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## **Father-child interactions and children's risk of injury**

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## **Father-child interactions and children's risk of injury**

### **Abstract**

Unintentional injury is an important cause of infant and child hospitalisation and parents play a key role in reducing children's risk-taking behaviour. Studies show that maternal and paternal parenting and supervision of children differs, but there is little research showing how fathers' parenting may influence children's tendency to engage in risk-taking behaviour. Recent theoretical developments suggest that father's parenting may be particularly effective in encouraging safe risk taking. In this study, we examine how well parenting practices typically undertaken by fathers predicts rates of children's injury risk at three years. Questionnaire data were collected from 46 fathers. Results show that both duration of rough-and-tumble play and fathers' encouragement of perseverance predicted lower rates of injury behaviours, while their stimulation of risk-taking predicted higher rates of injury behaviours. The results are discussed in the light of developmentally appropriate risk-taking and fathering.

**Keywords:** fathering; father-child relations; child injury risk; rough-and-tumble play

### **Introduction**

As children explore their environment they will inevitably encounter hazards that hold the potential for mishap and injury. It is important that children learn how to manage these risks so that they can be confident in approaching new or uncertain situations, and are able to appraise the risk that attends the activity. Children's judgements and responses to physical risk are influenced by their gender and age, social and situational factors (Boyer, 2006), as well as their parents' attitudes and safety practices (Little, 2010; Schnitzer, Dowd, Kruse, & Morrongiello, 2014). During the preschool years, when children become mobile and begin to explore their environment, parents' proximity and supervision help protect children from injury (Morrongiello & House, 2004). An ultimate aim of development is for children to make their own rational judgements and responses, so it is also important to examine parents' role in the development of these capacities. However, the existing literature on injury and risky behaviour tends to overlook the influence of parenting on children's risk taking, and therefore injury.

Understanding risky situations and making judgements about these involve emotional and cognitive capacities. Such capacities are developed through interactions with parents, specifically, through parents' characteristics and their parenting styles (Darling & Steinberg, 1993; Pino-Pasternak & Whitebread, 2010). There is increasing evidence that fathers as well as mothers contribute to children's social and emotional regulation (Cassidy, Parke, Butkovsky, & Braungart, 1992; Hagman, 2014), mastery motivation and self-regulation (Volling, Blandon & Kolak, 2006; Wilson & Durbin, 2013) and autonomy (Besnard, Verlaan et al 2009). Fathers' contribution to their child's development is increasingly considered different from mothers' and feasibly unique (Dumont & Paquette, 2013; Majdandžić et al., 2014). However, there is relatively little research examining how fathering might be related

to children's injury-risk behaviour. Therefore, in this study we focus on how fathers' interactions with children can influence pre-schoolers' risky behaviour. First, we discuss the nature of risk-taking in childhood and parental influences on risky behaviour.

### **Risk-taking in children**

Risk-taking is an inherent part of exploration and physical play. Children seem to naturally desire to extend themselves in a myriad of ways that invoke risk: playing with great heights (e.g., jumping from a high wall or climbing a tall tree); playing at high speed (e.g., bicycling fast); playing with dangerous tools; playing near dangerous elements (e.g., near a cliff); play where there is a possibility of getting lost; and play-fighting with peers (Little & Eager, 2010; Sandseter 2009a). In the challenge and anticipation of such risk-taking, children experience wariness and fear that turns to thrill and satisfaction when the action is successfully completed (Sandseter, 2010). The peak emotion of exhilaration appears to be one of the most compelling motivators of risky physical play (Sandseter 2009b, 2010).

