, evolutionarily useful, and linked to normal brain development.



Growing and moving

Through big body play, children learn skills such as how their bodies move in space, where parts of their bodies begin and end, and how to control their physical movements. It is also an effective way for young children to have their physical touch needs met, when the play is both individually appropriate (i.e., comfortable for a given child) and age-appropriate (Carlson 2006; Reed 2005).

Participation in regular physical activity also helps prevent chronic health problems, such as diabetes, high blood pressure, and high cholesterol, even in very young children.

Skeletal and muscular development in infancy

Infants gain obvious gross motor benefits from the rough play they enjoy using their own bodies and the bodies of their peers and caregivers. A human infant is born possessing all the muscle fibers he or she will ever have. These fibers are small, however, with a high ratio of water and fat to muscle. As the child grows and develops, the ratio changes and muscle

strength increases (Boyd & Bee 2006). Also, a newborn's leg bones are

too soft to support his or her body weight. This lack of muscle strength combined with too-soft leg bones means that infants are floor-bound for the majority of their first year.

Because infants can engage in big body play even while they lack muscle and bone strength, such unstructured, very active play is ideal in supporting their emerging physical capabilities. Long stretches of spontaneous reaching, grabbing, kicking, waving, rolling, and scooting all develop an infant's bone and muscle strength. There is evidence, moreover, that whereas low-birthweight premature infants usually lose bone strength after birth, even brief range-of-motion activity can prevent the problem, allowing for more normal bone development—even in the first few weeks of life (Litmanovitz et al. 2003).

Physical health

Young children rarely remain vigorously active for an hour straight, as an exercising adult or older child engaged in an organized sport might do.

Young children's spontaneous physical play tends to come in very active bursts lasting from 5 to 15 minutes. Nonetheless, those bursts add up and accumulate into health benefits that are similar to those for older children and adults.

When young children have the opportunity to play in rough, active, highly physical ways, they get their heart rates up; they stretch their limbs; they strengthen their bones, muscles, and ligaments; they burn calories and maintain a healthy weight; and they learn new physical skills, all of which contribute hugely to their fundamental health and optimal growth.

As Pellegrini and Smith (1998a) noted, "Play may be the only way [young children] are likely to get sufficient exercise training, at least before organized games and sports, in human societies" (610).

Studies are clear about the benefits of physical activity in promoting physical health and general well-being (e.g., Sola et al. 2010). Children who are active—running, jumping, throwing, climbing—do better on tests of physical fitness, in areas including endurance, speed, agility, balance, and strength. They also show a reduced body mass index, which measures overall body fat, and better oxygen intake. They are less likely to be overweight or obese, which is a common and pressing American problem at present, in part as a result of children's sedentary

lifestyles. Participation in regular physical activity also helps prevent chronic health problems, such as diabetes, high blood pressure, and high cholesterol, even in very young children (Ward 2010).

Preschool and beyond: Discovering size, strength, and control

Through big body play, children in the preschool years and beyond become more aware of their own physical abilities: *how strong they are, how fast they are, how heavy they are*. Part of children's success at rough-and-tumble play results from their ability to control their body movements so that neither they nor their play partners are hurt (Paquette et al. 2003). For example, the motions of rough-and-tumble play are mostly tagging and wrestling moves that either completely avoid body contact ("You missed me!") or that make contact in a way that does not cause injury or harm. And even though it is generally friends who play together this way, they are often of unequal body weight, size, and strength.

Leaping expresses faith in yourself and in your environment. The opportunity to jump from different heights and land safely is incomparable, a test of self and gravity (Greenman 2007, 292).

So, how do children develop the skills of knowing their own strength and then, if necessary, restraining themselves for the sake of the play and their relationships? They learn by participating in the give-and-take of rough-and-tumble play, which provides immediate feedback. Take this scenario:

Two preschool boys are throwing a ball back and forth on the playground. One calls to the other, "Want to wrestle?" The other boy says, "Sure!" So, the boys fall to the ground, put their arms around each other, and begin to wrestle. The larger boy rolls on top and pins the smaller boy to the ground. The smaller boy pushes against the larger boy's chest, and the larger boy jumps up, saying, "I'll let you go first next time, cause I'm bigger."

