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Risky play in children's emotion regulation, social functioning, and physical health: an evolutionary approach

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ABSTRACT

The focus of this theoretical paper is to explore three biopsychosocial levels of children's risky play: (1) mental health and emotion regulation, (2) social functioning and challenging norms, and (3) physical health and development. As such, in this paper, we expand Sandseter's and Kennair's focus in their original article in 2011 on the evolved function of risky play as an anti-phobic mechanism, and consider other types of risk than physical risks and other types of play, including other types of emotional regulation than anxiety reduction. Motivated by the thrilling emotions involved in risky play, one matures in competency and masters new and more complex psychosocial settings. Play with emotional, social, and physical risk may have evolved to increase the child's psychosocial competency here-and-now, but also train them for future adult contexts. We recommend that future research consider how risky play in all contexts may have a similar function.

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Risky play; emotion regulation; social functioning; physical health; evolutionary function

Introduction

Ten years ago, Sandseter and Kennair (2011) suggested that risky play may be seen as an evolved adaptation that emotionally motivates children to seek out previously challenging situations and behaviours as they mature physically and develop psychologically. To achieve this, children need the motivation to seek out and expose themselves to different phenomena and situations that cease to be dangerous to them as they mature. The ecological phenomena that the child displays fear towards would have been truly hazardous at lower levels of physical maturation and thus ought to elicit functional fear at earlier stages of lower physical ability. As children become more physically mature, the thrilling sensation and hedonic emotional valence experienced during risky play provide this motivation to approach and master these situations. Risky play and thrill are thus specific, modular, evolved mechanisms to ensure that children overcome

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their anxiety and aid the approach and exposure process and thereby reduce these non-associative, maturationally acquired phobias – explaining why these phobias decrease with age (Poulton et al., 1999). Exposure and response prevention therapy thus mirrors this process, without generally including the addition of the positive or hedonic emotional sensation of thrill experienced in risky play.

Risk and play have similarities or coincide, as the very nature of play provides experience with unpredictability and uncertainty (see for example Niehues et al., 2013; Špinka et al., 2001). Seeking out unpredictability and slightly fearful situations including fights, heights, speed, and risky movements as found in human play, are similarly found in non-human juvenile mammals (e.g. primates, carnivores) and some kinds of birds (Aldis, 1975; Power, 2000; Smith, 1982). Aldis (1975) also shows that an important aspect of this kind of play in both animal and human groups is to explore emotions such as thrills and excitement. This strengthens the evolutionary explanation of play. Thompson (1998) suggested that one of the evolutionary functions of rough-and-tumble play, along with other functions such as competitive physical and social skills, might be self-assessment of an individual's skills through play, and though this modify further play optimal benefits.

Risky play, as used in Sandseter and Kennair (2011), was defined as 'thrilling and exciting forms of physical play that involve uncertainty and a risk of physical injury' (Sandseter, 2010b). This definition rested on six categories of risky play (Sandseter, 2007): (1) play with great heights, (2) play with high speed, (3) play with dangerous tools, (4) play near dangerous elements, (5) rough-and-tumble play, and (6) play where children go exploring alone. This original definition and categorization of risky play emphasized physical risk-taking and was partly a response to the risk aversion trends in Western societies focusing on physical injuries (Brussoni et al., 2012; Brussoni, Brunelle, et al., 2015; Wyver et al., 2010). Kleppe's (2018) work on 1- to 3-year-olds' risky play built on these developments and included both positive and negative outcomes on a variety of potential aspects in his definition of risky play. That is, the outcome can be physical, but also emotional or environmental.

On an overall level, the understanding of *risk* has broadened. Risk was previously a concept that mainly addressed future *negative* outcomes. However, after 2010, the discourse was addressed more as future *uncertainties* (Ball & Ball-King, 2011). This change of discourse opens towards a recognition of the necessity to sometimes take a risk to achieve a positive result and thus a preference for risk-benefit assessments over only risk-reducing measures (Gill, 2017). Whether risk has (mainly) negative or positive connotations is related to context. For example, if one considers risk-taking in play or sport, one associates excitement and fun (Breivik, 2001). If one considers sensation-seeking, one associates risk-taking with positive emotions such as thrill and arousal (Zuckerman, 2009). If one considers risk-taking in business, one associates large profit (Rescher, 1983), and if one considers risk-taking in personal development, one might associate metaphors, such as 'leaving one's comfort zone', with positive emotional and professional gains (Bardwick, 1991).