This touch-and-go characteristic of risky physical play is thought to benefit children's development. Many educators and researchers are of the view that risky play is a normal part of children's development (Niehues et al., 2013; Wyver et al., 2010). Through successful mastery of the risky challenge, children's cognitive processes, emotional regulation, and social skills are developed (for a review of development of risk-taking, see Boyer, 2006). Risky play during the preschool period is particularly important to healthy development of cognition and emotion processes. Assessing the hazard, estimating competence and probability, and forecasting the consequences involve reasoning skills, cognitive representation, as well as executive functioning processes such as inhibitory control and attention shifting (Lahat et al., 2012). All are key processes in cognition that lay the foundation for later learning. Repeated experiences in different contexts will use the child's current capacities at the same time as extending their ability. The managing of the mixed emotions accompanying risky play is also accomplished through repeated experiences of anticipating, acting and experiencing the fear and thrill (Sandseter, 2009b). In particular, the positive emotions and curiosity actions associated with risky play facilitate the development of flexibility and scope of attention (Frederickson & Branigan, 2005). As it requires a fine balance between telic (anxiety) and paratelic (arousing) states (Sandseter, 2010), risky play is both exciting and valuable. Given the profound effect of emotion on cognitive processes such as attention, memory and knowledge (Blanchette & Richards, 2010), risky play appears to be an important opportunity to experience a wide range of emotions and to develop self-regulatory strategies.

### ***Antecedents and prevention of risky behaviour***

As indicated by the foregoing discussion, the ability to bring into play processes to manage risk successfully will vary considerably across individuals. Individual, developmental and parental factors are implicated. Sex and temperament are linked to increased injury-risk behaviour. Just as men take more risks than women (Byrnes, Miller, Schafer, 1999), boys tend to take more risk than girls (Ginsburg & Miller, 1982; Morrongiello & Matheis, 2004; Morrongiello & Rennie, 1998) and gender socialisation contributes to this trend (Galligan & Kuebli, 2011; Granié, 2010). Temperament traits such as sensation seeking and impulsivity

have also been linked to injury-risk behaviour in young children (Boyer, 2006) as have oppositional behaviour (Jacquess in Rivara, 1995) and externalising behaviours (Wazana, 1997).

Risk appraisals and responses are also developmentally linked. Risk-taking is understood to be governed by the child's executive function or ability to integrate emotional understanding and information in order to make decisions (Lahat et al., 2012). Infants are thought to develop physical risk perception as they first learn to crawl (Cintas, 1992); by three to five years of age, many children are able to identify unsafe situations (Little, 2006), and to process probability information and use decision-making strategies (Boyer, 2006). Older children tend to make these judgements more quickly as well as comprehend the negative consequences of such risks (Little & Wyver, 2010).

In the family environment, extensive research by Morrongiello and colleagues has demonstrated that physical proximity to the child is the most effective prevention strategy (Morrongiello & House, 2004), while teaching children safety rules may not be a reliable preventative strategy (Morrongiello, Corbett & Bellissimo, 2008). Although parents hold differentiated views on risk for their sons compared to their daughters (Morrongiello et al., 2010), there appear to be no differences between mothers and fathers regarding the effectiveness of their supervision (Morrongiello, Walpole & McArthur 2009). Some fathers consider that the inevitable minor injuries sustained in childhood can help the child to 'toughen up', strengthening their emotional resilience and awareness of risk (Lewis, DiLillo & Peterson, 2004). Fathers may also see 'overprotection' as a hindrance to child development, although they understand that this need may change with the age and experience of the child (Brussoni & Olsen, 2012; Schwebel & Brezaussek, 2010).

### **Facilitating risky play: Fathers and exploration**

However, given the developmental imperative for exploration, it is important for parents to support children's emotional and cognitive self-regulatory capacities to assess and manage risk. A secure attachment relationship and positive parenting practices, such as expressing affection and supporting curiosity, are linked to children's capacity to self-regulate their behaviours and emotions, as well as to their cognitive and intellectual development (Deater-Deckard & Petrill, 2004; Sroufe, 1979; Weinfield, Sroufe, Egeland & Carlson, 2008). In particular, increasing amount of research shows that fathers provide support and challenge for the development of children's autonomy, competence and interest (Bretherton, Lambert, & Golby, 2005; Grossman, Grossman, Fremmer-Bonbik, Kindler, Scheuerer-Engelisch & Zimmerman, 2002; Whipple, Bernier & Mageau, 2009). This facilitation occurs through the attachment relationship, where fathers provide not only sensitive responding in times of distress, but also stimulation with limit setting for exploration - 'secure exploration' (Grossman et al., 2002; Paquette, 2004). In this view, fathers act as facilitator or catalyst, introducing the child to novelty and risk, encouraging initiative and perseverance. They metaphorically 'open their child to the world' thus facilitating experiential knowledge and the growth of confidence (Bowlby, 1988; Le Camus, 2000; Paquette, 2004).