The larger boy was immediately aware of his physical advantage. He also realized that if he wanted the enjoyable wrestling play to continue, he needed to make some provision for his larger size and greater strength.

So he decided to hold back some (called *self-handicapping*) and allow the

smaller boy to strike first, so the match could proceed more fairly and so last longer. The experience provided both children feedback on their relative size and strength.

Feeling and interacting

Big body play also enhances social development as children learn turn taking, self-handicapping, and collaborative play in games with rules. They learn social skills through accepting dominant and subordinate roles, negotiating, and developing and maintaining friendships. Big body play promotes cooperation and compromise (Boulton & Smith 1992).

Social-emotional development in infancy and toddlerhood

Through the active, unstructured, very physical interactions babies and toddlers have with their own bodies, other babies, and adults, they learn an incredible amount about themselves, their bodies, and the world (McCune 1998). Based on this knowledge of self and the world, the interactions build a foundation for critical emotional abilities. In big body play, an important emphasis is on what the infant is learning about his or her own body (Sheets-Johnstone 2008).



Self-concept, meaning a person's knowledge about himself or herself, generally starts developing at about 1 to 2 years old (Houck & Spegman 1999). In the sensorimotor phase, children at this age move independently and act on their own. They will start to recognize themselves in a mirror or picture, and soon can verbally articulate awareness of themselves as

entities independent from their mother and others around them. Then they begin demonstrating self-conscious emotions, such as embarrassment and pride (Houck 1999).

But this self-concept all begins with an awareness of their physical body. Differentiated cries and certain physical reactions, such as kicking in protest, indicate that a baby is developing a self-concept. The ability to represent and reflect on one's own body explicitly and objectively may be a unique dimension of early development, a distinct component of objective self-awareness that emerges in toddlerhood (Brownell et al. 2007).

Once very young children are aware of how movement affects their own bodies, they are then able to develop a sense of how their movements can affect others. *Empathy* is the combined ability of being able to interpret what another person is feeling and then to experience related emotions yourself (Light et al. 2009). It begins with an understanding of oneself and one's own reactions and responses. As

infants gain awareness of their

own feelings, they are able to interpret others' feelings and match them. In empathy, according to Sheets-Johnstone (2008), "We basically make sense of each other in ways outside language. In this sense making, movement is our match-point" (194). In this physical way, then, empathy is born.

Consider the following scenario:

Six-month-olds Zoe and Nate are on a blanket on the floor, Zoe on her back and Nate on his stomach. Zoe flips over and lands on Nate's arm. After several seconds of having Zoe's weight on his arm, Nate begins to cry, vigorously kicking his feet and legs as he does. Alarmed by Nate's cries and kicks, Zoe stares at him for several seconds, then rolls over. Now Nate is completely underneath her.

Zoe wiggles, scoots, and smiles. Nate continues to cry and kick. She rolls off him. Nate quiets and rolls over onto another area of the blanket.

In this scenario, both babies experience many physical sensations, including the feel and weight of each other's bodies against their own. Nate is unhappy with the sensation of Zoe's body weight first on his arm and then on his chest. Judging by his cries and kicks, he finds its heaviness extremely uncomfortable. When Zoe rolls off, Nate feels the pressure relieved.

For her part, Zoe experiences the feeling of Nate's arm and body underneath her, the sounds of his cries, and the pressure of his feet and legs kicking against her. When she rolls away, Zoe feels flat, firm ground underneath her. Both experience the cessation of Nate's cries.

Through these multiple sensations and the act of initiating various behaviors (e.g., crying, kicking, rolling away), the babies added to their awareness of self and another; the experience was informative and useful, even though not entirely pleasant. They learned about their own sensations and added to their emerging self-concepts, experiencing the beginnings of empathy.

Although roughand-tumble play looks to be an activity of physical dominance, it

actually prompts children to learn how to restrain themselves for the sake of the play and their relationships.

Preschool and beyond: Self-restraint and reciprocity

As children enter the kindergarten and primary years, they want to practice emerging social skills such as fairness and reciprocity (turn taking); big body play provides rich opportunities for practicing those. Children become aware of the consequences of failing to harness or handicap their own strengths if the opponent is smaller or weaker. So although rough-and-tumble play looks to be an activity of physical dominance, it actually prompts children to learn how to hold back physically, how to restrain themselves for the sake of the play and their relationships. Successful rough-and-tumble play depends on reciprocity.

