**ENSURES PHYSICAL SAFETY**

This section will include literature on factors related to exploration in children and risk taking in children.

**2019**

**Bell, M. D., Imal, A. E., Pittman, B., Jin, G., & Wexler, B. E. (2019).**

 **The development of adaptive risk taking and the role of**

**executive functions in a large sample of school-age boys and**

 **girls. *Trends in Neuroscience and Education, 17*, 100–120.**

 **doi: 10.1016/j.tine.2019.100120.**

**Background:** The Balloon Analogue Risk Task for Children (BART-C) demands self-regulation of emotion that requires risk-tolerance and adaptive risk-taking to make good decisions under stress (hot cognition).

**Methods:** BART-C measures of adaptive risk-taking in 5,409 children K-8th grade were analyzed for improvements by grade, for relationships to executive functioning (EF) and for associations with school characteristics and academic achievement.

**Findings:** BART-C improved across grades. Boys showed significantly greater Recklessness, particularly in middle school. EF was a partial mediator between grade and Variability and Recklessness. Better BART-C Total score and less Recklessness were related to lower free-or-reduced-school-lunch percentage and better math and reading proficiency of children's schools.

**Conclusions:** BART-C is a potential “hot-cognition” measure of self-regulation and adaptive risk-taking for children.

**Schwebel, D. C. (2019). Why “accidents” are not accidental: Using**

 **psychological science to understand and prevent unintentional**

 **child injuries. *American Psychologist*, *74*(9), 1137–1147.**

**https://doi.org/10.1037/amp0000487.**

Injuries are the leading cause of death for American children, killing over 11,000 children in 2017. They are also a rapidly increasing public health challenge globally: The World Health Organization ranks injury as the leading cause of death globally for children Ages 5 to 18 years, and the Global Burden of Diseases project estimates over 2 million children Ages 0 to 19 years died from injuries worldwide in 2017. Unintentional injuries, sometimes referred to as 'accidents' by the lay public, are generally preventable, and psychological science has much to offer in societal efforts to develop, evaluate, implement, and disseminate effective prevention strategies. I first discuss the multifaceted causes of child injuries, which can be conceptualized using classic psychological theory, such as Bronfenbrenner’s ecological theory, or classic injury prevention theory, such as the Haddon Matrix. In either case, behavioral risks stem from the child’s developmentally influenced decisions and behaviors; the child’s family, social, and physical contexts; and the child’s broader cultural environments. Risks can also be conceptualized temporally, through behavioral analysis such as antecedents, behaviors, and consequences of the injury. I then present examples of behaviorally focused interventions that target the child, the adult supervisor, and the environment. In each case, I consider psychological risk factors present and the theory-based strategies that might interrupt or alter risk pathways to prevent injury events. I close with comments on the scope of injury as a global public health challenge and the central role psychologists can and should play to reduce the burden of child injury on the world’s population.

**2018**

**Norcia, A. D., Bombi, A. S., Cannoni, E., & Marano, G. (2018). Physical Risk Taking in Preschoolers: A Comparison between children’s and mothers’ perceptions. *Journal of Child and Family Studies,27*(9), 3027-3036. doi:10.1007/s10826-018-1115-3**

Children's injuries are a serious public-health problem, but they could be substantially reduced by proper prevention. According to the literature the best predictor of injuries is the physical risk taking. In this study we examined preschoolers' and mothers' perceptions of children's physical risk taking. Participants included 203 children (M age = 60 months), their mothers and their teachers. We first compared children's and mothers' answers about desired and allowed level of risk in some play situations,and then we verified if children's and mothers' ideas equally predicted the risk for injuries at school. The teachers completed the Injury Behavior Checklist. Findings showed that children's desired risk taking was higher than their mothers believe. We also found that children at school, in absence of their parents but under the supervision of another adult, behaved according to their own wishes. Our findings suggest that mothers are not always reliable informants about the risk taking behavior of their young children while they are at school. Children's desires are a good predictor of their actual behavior, and for this reason interventions aiming at the reduction of injuries should be directed not only toward parents and teachers but also to the children themselves.