Two aspects of fathering that may serve secure exploration and this particular function of ‘opening the child to the world’ are the arousing style of fathers’ behaviour and fathers’ propensity to engage in vigorous physical play. Fathers’ play often involves bursts of high energy that increase as playtime extends (Feldman, 2003). Blocking play moves, sudden changes of routine that provoke surprise, humorous interchanges or pretending to fight bring surprise and complexity to the child, and this paternal behaviour has been documented in numerous studies (Grossman et al., 2002; Keltner, Capps, Kring, Young, & Heerey, 2001; Labrell, 1994; Yogman, Kindlon, & Earls, 1995). The stimulation and challenge invoke aspects of the child’s wider social and experiential milieu and help the child towards successful independence.

Fathers also engage in more vigorous physical play than mothers, much of this as rough and tumble play or roughhousing (MacDonald & Parke, 1984). While some mothers also play rough-and-tumble games with their children, fathers more frequently play this style of game and are likely to defend its benefits when mothers point to possible injuries, or to tearful or hyperactive endings (Fletcher, May, St George, Morgan, & Lubans, 2011; Laflamme, Pomerleau, & Malcuit, 2002). In rough and tumble, when fathers are both sensitive and challenging, children will experience a range of emotions and cognitions, and need to self-regulate in order to play with an obviously stronger but friendly opponent. In high quality sensitive play, fathers will help their child regulate these emotions so that they remain motivated to engage and win (Fletcher, StGeorge, & Freeman, 2013). The quantity and quality of father-child play are positively related to children’s attachment relationships (Newland, Coyl, & Freeman, 2008), and also to children’s social skills with peers (empathy and lack of aggression) (Fletcher et al., 2013; MacDonald & Parke, 1984).

In sum, there is increasing evidence and argument for recognising the complementarity of fathers’ contribution to child development, with emphasis on the benefits of the arousing and stimulating nature of paternal interactions. By encouraging their child to extend themselves – take on new challenges, be independent, develop strength or complete difficult tasks – fathers stimulate risk-taking as well as provide emotional and instrumental support. As emotional regulation and behavioural regulation are important protective factors (Morrongiello Klemencic, & Corbett, 2008; Morrongiello, Kane, McArthur, & Bell, 2012), multiple opportunities to learn and apply these skills are vital to adaptive development.

### ***The current study***

Given that fathers are key facilitators of childhood exploration, and that risk-taking is part of this exploration, the aim of this study was to examine the role fathers play in minimising childhood injury risk. Specifically, we aimed to determine which aspects of father-child rough-and-tumble play and fathering behaviours would be related to minimising childhood risky behaviours.

## **Method**

### ***Participants***

For this analysis, 46 father-child dyads (18 boys and 28 girls) from the longitudinal Montreal Study (Dumont & Paquette, 2013) were included. All fathers were the biological parent of the child and were recruited from French-speaking neighbourhoods of Montreal, Canada, with 91% being Quebecoise or North American. Fathers' average age was 36 years; children's average age was 35 months (see Table 1). Fathers' education background varied: 7% had attended or completed secondary school, 22% had attended or completed post-secondary vocational college and 72% had attended or completed university studies. Fathers averaged 40 work hours per week (range 8-80) and for the majority (85%) family revenue was over \$60,000CAN. This study was conducted in accordance with ethical approval from University of Montreal.