Children who play this way with each other usually are already friends, and the rough-and-tumble play can enhance their relationship by supporting the skills needed in strong friendships. Just as no one wants a friend who takes all the time or attention, or who dominates the whole conversation, no child wants a rough-and-tumble play partner who dominates the whole activity.

Most successful play experiences, like successful relationships, are successful because both partners know how to wait, how to give and take, and how to listen as well as talk. In big body play, children have opportunities to practice and begin to master these skills. For example, consider a group of children playing King of the Hill. In order for the play to continue, the children have to take turns being the “King” as well as being the ones rolled down the hill. If the King never exchanged roles with the other children, most of them would tire quickly of always being the ones rolled and would quit the game.

Or, consider a wrestling bout. If one child were always to end up on the bottom, that child would soon no longer want to wrestle. Both children quickly learn that to keep things fun and interesting and to ensure they have someone to wrestle with, they must take turns being on the bottom. They also learn that in offering to be on the bottom, someone else gets to be on

the top. And in offering to go last, someone else gets to go first.

Waiting to be on top or go first is rewarded by the friendship and the continued play.

Preschool and beyond: Assertiveness

Children also learn another important social skill through rough-and-tumble play: how to stand up for themselves when necessary (Paquette et al. 2003). Although children will realize that backing down and compromising are the most socially successful routes in most cases, there are times when assertiveness will be the right choice. Because rough-and-tumble play gives children opportunities to feel and know their own strength, they will feel more confident when a situation demands some dominance or limit setting from them.

For example, a child might need to assert when the play has gone on too long or when he has had enough:

Andy and Evan are rolling around on the playground. For several minutes, they wrap their arms around each other and roll side-to-side the length of the playground. Andy begins to tire of the play and starts to get up. Evan wants to continue, so he reaches to pull him back. Andy, who wants to stop, firmly says, “No!” Evan releases him, and he stands and walks away.

In this scenario, the interaction provided the tired boy a chance to practice successful boundary setting, engendering confidence in his own decision making and self-efficacy.

Socially Rejected or Awkward Children

As beneficial as rough-and-tumble play is for children with typically developing social skills, it is of as much and perhaps even more value for children whose social skills lag. Big body play provides opportunities for “socially rejected” children—those who lack the social skills needed to form successful relationships—to experience and practice the very skills they lack: turn taking, understanding nonverbal signals and body language, using words to communicate emotions and desires, boundary setting, and a strong sense of self.

Unfortunately for these children, though, without these same skills as precursors, rough-and-tumble play is difficult, sometimes impossible, for them. Socially rejected children often misunderstand the playful intent of their playmates’ tags and jabs and respond to them in a

hostile manner. Indeed, rough-and-tumble play is 25 times more likely to become real fighting when socially rejected children are among the participants (Schafer & Smith 1996; Smith et al. 2004).

Because of this more frequent escalation of friendly play into aggression and sometimes violent play, teachers are hesitant to allow socially rejected children to engage in rough-and-tumble play, fearing—and perhaps rightly so—that someone will get hurt.

What research shows, however, is that “it may not be the case that the more socially competent children engage in more play-fighting, but rather that the play-fighting may promote the development of social competency” (Pellis & Pellis 2007, 97). In other words, it’s possible that socially savvy children don’t come to the play already that way; they get that way from the play.

Communicating

Big body play enhances language development as children use and learn to understand nonverbal communication. It also helps them to understand the reciprocal nature of language in conversation, practiced so beautifully in the reciprocal nature of rough-and-tumble play. Children learn language skills through signals and nonverbal communication, including the ability to perceive, infer, and decode.

One of the main contributions of big body play to children’s development is the way it supports nonverbal communication through its use of signals.

Differentiated cries and gestures in infancy

The motions and gestures that infants often use to communicate with adults and with other infants demonstrate the emergence of pre-linguistic skills. Such signaling is the way children begin to express their needs, beginning in infancy (Paquette et al. 2003).