**2016**

**Van Rooijen, M., & Newstead, S. (2016). Influencing factors on professional attitudes towards risk-taking in children’s play: a narrative review. *Early child development and care*, 1-12.**

There is a growing concern that adults who supervise children’s play may restrict opportunities for children to engage in risky activities. Risk-benefit assessment is commonly advocated as a way of allowing children to take managed risks within settings. However ‘risk-benefit’ adopts a limited strategy of convincing professionals of the developmental benefits of risk, disregarding other factors which may also influence professionals when making risk assessments in their settings. This paper proposes an alternative approach to supporting practitioners in allowing risk by exploring the complexity of these influencing factors. A narrative literature review identifies five inter-related factors which affect professionals’ attitudes to risk. The relationships between these factors are discussed and presented as a model which illustrates the complexity faced by practitioners when carrying out risk assessments. The authors argue that children’s opportunities to benefit from risk in play may increase if these influencing factors could be explored within professional development.

**Spencer, G., Bundy, A., Wyver, S., Villeneuve, M., Tranter, P., Beetham, K., ... & Naughton, G. (2016). Uncertainty in the school playground: shifting rationalities and teachers’ sense-making in the management of risks for children with disabilities. *Health, Risk & Society*, *18*(5-6), 301-317.**

Recent theoretical debates highlight the competing risk logics and varying rationalities mobilised in response to dangers and approaches to risk management. Yet the concept of uncertainty, and how it informs perceived risks, is relatively less well understood. Debates of this kind are illuminated in contexts where risks are managed as part of everyday practice. The school setting provides an example of a context in which risks are continuously negotiated amidst dominant protectionist concerns about children’s well-being and safety. Such protectionist concerns are particularly pronounced for children with disabilities, as assumptions about limited capabilities complicate and structure the everyday play experiences for children. Drawing on findings from the Sydney Playground Project, in this article we aim to unpack the felt discomfort experienced by school staff in their responses to uncertain moments in children’s play. We report qualitative data collected from two schools between October 2014 and September 2015 using video observations of children’s play and teachers’ responses to an online Tolerance of Risk in Play Scale. Our findings point to the competing logics and forms of sense-making operationalised by teachers to manage the unknown. Our analysis explored the ways in which risk strategies were (re)framed by school staff and such reframing explained their action (or inaction) in the playground and how these were underpinned by concerns about professional accountabilities. Their responses located risks within the child with disabilities, rather than the play activity itself. Another approach to uncertainty can be achieved by mobilising a discourse of trust in which ‘letting-go’ offers children opportunities to reflexively engage in risk-taking.

**Saunders, C. (2016). An Exploration into the Facilitation of Risky Play Indoors. *Reinvention: An International Journal of Undergraduate Research*, *9*(2).**

'Risky play' is a valued play type in Early Childhood Education and Care, due to the benefits it provides to children's holistic development. However, risky play is often considered an outdoor play type; as current safety concerns and lifestyle changes are resulting in children spending more time indoors, provision of risky play is therefore under threat. This article aims to explore the extent to which this provision can be facilitated indoors. Sandseter's (2007a: 243) categorisation of risky play as play with 'great heights, high speed, harmful tools, near dangerous elements, rough-and-tumble play and play where children can disappear or get lost' is used to identify the physical risky play behaviours of focus in the study. A case study, in a Norwegian kindergarten, was conducted using observations of children's play and interviews with practitioners to analyse the facilitation of risky play indoors and the associated attitudes of practitioners. The findings identified that some risky play types are possible indoors, although prominent barriers were evident. Sandseter's categorisation is also recognised as restrictive when applied to the indoor environment, resulting in the call for further research to expand the study's findings, and to reconsider how risky play indoors is categorised.

