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Risky Play

Why Children Love and Need It

Peter Gray

To begin, a couple of definitions are in order. *Play*, as the term is used in this chapter, is what others may refer to as *free play*, or *unstructured play*. The *free* is omitted here to avoid redundancy. To this author (and many other play researchers), if it isn't free it isn't play. *Unstructured* is omitted because, as Vygotsky (1978) pointed out long ago, all play is structured—structured by the players themselves. Play is never random activity. Activities such as adult-directed sports, which are structured by an outside authority rather than by the players are not play, or at least not fully play.

Elsewhere I have elaborated on a definition of play derived partly from classic writings on the subject, partly from research on what children themselves most often refer to as play, and partly from my own observations (Gray, 2012). Briefly, the definition holds that play is any activity that is (1) *self-chosen and self-directed*, (2) *intrinsically motivated* (done primarily for its own sake rather than for some goal outside itself), (3) *guided by mental rules* (structured by concepts in the players' minds that delimit what is appropriate or not within the play), and (4) *imaginative and creative* (players think of themselves as stepping out of the real world into an imaginary world, and the rules in play always leave plenty of room for creativity). This definition gives us, right off, some clues about what children gain in play, beyond the fun involved. They learn to choose and structure their own activities, discover what they enjoy (their passions), learn to create and follow rules, and exercise their imagination and creativity.

For research with non-human animals it is necessary to modify this definition, especially as there is no way to know whether or not imagination occurs in animal play. Play in animals is typically defined as consisting of activities that are structurally similar in some ways to goal-directed activities (such as fighting, preying, or escaping), but are conducted for their own sake rather than to achieve some real-world goal (such as defeating an actual enemy, capturing real prey, or fleeing from an actual predator) (Bekoff & Byers, 1981; Gray, 2012). Ever since the publication of Groos's (1898) classic book, *The Play of Animals*, the leading theory of the evolutionary value of animal play is that it provides practice for real-world survival-promoting activities (Gray, 2019).

The other term in this chapter's title that warrants some initial explanation is *risky*. To take a risk, of course, is to engage in an activity that could harm oneself. Groos himself pointed out that essentially all play among non-human animals involves risk. For example, the movement and noise created by almost every form of animal play could attract predators, and researchers have observed predation of playing animals in natural settings (Aldis, 1975). From a purely short-term safety point of view, young animals would be better off if they spent their free time curled up asleep or dormant in a burrow rather than romping around. Researchers who examine play from an evolutionary

perspective, from Groos on, have pointed out that the drive to play would not have evolved by natural selection, if the long-term value of play did not outweigh the short-term risk.

Threat of predation by wild animals is not a serious problem for most children in modern societies. Our modern concerns for risky play, dealt with in this chapter, have more to do with the chances of injury from an accident, such as a fall, or of harm coming from another human being. This chapter is divided into five sections. The first presents evidence that children and other young mammals often choose to play in ways that entail obvious risk, where risk seems to be intrinsic to the joy of play, not just a side effect. The second describes the ever-increasing restrictions that we as a society have placed on children's opportunities for risky play. Following that are two sections dealing, respectively, with the physical and mental health consequences of restrictions on risky play. The final section describes some ways by which opportunities for risky play can be restored in today's safety-conscious world.

The Biological Drive to Play in Risky Ways

Young mammals of many species have been observed to play in ways that seem designed to produce in them some degree of fear. As examples, goat kids frolic along steep slopes and leap awkwardly into the air in ways that make landing difficult; young macaque monkeys chase one another in trees, high enough up that a fall could injure; and young chimpanzees have been observed to drop from high branches and catch themselves on lower ones just before hitting the ground (Aldis, 1975). The most common varieties of play for most young mammals are playful chasing and wrestling, both of which entail at least some risk of injury. For many species, the preferred position in such play is the more vulnerable one, where risk of injury is greatest—that of being chased in a chasing game and that of being pinned and struggling to get free in a play fight (Bekoff, 2004; Gray, 2019; Pellis & Pellis, 2011). Such observations have led to the theory that a major function of animal play is that of learning how to handle possible real-life emergencies under the relatively controlled conditions of play (Spinka, Newberry, & Bekoff, 2001).

Consistent with this theory, in studies of free-living ground squirrels (Marks, Vizconde, Gibson, Rodriguez, & Nunes, 2017) and marmosets (Mustoe, Taylor, Birnie, Huffman, & French, 2014), animals that had engaged in more rough-and-tumble play subsequently adapted more readily, with fewer signs of stress, to fear-inducing novel environments than did those who had played less. In other research, laboratory rats that were allowed controlled amounts of rough-and-tumble play during a critical period of their development coped better when subsequently exposed to novel, fear-inducing conditions than did those that had been deprived of such play (Einon, Morgan, & Kibbler, 1978; Einon & Potegal, 1991). Research with rats has also shown that rough and tumble play promotes growth of brain connections, between the prefrontal cortex and emotion-control areas of the limbic system, that are crucial for modulating innate fear responses (Pellis, Pellis, & Himmler, 2014).