For example, the sound of a cry that a baby makes when in the physical discomfort of being rolled on by another baby is different from the cry expressing fatigue or hunger. Babies experiencing the displeasure of a physical sensation might also kick their legs, as Nate did in the earlier vignette, or push or wave their arms. And babies experiencing

joy in the interaction might coo or smile or close their eyes. By smiling and wiggling, for example, Zoe signaled that she enjoyed the sensation of being off the ground and on Nate's body.

The differentiated cries, coos, facial expressions, and actions such as kicking provide the infant the opportunity to practice communicating. This use of both verbal and nonverbal communication provides the foundation for later language learning.

Preschool and beyond: Signals and nonverbal communication

One of the main contributions of big body play to children's development is the way it supports nonverbal communication through its use of signals (Bjorklund & Brown 1998; Paquette et al. 2003).

When one child wants to invite another child to join the play, for example, she may signal by waving or gesturing "come here." During the course of the play, children might signal for the play partner to stop (holding out both hands in front, palms and fingers up), or for the partner to get up or get off (both hands placed firmly against the other child), or for the other to move or go the other direction (hands waving back and forth, or fingers swirling in a circular motion).

The most often used signal in rough-and-tumble play, and the one that seems to universally signify the playful nature of these very physical interactions, is the "play face." Children smile when they are playing in a friendly and appropriate way. Their smiles signal their acceptance and enjoyment of the play. It is what clearly denotes rough-and-tumble play as play rather than as aggression, sending an unmistakable signal that the child finds the experience welcoming and joyful.

Children also use their eyes to signal desire and intent. For example, a child who is enjoying the play might close her eyes while laughing. In contrast, a child experiencing pain or displeasure would widen her eyes or begin to stare.

When children learn to decode such signals, their ability to succeed socially is enhanced (Pellegrini & Smith 1998b). As friendships begin to form during the preschool years, successful communication is foundational to these budding friendships. When children know how to correctly "read" and understand what others are communicating through their eyes or gestures or facial expressions, each child is better able to form strong friendships.



The practice of developing narratives to go along with the play is an important bridge to later involvement in sports and other socially competitive activities that are language based.

Preschool and beyond: Negotiation, narration, and other language skills

In addition to strengthening decoding and nonverbal skills, rough-and-tumble play provides a unique opportunity for strengthening verbal skills, particularly negotiating and narrating. Because young children are not natural turn takers, they often have to discuss “the rules” or the plans for the play before they begin, and they discuss how to adjust things as they go. To succeed at this, they must use and master early negotiation skills as they play with their peers.

In the following vignette, for example, one boy verbalizes a plan for play that allows the game to proceed without fighting or distress:

After a group of children decide to hang upside down from a climbing structure, they have to decide who will go first, next, and so on. Several children, of course, want to go first. Dante offers that, “Once we start going, then everybody will get to be first,” meaning that the

next child in line will always then be “first” after the child at the front of the line goes. Some of the children are understandably skeptical. Once the line begins to move, though, they see that he is correct—each child now has a turn being “first” in line.

This example demonstrates very basic negotiation, wherein all the children witnessed one boy’s ability to find and offer a solution and to communicate it effectively to the others. The situation provided a chance for Dante to practice his communication skills. And it set an example for the less socially skilled children to learn from and follow.

As games become more complex amongst older young children, the rules they negotiate, and how they do so, become more complex, as well. Jarvis (2007a) even refers to a “rule-negotiation culture” in emphasizing how absorbed young children become in creating and adhering to the rules of their self-made games (256).

The tendering of rules is often embedded in a narrative, which can be a fantasy, an explanation of the activity, or a way to augment the events taking place—all ways to connect thoughts and actions through language. Developmentally, the practice of developing narratives to go along with the play is an important bridge to later involvement in sports and other socially competitive activities that are language based. After the preschool ages, there is a metamorphosis from the more impulsive, chaotic rowdy play into more formalized games with simple (and even later, elaborate) child-developed rules (Jarvis 2007a; Pellegrini 1989).