**Humphreys, K. L., Tottenham, N., & Lee, S. S. (2016). Risky decision-making in children with and without ADHD: A prospective study. *Child neuropsychology*, 1-16.**

Learning from past decisions can enhance successful decision-making. It is unclear whether difficulties in learning from experience may contribute to risky decision-making, which may be altered among individuals with attention-deficit/hyperactivity disorder (ADHD). This study follows 192 children with and without ADHD aged 5 to 10 years for approximately 2.5 years and examines their risky decision-making using the Balloon Emotional Learning Task (BELT), a computerized assessment of sequential risky decision-making in which participants pump up a series of virtual balloons for points. The BELT contains three task conditions: one with a variable explosion point, one with a stable and early explosion point, and one with a stable and late explosion point. These conditions may be learned via experience on the task. Contrary to expectations, ADHD status was not found to be related to greater risk-taking on the BELT, and among younger children ADHD status is in fact associated with reduced risk-taking. In addition, the typically-developing children without ADHD showed significant learning-related gains on both stable task conditions. However, the children with ADHD demonstrated learning on the condition with a stable and early explosion point, but not on the condition with the stable and late explosion point, in which more pumps are required before learning when the balloon will explode. Learning during decision-making may be more difficult for children with ADHD. Because adapting to changing environmental demands requires the use of feedback to guide future behavior, negative outcomes associated with childhood ADHD may partially reflect difficulties in learning from experience.

**Gagnon, K. T., Cashdan, E. A., Stefanucci, J. K., & Creem-Regehr, S. H. (2016). Sex differences in exploration behavior and the relationship to harm avoidance. *Human Nature*, *27*(1), 82-97.**

Venturing into novel terrain poses physical risks to a female and her offspring. Females have a greater tendency to avoid physical harm, while males tend to have larger range sizes and often outperform females in navigation-related tasks. Given this backdrop, we expected that females would explore a novel environment with more caution than males, and that more-cautious exploration would negatively affect navigation performance. Participants explored a novel, large-scale, virtual environment in search of five objects, pointed in the direction of each object from the origin, and then navigated back to the objects. We found that females demonstrated more caution while exploring as reflected in the increased amounts of pausing and revisiting of previously traversed locations. In addition, more pausing and revisiting behaviors led to degradation in navigation performance. Finally, individual levels of trait harm avoidance were positively associated with the amount of revisiting behavior during exploration. These findings support the idea that the fitness costs associated with long-distance travel may encourage females to take a more cautious approach to spatial exploration, and that this caution may partially explain the sex differences in navigation performance.

**2015**

**Cordovil, R., Araújo, D., Pepping, G. J., & Barreiros, J. (2015). An ecological stance on risk and safe behaviors in children: The role of affordances and emergent behaviors. *New Ideas in Psychology*, *36*, 50-59.**

Unintentional injuries are a major cause of disability and death among children. Initial strategies to address child safety issues have primarily either focused on the environment, trying to identify “risk environments”, or on the individual, trying to identify “at risk children”. More recently, the interaction between child and environment is starting to be addressed in order to enhance the understanding of childhood injuries. The present review suggests a framing of these studies in ecological theory, which implies that children with certain characteristics perceive certain affordances in the environment. In this context, risk may be considered a relational concept. The literature on risk prevention is reviewed and the role of caregivers in managing affordances is emphasized.

**Little, H. (2015). Mothers’ beliefs about risk and risk-taking in children’s outdoor play. *Journal of Adventure Education & Outdoor Learning*, *15*(1), 24-39.**

Changes to social and environmental contexts impact on children’s opportunities for and the nature of outdoor play in many ways. A number of studies over the past decade have noted a trend towards over-protective parenting practices that restrict children’s activities and limit children’s independent mobility and engagement with their neighbourhoods. Through semi-structured interviews with mothers of four-year-old to five-year-old children, this study examined beliefs about children’s outdoor play opportunities and exposure to and management of potential risks in outdoor environments. Whilst the mothers overwhelmingly acknowledged the benefits of risky outdoor play, tension existed between their desire to provide opportunities for their children to safely engage in such play and overcoming their own fears and concerns about their children’s safety. The study has implications for examining ways in which children gain access to outdoor play and the role that early childhood settings may have in providing access to outdoor play environments that compensate for children’s decreased opportunities in other areas of their lives.

