



Parents' Perception of Risk in Play: Associations with Parent and Child Gender

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Abstract

Allowing children the opportunity to take risks in their play may provide learning experiences that benefit children's health and well-being. Parents' perception of risk in children's play may affect their behaviour and, in turn, their child's risk-taking opportunities. This paper examines whether parent and child gender are associated with parents' perceptions of risk in children's play and whether any gender differences hold after controlling for parent anxiety. Data were collected from 88 parent dyads who were parents to preschool-aged children in England. Parent gender differences were found, with mothers perceiving greater risk in children's risky play activities than fathers. Child gender was not significantly related to parents' perception of risk. These findings are important for informing the development of programmes and advice designed to encourage parents to support their children's outdoor, risky play. Specifically, they indicate that, for mothers in particular, support around perceiving risk and risk-reframing might help parents to give their child the opportunity to play in this way.

Keywords Risk · Perception · Play · Parents · Children

Highlights

- Mothers and fathers may perceive risk in their children's play differently.
- Parents with preschool-aged children completed a measure assessing their perceptions of risk across play activities.
- Across 88 parent dyads, mothers perceived more risk in their children's play than fathers perceived.
- Parent's perceived risk similarly irrespective of their child's gender.

Risky play, also referred to as adventurous play, refers to exciting play where there is an element of uncertainty or risk of injury (Sandseter, 2009), for example climbing trees and jumping from rocks. This type of play has broad benefits for physical, social and emotional development (Brussoni et al., 2015; Christensen & Mikkelsen, 2008; Greenfield, 2004). For example, children who engage in risky play learn how to avoid injury, develop their physical ability, gain confidence and increase their ability to judge risk (Sandseter & Kennair, 2011; Sandseter et al., 2022). In addition, it is

proposed that by exposing a child to physiological arousal and giving the child an opportunity to master and control their fear, risky play may decrease risk for problematic fears and anxiety in the longer term (Dodd & Lester, 2021; Sandseter & Kennair, 2011). Some initial evidence in support of this hypothesis has recently been found, with children who spend more time playing adventurously reported to have lower internalising problems (Dodd et al., 2021).

Parents have a vital role to play in protecting their children from physical injury but also in encouraging them to take appropriate risks that support positive development (Kelley et al., 1998). Indeed, mothers report feeling pressure to find a balance between allowing their child to engage in risky play and their fears about child injury. Theory regarding parent decision-making in the context of risk is scarce but evidence from other domains indicates that risk perception is an important factor affecting decision-making and behaviour. Hunter (2002) describes the perception of risk as the perceived risk inherent in a situation. Given that

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parents can act as gatekeepers to children's opportunities to engage in risky play, their perceptions of risk may be crucial for children's engagement in this type of play.

These constructs have received limited attention in the risky play literature, although Dodd et al. (2021) found that children spent more time playing adventurously when their parents were more tolerant of risk. Further support for the importance of parent attitudes to risk in general comes from Little (2010) who interviewed parents (11 mothers, 1 father) of preschool-aged children and then observed them supervising their child's play in a playground. Parent's beliefs about their own personal physical, psychological and financial risk-taking were predictive of their child's risk-taking behaviour during the play session. Given that children whose parent's perceive more risk may have less opportunity to engage in risky play (Sandseter et al., 2020), it is important to consider what factors affect parent perception of risk. Previous research gives some indication of individual difference factors that might be important including child gender and parent gender (Oliver et al., 2022) as well as the child's age (Macquarrie et al., 2022; Oliver et al., 2022). In addition, parents who are more anxious may perceive more risk in play and be less tolerant of risk (Oliver et al., 2022, 2023). Each of these factors is now discussed in turn.

From an evolutionary perspective, it has been argued that, in general, fathers may be better placed to support the encouragement of play and risk-taking, whereas mothers may be predisposed to prioritise care and protection (Bögels & Phares, 2008; Bretherton et al., 2005; Labrell, 1996; Lamb, 1977). The basic rationale in these theories is that men are biologically able to have more children than women and fathers are therefore less protective of their children, on average, than mothers. Aligned with this, there is evidence that fathers place a high value on providing their children with activities involving risk (Brussoni & Olsen, 2011) and that fathers engage more in rough-and-tumble play with children than mothers (Paquette & Dumont, 2013). It has also been identified that fathers are, on average, more comfortable than mothers in encouraging their children to engage in risky physical activities (Brussoni et al., 2013). Despite these hypothesised gender differences between mothers and fathers, research examining gender differences in relation to risk in play is scarce and conflicting. Brussoni et al. (2013) found in a qualitative study that heterosexual couples with children aged 1–7 years perceived men as more comfortable with risk in play than women. In contrast, Olsen et al. (2019) found no differences between mothers' and fathers' scores on the Risk Engagement and Protection Scale (REPS) which measures attitudes regarding the benefits of risky play and protecting children from injury.