## ***Measures***

### ***Fathering***

*Opening to the World Questionnaire* (OWQ; Paquette, Eugène, Dubeau, & Gagnon, 2009). The OWQ is a measure of fathers' involvement with their child and is based upon Paquette's (2004) activation relationship theory. The OWQ consists of three scales: Stimulation of Perseverance, Stimulation of Risk Taking, and Punishment. Stimulation of Perseverance (13 items) measures how the father encourages the child to accomplish difficult things, overcome personal limits, persevere in the face of adversity, and invites the child to explore or initiate contact with an unfamiliar child. Stimulation of Risk Taking (8 items) looks at how the father encourages the child to undertake risky activities and allows the child substantial autonomy in his/her exploration of the environment. The Punishment Scale (6 items) consists of items measuring punishing or scolding the child if the child disobeys, does not try or breaks something. Fathers indicate the frequency of their parenting behaviours in these domains on a 6-point Likert scale (1-6, Never to Very Often). Reliability (Cronbach's alpha) of each scale in the current sample was high: Stimulation of Perseverance ( $\alpha = .86$ ), Stimulation of Risk Taking ( $\alpha = .70$ ) and Punishment Scale ( $\alpha = .81$ ).

*Father-Child Play Questionnaire.* Fathers were asked to report on the duration (in minutes) and frequency of RTP with their child. Frequency was measured on a 6-point scale (1 = never; 2 = 1-3 times per year; 3 = 1-3 times per month; 4 = 1-2 times per week; 5 = 3-4 times per week; and 6 = 5 times per week and more).

### ***Child outcome***

*Injury Behaviour Checklist* (IBC; Speltz, Gonzales, Sulzbacher, & Quan, 1990). The IBC measures 24 risky behaviours of preschoolers, such as running onto the street, climbing furniture, or playing with sharp objects. The IBC has been found to be a better predictor of child injury than parent-report of child problems (Speltz et al., 1990), and is positively related to actual injury rates (Potts et al., 1997; Speltz et al., 1990). In this study, fathers were asked to indicate the frequency their child displayed each behaviour over the previous six months using a 5-point scale (0 = Never to 4 = Very Often/More than once a week). Scores were summed to create the IBC index. Potential scores ranged from 0 to 96, with higher scores indicating more risk taking ( $\alpha = .77$  for this sample).

## ***Procedure***

Data for this study were taken from the second stage of the longitudinal Montreal Study (Dumont & Paquette, 2013). Fathers were recruited to the study through advertisements placed in neighbourhood newspapers and early childhood centres in the Montreal region and surrounding area. In the first stage, father-child dyads were filmed playing together and fathers completed questionnaires regarding their socio-demographic situation and their involvement with the participating child. When the children reached the age of three years, their fathers completed an at-home questionnaire on fathering style, types of father child play, and child injury-risk behaviour. This study reports on the second stage only. Descriptive and regression analyses were conducted in SPSS Version 20.

## **Results**

Descriptive statistics for each measure can be seen in Table 1. The IBC average score indicated that overall, children rarely behaved in a way that would risk injury (as reported by fathers). Every child was reported to have incurred some sort of risk at least once, and all risky behaviours were reported at least once. The most frequent injury-risk behaviours were jumping from heights and falling. The least frequent were playing with fire, and leaving the house without permission.

An independent samples t-test for the IBC Index scores revealed that there was no significant difference between male ( $M = 22.72$ ,  $SD = 7.0$ ) and female ( $M = 22.00$ ,  $SD = 7.9$ ),  $t(44) = .315$ ,  $p = .754$ , and so all IBC analyses have been collapsed across gender.

The physical play scores showed that most fathers played rough house with their child once or twice a week, with such play lasting on average 5 minutes, although the standard deviation and multiple modes of 2 minutes and 10 minutes suggest wide variation in fathers' estimation of this play. There were no significant sex differences in length of play.

Scores on the Opening to the World Questionnaire show that overall fathers often encouraged their child to initiate activities and persevere. They also regularly stimulated risk-taking behaviour, such as allowing children to be out of sight, or to use skate-boards and knives, while punishment of their child was rare or occasional.

The relation between IBC Index score and each measure was calculated using Pearson Correlations (see Table 1). IBC Index score was significantly correlated with RTP duration and was marginally correlated with two of the OWQ scales (Perseverance and Risk Stimulation). However, there were no significant relations between IBC Index score and child or father age, or frequency of RTP,  $r = .103$ ,  $p = .497$ . Given the lack of significant relations, these variables were not included in the consequent analysis.