**Humphreys, K. L., Lee, S. S., Telzer, E. H., Gabard‐Durnam, L. J., Goff, B., Flannery, J., & Tottenham, N. (2015). Exploration—exploitation strategy is dependent on early experience. *Developmental psychobiology*, *57*(3), 313-321.**

Traditional conceptualizations of early adversity characterize behavioral outcomes as maladaptive. However, conditional adaptation theory proposes that differing behavioral phenotypes following early experience are appropriate for the expected environment (e.g., behaviors likely to result in the best outcome based on environmental expectations). In the present study, youth with (*n* = 46) and without (*n* = 91) a history of previous institutionalization completed a laboratory-based experimental paradigm in which exploration—exploitation strategy was examined, a phenotype relevant to environmental expectations. Previous institutionalization was associated with decreased exploration and increased exploitation. A strategy favoring exploration resulted in greater success in the generous task condition whereas a strategy favoring exploitation produced greater success in the restricted task condition. These results suggest that exploration—exploitation strategy may be influenced by early experience, and the resulting success of strategy choice is context dependent and in line with expectations of the future environment based on early experience.

**2014**

# **Allin L., West A., & Curry S. (2014). Mother and child constructions of risk in outdoor play. *Leisure Studies, 33*(6), 644-657. doi: 10.1080/02614367.2013.841746**

Managing the risks to which children are exposed in contemporary Britain is complex, requiring parents to balance opportunities for a child’s development with an appropriate concern for the potential consequences. Managing risk is particularly an issue for mothers, who, despite societal changes, tend to retain overall responsibility for the care of children. This paper explores the meanings mothers attach to risk and how this influences their children’s outdoor play. It also extends the scope of much existing literature by including children’s own perspectives on risk in outdoor play. Semi-structured interviews were undertaken with 12 mothers who had children aged between 9 and 11 years old who attended a north-east school. Two focus groups were also held, each with six of the children. Findings are analysed in relation to mother and child constructions of risk; mothers and children as risk managers; and negotiating mothering choices. The paper pays particular attention to the way in which mothers’ decisions were framed within risk cultures and dominant views of ‘good’ and ‘bad’ mothering.

# **Hill A., Bundy AC. (2014). Reliability and validity of a new instrument to measure tolerance of everyday risk for children*. Child: Care, Health and Development, 40*(1), 68-76. doi:10.1111/j.1365-2214.2012.01414.x.**

A modicum of everyday risk provides opportunities for children to extend the limits of their competence. However, increasingly negative perceptions of risk have led to risk-averse behaviours in adults, including severely restricting children's play. The degree to which risk in play is tolerated by adults impacts on the lives and experiences of children. However, no measure of adult tolerance to everyday risk exists.

**Purpose**: To develop a valid and reliable instrument examining adults’ tolerances of risk during children's play.

**Methods**: A 31-item survey of risk tolerance was developed based on a Norwegian model of risky play; 100 parents and teachers of children aged 3 to 13 years completed the instrument. Data were subjected to Rasch analysis. Psychometric properties of the data were examined.

**Results**: Iterative analyses produced an instrument with goodness of fit statistics in the acceptable range, a logical item hierarchy, person separation index >2 and reliability index of 0.87. There was a strong positive relationship between participants’ self-perceived risk tolerance and scores on the instrument, and between the age of the child and scores on the instrument.

**Conclusions**: The Tolerance of Risk in Play Scale (TRiPS) yields valid and reliable data for measuring the success of interventions to change adults’ everyday risk beliefs, and for exploring the impact of adults’ risk tolerance on children's play and development.

## **Sandseter, E.B.H. (2014). Early childhood education and care practitioners' perceptions of children's risky play; examining the influence of personality and gender. *Early Child Development and Care, 184*(3), 434-449. doi:10.1080/03004430.2013.794797.**

While there is a growing interest in children's risk-taking behaviours and their safety when at play, there is also a focus on the need to balance the hazards of risks with the benefits of risk. This is also a growing concern among researchers of early childhood education and care (ECEC). The research conducted thus far on ECEC practitioners' perceptions of children's risky play has been qualitative. The aim of this study takes a quantitative approach to ECEC practitioners' perceptions of children's risky play with an aim to reveal how the perception is related to the practitioner's age, gender, and personality. Questionnaires, including a personality test, were administered to 116 Norwegian ECEC practitioners (20% male practitioners). The results indicate that male practitioners score higher on excitement-seeking scales than female practitioners, have a more liberal attitude towards children's risky play, and allow children to engage in greater risky play than women.