Different aspects of risk make different domains of risky play and different functions of this behaviour in the regulation of the child's emotions. The fundamental hedonic valence of the thrilling sensation of mastering something that previously was both dangerous and fear-eliciting makes risky play a general motivational process. The

biopsychosocial nature of risky play, therefore, has consequences for the development of both physical and mental health, as well as social interaction and norms. At the same time, we need to understand how risk has not reduced fitness and how children have evolved to cope with and benefit from engaging with risk adaptively and developmentally.

Aim of this paper

In this theoretical paper, we aim to expand the narrow focus on anxiety and physical risk from the original paper (Sandseter & Kennair, 2011) and cover three biopsychosocial levels of risky play: (1) mental health and emotion regulation, (2) social functioning and challenging norms, and (3) physical health and development. The aim is to suggest – based on the original paper and extant research – that a broader understanding of risk beyond physical danger and considering emotions other than anxiety provides a more general model: Children have evolved to develop an interest in several specific risky play domains, motivated similarly by thrilling emotions and mastery of new and exciting psychosocial domains. As such, what is perceived as risk is not fitness reducing, rather engaging in risky play has had adaptive advantages and fostered development.

Mental health and emotion regulation

According to evolutionary theory, developing children need to functionally fear many physical hazards in their ecology, including but not limited to water, heights, the dark, strangers, dangerous objects, and different animals. This provides us with the disposition to fear specific evolutionary phenomena (Öhman et al., 1976; Öhman & Mineka, 2001, 2003) but not necessarily modern and real dangers, due to mismatch theory (Kennair, 2007; Kennair & Lindner, 2017). We evolved to be adapted to the Environment of Evolutionary Adaptiveness (EEA; Tooby & Cosmides, 1992), not the current modern environment. This results in more fear of the dark and height and a preparedness for fear of snakes across species and of spiders in countries without venomous spiders, than fear of sugar, fat, and other actual risks in the modern world (Burghardt et al., 2009; Öhman & Mineka, 2003; Poulton et al., 1998).

Fear of dangerous ecological features such as height (Menzies & Clarke, 1993; Poulton et al., 1998) and water (Poulton et al., 1999) thus mature naturally in children. This is functional fear or nonfunctional anxiety dependent upon age and maturation. The original functional understanding of risky play was as an evolved mechanism to remove remaining nonfunctional anxiety as the child matures and becomes competent to master situations that previously were beyond their capacity to cope with (Sandseter & Kennair, 2011).

We expand this original focus on anxiety to encompass other psychosocially relevant contexts and emotions. Rather than only being an anti-phobic mechanism, different forms of risky play may have a wider array of functions. We argue here that risky play and the thrilling sensation elicited by mastering previously feared ecological features, situations, and phenomena have a broader emotion regulation function, of which the anti-phobic function is a subcategory. For example, both positive and negative emotions (e.g. joy, discomfort, awkwardness, fear) from social and physical closeness with peers

may be explored and mastered through play, including the risky play of rough-and-tumble. Social roles, competitiveness, and self-assertiveness may likewise be explored under in vitro forms, where the stakes are low, and the consequences are mostly psychological. One may learn how to empathically understand others' intentions, motives, and mental states, and one may experience a breadth of different emotional states. However, this set of mentalization capacities goes beyond mere anxiety reduction, mirroring other therapeutic models and approaches (Bateman & Fonagy, 1999; Fonagy & Bateman, 2006; Greenberg, 2004).