Interestingly, there typically are quite specific gender differences in the narrations, indicating that big body play either contributes to or reveals, or both, the diverging development of boys and girls. Jarvis (2007a),

in a study of 4 and 5-year-olds, found that boys and girls created different types of stories with highly specific gender roles. Girls’ narratives around their play tended to show competition for being the nicest, whereas boys’ narratives emphasized their toughness. The narratives might involve roleplaying of animals, fairy tale characters, popular media characters, and so forth, providing plenty of practice for improving on children’s growing language skills.

Thinking

From infancy onward, big body play enhances cognitive development, improving young children's problem-solving and spatial skills, attention, and achievement.

Locomotion and exploration in infancy

Movement and the tactile exploration that come with big body play both foster learning in infants. Basic locomotion activities—cruising, crawling, sitting, pulling to stand, and other big body movements—teach an infant about her own body in relation to her environment. With opportunities for physical experiences, she can know where she is in relation to objects and other things simply by looking around and making a connection between her visual and physical experiences (Uchiyama et al. 2008).

When infants bang objects with their hands, throw or mouth objects, squeeze a ball, or reach for and grab fabrics, toys, and each other, they are exhibiting curiosity, a hallmark of healthy cognitive development. When we support their body movements, we support their curiosity and learning (Honig 2009).

Preschool and beyond: Problem-solving skills

At times, big body play requires complex decision-making and problemsolving skills. Problem solving is required because children must first pay attention, then plan, organize, sequence, and make decisions about what they will play and how. One study of kindergarten-age boys showed that the amount of time spent in active social play with other boys directly predicted their problem-solving skills a year later (Pellegrini & Blatchford 2000).

How might this connection between active social play and skill development work? Say a group of preschoolers want to hang upside down from the top rung of a ladder on a piece of climbing equipment on their playground. Several problem-solving steps are involved to achieve the play:

They first see the rung (*pay attention*), then they begin to discuss how to hang from it (*plan*). The hanging from it part is difficult because it will require a child to be able to pull a leg up and over the rung, and then pull the other leg up and over the rung, all while still hanging on the rung. One child begins to do this. He is successful, and swings upside down for several seconds before

grabbing the rung with his hands, swinging his legs around, and dropping to the ground. The next three children all have difficulty.

They discuss their difficulty, and decide to ask for help (*organizing*) from the teacher—who has been closely supervising this activity. Each child tells the teacher what kind of support he or she needs, saying things such as, “Help me hold on” or “Now help me pull my foot out” (*sequencing*). One child, after several attempts, decides the task is too hard, and he decides to climb down (*decision making*).

Throughout rough-and-tumble play, children have to make assessments about their own capacities; about their play partners’ capacities and relative size, speed, or strength; about their partners’ ability to decode signals and capitulate; about how to get out of an uncomfortable situation; about how to achieve what peers or older children achieve; about what to say, and how to say it, to enhance the play; about helping a weaker or less competent peer; about when to engage an adult; and so forth.

Rough-and-tumble play provides unique opportunities to practice all kinds of problem-solving skills. Exercising these skills might seem to be simply about competition and dominance. In fact, the skills have been shown to allow children to explore the complex dynamics of justice mediation and peacekeeping (Holland 2003). The social components of roughand-tumble play have positive implications for the development of the individual, the harmony of the group, and solidarity amongst peers and within children’s community at large.

Use the elements of movement—space, shape, force, flow, time, and rhythm—to encourage children to discover various ways to perform skills. If children are jumping around the playground or classroom, ask them playfully to try jumping backward, sideways, or around in circles; while being very big or very small;

with pauses in between; and slowly or quickly (Pica 2006, 78).

Preschool and beyond: Spatial skills

Researchers have speculated that gender differences in the types of physical play that children choose may shed light on the links between rough-and-tumble play and cognitive development, specifically spatial skills (Bjorklund & Brown 1998). Silverman and Eals (1992) suggested that a gender division in labor in ancient times—males being more involved in hunting and navigation and females more involved in foraging—may have led to an evolution of gender differences that shows up in spatial abilities *and* physical play.

For example, boys tend to choose activities that require hand-eye coordination, such as football or climbing on trees or equipment; and boys tend to perform better than girls on cognitive tasks that require mental rotation and involve spatial relations. Girls tend to perform better on tasks requiring fine motor skills and on object-location memory tasks (Silverman & Eals 1992). Likewise, in a study of preschoolers, researchers again found gender differences in spatial abilities, and a significant, positive correlation between the amount of time spent on spatial activities while playing and performance on tests of spatial abilities (Connor & Serbin 1977).