The theorised gender differences between parents are consistent with gender differences in risk-taking more generally, where men are less likely to expect negative consequences, rate the severity of negative consequences as less negative and are more likely to engage in risky behaviour across a range of domains (Harris & Jenkins, 2006). Alongside this are gender differences in anxiety, with women experiencing higher levels of anxiety than men (McLean et al., 2011). High anxiety, in turn, may increase perception of risk (Kallmen, 2000). In keeping with this, recent research suggests that anxiety is more likely to be a barrier to mothers supporting their child's risky play than it is for fathers (Oliver et al., 2023). Examination of differences between mothers' and fathers' risk perception should therefore ideally account for differences in anxiety, as this could underpin apparent gender differences.

Child gender may also affect parent's perception of risk, but previous research has been inconsistent in relation to this. For example, Morrongiello and Dawber (2000) found that mothers of sons tolerated more risk than mothers of girls. Similarly, Olsen et al. (2019) found that parents of daughters scored more highly on a scale measuring protection from injury than parents of sons. In contrast, Creighton et al. (2017) found that whilst fathers considered risk-taking to be part of their identity as a parent, they were consistent in their judgements and decisions around risk for their sons and daughters. There is however a paucity of research examining mother's and father's perception of risk in regards to their sons and daughters.

Increasing understanding about how parent and child gender relate to the perception of risk in play is important for understanding the factors that influence children's access to risky play and therefore for interventions that aim to help parents to encourage their child's risky play (e.g. Brussoni et al., 2018). This paper aims to examine differences between mothers and fathers and between parents of girls and boys in their perception of risk across a range of children's risky play activities. As a secondary aim, we examined the extent to which any parent gender differences held after controlling for parent anxiety. It was hypothesised that there would be gender differences in parent responses regarding risk, with mothers more risk-averse (as indicated by higher perception of risk). We also tentatively hypothesised that parents would be more risk-averse (as indicated by higher perception of risk) when considering a daughter than a son. The data used in this study was collected as part of a larger study examining children's anxiety, data from the play-related measures have not been used in any other research published as part of this study (see Dodd et al., 2020; Rayson et al., 2023).

Method

Participants

This study uses data from 88 parent dyads, consisting of men aged 29–49 years ($M = 38.8$, $SD = 4.63$) and women aged 28–45 years ($M = 36.2$, $SD = 3.29$). All 88 dyads included a man and a woman with parenting roles; same or mixed-gender couples were eligible to participate but none took part. Separated parents were eligible to participate but, given the focus on parenting dyads, single parents were not eligible. Of the 88 men, 87 were fathers of the child participating and one was an uncle. Of the 88 women, all were mothers of the child. Participants were recruited via a larger study of 180 families with preschoolers aged 3–4 years, known as the Watch Them Grow study. For the larger study, families were recruited through preschools, social media, advertisements and word of mouth. A subset of those participating in the Watch Them Grow study ($n = 109$; selected based on participation dates) were invited to participate in this study and 88 dyads completed the relevant questionnaires. Where there was more than one child in the family, parents were asked to respond with their preschool-aged child who was participating in the larger study in mind. These children were 38 boys and 50 girls, aged 3.43–4.64 years ($M = 3.96$, $SD = 0.23$). The children were mostly described by their parents as being White British (88%). Further demographic information for both parents and children can be found in Supplementary Materials in Table S1.

Measures

Play Activities Questionnaire (PAQ)

For the purposes of the research, a risky play measure was designed for parents to complete. The Play Activities Questionnaire (PAQ) is an image-based questionnaire designed to measure the perception of risk in play, including images with a view to improving ecological validity. An initial version of the questionnaire was revised following feedback from the Child Anxiety Research Group at the University of Reading. The questionnaire was piloted using a convenience sample of 4 mothers and 2 fathers of 4- to 8-year-old children. This piloting indicated that the questionnaire captured variability in responses, but some amendments were made to the formatting and instructions to improve clarity. The final version of the parent-report PAQ contained 12 images, selected to cover the full range of risky play types (Sandseter, 2007) Images were sourced online (www.flickr.com; www.morguefile.com) and included images of children riding a rollercoaster, carving a pumpkin, riding a quadbike, etc. Parents were asked to

imagine they had gone somewhere new with their child and they see another child doing the activity shown in the image. The child says to the parent that they would like to do it. Parents were asked to imagine that their child wants to do it independently so the parent would not be able to do the activity with the child or hold onto their child. Following each image, parents rated how risky they felt the activity was on a 10-point scale, from 1 (*not at all risky*) to 10 (*extremely risky*). Responses to this question were summed across the 12 images to give an overall Perception of Risk (PoR) score. Parents also answered some other questions that are not the focus of this study. Internal consistency for the PoR score was good for fathers ($\alpha = 0.83$) and mothers ($\alpha = 0.82$).