Human children, everywhere, appear to be at least as motivated to play in risky ways as are the young of other mammals. Sandseter (2011) has described six categories of risks that seem to attract children everywhere in play. These are (with my elaborations):

- *Great heights.* Children climb trees and other structures to scary heights.
- *Rapid speeds.* Children swing on vines, ropes, or playground swings; slide fast on sleds, skis, skates, or playground slides; shoot down rapids on logs or boats; and ride bikes, skateboards, and other devices fast enough to produce the thrill of almost but not quite losing control.
- *Dangerous tools.* Depending on the culture, children play with knives, bows and arrows, farm machinery, woodworking equipment, or other tools known to be potentially dangerous.
- *Dangerous elements.* Children love to play with fire, or in and around deep bodies of water.
- *Rough and tumble.* Children everywhere chase one another around and fight playfully and, like other young mammals, typically prefer being the one in the more vulnerable position.

- *Disappearing/getting lost.* Little children play hide and seek and experience the thrill of temporary, scary separation from companions. Older ones venture off, away from adults, into places filled with imagined and possibly real dangers, including the danger of getting lost.

As is the case with other mammals, it seems likely that such play helps children learn to regulate their fear and, thereby, allows them to respond more adaptively in real-life emergencies. As Sandseter (2011) suggests, such play might also allow people to experience everyday life with fewer life-constraining phobias and less anxiety—less fear of the unpredictable future. Children develop courage through risky play.

Increased Societal Restrictions on Children’s Risky Play

Over the past several decades there has been a gradual, but overall huge decline in children’s freedom to play, especially to play outdoors away from adult monitoring or supervision, in the United States and many other parts of the developed world (Gray, 2011). Evidence for this comes from traditional historical analyses (Chudacoff, 2007), from diary studies of how children’s time is spent (Hofferth, 2009; Hofferth & Sandberg, 2001), and surveys in which parents describe their own childhood play compared to that of their children (Clements, 2004; O’Brien & Smith, 2002). Chudacoff (2007) refers to the first half of the 20th century as “the golden age of unstructured play” in America. By the beginning of the 20th century, most children were freed from long hours of labor and had ample time and opportunity to play, but beginning in the mid 1950s that freedom began to decline, a decline that has continued until today.

It is not possible to quantify reliably the amount of decline in such play over the decades, as different researchers have used different definitions and measures, but everyone who has examined the matter agrees that the decline—especially in outdoor play—has been huge. The reasons for the decline are many. They include increases in the amount of time that children must spend in school and at school work at home; increased fears on the part of parents and all of society about potential dangers to children outdoors; increased sizes of houses and decreased sizes of families; declines in the degree to which families know their neighbors; declines in availability of vacant lots and other unoccupied spaces in which to play; increased emphasis on adult-directed activities for children, such as youth sports, at the expense of play; and increased fears of lawsuits if children are injured while playing. (For more on some of these reasons, see Brussoni, Olson, Pike, & Sleet, 2012; Gray, 2011, 2013.)

The belief that children and even teens must be continuously monitored and supervised has become something of a moral imperative (Thomas, Stanford, & Sarnecka, 2016), which inhibits even those parents who would like to give their children more freedom. As a result, freedoms to venture away from adults outdoors that were common even to 6 and 7 year olds decades ago—such as walking or bicycling to school or a nearby park or a friend’s house—are now frequently denied even to children in their early teens. In a survey in the UK a few years ago, 43% of parents stated that children under age 14 should not be allowed outside at all unsupervised (Brussoni et al., 2012). Other studies have revealed dramatic declines over generations, within families, in children’s freedom to roam. As illustration, interviews of three generations in two families in northern England revealed that the range of allowed independent movement from home for 6 to 10 year olds was several kilometers for the grandparents (when they were children), about half a kilometer for the parents, and *nowhere* for the current generation of children (Woolley & Griffin, 2015).

When parents have been asked why they restrict their children’s freedom to roam and play outdoors, the most frequent reason given is fear of abduction or molestation by a stranger (Gray, 2011). This fear occurs despite evidence that crimes against children by strangers are extraordinarily rare throughout North America. Indeed, research in Canada suggests that the odds that any given child will ever be abducted by a stranger are about 1 in 14 million (Tremblay et al., 2015). When

children are molested or abducted, the perpetrator is usually a relative or someone else well known to the family, and the crime is usually initiated in the home or another dwelling, not outdoors. The likelihood of such a crime is reduced further, of course, when children are playing with other children, who would be witnesses.

