

SUPPLEMENT 1

Developmental benefits of children's risky play

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Injury Prevention

Quite a few researchers have documented how children are active explorers, often both seeking and preferring risky play that may involve physical risk-taking activities and play where the ability to fight and physical strength are tested. [1–6] In one of the classic works on animal and human play, Aldis [7] points out that much of children's play is related to fear, and that young children actively seek out the thrills of fearful situations such as swinging and jumping from high places. Both observations of children's expressions in play [8] and interviews with children about their motives for engaging in risky play, [9] indicate that the ambiguity of experiences in risky play is the central point in children's motivation for engaging in this kind of play. Sandseter's [3,9] study showed that the primary motivation for the children to engage in risky play was the pleasant emotions it would give them as they gained a higher level of arousal and mastered risks they did not think they would dare. To achieve these experiences, they had several arousal-increasing strategies they incorporated in their play, such as intentionally increasing the height and speed of their play, acting more rashly, choosing more risky strategies of action and seeking to balance on the border of fear. Risk-taking in play includes both fear and excitement and this ambiguous feeling is what children seek in their play. [3,5,7,10–12]

WHAT DO CHILDREN LEARN THROUGH RISKY PLAY?

One of the benefits of children's engagement in risky play is the "lessons for life" that they unconsciously learn while practicing handling risks. Risky play, as several researchers argue, is a way for children to enhance their risk mastery skills. Children approach the world around them through play; they are driven by curiosity and a need for excitement; they rehearse handling real-life risky situations through risky play; and they discover what is safe and not. [4,13–16] From a risk-theory perspective, this means that children gain a realistic notion of the objective risk in the situation. [13]

Boyesen [17] states that in order for a child to "learn" how to master a risky situation, s/he will need to somehow approach the situation, and thereby increase the risk. This is similar to the argument proposed by Ball [1] and Stutz, [18] who emphasize the importance of letting children develop a sound sense of risk through taking risks in play. In a similar vein, a study investigating play providers' views of children's

risky play in the UK reported that enabling children to test their abilities, develop skills for use in the wider world and learn about the real consequences of risk-taking were the most important benefits of risks and challenge in play. [19] Aldis [7] exemplifies how children progressively encounter risky play and seek out thrills in a gradual manner, which allows them to master the challenges involved. In this way, their subjective perception of the risk becomes more realistic. Through risky play, children prepare for handling real risks and dangers – it is a serious risk-management exercise. [13]

The benefits of risky play involving activities related to height and speed, such as sliding, swinging, climbing and bike riding, may be relevant to learning about one's ecology, exploring the environment [20] and practicing and enhancing different motor/physical skills for developing muscle strength, endurance and skeletal quality. [21–25] All physical practice and training might be relevant for the developing child. These kinds of play also involve training related to perceptual competencies, such as depth-, form-, shape-, size-, and movement perception, [26] and general spatial-orientation abilities. [20]

Children venturing out on their own away from the surveillance of caretakers is a way of exploring one's world and becoming at home in it. [4] Bjorklund and Pellegrini [20] similarly argue that children come to know their environment through continuously exploring new areas and objects. It seems that children attain enhanced familiarity and competence about their environment, its potentials and its dangers through exploring its features. [20]

Rough-and-tumble play also involves great physical and motor stimulation. [21–25] Another possible function of rough-and-tumble play is to enhance social competence through affiliation with peers, social signaling, as well as good managing and dominance skills within the peer group. [23,24] It also provides for practice of complex social skills, such as bargaining, manipulating and redefining situations. [27,28]

ANTI-PHOBIC EFFECTS OF RISKY PLAY

Another recently described evolutionary function of children's risky play refers to the anti-phobic effect such play may have. [29] This suggested function of children's risky play

is based on research suggesting that several human fears and phobias, such as fear of heights, fear of water and separation anxiety, appear naturally at a developmentally relevant age as a part of the child's maturation due to interplay between genes and the environment, yet vanish again due to a natural interaction with the relevant environment and the anxious stimulus as part of normal development.[30,31] Research on fear of heights has shown that sustaining injury due to falls both before age five and between ages five and nine is associated with the absence of fear of heights at age eighteen.[32] Thus, risky play with great heights may provide a desensitizing or habituating experience, resulting in less fear of heights later in life.[29] Similarly, research on separation anxiety shows that the number of separation experiences before age nine correlates negatively with separation anxiety symptoms at age eighteen,[33] and research on fear of water has concluded that there is no relationship between experiencing water trauma before age nine and the symptoms of water fear at age eighteen.[34] These findings suggest that risky play, where children separate from their caretakers by exploring new and unknown areas and play near and in water, may also have habituating effects on the innate fears of separation and water.[29] As such, Sandseter and Kennair[29] suggest that one important aspect of risky play is the anti-phobic effect of exposure to typical anxiety-eliciting stimuli and contexts, in combination with positive emotions (thrills, excitement and fearful joy) and relatively safe situations. The children learn to cope with and no longer to fear potentially dangerous situations.

WHERE WE OUGHT TO GO/CALL FOR ACTION

Understanding of why and when children engage in risky behavior is important, particularly if such behavior in the long run is beneficial to their normal development. It seems that risky behavior is maintained despite adults' attempts to make children's environments relatively risk free. From both a safety perspective, as well as from a normal psychological developmental perspective, understanding the function of risky play and the different psychological mechanisms and motivational systems involved is important.

In practice we should outline the balance between safety requirements and children's needs and opportunities to play freely in challenging, stimulating and developing environments. The balancing act of letting children explore and take risks while still keeping them safe from fatal and serious injuries is not easy. The safety legislation on children's play environments and the recent growing safety concerns among parents and caretakers should not result in restricting children from engaging in risky and challenging play activities. Rather, caregivers and supervisors should let children encounter risks and challenges within a relatively

safe play setting,[4] even though one would have to take this important knowledge at the risk of some minor injuries. Children should be able to engage in challenging play, adjusted to each individual's sense of risk and urge for exhilaration, and preschool staff, teachers and parents should be encouraged to support and maybe even inspire this.

Play environments are also important for children's opportunity to engage in risky play.[35] At playgrounds and play environments, one must consider both the risks and the developmental benefits of letting children face the risks.[1] A preoccupation with strict surveillance and restrictions of risky play would hinder the children from positive mastery experiences such as fun, enjoyment, high arousal, excitement, thrill, pride, achievement and healthy self-esteem.[12–14,16] Paradoxically, risk-avoidance puts children at greater risk because they may miss out on important developmental benefits.[1,4,13–18] Through risky play, children prepare themselves to handle “real risks and dangers,” it is “serious risk-management exercise.”[13]

Children's safety is important and severe injuries or death must be avoided. However, the benefits of risky play should be highlighted and brought forward as a natural part of the play safety discussion.

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