Table 1 near here



A multiple linear regression was performed on the data using IBC Index score as the dependent variable. The three OWQ scales and RTP duration were used as predictor variables. A significant model was found,  $F(4,45) = 5.39, p = .001$ . This model was shown to explain 28% of the variance in IBC Index scores ( $R^2_{\text{Adj}} = .280$ ). The regression coefficients and significance for each of the four predictor variables are shown in Table 2. Perseverance, Risk Stimulation and RTP duration were all found to be significant predictors of IBC score, but Punishment was not. The Tolerance scores for each predictor were close to 1, confirming that collinearity was not present among the predictor variables.

Table 2 near here

## Discussion

The role of fathers in children's injury-risk behaviour has largely been neglected, but recent research suggests that fathers may have a positive impact on their children's behaviour, particularly in relation to safe exploration (Paquette, 2004). In this study, we sought to examine the relations between fathers' parenting activities, including vigorous physical play, and children's risky behaviours. The results showed that most fathers were encouraging and facilitative of play and socialising, and they allowed their children to undertake some risky behaviours, but they were not overly punitive. Encouragement of perseverance and less risk-taking stimulation predicted lower injury-risk behaviour in pre-schoolers. Fathers' involvement in physical play was also related to lower injury-risk behaviours. The results were consistent across child gender and fathers' age.

### *Injury risk behaviour*

The injury risk behaviour of the children in this sample was relatively low, the most frequent risky behaviours being climbing on and jumping off furniture, taking chances in the playground and exploring places that are off-limits. The rates of reported injury-risk behaviour in this study are consistent with other non-clinical populations, for example, IBC scores for preschool and elementary students were  $M = 17.50$ , ( $SD = 12.10$ ; range = 0-53,  $n = 62$ ), and  $M = 22.06$  ( $SD = 11.21$ ; range 3-53,  $n = 209$ ) in DiLillo, Potts, & Himes (1998) and Bijttebier, Vertommen, & Florentie (2003) respectively. While there were no sex differences in physical risky behaviour in our study or in that of Di Lillo, boys took more physical risk than girls in Bijttebier. Playing at heights, with speed and with dangerous elements are ways in which children seek to challenge themselves, not only in attempting to master the challenge but also to experience the 'thrill' of the challenge (Sandseter 2009b, 2010). The problem, of course, is that children may not have the experience or the developmental capacity to judge the extent of the hazard within the activity, that is, the likelihood of injury. While risky behaviour may be infrequent, childhood injury is a serious public health issue. In developed countries, falls are the most common medically attended childhood injury, and injury is the leading cause of death in children across Western nations (Young, Wynn, He, & Kendrick, 2013). The developmental task of managing risky situations is one of high importance.

### ***Physical play and injury-risk behaviour***

The duration of fathers' play with children in this study was related to their risky behaviour, while how often fathers played with their children was not. The longer fathers played with their children, the lower their score on the IBC. Although frequency was not related to injury-risk behaviour, others have found that frequency interacts with the quality of the play, with positive and negative effects on child outcomes (Flanders, Leo, Paquette, Pihl, & Séguin, 2009).

The apparent positive effect of the longer periods of physical play on injury-risk behaviour suggests that the interactions during the rough or tumble play were key. High-quality rough-and-tumble play is characterised by physical and emotional challenge, where fathers sensitively improvise the play to keep children motivated to engage and win (Fletcher et al., 2013). Father and child both need to regulate their emotions and behaviour to sustain the mutual enjoyment of the play. Flanders et al. (2010) found that when fathers were dominant during rough-and-tumble play interactions, children were rated higher on an emotion-regulation checklist than when fathers were low-dominant in play. Being dominant meant containing the play and setting limits (Flanders et al., 2009). Similarly, Fletcher et al. (2013) showed that sensitive and challenging rough and tumble play was positively linked to preschoolers' emotional competence and behaviour. The practice of limiting one's actions and emotions during high-energy, competitive, physical play may allow for the development of emotional regulation and impulse control, which prepare the child to be less aggressive, reactive or impulsive in risky situations (Flanders et al., 2009; Morrongiello et al., 2012; Paquette, 2004).