Research has shown that the presence of parents or other caregivers generally interferes with children's play. For example, a study in Zurich compared 5 year olds living in neighborhoods where children that age were still allowed to play outdoors, unsupervised, contrasted with 5 year olds in neighborhoods where, because of traffic, such freedom was not allowed (Hüttenmoser, 1995). Parents of the latter group were much more likely than those of the former to take their children to parks, where they could play under parental supervision, but this did not undo the deficits caused by loss of neighborhood freedom. The children playing in neighborhoods spent, overall, more than twice as much time outdoors, were much more active while outdoors, had more than twice as many friends, and had better motor skills and social skills than those deprived of neighborhood play.

Hüttenmoser's further observations led him to conclude that trips to parks with parents failed to compensate for lost neighborhood freedom because (a) parents did not have patience or time to stay long at the park, so play was constricted in time; (b) parental monitoring reduced children's freedom to play in vigorous, challenging, risky ways; (c) there were usually no consistent play groups at parks, so opportunities for collaborative play among friends were reduced; and (d) the parks afforded fewer ways of playing than the neighborhoods, because of the greater variety of playthings in neighborhoods, where kids could bring out equipment from their homes. The only kind of play that was more common in parks than neighborhoods was play on playground equipment. In contrast, chasing one another, being noisy, riding bikes or tricycles, roller skating, building huts, using tools, and self-created games of all types were much more frequent in neighborhoods than in the parks.

Another study that revealed inhibiting effects of adults on play involved systematic observations in 20 parks in Durham, North Carolina (Floyd et al., 2011). The researchers toured the parks at various times and recorded the activity level (vigorous, moderate, or sedentary), sex, and estimated age of the children they observed. They also recorded temperature, the presence or absence of a parent or other adult caregiver, the presence or absence of other children, and various other attributes of the setting. They found that the single most significant factor in suppressing vigorous (and presumably somewhat risky) activity was the presence of a parent or other adult caregiver, and the most significant factor in increasing such activity was the presence of other children to play with. The former reduced vigorous activity by about 50% and the latter increased such activity by 370%.

Risky Play and Physical Health

A central question regarding children's risky play is that of whether the health benefits—which may include improved physical conditioning, improved ability to respond adaptively to real-world dangers, and improved ability to evaluate risk—outweigh the costs from possible injuries. Of course, that benefit/cost ratio depends on all sorts of variables, most notably the degree of risk involved in the play, but there is good evidence that children playing independently of adults are usually quite good at judging their own abilities, so serious injuries from such play are relatively rare.

A systematic review of research on injuries from various activities among 6 to 12 year olds suggests that children are safer in self-directed play than they are in adult-directed sports (Nauta, Martin-Diener, Martin, van Mechelen, & Verhagen, 2015). According to that review, the average rate of injuries serious enough to require medical treatment was 0.15 per 1,000 hours of "active commuting" (mostly walking or bicycling), 0.16 per 1,000 hours of "leisure time physical activities"

(self-directed physical play), and 0.27 per 1,000 hours of participation in sports. This finding is consistent with other analyses suggesting that sports injuries are a much greater health problem for children than are injuries derived from children's own play (e.g., Hyman, 2009). When children play competitive sports, pushed on by coaches, parents, and the drive to win, they often play through injuries and set aside their own better judgments about risk. This is why Little League pitchers sustain serious elbow injuries, young swimmers sustain serious shoulder injuries, and Pee Wee Football players get concussions. When playing independently of adults, children care about having fun much more than about winning or showing off, so they rarely push themselves in truly dangerous ways.

Some researchers, including Grant Schofield at Auckland University of Technology (New Zealand), contend that children are safer when allowed to play in their own ways than when subject to adult-imposed rules. As a demonstration of this, Schofield partnered with the principal of the Swanson Primary School in Auckland for an 'experiment' in which the school did away entirely with rules at recess. The results, widely reported in the popular press (e.g., Saul, 2014), included immediate and sustained increases in the joy of recess and in seemingly risky play—such as tree climbing, skateboarding, and rough-and-tumble games—coupled with immediate and sustained decreases in bullying, vandalism, and injuries. Unfortunately, this work has apparently not to date been reported, with data, in an academic publication. However, the finding fits with my own observations of children playing without adult supervision (Gray & Feldman, 2004). One interpretation is that when children are not subject to rules or interventions from on high, they use their common sense to play in vigorous, thrilling, yet relatively safe ways. Children have much more common sense than most adults credit them as having.

