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Levels of positive risk-taking and peer context in preschoolers' play

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Abstract
The aim of this study was to identify whether preschool aged children's positive risk-taking in play is influenced by peer context. Research on children's risk-taking has traditionally had a focus on the negative aspects of risk, especially behaviours that lead to significant and easily preventable unintentional injury. More recently, researchers have started to consider the positive aspects of risk-taking in young children's play, particularly as such behaviours support children's physical development. Recognition of the importance of risk-taking in play is represented in recent policy and curriculum documents (e.g. QIAS and EYLF) with early childhood teachers encouraged to promote such behaviours. Despite this, little is known about the social and physical contexts that support positive risk-taking and how these might interact with individual characteristics of children. Such information is important, especially as attempts to increase positive risk-taking in play can be counteracted by 'surplus safety' (i.e. excessive attempts to ensure children's environments are safe and injury free). Although there is promotion of positive risk-taking in play in the aforementioned documents, regulatory requirements, as written and implemented, generally have a bias towards risk minimisation or removal.

The present study was conducted at a Sydney Child Care Centre. Twelve children, 4 girls and 8 boys (age range 48 to 60 months, M = 54.57, SD = 5.20) were videorecorded during free play sessions. Videos were coded for both positive and negative risk-taking and levels of risk-taking using a scheme developed by the first author (Little & Eager, in press) and the number of peers present during social participation. Results indicate that the impact of peers is limited, but that play involving pairs of peers is associated with low level negative risk-taking. Limitations of the results, including the exploratory nature of this study, are discussed.

Keywords: Risk-taking, outdoor play, peer interaction, surplus safety

Introduction
Risk-taking is often associated with recklessness and behaviours that lead to adverse outcomes (see Boyer 2006), yet it is known that risk-taking is important for young children's developmental outcomes and typically occurs during play (e.g. Bundy, Luckett, et al., 2009; Bundy, Tranter, Naughton, Wyver & Luckett., 2009; Little & Wyver, 2008; Mitchell, Cavanagh, & Eager, 2006; Sandseter, 2009). Many researchers are now concerned that opportunities for young children's positive risk-taking are diminishing (e.g. Gill, 2007) and this is associated with changes in children's play (see Wyver, et al, 2010).

Recent policy and curriculum documents such as the QIAS (Quality Improvement and Accreditation System - National Childcare Accreditation Council, 2005) and EYLF (Early Years Learning Framework, DEEWR, 2009) have drawn attention to the importance of positive risk-taking. This change in policy development is consistent with current research, but there remain some difficulties for teachers in implementing these

recommendations. First, there is the problem that Waller (2006) has identified of contradictory discourses where on the one hand, contemporary images of the child view children as capable and resourceful and their autonomy is encouraged (Stonehouse, 2001). On the other hand, early childhood policy is often informed by the view that children are vulnerable and in need of protection. Second, research on positive risk-taking is in its early stages. At this point in time, it is unclear how to support positive risk-taking in young children. At a minimum, it is possible to consider the influence of pedagogical, physical and social contexts. Each is likely to be an individual contributor and there is potentially a coalescence of these three factors in addition to individual child characteristics and the broader sociodemographic factors relevant to each centre.

Some factors that influence negative risk-taking may also apply to positive risk-taking. For example, factors identified in Morrengiello and Lasenby-Lessard (2007) which include a range of situational, familial and individual influences, are likely to apply equally well to positive risk-taking (see Little, 2009). However, the relative contribution of these factors is difficult to disentangle. Most research on positive risk-taking in young children has been conducted in real world contexts (rather than contexts contrived for the purposes of research) (e.g. Little & Wyver, in press; Sandseter, 2009). These designs are important because of their ecological validity. These types of correlational designs will continue to be important to establish the major factors that appear to be involved in young children's positive risk-taking.

The role of peers young children's risk-taking is yet to receive attention, although it is apparent that peers have an important role in the play or preschoolers (Wyver & Spence, 1995). Morriengellio and Dawber (2004) note that research on risk-taking in young children has had a focus on the role of adults or characteristics of environments in which injury occurs. Research on negative risk-taking has consistently found a relationship with peer interaction. In a review of this research, Boyer (2006) notes that the nature of the relationship between peer interaction and risk-taking is unclear and the evidence to date is not adequate to suggest a direct causal relationship. Peer context has been found to influence the level of negative risk-taking found in primary school children. Morriengiello and Dawber found in primary school-aged dyads that persuasion to engage in risk-taking was often successful and success increased when the activity was familiar. For school aged children, presence of a peer, even a peer who is unknown to a child and not interacting with the child, can increase the level of risk-taking (Morrongiello & Sedore, 2005). The influence of peers on school-aged children's risk-taking is complex. The relationships between peers and negative risk-taking in school aged children are likely to be substantially different to those found in preschool aged children's positive risk-taking. Nonetheless, the research does suggest that peer interactions are important in risk-taking and should be investigated in research with younger children. The aim of this pilot study was therefore to examine the relationship between peer interaction and risk-taking in the play of preschool aged-children.