Some types of big body play require a great deal of spatial ability, such as estimating how fast to run to which spot to kick a soccer ball, or thinking through and enacting the complex plays one sees on a basketball court, or in the similar made-up games young children devise. These games involving big body play contribute to improved spatial skills, and the more children (of both sexes) use those skills, the better they get (Bjorklund & Brown 1998).

Rough-and-Tumble Play for Boys

In aggressive sports, the opposing player congratulates hard, clean hits. This knowledge begins at an early age where fathers are rolling around on the floor with their infant sons.

—Reed and Brown 2000, 335

Rough-and-tumble play is good for all children, but it seems to have a strong and special draw for boys in particular. They engage in it more often than girls, they develop boys-only games and cultures around it, and there may be unique benefits of rough-and-tumble play for them.

That boys engage more than girls do in contact-oriented rough-and-tumble play is well-established (Carson et al. 1993; DiPietro 1981; Humphreys & Smith 1984). There is certainly plenty of mixed-gender rough play, but boys tend to initiate rough-and-tumble play more often and girls tend to withdraw from it sooner (Fabes 1994; Meany et al. 1985; Pellis et al. 1996). Also, starting by age 4 or so, boys tend to self-group in boys-only games, whereas girls tend

to segregate themselves from the boys' games (Fabes 1994; Jarvis 2007a). Also, when boys are deprived of opportunities for active physical play, they are especially active when they do get to play compared with girls, who are less so (Pellegrini & Smith 1998a).

Why should such a difference exist? It may be biological, at least in part, since levels of testosterone have a clear influence on how much children of both sexes engage in very physical play, and of course, boys have higher levels of testosterone than girls (Hines et al. 2002). It may also in part be cultural, as boys practice defending their turf and protecting their territory; some would even argue these games are a precursor to a sense of nationalism and patriotism in adulthood (O'Donnell & Sharpe 2004). Jarvis (2007a) studied a group of kindergarten-age boys playing soccer and wrote:

Although I never observed any discussion between the children on this point, the division of territory between the age cohorts within the school (with the field split into rough quarters) was never disregarded during the times of my observations; the children appeared to have a firm, implicitly agreed sense of where "their" territory began and ended. (251)

As noted in the section on cognitive thinking, there is also a link between boys' choices of physical play activities and their performance on spatial-skills tests, perhaps lending support to an evolutionary perspective on rough-and-tumble play.

Yet perhaps the most moving and compelling aspects of rough-and-tumble play for boys are found in the social dynamics of the

interactions that exist only within boys-only rough play. Boys learn from each other how to show care and concern, how to protect others, how to assert and defend themselves in socially successful ways, how to play out stories and fantasies in what Jordan (1995,76) calls a “warrior discourse,” how to negotiate rules, and how to touch each other in male-acceptable ways.

Consider this description of boys in kindergarten to early primary grades in the United Kingdom playing “football” (soccer in the United States):

The boys clearly showed care and concern towards each other in order not to exclude regular members of the footballing group. When Rory was recovering from a broken arm and was not supposed to engage in rough football for the week after his cast was taken off, the other boys playing football encouraged him to join in, made a point of passing to him and refrained from tackling him when he had the ball. A subtle signalling system was also observed that allowed the football players to show approval towards one another, a light tap on the back, usually administered by a slightly older boy to a boy who had taken a heavy fall or a minor injury without making a fuss. (Jarvis 2007a, 252)

There are clear mentoring relationships among the boys, wherein the older or more socially adept boys subtly teach the younger or less mature boys how to display toughness while simultaneously showing awareness and care about others’ well-being. Through rough-and-tumble play, boys learn that it is okay to jump up and down and hug when a goal is scored—but not when you get hurt. They also learn how not to touch their friends (e.g., no holding hands) and how and when to touch their friends (e.g., a light tap on the back after a score or after showing toughness). Through rough-and-tumble play, boys learn and practice ways of expressing a masculine type of intimacy that is reserved for male-to-male friendships.