Another consideration, often forgotten in the concern about safety, is that children are remarkably resilient in bouncing back from injury. Researchers in British Columbia followed, for a year, a large sample of children, aged 0 to 16, who had been diagnosed with injuries at a children's hospital, using the Health Quality of Life Scale to assess recovery (Schneeberg et al., 2016). Except in rare, very severe cases, they found no evidence of permanent scarring, physically, emotionally, or intellectually, even with injuries severe enough to require hospitalization. On average, the children were at least as well off on all these indices a year after the injury as they were before the injury.

The most well documented health benefits of allowing children to play and explore in their self-chosen, sometimes risky ways have to do with the amount of physical activity they get. One study, involving observations of children aged 10 and older in parks, revealed that those without apparent adult supervision were nearly three times more likely to be physically active, at any given moment, than were those engaged in adult-organized activities (Spengler et al., 2011). Other research has shown that children who are allowed to transport themselves, by walking or bicycling to school and other places, get more physical exercise, are physically healthier (by blood pressure and adiposity measures), and have more friends than those who are not allowed such independent mobility (Brussoni et al., 2015; Lubens, Boreham, Kelly, & Foster 2011; Machado-Rodrigues et al., 2014; Mitra, Faulkner, Buliung, & Stone, 2014).

Risky Play and Mental Health

As noted earlier, rats deprived of rough-and-tumble play subsequently show poorer coping than other rats when exposed to frightening situations. Ethical and practical considerations, of course, prevent such play deprivation experiments with human children, but there has been at least one experiment involving a controlled increase in opportunities for risky play. Brussoni, Ishikawa, Brunelle, and Herrington (2017) introduced opportunities for risky play by modifying the outdoor play environment of two childcare centers, for children aged 2 to 5, in a repeated measures design. The intervention resulted in significant measured decreases in depressed affect and antisocial behav-

ior, and significant increases in prosocial behavior among the 45 children involved. In focus groups, the early childhood educators also claimed to observe improved socialization, problem-solving, self-regulation, creativity, and self-confidence, and reduced stress, boredom, and injury as a result of the intervention.

A concern of some is that children who experience frightening accidents or injuries in play might develop lifelong phobias, but research has provided little or no evidence to justify that concern. In fact, a study of fear of heights revealed that children who suffered an injury due to a fall before age 9 were *less* likely to fear heights at age 18 than were those without such an experience (Poulton, Davies, Menzies, Langley, & Silva, 1998), and another study found no relationship between the experience of water trauma before age 9 and fear of water at age 18 (Poulton, Menzies, Craske, Langley, & Silva, 1999). Sandseter and her colleagues have argued convincingly that risky play reduces phobias by leading children to feel comfortable in situations that were initially frightening (Kennair, Sandseter, & Ball, 2018). The child who faces her fear of heights by climbing trees in play, a little higher each time, will be less likely to fear heights in adulthood than the child who is prevented from such play. This is the same principle that underlies exposure therapy, which is well understood to be the most effective treatment for phobias (Foa & McLean, 2016). People overcome phobias not by avoiding the feared situations but by experiencing them.

Over the same decades that we have witnessed a huge decline in children's freedom to play, we have witnessed an equally huge decline in young people's mental health (Gray, 2011, 2013). The best evidence for this comes from cross-temporal meta-analyses of scores on standardized clinical questionnaires, which have been used with normative groups of young people in unchanged form over the decades. For example, analyses of scores on the depression scale of the Minnesota Multiphasic Personality Inventory and scores on Taylor's Manifest Anxiety Scale indicate that the rates of what today would be labeled as Major Depressive Disorder and as Generalized Anxiety Disorder among young people increased by five- to eightfold between the 1950s and late 1990s or early 2000s (Twenge, 2000; Twenge et al., 2010). These increases have been roughly linear over time. Twenge found that these increases do not correlate with wars or economic cycles, and there is no evidence that they correlate with the divorce rate (which peaked, in the United States, in the 1970s), but they do correlate well with the continuous decline of children's freedom.

To anyone familiar with the benefits of play, this correlation should not be surprising. A life without play, for children, is depressing indeed; and when play is replaced with ever-more competitive, adult-judged, high-pressure activities, both in and out of school, life is anxiety provoking. An additional causal mechanism for a link between the decline of play and rise of depression and anxiety is suggested by cross-temporal meta-analyses of a standard assessment of locus of control, which reveal a continuous decline in internal locus of control—that is, in the sense of being in control of one's own life—in school-aged children and young adults since the 1960s (Twenge, Zhang, & Im, 2004). Clinical psychologists have long known that a lack of internal locus of control predisposes a person for depression and anxiety (Alloy et al., 2006; Weems & Silverman, 2006). So, a reasonable causal chain here is that, with reduced freedom to play, children fail to develop a strong sense of control over their own lives (as play is where they *do* control their own activities), which, in turn, sets them up for depression and anxiety. It is reasonable to suppose that risky play, and the experience of mastery over fear that it produces, would be especially instrumental in promoting an internal locus of control.