### ***Opening to the world and risky behaviour***

The Opening to the World scales focused specifically on how fathers facilitate and control their child's exploration of their environment. The scales were devised to represent stimulation of perseverance, stimulation of risk-taking and punishment posited by Paquette et al. (2009) to be key paternal functions. Previous research has shown that stimulation of perseverance is linked to children's prosocial behaviour (Tremblay in Paquette, 2009). In this study we found support for relations between paternal behaviour and child outcomes, although fathers' encouragement of perseverance and of risk taking worked in opposite directions. The fathers' stimulation of perseverance through encouraging his child to succeed and facilitating his motor skills, led to a reduction in the child's injury-risk behaviour. However, encouraging specifically risky activities and letting the child 'do what he wants' at the park were linked to higher rates of injury behaviour. While some items are similar across the two scales (e.g., I encourage my child to explore around him when we go to a new location – Perseverance scale; When we go to the park, I let my child do what he wants – Risk scale), the Risk scale specifically identifies encouragement of risk taking without limits (I encourage my child to take physical challenges). These results are consistent with the theoretical model underpinning the Opening to the World Questionnaire which describes the

optimal 'activation' relationship between child and father as one where the father encourages exploration but maintains control through setting limits (Dumont & Paquette, 2013).

This study was undertaken with a convenience sample of fathers, most of whom were tertiary educated and middle-income earners; children's injury-risk behaviour was also relatively low. To better understand protective and risky fathering behaviours in relation to child injury, it would be informative to work with populations where children's risk of injuries is already known to be higher. In addition, it would be important to conduct further studies to see how the quality of rough and tumble play might be linked to injury-risk behaviour. Investigation is also needed to determine the optimal duration of rough and tumble bouts, and how this might interact with frequency of play.

## **Conclusion**

In this study, we combined two quite different contexts of fathering – parenting style and physical play – in order to better understand characteristics and effects of fathering. It is significant that *both* were related to lower injury-risk behaviour. Fathers may influence young children's ability to manage risk by encouraging the child to try new activities and to persevere in the face of uncertainty. Fathers' challenge to their children's physical and emotional regulation in rough and tumble may also support the child's capacity to assess risk (Lahat et al., 2012). In fact, father-child relationship quality alone can be a protective factor (Schwebel & Brezaussek, 2010). Fathers wishing to protect their children from injury would be advised to ensure that within a positive relationship, they engage in co-operative physical play, they encourage perseverance, and are mindful of setting limits when supporting their child to explore their world. Eventually, the developmental and protective effects of fathers' stimulation of autonomy and secure exploration could be used as leverage in improving child health outcomes.

Table 1.

*Descriptive statistics (mean, standard deviation and range) and correlations with IBC Index score for each of the measures used in this study.*

	Mean (SD)	Range	<i>r</i>
Children's Age (months)	35.14 (2.0)	30-43	-.033
Fathers' Age (years)	36.8 (5.4)	27-51	.013
IBC Index Score (max = 96)	22.3 (7.5)	9-38	-
RTP Duration (minutes)	6.5 (5.7)	0-20	-.379**
RTP Frequency	4.0 (1.1)	1-6	.103
OWQ: Perseverance (max = 78)	60.9 (8.9)	36-74	-.242^
OWQ: Risk Stimulation (max = 48)	31.3 (5.5)	12-39	.281*
OWQ: Punishment (max = 36)	16.4 (4.8)	6-30	.079

^ $p < .06$  \* $p < .05$  \*\* $p < .01$

Table 2.

*Standardised regression coefficients and t-values for each of the four variables used to predict IBC Index score.*

	$\beta$	<i>t</i>
OWQ: Perseverance	-.298	-2.26*
OWQ: Risk Taking	.420	3.14**
OWQ: Punishment	.009	0.07
RTP Duration	-.453	-3.46**

\* $p < .05$  \*\* $p < .01$

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