Being tough is a critical ingredient for social success for boys. It relates to peer status, to popularity, and to leadership roles within peer groups (Hartup 1983; Pellegrini,1995; Strayer 1980; Vaughn & Waters 1981). Boys use rough-and-tumble play as a unique means both of discovering their toughness for themselves and of establishing their tough

reputation amongst their peers. And all of this must be done in a way that preserves friendships. Boys have to learn how to show they are stronger and faster than other boys, while also showing they know how to hold back on their strength or speed so as not to hurt a friend. It is a complicated and sophisticated process, ever dynamic as relative physical strengths change and as social and emotional skills emerge and change.

—Heather Biggar Tomlinson

Preschool and beyond: Attention and achievement

Bjorklund and Brown (1998) put it plainly when they wrote, “Despite the social consequences of [rough-and-tumble] activity, the mechanisms involved are every bit as ‘cognitive’ as are those associated with math seat-work” (604). Vigorous physical activity, the kind that is associated with unstructured big body play, indeed has a relationship to cognitive and academic performance (Tomporowski et al. 2008).

While sitting increases fatigue and reduces concentration, movement feeds oxygen, water, and glucose to the brain, optimizing its performance (Pica 2006, 112).

Big body play gets children’s blood going and minds moving, or rather, gets the mind settled; it has been linked to better attention and concentration skills in school (Hillman et al. 2005; Shephard 1996; Taras 2005). By providing regular opportunities for physical activity and at least an hour a day for sustained, moderate to vigorous, unstructured physical play, adults not only support healthy big body play but also support children’s periods of quiet attention: Children tend to remain calm for longer periods of time following the very active play (Scott & Panksepp 2003).

A new kindergarten teacher shared his experience:

I was teaching my heart out, but I did not feel that my students were learning. They were constantly touching each other, pulling hair, rolling on the floor, standing up, and playing with their jackets and clothes. Then one day,

I told myself that I had tried things the conventional way, and now I was going to try things my way. From then on, I had my students up and moving. We sang songs and marched around the room to learn the days of the week and the months of the year. We did daily physical exercises. We did math by creating patterns with our bodies, such as *snap, clap, stomp* and *jump, run, wiggle*. We did skip-counting using hip hop music that the kids were familiar with. After a few days of this, my students were able to sit and listen during the times that required them to do so. They were not touching each other, pulling hair, rolling on the floor, standing up, or playing with their jackets and clothes. My kids were learning, and they were happy. True teaching was taking place.

Recent studies examining thousands of children show that active physical activity and play are related to better performance in both reading and mathematics (Grissom 2005; Stevens et al. 2008).

As previously noted, it seems to be that it is vigorous, active play—rather than a traditional physical education curriculum per se, which may not provide an intense bout of activity—that is associated with higher academic performance (Coe et al. 2006). Children’s self-determined rough-and-tumble play is good for the mind as well as the body.

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Boisterous, rowdy, loud, vigorous, rough, exuberant, and always physical in nature, big body play is the naturally occurring play style that gives children the opportunities they need for overall optimum development.



From birth, children gather enormous information from their bodies. They learn about themselves, and about how they affect the environment and others in it. This self-knowledge and world knowledge forms the foundation for future exploration and learning. This foundation, built on ample opportunities to learn about their own bodies, boundaries, strength, needs, abilities, power, and control, can provide young children the physical, social-emotional, and thinking skills to have healthy, rewarding experiences and successful relationships in early childhood and throughout their lives.

Hanging from the monkey bars and playing Tag and soccer is a kind of serious business. But it's not the process that is serious—playing is resolutely not serious—it's the results that are serious, in a good way. As much as children need rough, rowdy play for staying physically fit, they need it even more to learn about the complex social dynamics amongst friends and peers, to gain problem-solving experience, to practice empathy and negotiation skills, and to be ready to sit and focus inside the classroom when that is required.

As discussed in the next chapter, if we adults can provide the time, space, and encouragement for safe big body play, we will be rewarded. We will see children who show delight and exuberance; who are spontaneous and creative in their play; who can “run wild” and then sit calmly, ready to focus; and who are confident in themselves and selfless toward their peers.



National Association for the Education of Young Children

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