State-Trait Anxiety Inventory (STAI)

The trait scale of the self-report Y2 State-Trait Anxiety Inventory (STAI-Y2; Spielberger et al., 1983) questionnaire measures adult trait anxiety. Responders are asked to indicate how often they generally feel each of the 20 items such as *I feel nervous and restless* and *I feel secure*, rating each from 1 (almost never) to 4 (almost always), with some items reverse scored. The higher the sum of the scores, the higher the trait anxiety. STAI-Y2 demonstrates good construct validity and internal consistency ranging from 0.86 to 0.95 (Spielberger et al., 1983). Internal consistency for was good for fathers ($\alpha = 0.89$) and excellent for mothers at ($\alpha = 0.93$).

Procedure

During an initial lab-based session for the Watch Them Grow study, parents provided informed consent and children provided assent after watching a short animation about the study. Parents completed questionnaires regarding play and their children played a range of games. Parents who attended the session were given information to take home for the child's other parent which invited them to complete parallel questionnaires online. These parents provided informed consent via the online questionnaire. Where parents were separated, families were asked to share the information with the child's other parent if they had an active caregiving role or, if they felt it was more appropriate, to invite a step-parent or other figure with a caregiving role should there be one. For ease, participants are referred to as mothers and fathers during the results and discussion. Families were given £35 for participating in a lab-based session which formed part of the Watch Them Grow study and partners were offered £5 for their time if they completed their questionnaires.

The study methods and procedures were approved by the University of Reading Research Ethics Committee (UREC

16/56). Data are available from ReShare: <https://doi.org/10.5255/UKDA-SN-853813>. Analysis scripts are available upon request.

Missing Data

There was no missing data as all fields of the questionnaire were mandatory.

Results

Outliers were identified using boxplots for both fathers' and mothers' STAI scores and these variables were Winsorised prior to analyses being conducted, where any values lower than the 5th percentile or higher than the 95th percentile were given the value of the 5th and 95th percentile respectively.

Preliminary Analyses

To get an insight into trends in the data, we initially compared mothers and fathers on PoR scores as well as STAI scores. Next, we compared PoR scores between parents who were responding in relation to their son and parents who were responding in relation to their daughter. Finally, we examined whether parent PoR was associated with their anxiety (STAI scores). There were significant differences between fathers and mothers on PoR scores $t(87) = -5.01$, $p < 0.001$, $d = 0.53$ (see Fig. 1), with mothers perceiving more risk in children's play ($M = 73.32$, $SD = 14.03$) than fathers ($M = 63.98$, $SD = 14.72$). There were also significant differences between fathers and mothers on STAI

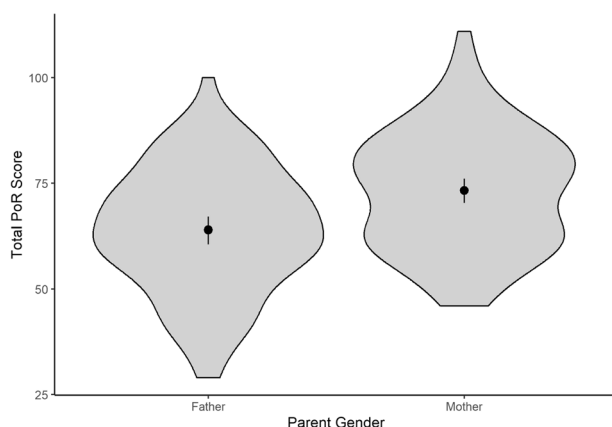


Fig. 1 Perception of risk scores by father and mother, with the point being the mean score, and the whiskers representing 95% confidence levels around the mean. Shaded area shows distribution of scores, wider shaded area indicates a greater proportion of participants with that score, narrower shaded area indicates a smaller proportion of participants with that score

scores $t(87) = -3.45$, $p < 0.001$, $d = 0.37$, with mothers reporting higher anxiety ($M = 40.06$, $SD = 9.53$) than fathers ($M = 36.24$, $SD = 7.59$). Trait anxiety was not significantly associated with PoR for fathers ($r(86) = 0.05$, $CI = -0.16, 0.26$, $p = 0.65$) nor mothers ($r(86) = 0.02$, $CI = -0.19, 0.23$, $p = 0.82$). There was no significant difference in parents' PoR scores when they were responding regarding their daughter ($M = 68.66$, $SD = 15.42$) or son ($M = 68.63$, $SD = 14.73$), $t(174) = -0.012$, $p = 0.99$, $d < 0.01$.