How to Enable Risky Play in Our Time

There is some reason to believe that we are now approaching a turning point, where the decline in children's freedom to play may be starting to reverse itself. In this last section, I describe a sample of the efforts, in the United States and Canada, to bring adventurous, outdoor play back to children's lives.

Many families have come to understand the benefits of outdoor play, but then face the problem that their children cannot find other children outdoors with whom to play. The primary stimulus for children's outdoor play is other children, so even those who are allowed out soon go back indoors, or move onto their smart phones, if there is nobody with whom to play. If the only place where they can find their friends is online, then that is where they will hang out. Some families have tackled this problem by initiating changes in their neighborhood. Lanza (2012) has described a number of such successes in North America, ranging in location from a poor urban street in the South Bronx, New York, to his own affluent suburban neighborhood in Palo Alto, California. In general, such projects involve making the neighborhood attractive for outdoor play and safe enough that parents allow their children out without feeling a need for direct supervision. In the South Bronx, for example, this was accomplished by having the city close off the street for traffic during play hours and recruiting grandmothers in the neighborhood to sit outside to ensure sufficient safety.

Another promising route to renewing play, especially risky play, would be to develop adventure playgrounds within self-commuting distance of children everywhere. Adventure playgrounds, also called 'junk playgrounds,' are quite common in Europe but rare in North America. Wikipedia currently lists seven of them in the United States and two in Canada, although that is probably not a complete list. These playgrounds are deliberately designed to look like old-fashioned dumps—with used tires, boards, ropes, and other disposable items to play and build with, along with tools such as hammers and saws for building (see Figure 3.1).



Figure 3.1 Adventure playgrounds, sometimes called junk playgrounds, are places where children can build, climb, experiment, and learn to solve problems on their own. They are a partial solution to the problem of finding places for true play in today's world.

CALLOUT BOX 3.1 Adventure Playgrounds

Adventure playgrounds prioritize children's opportunities to interact with, construct, and modify elements of the play environment. They typically feature self-built dens and structures, the tools and support for making them, an abundance of 'loose parts' (various junk, natural and recycled materials), and access to the elements—fire, water, and earth. Children are supported by adult playworkers who help create and protect the conditions in which children can play freely.

Landscape architect C. Th. Sørensen is renowned for creation of the first 'junk playground' (*skrammellegeplad* or *byggelegeplad* 'building playground') in Emdrup, Denmark in 1943, which inspired adventure playground movements around the world.

In the post-World War II years, adults noticed how children were attracted to playing in derelict and brownfield sites which provided endless physically challenging play. In the 1950s and 1960s, an era when international membership associations concerned with children's well-being were forming (C. Th. Sørensen became the first president of the International Playgrounds Association, for example), a network of adventure playgrounds began to grow.

The adventure playground movement has been challenged in recent decades by risk-averse practices, fear of litigation, and commercialization of childhood and the term 'adventure playground' appropriated to describe challenging fixed equipment playgrounds. However grassroots developments continue to promote adventure play, in different forms and different ways (for example loose parts play in schools, community revitalization projects) and there are indications of a positive shift in attitudes toward the importance of play, and risk in play, which act as a reminder of the value and the relevance of the original adventure playground concept.

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Hare, H. (2011). What is a Danish adventure playground. In *Play Rights 50th anniversary edition*. Faringdon: International Play Association: Promoting the Child's Right to Play.

McKendrick, J. H., Loebach, J., & Casey, T. (2018). Realizing article 31 through General Comment No. 17: Overcoming challenges and the quest for optimum play environment. *Children, Youth and Environments*, 28(2), 1–11. Retrieved from www.jstor.org/action/showPublication?journalCode=chilyoutenvi.

Terada, M., Ermilova, M., & Kinoshita, I. (2018). Why do we need adventure playgrounds in rural areas? The revitalization project of Ishikawa, Fukushima. *Children, Youth and Environments*, 28(2), 159–174. Retrieved from www.jstor.org/action/showPublication?journalCode=chilyoutenvi.