The anti-phobic effect of risky play is both motivational and behavioural, as it trains an age- and skill-appropriate coping and mastery of the local ecology as well as the intrapsychic responses to the environment and behavioural interaction with it. This feedback process thus makes the maturing child able to develop ecological, psychological, physiological, and behavioural skills in concert. However, the relevant developmental ecology consists of more than just physical risks and downregulation of phobic avoidance or upregulation of thrilling exposure: Social development demands emotional regulation of several other emotions, including anxiety, but not limited to anxiety.

Emotional regulation in interaction with peers includes prosocial situations and the prosocial emotions involved in sharing, helping, comforting, communicating, coordinating, and more challenging situations involving less prosocial emotions such as domination, bullying, exclusion, quarrelling and fighting. Research has indicated that engaging frequently in pretend play is associated with higher emotion regulation skills among children (Galyer & Evans, 2001). Through pretend play, role play and other forms of play, one can wage wars and build cities in the sandpit, form families and raise children in the dollhouse, and hunt and find fantastic beasts together in the forest. One may create games following arbitrary social rules and demand strict adherence to these rules. One may practice physical skills such as stealth, speed, strength or psychological skills such as cunning, strategy, manipulation or social coordination. One may compete without large consequences, where losing is less dangerous than in reality. One may be a couple, practice kissing and engage in domestic disputes and breakup or divorce. If the hypothesis of the current paper is correct, play may potentially, theoretically function as an evolved developmental and practice arena for emotion regulation within many different psychosocial areas. In this way, a host of different discrete but also complex social emotions and motivational states may be elicited, motivate behaviour and learnt to be regulated by play. Sutton-Smith (2008; 2017), for instance, points to excitement and happiness as important emotions evoked by play, but at the same time he discusses how primary expressive emotions, some being more dark and negative, are motivations to some types of play. He shows how play such as teasing and hazing can create emotions such a s shock and surprise, how play including physical and mental competition can produce anger, while risky play could result in physical or mental fear.

When experiencing loss in play, one must be able to handle feelings of defeat, sorrow, and low esteem. In victory, one may rejoice and celebrate the imagined spoils of war. One may experience quarrelling and anger over the unfairness of status, resources, relationships. and ownership. LaFreniere (2011) discusses that vigorous social play benefits not only all children's physical development but also their emotional communication and emotional regulation skills. LeFreniere also shows how rough-and-tumble play is especially important for boys to learn emotion regulation skills related to managing

anger and aggression. Similarly, Lindsey and Colwell (2013) found that both physical exercise play and rough-and-tumble play predicted higher emotion regulation among preschool children, and sociodramatic play, in addition to predicting emotion regulation, was also associated with emotional expressiveness and emotion knowledge. As one plays out different roles in making belief worlds and symbolic games and competitions, one is awash with emotions while navigating the social group and coordinating with one's peers. Through play, emotional regulation is practised in a safer, more hedonic, and less consequential setting. Mirroring the anti-phobic effects of risky play, social role-play and competitions provide a framework for building and developing social skills. Furthermore, this may foster an ability to cope with and master the social reality of one's peer group while simultaneously being motivated to do so and learning how to regulate emotions. Emotions elicited by winning or losing, being included or excluded, being boss or follower, being mom or dad or child or aunty or the family dog.

All these different psychosocial risk domains demand training as psychological skill sets and at the same time demand psychosocial skills here and now. Different forms of play construct a laboratory for testing out big emotions: playing girlfriend/boyfriend before hormones and romantic feelings become too serious, winning, or losing at different competitions before puberty changes it into real dominance hierarchies. There are, therefore, both deferred and immediate adaptations involved in the breadth of different domains of play. Researchers interested in the specific types of risky play may therefore benefit from considering the functional (both deferred and immediate) aspects related to psychosocial maturation and emotional regulation, and mentalization.