Linear Mixed Effects Models

Linear mixed effects models were fit using lme4 package in R (v1.1-34; Bates et al., 2015) to establish predictors of parent PoR scores. Prior to conducting these analyses, child age, parent age and parent education level were examined as potential confounds in relation to PoR (see supplementary material). Of these confounds, mothers' PoR was significantly associated with higher parent age, $r(82) = 0.28$, $p = 0.01$, but not to child age or parent education; only parent age is therefore included in analyses as a covariate. Linear mixed-effects models were used to account for the dependency between parents of the same child by including a random intercept for each child. Four models were conducted. First, with parent gender as the sole predictor, second with child gender also entered into the model. The third model included STAI score and parent age to examine whether the addition of these potential confounds affected results. The results of these three models are shown in Table 1. The final model included the interaction between parent and child gender, which was not significant ($B = 4.98$, $p = 0.22$, $R^2_{\text{marginal}} = 0.11$) and did not affect the significance of the other predictors; this model is not therefore reported in full.

As shown in Table 1, the initial model showed that parent gender was a significant predictor of PoR, accounting for 9.7% of the variance ($B = 9.34$, $p < 0.001$, $R^2_{\text{marginal}} = 0.10$), with mothers perceiving greater risk than fathers. Child gender was added in a second model and no significant effect of child gender was found ($B = 0.03$, $p = 0.99$, $R^2_{\text{marginal}} = 0.10$). In a third model, trait anxiety and parent age were both added and neither were significant predictors (STAI $B = 0.17$, $p = 0.88$; Parent Age $B = 1.88$, $p = 0.12$, $R^2_{\text{marginal}} = 0.11$). Parent gender remained a significant predictor across models ($p < 0.001$), suggesting that it was not accounted for by differences in anxiety between mothers and fathers and was robust to controlling for parents' age and child's gender.

Discussion

In this paper we aimed to examine whether parent gender and child gender were associated with parent perception of

Table 1 Linear Mixed Effect Models to establish predictors for PoR scores

Predictors	PoR parent gender		Plus child gender		Plus STAI and parent age	
	Standardised estimate	Unstandardised estimate	Standardised estimate	Unstandardised estimate	Standardised estimate	Unstandardised estimate
Intercept	0	63.98	0	63.96	0	63.65
Parent gender (Ref = male)	0.34	9.34	0.34	9.34	0.37	10.42
Child gender (Ref = male)			0.002	0.03	-0.04	-0.48
STAI score					0.01	0.17
Parent age					0.13	1.88
Random effects						
σ^2	151.36		153.10		160.03	
τ_{00}	53.11 <small>ChildID</small>		55.23 <small>ChildID</small>		51.52 <small>ChildID</small>	
ICC	0.26		0.27		0.24	
N	88 <small>ChildID</small>		88 <small>ChildID</small>		88 <small>ChildID</small>	
Observations	176		176		171	

Parent age and STAI score are centred

*** $p < 0.001$

risk in play. We also explored whether any parent gender differences were robust after controlling for parent anxiety. The results are discussed in relation to parent gender first, followed by child gender and parent anxiety.

We hypothesized that there would be gender differences in parent responses regarding risk, with mothers more risk-averse (as indicated by higher perception of risk) than fathers. Our findings provided support for this hypothesis with mothers found to perceive more risk than fathers. This gender difference in parent perception of risk is consistent with well-established gender differences in risk perception more generally (Alsharawy et al., 2021; Harris & Jenkins, 2006) as well as prior qualitative work focused on risky play (Brussoni et al., 2013). The findings are not consistent though with Olsen et al. (2019) who found no gender differences in relation to attitudes to risk in play and protection from injury. This difference in findings may be due to the subtle difference in what Olsen and colleagues measured. In their study, they focused on general beliefs and concerns rather than risk perception per se. It is feasible that mothers and fathers could share similar beliefs that risky play offers benefits for children whilst simultaneously assessing the level of risk present within a specific play activity differently. This provides some initial suggestions that programmes to support children’s opportunities for risky play may need to address perceptions and judgements regarding risk and not just beliefs about risky play.