The staff members at adventure playgrounds are called playworkers, and they are trained to avoid intervening in children's play unless they see something truly dangerous. They keep the play area free of hazards but not free of risks. A 'hazard' is anything that presents a danger that would not likely be noticed by the players—such as an upright nail or a rotting tree limb ready to fall if climbed on. A 'risk' is a danger that the players can clearly see and judge for themselves whether or not they can handle it—such as a tree to climb or a rope to swing on. At many adventure playgrounds, parents are asked to stay out of the play area and are encouraged not to wait near enough to the area to watch (see Figure 3.2). Ideally, children who live close enough travel to the playground themselves, and this typically does happen in Europe. Adventure playgrounds are



Figure 3.2 A key feature of most adventure playgrounds is that parents and other adults are encouraged or even required to leave the kids alone.

deliberately designed to enable children to take risks in a relatively safe environment. The short documentary film *The Land* (see <http://playfreemovie.com>) depicts an adventure playground in Wales, and watching it one can see children playing with all of Sandseter's universal categories of attractive risks—height, speed, tools, elements (fire), rough and tumble, and disappearing (hiding).

References

- Aldis, O. (1975). *Play-fighting*. New York: Academic Press.
- Alloy, L. B., Abramson, L. Y., Whitehouse, W. G., Hogan, M. E., Panzarella, C., & Rose, D. T. (2006). Prospective incidence of first onsets and recurrence of depression in individuals at high and low cognitive risk for depression. *Journal of Abnormal Psychology, 115*, 145–156.
- Bekoff, M. (2004). Wild justice and fair play: Cooperation, forgiveness, and morality in animals. *Biology and Philosophy, 19*, 489–520.
- Bekoff, M., & Byers, J. A. (1981). A critical reanalysis of the ontogeny of mammalian social and locomotor play: An ethological hornet's nest. In K. Immelmann, G. W. Barlow, L. Petrivoch, & M. Main (Eds.), *Behavioral development: The Bielefeld interdisciplinary project* (pp. 296–337). New York: Cambridge University Press.
- Brussoni, M., Gibbons, R., Gray, C., Ishikawa, T., Sandseter, E. B., Bienenstock, A., Chabot, G., Fuselli, P., Herrington, S., Janssen, I., Pickett, W., Power, M., Stanger, N., Sampson, M., & Tremblay, M. S. (2015). What is the relationship between outdoor risky play and health in children? A systematic review. *International Journal of Environment and Public Health, 12*, 6423–6454.
- Brussoni, M., Ishikawa, T., Brunelle, S., & Herrington, S. (2017). Landscapes for play: Effects of an intervention to promote nature-based risky play in early childhood centres. *Journal of Environmental Psychology, 54*, 139e–150e.