Method

The data used in this study came from a larger project on risk-taking in young children conducted by the first author. The larger study included videorecorded observations of children's free outdoor play in child care. The larger study did not include an analysis of social interaction and therefore some videos were conducted in contexts in which opportunities for social interaction were limited. These videos were not included in the present study. The videos selected for the present study were those in which it was apparent that children were free to determine the extent of their interactions with peers.

Approval to conduct the research was obtained through the Macquarie University Ethics Research Committee and the governing body of the child care centres. Directors of individual centres also gave approval for the research to occur.

Participants
The children participating in this research were 4 females and 8 males aged between 48 to 60 months (mean 55.5 months). Written parental consent was obtained from their parents and the children provided verbal consent to participate. Children were aware that their outdoor play was being video recorded.

The Play Context
All play was recorded outdoors. The setting offered by the centre involved a range of balance beams, climbing equipment and slides (see Figure 1). These were arranged in a pathway that children could follow (i.e. complete all of the activities) but it was not necessary for children to engage with all activities and there was sufficient space for children to opt out completely and engage in other activities (which some children did, but only briefly). An example of playground equipment from one of the participating centres can be seen in Figure 1. The photograph does not show all of the play space available to children at the centre. The playground was consistent with Lee's (1999) classification of traditional equipment playgrounds.

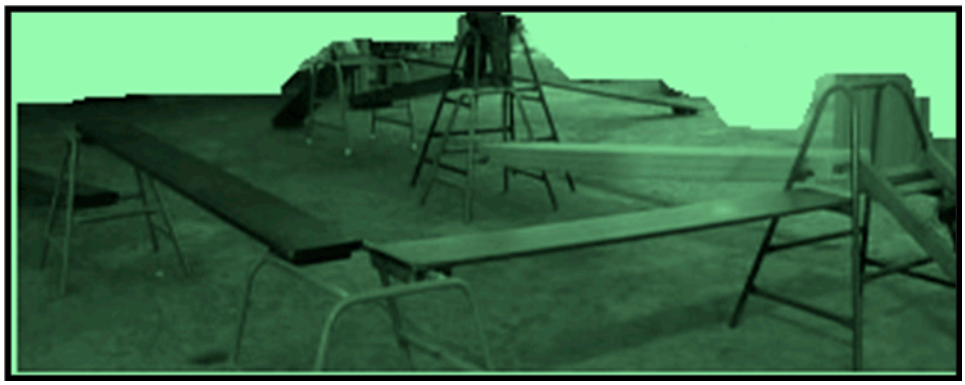

Figure 1: An example of playground equipment in one participating centre. Features that may identify the centre have been removed from this photograph.

The centre was rated by the first author on the Early Childhood Environment Rating Scale (Revised Edition) (ECERS-R) for outdoor provisions. The average score was 6.39 (upper score is 7). Scores of 5 and above on this scale are indicative of "good" provisions (Harms, Clifford & Cryer, 1998). Children in centres rated as within the highest quartile using the ECERS-R have been found to engage in less sedentary activity (Dowda, Pate, Trost, Almeida, & Sirard, 2004), which is important for the present study as risk-taking in active physical play was the focus. The twelve participants were able to freely interact with other same age peers, but also had the option of engaging in solitary play. There were no instructions or requirements for children to engage in particular types of play. Staff were present but not intrusive and did not direct play. The only involvement of teachers was to support children who needed help with the equipment or in one case comfort a child who had hurt himself. All children appeared to be engaged in moderate to vigorous levels of physical activity during the observations.

Coding of Social Play
The coding scheme was designed to focus mainly on the quantity rather than the quality of the social interactions. Although the qualitative aspects of interaction are important, it was considered that the data collected were not appropriate to code for these aspects of play and there were no additional measures that are usually considered important as supplementary evidence (e.g. peer or teacher reports of friendships or peer preferences).

Children's social play was categorised as one of the following: Solitary (playing alone), Parallel (playing alongside other children but not interacting with them), Interaction with One Peer, Interaction with Two Peers, Interaction with Three or More Peers. Ratings were made every 20 seconds (a total of 15 ratings per child) and the rating reflected the type of social interaction that dominated the 20 second segment. Ratings were conducted by the second author who was blind to the risk-taking categories that had previously been used to categorise each child's play.