Our second hypothesis related to child gender. We tentatively hypothesized that parents would be more risk-averse (as indicated by higher perception of risk) when considering a daughter than a son. This hypothesis was tentative given inconsistencies in the literature, with some evidence suggesting that parents are risk-avoidant with daughters (Morrongiello & Dawber, 2000; Olsen et al., 2019), and others suggesting no differences in risk orientation by child gender (Creighton et al., 2017). Our findings showed no effect of child gender in relation to parent perception of risk in play. This finding is therefore consistent with Creighton et al. (2017) who found that parents perceived risk similarly across child genders. We found no interaction between parent gender and child gender in our exploratory analyses, suggesting that mothers and fathers do not differ in their responses for boys and girls.

Our final aim was to examine whether any gender differences in perception of risk and risk tolerance held after controlling for parent anxiety, which they did. Mothers reported significantly higher anxiety than fathers, which is consistent with population differences between men and women (McLean et al., 2011) and supports the need to include anxiety as a covariate. Parent anxiety was not significantly related to parent’s perception of risk which was not expected given research showing that, in other contexts, higher anxiety is associated with increased perception of

general and personal risk (Kallmen, 2000) and less own risk-taking (Broman-Fulks et al., 2014; Giorgetta et al., 2012). It is also inconsistent with recent research showing that mothers cite their own anxiety as affecting their child's access to risky play (Oliver et al., 2023). One consideration is that anxiety may be more closely associated with avoidance behaviours than perceptions of risk, with parents who are higher in anxiety more likely perhaps to choose an avoidant response (for example telling their child not to climb any higher) than those who are lower in anxiety. As we focused on the perception of risk, we were not able to evaluate this but future research, particularly observational research will be an important next step to further explore the links between parent anxiety and children's access to risky play.

Overall, the pattern of results has implications for programmes designed to increase children's opportunities for risky and adventurous play (e.g., Brussoni et al., 2018). Given that mothers appear to judge children's risky play activities as being riskier than fathers judge them to be, it may be particularly important for programmes of this nature to focus on supporting mothers with risk perception in the context of their children's play. We found no difference related to child gender, meaning that, at least in relation to risk perception, there is no need for programmes to prioritise parents who have a child of a particular gender. Furthermore, although not a specific focus of this work, the comparison with previous studies highlights the distinction between risk perception in relation to specific activities, as evaluated in the present study, and more general attitudes to risk-taking during play, which have been evaluated in relevant previous research (e.g., Olsen et al., 2019); it seems plausible that interventions might increase positive beliefs about the benefits of risky play for children but that these may not be sufficient for changing children's play opportunities if parents continue to perceive play activities as too risky. Some exercises to challenge any maladaptive beliefs about the level of risk may be useful to address this latter issue. Of course, it is also important to keep in mind that not all concerns about risk are maladaptive; any such intervention must balance potential risks with potential benefits for children.

There are various strengths to this paper. We have been able to look at gender differences in parent risk perception in play for the first time using a novel measure with photos to improve ecological validity. A strength is the recruitment of a good-sized sample of parent dyads. Limitations include the use of self-report measures, which can be affected by socially desirable responding, require accurate insight into risk perception and may be affected by the child in the photograph not being their own child. Previous work has highlighted the mismatch that can exist between beliefs about the benefits of risky play and

behaviour in relation to supporting risky play (Nesbit et al., 2021). Moving forward, it will therefore be important to consider how to capture parents' actual behaviour in the context of children's play, perhaps via observational research, and to explore in more depth how parents assess risk and make decisions about when to intervene using qualitative methods. A final limitation is that we only considered a narrow age range and family structure examined. This prevents us from examining whether and how parent gender differences in risk perception might change as children age and how parent's perceive risk within a wide variety of family structures. These represent interesting and important directions for future research.

Conclusion

Overall, our findings indicate that mothers and fathers of preschool-aged children may differ in their perception of risk in children's play. Parent anxiety does not appear to be strongly associated with perception of risk, although previous research shows that parent anxiety about their child getting hurt, may act as a barrier. The findings have relevance for programmes that aim to encourage parents to provide opportunities for children to engage in risky play, which will need to consider that mothers and fathers may perceive different levels of risk in play.

Data Availability

Data are available from ReShare: <https://doi.org/10.5255/UKDA-SN-853813>

Code Availability

Analysis scripts are available upon request.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10826-024-02844-9>.

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Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

Ethics Approval Methods and procedures were approved by the University of Reading Research Ethics Committee (UREC 16/56).

Consent to Participate and Consent to Publish Study participants provided informed consent to take part in the research and to have their data published.

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