- Brussoni, M., Olson, L., Pike, I., & Sleet, D. (2012). Risky play and children's safety: Balancing priorities for optimal child development. *International Journal of Environmental Research and Public Health*, *9*, 3134–3148.
- Chudacoff, H. P. (2007). *Children at play: An American history*. New York: New York University Press.
- Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues in Early Childhood*, *5*, 68–80.
- Einon, D., Morgan, M. J., & Kibbler, C. C. (1978). Brief periods of socialization and later behavior in the rat. *Developmental Psychobiology*, *11*, 213–225.
- Einon, D., & Potegal, M. (1991). Enhanced defense in adult rats deprived of playfighting experience as juveniles. *Aggressive Behavior*, *17*, 27–40.
- Floyd, M., Bocarro, J., Smith, W., Baran, P., Moore, R., Cosco, N., Edwards, M., Suau, L., & Fang, K. (2011). Park-based physical activity among children and adolescents. *American Journal of Preventive Medicine*, *41*, 258–265.
- Foa, E. B., & McLean, C. P. (2016). The efficacy of exposure therapy for anxiety-related disorders and its underlying mechanisms: The case of OCD and PTSD. *Annual Review of Clinical Psychology*, *12*, 1–28.
- Gray, P. (2011). The decline of play and the rise of psychopathology in childhood and adolescence. *American Journal of Play*, *3*, 443–463.
- Gray, P. (2012). Definition of play. In *Encyclopedia of play science*. Retrieved from www.scholarpedia.org/article/Encyclopedia_of_Play_Science.
- Gray, P. (2013). *Free to learn: Why unleashing the instinct to play will make our children happier, more self-reliant, and better students for life*. New York: Basic Books.
- Gray, P. (2019). Evolutionary functions of play: Practice, resilience, innovation, and cooperation. In P. K. Smith & J. Roopnarine (Eds.), *The Cambridge handbook of play: Developmental and disciplinary perspectives* (pp. 84–102). Cambridge, UK: Cambridge University Press.
- Gray, P., & Feldman, J. (2004). Playing in the zone of proximal development: Qualities of self-directed age mixing between adolescents and young children at a democratic school. *American Journal of Education*, *110*, 108–145.
- Groos, K. (1898). *The play of animals*. New York: Appleton.
- Hofferth, S. (2009). Changes in American children's time, 1997–2003. *International Journal of Time Use Research*, *6*, 26–47.
- Hofferth, S., & Sandberg, J. E. (2001). Changes in American children's time, 1981–1997. In T. Owens & S. Hofferth (Eds.), *Children at the millennium: Where have we come from, where are we going?* (pp. 193–229). New York: Elsevier Science.
- Hüttenmoser, M. (1995). Children and their living surroundings: Empirical investigations into the significance of living surroundings for the everyday life and development of children. *Children's Environments*, *12*, 403–413.
- Hyman, M. (2009). *Until it hurts: America's obsession with youth sports and how it harms our kids*. Boston: Beacon.
- Kennair, L., Sandseter, E., & Ball, D. (2018). Risky play and growing up: How to understand the overprotection of the next generation. In A. Kaufman (Ed.), *Pseudoscience: The conspiracy against science* (pp. 171–194). Cambridge, MA: MIT Press.
- Lanza, M. (2012). *Playborhood: Turn your neighborhood into a place for play*. Menlo Park, CA: Free Play Press.
- Lubans, D., Boreham, C., Kelly, P., & Foster, C. (2011). The relationship between active travel to school and health-related fitness in children and adolescents: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, *8*, 1–12.
- Machado-Rodrigues, A., Santana, A., Gama, A., Mourao, I., Nogueira, H., Rosado, V., Mota, J., & Padez, C. (2014). Active commuting and its associations with blood pressure and adiposity markers in children. *Preventive Medicine*, *69*, 132–134.
- Marks, K. A., Vizconde, D. L., Gibson, E. S., Rodriguez, J. R., & Nunes, S. (2017). Play behavior and responses to novel situations in juvenile ground squirrels. *Journal of Mammalogy*, *98*, 1202–1210.
- Mitra, R., Faulkner, G., Buliung, R., & Stone, M. (2014). Do parental perceptions of the neighbourhood environment influence children's independent mobility? Evidence from Toronto, Canada. *Urban Studies*, *5*, 3401–3419.
- Mustoe, A. C., Taylor, J. H., Birnie, A. K., Huffman, M. C., & French, J. A. (2014). Gestational cortisol and social play shape development of marmosets' HPA functioning and behavioral responses to stressors. *Developmental Psychobiology*, *56*, 1229–1243.
- Nauta, J., Martin-Diener, E., Martin, B., van Mechelen, W., & Verhagen, E. (2015). Injury risk during different physical activity behaviours in children: A systematic review with bias assessment. *Sports Medicine*, *45*, 327–336.
- O'Brien, J., & Smith, J. (2002). Childhood transformed? Risk perceptions and the decline of free play. *British Journal of Occupational Therapy*, *65*, 123–128.

- Pellis, S. M., & Pellis, V. C. (2011). Rough and tumble play: Training and using the social brain. In A. D. Pellegrini (Ed.), *The Oxford handbook of the development of play* (pp. 245–259). New York: Oxford University Press.
- Pellis, S. M., Pellis, V. C., & Himmler, B. T. (2014). How play makes for a more adaptable brain: A comparative and neural perspective. *American Journal of Play*, 7, 73–98.
- Poulton, R., Davies, S., Menzies, R. G., Langley, J. D., & Silva, P. A. (1998). Evidence for a non-associative model of the acquisition of a fear of heights. *Behaviour Research and Therapy*, 36, 537–544.
- Poulton, R., Menzies, R. G., Craske, M. G., Langley, J. D., & Silva, P. A. (1999). Water trauma and swimming experiences up to age 9 and fear of water at age 18: A longitudinal study. *Behaviour Research and Therapy*, 37, 39–48.
- Sandseter, E. (2011). Children's risky play from an evolutionary perspective: The anti-phobic effects of thrilling experiences. *Evolutionary Psychology*, 9, 257–284.
- Saul, H. (2014, January 28). New Zealand school bans playground rules and sees less bullying and vandalism. *Independent*.
- Schneeberg, A., Ishikawa, T., Kruse, S., Zallen, E., Mitton, C., Bettinger, J., & Brussoni, M. (2016). A longitudinal study on quality of life after injury in children. *Health and Quality of Life Outcomes*, 14, 120–131.
- Spengler, J., Floyd, M., Maddock, J., Gobster, P., Suau, L., & Norman, G. (2011). Correlates of park-based physical activity among children in diverse communities: Results from an observational study in two cities. *American Journal of Health Promotion*, 25, e1–e9.
- Spinka, M., Newberry, R. C., & Bekoff, M. (2001). Mammalian play: Training for the unexpected. *Quarterly Review of Biology*, 76, 141–168.
- Thomas, A., Stanford, P. K., & Sarnecka, B. W. (2016). No child left alone: Moral judgments about parents affect estimates of risk to children. *Collabra*, 21, 1–15.
- Tremblay, M. S., Gray, C., Babcock, S., Barnes, K., Bradstreet, C. C., Carr, D., Chabot, G., Choquette, L., Chorney, D., Collyer, C., Herrington, S., Janson, K., Janssen, I., Larouche, R., Pickett, W., Power, M., Sandseter, E. B. H., Simon, B., & Brussoni, M. (2015). Position statement on active outdoor play. *International Journal of Research and Public Health*, 12, 6475–6505.
- Twenge, J. M. (2000). The age of anxiety? Birth cohort changes in anxiety and neuroticism, 1952–1993. *Journal of Personality and Social Psychology*, 79, 1007–1021.
- Twenge, J. M., Gentile, B., DeWall, C. N., Ma, D., Laceyfield, K., & Schurtz, D. R. (2010). Birth cohort increase in psychopathology among young Americans, 1938–2007: A cross-temporal meta-analysis of the MMPI. *Clinical Psychology Review*, 30, 145–154.
- Twenge, J. M., Zhang, L., & Im, C. (2004). It's beyond my control: A cross-temporal meta-analysis of increasing externality in locus of control, 1960–2002. *Personality and Social Psychology Review*, 8, 308–319.
- Vygotsky, L. S. (1978). The role of play in development. In M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (Eds.), *Mind in society: The development of higher psychological processes* (pp. 92–104). Cambridge, MA: Harvard University Press.
- Weems, C. F., & Silverman, W. K. (2006). An integrative model of control: Implications for understanding emotion regulation and dysregulation in childhood anxiety. *Journal of Affective Disorders*, 91, 113–124.
- Woolley, H. E., & Griffin, E. (2015). Decreasing experiences of home range, outdoor spaces, activities and companions: Changes across three generations in Sheffield in north England. *Children's Geographies*, 13, 677–691.