**Cordovil, R., Araujo, D., Pepping, G., & Barreiros, J.(2015). An ecological stance on risk and safe behaviors in children: The role of affordances and emergent behaviors.** [***New Ideas in Psychology***](http://www.sciencedirect.com/science/journal/0732118X)***, 36*, 50–59.**

Unintentional injuries are a major cause of disability and death among children. Initial strategies to address child safety issues have primarily either focused on the environment, trying to identify “risk environments”, or on the individual, trying to identify “at risk children”. More recently, the interaction between child and environment is starting to be addressed in order to enhance the understanding of childhood injuries. The present review suggests a framing of these studies in ecological theory, which implies that children with certain characteristics perceive certain affordances in the environment. In this context, risk may be considered a relational concept. The literature on risk prevention is reviewed and the role of caregivers in managing affordances is emphasized.

**2011**

[**Lasenby-Lessard J**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Lasenby-Lessard%20J%22%5BAuthor%5D)**, &** [**Morrongiello BA**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Morrongiello%20BA%22%5BAuthor%5D)**. (2011). Understanding risk compensation in children: Experience with the activity and level of sensation seeking play a role.** [**Accid Anal Prev.**](http://www.ncbi.nlm.nih.gov/pubmed/21545863) **43(4):1341-7.**

The aims of this study were to determine if children 7-12 years show risk compensation when engaging in ecologically valid recreational sports tasks, and to explore how experience with the activity and extent of sensation seeking influence this. Children were positioned up on a platform, on a bike or wearing rollerblades, and they were presented varying heights and inclines from which they selected the greatest one they go down when wearing and not wearing safety gear appropriate to the activity; when making their ratings they anticipated actually doing the task. Results revealed that children engaged in significantly more risk taking when wearing safety gear, thereby demonstrating risk compensation, and this was significantly greater for the activity with which they had greater experience. However, children high in sensation seeking demonstrated significantly more risk compensation in both the high and low experience activities, although the injury risk appraisals that predicted risk compensation varied with experience level. Implications for the design of injury prevention programs and directions for future research are discussed.

**2010**

**See:** http://www.pecerajournal.com/Pecera\_Journal/Journal\_2010\_files/1.pdf for [Risk, Challenge and Safety in Outdoor Play: Pedagogical and Regulatory Tensions](http://www.pecerajournal.com/Pecera_Journal/Journal_2010_files/1.pdf)

**2009**

**Figner, Bernd; Mackinlay, Rachael J.; Wilkening, Friedrich; Weber, Elke U. (2009). Affective and deliberative processes in risky choice: Age differences in risk taking in the Columbia Card Task. Journal of Experimental Psychology: Learning, Memory, and Cognition. 35(3), 709-730.**

The authors investigated risk taking and underlying information use in 13- to 16- and 17- to 19-year-old adolescents and in adults in 4 experiments, using a novel dynamic risk-taking task, the Columbia Card Task (CCT). The authors investigated risk taking under differential involvement of affective versus deliberative processes with 2 versions of the CCT, constituting the most direct test of a dual-system explanation of adolescent risk taking in the literature so far. The “hot” CCT was designed to trigger more affective decision making, whereas the “cold” CCT was designed to trigger more deliberative decision making. Differential involvement of affective versus deliberative processes in the 2 CCT versions was established by self-reports and assessment of electrodermal activity. Increased adolescent risk taking, coupled with simplified information use, was found in the hot but not the cold condition. Need-for-arousal predicted risk taking only in the hot condition, whereas executive functions predicted information use in the cold condition. Results are consistent with recent dual-system explanations of risk taking as the result of competition between affective processes and deliberative cognitive-control processes, with adolescents’ affective system tending to override the deliberative system in states of heightened emotional arousal. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

**Prior to 2009**

[**Christensen P**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Christensen%20P%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**,** [**Mikkelsen MR**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Mikkelsen%20MR%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**. (2008). Jumping off and being careful: children's strategies of risk management in everyday life.** ***Social Health Illn.******(1):*112-30.**