Coding of Risk-Taking
Based on current research on young children's risk-taking, the first author developed a coding scheme which includes levels of risk and whether the risk is positive or negative, as well as absence of risk or negligible risk. The nine categories are: Risk Avoidance, Exploratory/Risk Appraisal, No or Very Low Risk, Low Risk (Positive or Negative), Moderate Risk (Positive or Negative), High Risk (Positive or Negative). Full details of the coding scheme are provided in Little and Eager (in press). Importantly, coding involved a judgment about risk relative to the child's current capabilities (e.g. climbing three steps on a ladder may be a positive risk taking activity for some children, but involve no risk for others). As with the coding of social play, coding of risk-taking was conducted at 20 second intervals, initially by the first author and then 50% of observations were independently coded by a second rater with Kappa coefficients of 0.87 and above being obtained for each of the categories. This coding was conducted before the results of the social play coding were available.

Results
Social Play
No children were observed in Solitary Play. As can be seen in Figure 2, the majority of children were engaged in Parallel play. For 4 of the 12 children, this was the only level of social engagement observed. For another 2 children, more than 50% of play observed was coded as Parallel.

Although play was often Parallel, it did appear that children were learning from each other. 'Behavioural contagion' was often observed. If a child interacted with equipment in a new way, other children would often imitate. Imitation was observed even when children were not in close proximity and it was not always immediate (i.e. it could happen minutes after being observed).

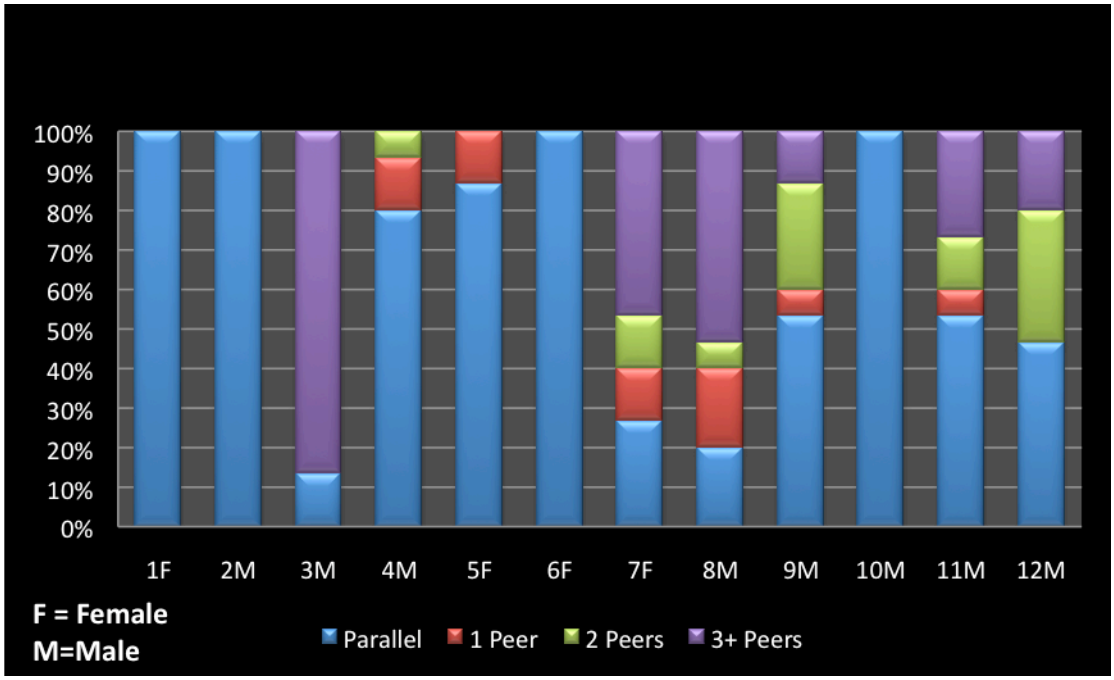

Figure 2: Percentage of time each participant spent in each type of peer interaction is represented. The bars represent the observed play of each of the 12 participants. The number on the *x*-axis is the participant number. The letter (M or F) indicates the gender of each participant.

Risk-Taking

The mean percentage of play in each of the risk-taking categories for the twelve participants is shown in Table 1. As can be seen, the majority of play was categorised as either Very Low Risk or Low Risk Positive. Low Risk Negative play was the next highest category, but accounted for a much smaller proportion of play. No cases of High Risk (Positive or Negative) or Moderate Risk Negative play behaviours were observed.