Chapter Takeaways

Key Talking Points

- Children everywhere, when free to do so, play in ways that entail risk of injury, as do the young of other mammals.
- Research with animals indicates that risky play promotes effective adaptation to fearful, stressful conditions later in life.
- Research reveals that children play in more vigorous and seemingly risky ways when they play away from adults than when adults are present, but sustain fewer serious injuries in such play than they do in adult-directed sports.
- Over the past several decades opportunities for children to play outdoors away from adults have declined greatly in North America and other developed parts of the world. Over these same decades, young people's physical fitness and sense of control over their own lives have declined, and their rates of anxiety and depression have increased greatly. There are good reasons to believe that the decline in child-directed risky play is a cause of these deleterious effects.

Benefits for Youth

- Renewing children's opportunities to play in freely chosen, physically challenging ways will improve their physical fitness.
- Such renewal will also help to ameliorate the current epidemics of depression and anxiety among young people.
- With more opportunity to control their own play lives, young people will develop a greater capacity for self-control outside play.

Benefits for the Public

- The physical and psychological health benefits of self-chosen risky play will reduce public and private expenditures on therapy.
- The youth of today are the adults of tomorrow. Self-chosen play is how young people acquire the skills of self-direction, including risk assessment, that allow them to contribute productively to society in adulthood.

Successful Examples

- The recent revival in development of adventure playgrounds, where the only adults present are playworkers trained in nonintervention, is one route toward renewing risky play in our time.
- Mike Lanza, in his book *Playborhood*, has described ways by which parents have successfully renewed children's outdoor free play in their neighborhoods.
- The non-profit Let Grow Foundation is currently working with schools and whole communities to restore free outdoor play in the United States.
- The so-called "Free Range Parenting Law," enacted by the state of Utah in the United States, is an example of how legislation can affirm parents' rights to allow their children to play outdoors unsupervised.

Recommended Actions

- Educators, psychologists, and pediatricians can educate parents and society in general about the value of child-directed play, including play that appears risky.
- Government authorities can pass legislation that encourages rather than restricts children's freedom to be in and play in public spaces without supervision.
- Communities can develop adventure playgrounds and nature playgrounds where children are free to play in their own, self-directed ways with minimal monitoring by adults.
- Schools can open up outdoor and indoor play spaces for play during non-school hours, with minimal monitoring by adults.

Supportive Resources

Lanza, M. (2012). *Playborhood: Turn your neighborhood into a place for play*. Menlo Park, CA: Free Play Press.

Skenazy, L. *Free-range kids: Giving our children the freedom we had (without going nuts with worry)*. San Francisco: Wiley.

Gray, P. (2013). *Free to learn: Why unleashing the instinct to play will make our children happier, more self-reliant, and better students for life*. New York: Basic Books.

Aquillano, S., & Hawkins, A. (Eds.). (2017). *Design & play: Imagination needs places to thrive*. Boston: Design Museum Foundation.