This article addresses the complexity of children's risk landscapes through an ethnography of 10- to 12-year-old Danish children. The data revealed how children individually and collectively engaged with risk in their everyday activities. The children assessed risks in relation to their perceptions of their health as strength and control, negotiated the conditions of playing, and attuned their responses to situations of potential social and physical conflict. In the paper this risk engagement is illustrated in a variety of contexts: children's decisions to wear or not to wear a bicycle helmet; playing and games and routine pushing and shoving at school. In looking after themselves, children negotiate rules of participation and they safeguard personal and collective interests. Gender differences in these processes are addressed and discussed. The article argues that risk engagement is an important resource through which children also learn from their own mistakes. This is a necessary learning process when children engage with their personal health and safety. The article critically discusses different sociological frameworks and shows the significance of the study for the growing literature on understanding the meaning of risk in childhood.

[**Morrongiello BA**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Morrongiello%20BA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**,** [**Lasenby-Lessard J**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Lasenby-Lessard%20J%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**. (2007).** [**Psychological determinants of risk taking by children: an integrative model and implications for interventions.**](http://www.ncbi.nlm.nih.gov/pubmed/17296684) ***Inj Prev. 13(1):*20-5.**

**Objectives**: To draw on empirical findings of the psychological factors that cause elementary-school children to engage in risky play behaviors that can lead to injury, with the aim of developing an integrative model that can support intervention-program planning.

**Methods**: An extensive review of literature on this topic was conducted, determinants of risk taking for which there was empirical support were identified, and results were synthesized to create an integrative model of children's risk taking.

**Results**: Research on risk taking in children is limited, but the findings support the importance of examining child, family and socio-environmental factors to understand children's risk-taking behaviors.

**Conclusions**: Development of a model outlining the determinants of risk behaviors can provide a foundation for initiatives that aim to reduce such behaviors and prevent childhood injuries.

[**Morrongiello BA**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Morrongiello%20BA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**,** [**Lasenby-Lessard J**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Lasenby-Lessard%20J%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**,** [**Matheis S**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Matheis%20S%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**. (2007).** [**Understanding children's injury-risk behaviors: The independent contributions of cognitions and emotions.**](http://www.ncbi.nlm.nih.gov/pubmed/17522114)***J Pediatr Psychol.******32(8)*:926-37.**

**Objective**: Unintentional injuries are a leading threat to the health of elementary-school children, with many injuries happening when children are left to make their own decisions about risk taking during play. The present study sought to identify determinants of children's physical taking.

**Methods**: An ecologically valid task that posed some threat of injury was used (i.e., highest height of a balance beam they would walk across). Ratings of cognitions (extent of danger, perceived vulnerability for personal injury, potential severity of injury) and emotional reactions (fear, excitement) were taken when on the beam, just before the children walked across.

**Results**: Regression analysis, controlling for age and sex, revealed that risk taking was predicted from ratings of danger, fear, and excitement. **Conclusions**: Both cognitive and emotional factors independently contribute to predict children's physical risk taking. Theoretical and practical implications of these findings are discussed.

[**Morrongiello BA**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Morrongiello%20BA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**,** [**Walpole B**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Walpole%20B%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**, &** [**Lasenby J**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Lasenby%20J%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**. (2007). Understanding children's injury-risk behavior: wearing safety gear can lead to increased risk taking.** ***Accid Anal Prev.*** ***39*, 618-23.**

The present study examined whether school-age children show risk compensation and engage in greater risk taking when wearing safety gear compared to when not doing so when running an obstacle course containing hazards that could lead to physical injury. Because sensation seeking has been shown to influence risk taking, this child attribute was also assessed and related to risk compensation. Children 7-12 years of age were videotaped navigating the obstacle course twice, once wearing safety gear and once without safety gear, with reverse directions used to minimize possible practice effects. The time it took the child to run through the course and the number of reckless behaviors (e.g., falls, trips, bumping into things) that the child made while running the course were compared for the gear and no-gear conditions. Results indicated that children went more quickly and behaved more recklessly when wearing safety gear than when not wearing gear, providing evidence of risk compensation. Moreover, those high in sensation seeking showed greater risk compensation compared with other children. Implications for childhood injury prevention are discussed.