Social functioning and challenging norms

One main reason for parents' (Allin et al., 2014) and teachers' (Little et al., 2012) intervening, regulating, and stopping play is the possibility of physical injury. E.g. in the US, teachers and playground owners are restricting children's play in fear of liability and lawsuits if injuries happen (Solomon, 2011). However, children's play is also regulated or stopped for other less concrete risks; for example, if there is social controversy or taboo related to play. In their study of Australian daycare staff's experience of risk, Cooke et al. (2020) found that employees felt that facilitating and allowing risky play among children exposed themselves as educators to the social risk of negative reactions from parents, colleagues or authorities who might think they let children take too big risks. The employees explained that trusting the children to manage things by themselves felt like running a risk for themselves as staff. They thought it was important that children should be allowed to experience autonomy and influence, but at the same time, this resulted in uncertainty among the employees as to whether negative consequences could arise. The daycare staff in Cooke et al.'s study also pointed to other types of risks children engaged in – risks that were not included in the original risky play concept. Engaging in social and emotional risk where one can receive negative social reactions and sanctions from peers around you, such as a boy who wants to dress up in girls' clothes or just to run the risk of being rejected when asking to join a play situation with other children, was considered risk-taking among children. Gray (2019) suggests that role play is one of children's natural ways of educating themselves, and that this entails both universal and cultural characteristics. One such universal

characteristic is that children learn through play by observing, listening, and later incorporating what they see and hear into their play. This entails a cultural adaptation, and one will therefore observe cultural differences in children's play. Common values of a given cultural group are channelled through their play; the 'scenes' they play out derives from their specific culture. The cultural perspective presumes that play equips children with the skills and abilities that are necessary and/or valuable in their specific context. Thus, one will also observe cultural differences in what is considered risky play, depending on the context.

Cooke (2020) showed how educators found play themes that are considered taboo by parents or society to constitute a kind of risk, probably reflecting the specific cultural context. One such recurring risky play theme is aggression or violence. From an early age, children pretend to fight, shoot, fence and throw items, including playing with toys that imitate weapons or are related to combat in various ways. Research has addressed aggression in play in various forms, e.g. pretend-play with aggressive themes and anger expression (Rao et al., 2021) and pretend-play with war/violence as a theme (Hart & Tannock, 2013). Similarly, there might be various socially related reasons why parents or ECEC staff feel the need to regulate or stop such play. First, ECEC staff report that they perceive this type of play negatively for the social environment, both for children and staff (Coplan et al., 2015). It is also presumed that play fighting and war play lead to aggression and conflicts between the children (Pellegrini, 1994; Rao et al., 2021). Not least, there is an assumption that such play, especially with realistic-looking toys, normalizes war and violence. Allowing children to play in such ways eventually *makes* children violent (Hellendoorn & Harinck, 1997; Watson & Peng, 1992). Altogether, from an adult perspective, there seems to be ample social risk in allowing aggressive or violent play-themes.

Can this type of risky play have immediate and deferred evolutionary benefits, such as those proposed in the original hypotheses? First, few studies link aggression in play to development, either on an individual psychological level or from an evolutionary perspective. Rao et al. (2021) summarized that previous research is inconclusive as to whether aggressive play leads to real aggression later. In their study, they found that a relatively small portion (10%) of observed pretend-play involved aggressive themes. They discuss whether aggression in play is a way for the children to allow aggressive peers to let off steam, to rehearse dealing with aggression or simply allow some aggression to be able to continue to play. Pellegrini (1994) found that only 1% of playfights turned into real fights. Not least, in the cases that turned into fighting, more children who lacked social skills and were more often rejected by playmates were involved. These findings indicate that there is a significant component of learning in this type of play. It can be interpreted as a successful way of practising and reducing nonfunctional behaviour and regulating aggressive emotions. Indicative aggression peaks early in toddlerhood and decreases throughout childhood along with maturation and social competence (Keenan, 2012).