Table 1: Mean Percentage of Observed Risk-Taking Behaviours

Risk-Taking Category	Percentage Observed	Standard Deviation
Risk Avoidance	2.18	6.54
Exploratory/Risk Appraisal	0.87	2.18
Very Low Risk	41.37	11.99
Low Risk Positive	48.18	12.10
Low Risk Negative	5.38	7.95
Moderate Risk Positive	0.46	1.08

Associations Between Social Play and Risk-Taking

The associations investigated are somewhat exploratory and involve multiple correlations (Pearson). Two procedures were used to reduce the risk of a Type 1 error (i.e. false positive) due to multiple correlations being conducted with the same data set. First, the number of possible comparisons was reduced. Only the three most frequently occurring risk-taking behaviours were examined, namely Very Low Risk, Low Risk Positive and Low Risk Negative. The four categories of social interaction were included

in the analysis. Secondly, a Bonferroni adjustment was used to set the alpha level (<.004). Although there is criticism that the Bonferroni adjustment is too conservative and can lead to Type 2 errors (false negatives) other adjustment procedures such as Šidák are not appropriate because the scores for each of the risk-taking and social interaction categories are not independent. Correlations approaching significance are reported below, following recommendations by Cabin and Mitchell (2000) to make clear how results would be altered if the Bonferroni had not been applied.

Overall, risk-taking was not found to be associated with peer interaction. This is with the exception of interactions involving two peers. Two peer interactions were positively correlated with Low Risk Negative play behaviours (r=.798, p=.002). A negative association between Very Low Risk play and interaction between two peers approached significance (r=-.736, p=.006) (this result would have been highly significant if the Bonferroni correction had not been applied).

Discussion

The main findings of this pilot study were that the influence of peers on risk-taking in outdoor play was limited. Where an influence occurred, it was in dyadic interactions and related to play involving low levels of negative risk-taking. Two possible implications arise from this finding in terms of supporting positive risk-taking. First, from the perspective of injury prevention, it may be appropriate to consider types of interactions as well as the available equipment and staff involvement. Second, it may be possible to consider ways of converting negative to positive risk-taking. Peers may provide support to each other in activity areas that involve some risk such as climbing and jumping from raised platforms. Similar recommendations have been made in consideration of injury prevention for older children (Morrongiello & Dawber, 2004) and it is clear that peers can provide an important role in supporting positive risk-taking.

It is important to note that participants in this study did not engage in higher levels of risk-taking (positive or negative). Although the playground was one involving the types loose and modifiable structures known to be associated with higher levels of physical activity (Hannon & Brown, 2008), modification of these structures was not an option for these children. The first author interviewed a range of Sydney child care staff, some of whom worked at the centre in which this study took place. Staff commented on the problems of risk mimimisation in play. For example, children selected higher levels for slides and climbing equipment, knowing that the heights were within their capabilities, but staff had to lower equipment to comply with regulatory requirements (Little, 2010).

As noted previously, the playgrounds in this study could be described as traditional-equipment play areas, using Lee's (1999) classification. Of the three types of playgrounds Lee studied, the traditional-equipment play areas were found to offer the least challenge and lead to the greatest amount of non-play. Sandseter (2009) also found preschools with traditional-equipment areas to offer less challenge and risk-taking opportunities for children than play areas that involve nature. Whilst it may be seen as a limitation of this study that a wider range of centre based play areas were not investigated, it is important to note that regulatory requirements within NSW limit opportunities for development of play areas that involve potentially riskier elements (Bown & Sumsion, 2007; Little 2006). Therefore, while the playground designs may not

be seen to offer sufficient opportunities for risk-taking, these playground designs are typical.

More detailed analysis of peer interactions during outdoor play may shed light on the circumstances under which peer influences are more or less important. For example, during the observations it seemed that children were selective about who they chose to be involved in risk-taking. The underlying reasons for this remain unclear.

Limitations

This study was conducted in a small number of centres with a small number of children. All centres were in the Sydney Metropolitan Area and were not in areas of extremes (e.g. disadvantage or affluence) and there were no significant variations in centre quality. Additionally, there were no examples of extreme risk taking observed. More extreme variations, individually or combined, may reveal different associations between social interaction and risk-taking. It is also important to note that the participants were in a single child care centre, so there are likely to be cluster effects that have not been adequately controlled for in the present design.

Conclusion

Taking the abovementioned limitations into consideration, the present findings may be seen as preliminary evidence from which future research can extend. These results do, however, indicate that presence of peers and interactions with peers has an impact on risk-taking. Further research is needed to extend the understanding of both the qualitative and quantitative aspects of peer interaction that may be relevant to young children's positive risk-taking. Intervention studies are required to determine whether it is possible to change peer influence on risk-taking from negative to positive. As is the case with the broader literature on children and adult risk-taking, it is likely that peer relationships will be found to be one of many factors that influence positive risk-taking. An important step in further research will be to examine peer influence on positive risk-taking in contexts in which children are acquiring skills to participate in new physical activities. It is likely that the skill acquisition phase will be the most revealing of levels of support provided by peers (or accepted from peers) when engaging in physical activities.

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