**Morrongiello, B.A. & Matheis, S. (2007). Addressing the Issue of Falls off Playground Equipment: An Empirically-Based Intervention to Reduce Fall-Risk Behaviors on Playgrounds** [***Journal of Pediatric psychology***](http://www.medscape.com/viewpublication/6929_index)***, 32*, 819-830.**

**Objective**: The present study evaluated the impact of an intervention to reduce fall-risk behaviors on playgrounds among children 6–11 years of age.
**Methods**: Children completed posters indicating risky playground behaviors they would and would not do. In the intervention group, video and audio presentations were used to expose children to injury occurrences so that injury vulnerability was communicated in a fear-evoking way. In the control group, children only completed the pre- and post-intervention measures.
**Results**: Significant decreases in intentions to risk-take were obtained in the intervention, but not the control group. Effectiveness did not vary with children's age or sex, but was greater for those scoring high in sensation-seeking.
**Conclusions**: A fear-appeals approach proved successful to reduce intended fall-risk behaviors, particularly for children high in sensation-seeking whose risk-taking is motivated by affect arousal.

**Morrongiello, B.A. & Major, K. (2002). Influence of safety gear on parental perceptions of injury risk and tolerance for children's risk taking. *Inj Prev*, *8*, 27-31.**

**Objectives**: Risk compensation theory has been shown to relateto how individuals behave in areas such as traffic safety andconsumer product safety. The present study examines whetherrisk compensation theory applies to parents' judgments aboutschool age children's permissible risk taking under non-safetygear and safety gear conditions for seven common play situations.The extent of the child's experience with the activity and parentalbeliefs about safety gear efficacy were examined as possiblemoderators of extent of children's risk taking allowed by parents.

**Methods**: A telephone interview was used to obtain each parent'sratings of permissible risk taking by their child (for example,speed at which child is allowed to cycle, height allowed toclimb to on a climber) under safety gear and no gear conditions,and ratings of child experience and gear efficacy.

**Results**: Results confirmed risk compensation operated underall seven play situations, resulting in parents reporting theywould allow significantly greater risk taking by their childrenunder safety gear than non-safety gear conditions. Childrenwith more experience with the activities were to be allowedgreater risk taking, even when not wearing safety gear. Parentswho believed more strongly in the efficacy of the safety gearto prevent injuries showed greater risk compensation. No sexdifferences emerged in any analyses.

**Conclusions**: Results highlight the need to communicate to parentsthat safety gear moderates injury risk but does not necessarilyguarantee the prevention of injury, particularly if childrenare allowed greater risk taking when wearing safety gear.

[**DiLillo D**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22DiLillo%20D%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**, &** [**Tremblay G**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Tremblay%20G%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**. (2001). Maternal and child reports of behavioral compensation in response to safety equipment usage.** ***J Pediatr Psychol.******26*, 175-84.**

**Objective**: To assess maternal and child risk compensation behaviors in response to several commonly used safety measures.

**Methods**: We administered a previously validated self-report measure of risk tolerance to a total of 151 mothers and their children in grades 3-7. Mothers indicated the level of risk they would permit their child to assume; children were questioned regarding the degree of physical risk they would typically assume while unsupervised by an adult. Participating families were randomly assigned to conditions in which safety equipment either was or was not present during assessments of risk tolerance.

**Results**: Mothers who viewed the stimulus materials depicting the use of safety precautions reported significantly higher levels of tolerance for risky behavior on the part of their children than did mothers who viewed identical materials without the safety precautions. No significant differences in estimated risk taking emerged between children in the two experimental conditions.

**Conclusions**: These data may reveal a compensatory mechanism by which parents escalate their threshold for acceptable risk behavior in the presence of safety precautions for their children. Such tendencies have the potential to offset some of the protection provided by the use of safety equipment.