Another controversial play theme is sexuality. As rhetorically formulated by Sutton-Smith: 'The adult public transcript is to make children progress, the adult private transcript is to deny their sexual and aggressive impulses' (2009, p. 123). However, as Sutton-Smith also describes, young children play naturally with their bodies; they explore and touch themselves and play with body fluids (de Graaf & Rademakers, 2006). They

might also play with peers in sexualized fashions; they explore by looking at each other, lying on top of each other, hugging and cuddling. Role play such as 'doctor' can attain sexualized aspects, when examining each other. (For various approaches to sexualised play see for example Sutton-Smith, 2009, chapter 7, 8 and 9). Parents and caregivers report that this is a side of children's development and a type of play they feel uncomfortable with, with the common consequence that they stop it and divert children to do something else (Skarpsno, 2013). The assumed risk is that children – by being allowed to play in such ways – will develop their sexuality too soon and/or an overly sexualized behaviour. Additionally, adults are afraid that playing sexually is a symptom of underlying issues, for example, abuse, and that allowing play will confirm to the child that the abuse is ok. Additionally, adults stop such play to socialize their sexuality, for example, to stop children from embarrassing themselves. Last, adults are worried that in sexualized play, children may experience that they are pressured by other children to do things they do not really want to, thus experiencing abuse by peers.

Again, one could counterargue that ample opportunities to engage in this type of risky play during early childhood might reduce nonfunctional behaviour, thereby providing both immediate and deferred benefits for the child. First, engagement in play with sexual aspects enables the child to interpret signals better, misinterpretations decrease, and generally, the children or young adolescents adapt appropriately as they gain experience and mature. Studies show that early sex education protects against later sexual abuse (Santelli et al., 2018; Walsh et al., 2015). Even if sex *education* is not directly transferable for the youngest children, play is an essential learning arena in early childhood, and it appears that maturation alone is not sufficient to become competent. Play could therefore function as a way to strengthen children's knowledge and competence related to their bodies, emotions and boundaries, thereby reducing risky sexual behaviour. In summary, there is little empirical evidence that either aggressive or sexual aspects in play are associated with similar risk behaviour in adolescence or adulthood. Positive developmental effects are probably just as likely.

Physical health and development

In their article, Sandseter and Kennair (2011) presented research from an evolutionary, adaptive perspective, indicating that risky play was a way of practising and enhancing different motor/physical skills for developing muscle strength, endurance, skeletal quality, etc. Since 2011, there has been some, but not much, development in research-based knowledge on the benefits of risky play on children's physical/motor skills. Brussoni, Gibbons, et al. (2015) performed a systematic review to explore the relationship between risky outdoor play and health in children. The results from the review focusing on physical health, e.g. physical activity, found a positive relationship between independent mobility (play where children go exploring alone) and children's everyday physical activity level. In the same systematic review, risky play supportive environments were found to have a positive relationship with children's physical activity level.

One disputed question is how early in age children are capable of understanding the degree of risk in a situation/scenario. Observational studies of children as young as 4–5 years of age (Sandseter, 2009, 2010a) and up to the age of 12 (Christensen & Mikkelsen,

2008; Green & Hart, 1998) have shown that children are able to mitigate or increase the risk according to how they experience the situation. Findings suggest that children aged 6–10 years (Hillier & Morrongiello, 1998), 4–5 years (Little & Wyver, 2010) and 5–6 years (Nikiforidou, 2017) can quite accurately assess risks and apply this competence to make risk decisions during their play activities. Kleppe (2018) observed that children between 1–3 years of age seek out risk and thrill repeatedly in play. There were indications that these aspects were a main motivation in their play, e.g. they increased the risk from repetition to repetition or 2–3-year-olds spoke between themselves about 'daring' and the possibility of 'breaking their legs'.

Even though research shows that children, even at a young age, are able to assess and consciously handle risk, another question is whether active physical play and risky play have a positive effect on their risk assessment and management, as hypothesized by Sandseter and Kennair (2011). Lavrysen et al. (2017) explored the relationship between children's experience of risky play and their risk assessment competencies and injury proneness. Through an intervention of an intensive period of scheduled risky play with 4- and 5-year-olds, they found that the intervention group showed a significant improvement in risk perception compared to the control group in risk assessment tasks. Similarly, Bloemers et al. (2012) found that inactive children (9-12 years) were more prone to injuries than physically active children, even though physically active children are more exposed to potential injury because they engage in more vigorous behaviours. In line with this, research has shown that young children with high motor skills have fewer injuries than young children with impaired motor skills (Myhre et al., 2012). Using virtual reality (VR) technology, researchers are breaking ground in investigating how children respond to real-life risks, for example, in traffic. In a VR study where children crossed streets with traffic at various difficulty levels, Morrongiello et al. (2015) found that 7–10-year-old children adjusted their walking speed according to the speed of the cars. When the cars had a higher speed, they increased their walking speed to avoid being hit. Similarly, Wang et al. (2020) found in another VR study that 10- to 13-year-old children chose riskier street crossings when the traffic was spread than when it was denser. Wang and colleagues also found that children with a low sensation-seeking personality missed more opportunities to cross the road than their higher sensation-seeking peers did, especially when traffic was spread and slow.