**Schwebel DC, &** [**Bounds ML**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Bounds%20ML%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**. (2003). The role of parents and temperament on children's estimation of physical ability: links to unintentional injury prevention.** ***J Pediatr Psychol.*** ***28,* 505-16.**

**Objective**: Unintentional injuries, the leading cause of pediatric mortality, are cause by a complex set of intrapersonal and environmental factors. The role of three critical variables--parental supervision, children's temperament, and estimation of children's physical abilities--was examined.

**Methods**: Sixty-four 6- and 8-year-old children completed a laboratory experiment with a parent. Both children and parents judged the child's ability to complete reaching, stepping, and crouching tasks. Parents also completed a parent-report measure of children's temperament.

**Results**: Both children and parents overestimated children's ability, although children did so more than parents. Parents of temperamentally impulsive and undercontrolled children judged that their children could complete tasks that were actually beyond the child's ability. Temperament also affected children's judgments while parents were known to be present or absent: Temperamentally impulsive and undercontrolled children were more accurate in their judgments when parents were standing next to them than when parents were hidden from view behind a one-way mirror.

**Conclusions**: The mechanism by which parental supervision might protect children from injury appears to be at least twofold: (a) Parents overestimate children's ability less frequently than children themselves, suggesting supervising parents could intervene to prevent children from attempting dangerous activities; and (b) children judge their physical abilities more cautiously when parents are present. Implications for temperament theory and for injury prevention are discussed.

[**Heck A**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Heck%20A%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**,** [**Collins J**](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Collins%20J%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**, Peterson L. (2001).** [**Decreasing children's risk taking on the playground.**](http://www.ncbi.nlm.nih.gov/pubmed/11678532)***J Applied Behavioral Anal*****ysis 34(3):349-52.**

Playground mishaps are some of the most common sources of injury and are the leading killer of children. The present study used a multiple baseline design across three classrooms (N = 379 children). With minimal teaching and rewards, children decreased and maintained decreased risky playground behaviors on slides. Floor effects on climbers prevented the demonstration of similar effects. The decreases seen in risky slide behavior are discussed within the context of preventive safety training for playground injuries.

[**Hillier LM**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Hillier%20LM%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**, &** [**Morrongiello BA**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Morrongiello%20BA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract)**. (1998). Influence of safety gear on parental perceptions of injury risk and tolerance for children's risk taking.** ***J Pediatr Psychol.*** ***23*, 229-38.**

**Objective**: To examine age and gender differences in children's perception of injury risk and to evaluate cognitive factors that relate to their appraisal of risk.

**Methods**: The participants were 120 children (6 to 10 years of age), who used a series of photographs, which depicted play activities that varied from no to high risk, to appraise injury risk.

**Results**: Children were able to distinguish varying degrees of injury risk. Boys rated risk as lower than girls, and 6-year-old children identified fewer risk factors and did so more slowly than 10-year-old children. For girls, perceived vulnerability to injury was the best predictor of injury risk ratings, whereas for boys it was judged severity of potential injury. **Conclusions**: Children's appraisal of risk and age and gender differences in related factors highlight important components for injury prevention programs.

**Morrongiello, B.A. & Rennie, H. (1998). Why Do Boys Engage in More Risk Taking Than Girls? The Role of Attributions, Beliefs, and Risk Appraisals. *Journal of Pediatric Psychology* 23, 33-43.**

**Objective**: Assessed for age and sex differences in school-agechildren's reporting of injury-risk behaviors, ratings of injury-riskin various play situations, attributions for injuries (self,other, bad luck), and beliefs about their vulnerability to injuryin comparison to their peers (more, less, comparable vulnerability).

**Methods**: We used a structured interview and drawings that depictedchildren showing wary or confident facial expressions when engagedin injury-risk play activities.

**Results**: Children's reported risk taking could be predictedfrom their risk appraisals, beliefs about the likelihood ofinjury, and attributions of injuries to bad luck, and thesefactors resulted in 80% correct assignment of cases by sex ina discriminant analysis. The wary affect display resulted inhigher injury-risk ratings than the confident display, withthis effect being greater for girls than boys.

**Conclusions**: Cognitive-based factors differentiate boys fromgirls and contribute to sex differences in children's injury-riskbehaviors.

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