The recent research on children's risk assessment and risk management strengthens the argument that being physically active, encountering challenges and risk, would most likely be preventive of injuries among children because it promotes motor skills, risk assessment competence and the ability to adjust behaviour to manage the risk. As such, this supports the evolutionary explanation that several types of physical risk-taking in play increase important skills both for survival in childhood (i.e. immediate benefits) and for handling important adaptive tasks in adulthood (i.e. deferred benefits), as put forward by Sandseter and Kennair in 2011.

Concluding remarks

In this paper, the aim was to review three biopsychosocial levels of risky play: (1) mental health and emotion regulation, (2) social functioning and challenging norms, and (3) physical health and development. Doing that, we proposed a broad understanding of

risk. We wanted to explore how children can learn to master various psychosocial domains and emotion regulation through engaging in risky play.

From an evolutionary perspective, it is not whether we are worried and anxious or not (Kennair, 2007) or happy or not (Buss, 2000) that is relevant; it is whether we actually fare better in life measured by inclusive fitness or the adaptive effects of our behaviour. The current approach suggests that both society and parents may worry or be anxious without this necessarily being adaptive (Kennair et al., 2018). However, the children's adaptive fear at a specific level of physical maturation might be keeping them safe at that point in time and at the same time become developmentally obsolete with increasing physical skills. The same may be true of other types of play. With increasing social, emotional, and psychological development skills, play may continuously improve these skills and improve emotional regulation across all psychosocial domains. Developmental adaptations may both provide deferred and immediate benefits: The skills that are being trained through play are both adaptive and relevant for survival in childhood (i.e. immediate benefits) and for future psychosocial and physical tasks in adulthood (i.e. deferred benefits).

From an evolutionary developmental psychology perspective, play mimics more types of psychotherapy than merely exposure therapy, which was mostly focused on in our consideration of anxiety (Kennair et al., 2018; Sandseter & Kennair, 2011). Both Greenberg's (2004) emotion-based therapy and Fonagy and Bateman's (2006) mentalization-based therapy include elements of psychosocial functioning that are integral parts of normal emotion eliciting and regulation, increased curiosity, mentalizing and mental perspective-taking and thereby risky play in all the different domains we have addressed above.

Future research may therefore consider how emotional functioning, regulation and psychosocial development are associated with naturally occurring forms of thrilling and emotion-eliciting play, which may be considered risky in the social, physical, and psychological domains. Play may be thrilling and fun and motivating and thereby regulate emotions and interpersonal and intra-psychological skills, and both improve function in the child's peer group and hone skills necessary for future adult life. We recommend that play researchers consider the evolved, functional aspects, both deferred and immediate, of specific types of play and how the risky element improves adaptation both here-and-now and in future adult life. Our position is firmly this: Naturally occurring types of broadly defined, risky play improve a child's mental well-being and improve emotional and psychosocial adjustment across a broad set of psychosocial and physical contexts.

In conclusion, there are many different forms of risk in the child's environment, apart from physical risk. Additionally, there are more emotions to adaptively regulate while mastering these risks than mere anxiety. From an evolutionary perspective, it is adaptive to have children engage with their psychosocial environment motivated by the thrill of psychosocial risk through play. Considering this aspect of an expanded understanding of risky play opens new avenues of research into the motivation and function of children's play with psychosocial risk.

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