School-Age Children's Attributions About Their Own Naturally Occurring Minor Injuries: A Process Analysis

Sara Gable, PhD, and Lizette Peterson, PhD
University of Missouri-Columbia

Objective: To analyze children's attribution of cause regarding their naturally occurring minor injuries in light of the pre-injury parental acceptability of children's behavior and the emotions children experienced immediately after the event.

Method: Sixty-one 8-year-old children were interviewed biweekly for one year about their naturally occurring minor injuries. Participants monitored environmental and psychosocial elements of the injuries and later answered questions about the cause of the event.

Results: For a total sample of 1,037 minor injuries, children most frequently designated fate as the primary cause. Further analysis revealed that attributions varied by children's pre-injury behavior and post-injury feelings. Children were equally likely to accept primary responsibility or to assign cause to fate when they were engaged in unacceptable behavior before the event. Similarly, children assumed primary responsibility for the injury when they experienced post-injury guilt. No differences in injury attributions were revealed by gender or by the child's frequency of injuries during the year.

Conclusions: Results highlight the significance of adult caregiver safety rule creation, endorsement, and ongoing communication for the socialization of children's safe behaviors.

Key words: minor injury; child attribution; naturalistic methods.

As the leading cause of death for children under the age of 18 (Rodriguez & Brown, 1990), childhood injuries are one of the most commonly occurring stressful events for families. To protect children from serious harm, parents typically use environmental (e.g., childproof medicine containers; Walton, 1982) and behavioral methods of intervention (e.g., child redirection, physically removing child from dangerous situation; Powers & Chapieski, 1986; Scheidt et al., 1988). Although these methods are essential for young children, who are developing self control (Kopp, 1982), the opportunity to implement and monitor these efforts is reduced with school-age children, who spend less time with adults. School-age children, by virtue of circumstance and ability, carry more responsibility for maintaining their safety and for making thoughtful decisions about how to act in future risky situations. Given that understanding causality is crucial in effectively preventing or coping with similar situations in the future (Friedberg & Dalenberg, 1991), it is surprising that so little is known about children's attributions concerning their own minor injuries.

All correspondence should be sent to Sara Gable, Human Development and Family Studies Extension, 162b Stanley Hall, University of Missouri-Columbia, Columbia, Missouri 65211. E-mail: gables@ext.missouri.edu.

© 1998 Society of Pediatric Psychology
There are many reasons to examine how children think and feel about their own injuries. One centers on the widely held belief that parents are the primary teachers and protectors of children (LeVine, 1974). Routine decisions about family safety rules and child supervision may be based on parents' beliefs about their children's perceived level of personal responsibility in safe and risky situations. Weiner (1993) theorizes that believing oneself to be the cause of an event raises the level of perceived personal responsibility for future behavior. Thus, if parents believe that children are able to accurately estimate their own role in safe and risky situations, parents may also think that children learn from their injury experiences and carry this knowledge forward. These beliefs may be the basis for the folk wisdom, "Once burned, twice shy." Parents often verbalize their beliefs that if a child gets hurt or has an "accident," this negative experience alone will prevent similar incidents.

A recent study reported that parents rarely follow up their 8-year-old children's injuries with teaching or discipline, suggesting that parents' may have inaccurate perceptions about their children's understanding of their own role in the injury (Peterson, Bartelstone, Kern, & Gillies, 1995). Gralinski and Kopp (1993) reported that mothers' use of preventive teaching interventions concerning toddler safety declined across the second and third year. Together, these findings suggest that by middle childhood, parents may overestimate the extent to which children are capable of regulating their own safe and risky behavior in the absence of external controls and post-injury remediation. Thus, asking children directly about their injury-related thoughts could provide insight into how children perceive their role and the contribution of other forces in their minor injuries.

Past research on children's attributions of causality has centered on children's beliefs about nonpersonal, external events and other children's social and emotional experiences (e.g., Earn & Sobol, 1990; Fabes, Eisenberg, McCormick, & Wilson, 1988; Wigfield, 1988). The current study is unique in that it focused on 8-year-olds' thoughts and feelings about their own experiences across a 12-month period. During middle childhood, children are able to reason about more complex problems and monitor their own activities, mental processes, and emotions (Collins, Harris, & Susman, 1995). Consequently, the child participants were expected to cogently discuss their injury experiences and offer reasonable explanations for them. The study design capitalizes on these cognitive abilities by simultaneously considering children's attributions to self, situation, and chance when explaining why their injuries occurred.

Another original feature of this research is the experience-based interview methodology (Peterson, Brown, Bartelstone, & Kern, 1996). Most attribution studies take place in laboratories and ask children about hypothetical situations (for an exception, see Fabes et al., 1988). The present work is based on children's thoughts and feelings about their own minor injuries. Parents and other adult caregivers will benefit from having information about children's perceptions of cause during real-life, risky situations.

Research shows that children can logically attribute cause to events. Preschoolers recognize illness as being caused by contact with the physical world (e.g., eating bad food, being with a sick child) rather than as a consequence for some misbehavior (i.e., illness as punishment) (Springer & Ruckel, 1992); they see success as the result of internal, stable, and controllable causes and failure as a product of external, unstable, and uncontrollable causes (Earn & Sobol, 1990; Wigfield, 1988). When different groups of children are compared, the complexity of attribution processes appears. Children's explanations for positive and negative events differ by gender (Burgner & Hewstone, 1993), interpersonal competence (Hughes, Robinson, & Moore, 1991), and family functioning (Perez-Bouchard, Johnson, & Ahrens, 1993). Earn and Sobol (1990) reported that popular fourth and fifth graders assign luck less often and personal control more often to successful academic experiences than do controversial, rejected, and isolated children, indicating that attributions may be linked to children's actual behavior.

In addition to evoking explanations, childhood injuries arouse a blend of emotions. When children get hurt, they invariably experience pain, sadness, fear, and, depending on the situation, they may feel guilt. Investigation of emotions and attributions shows that preschool and school-age children nonrandomly assign attributions to emotional events (Strayer, 1986). For example, preschoolers match happy events with nonsocial causes (e.g., material goods, external events) and sad and angry events with social reasons (e.g., aggression, fighting) (Denham & Zoller, 1991) and most frequently explain other children's happy, sad, angry, and distressed outbursts as the result of interactions with classmates (Fabes et al., 1988).

In summary, this study describes the cognitive
and emotional characteristics of children's naturally occurring minor injuries. Eight-year-old children participated because they were the youngest children who could be left without adult supervision in our state (Masters, 1978). The first goal will be to determine if children's explanations for their minor injuries primarily implicate external factors, personal behaviors, aspects of fate, or some combination of reasons. The descriptions of why injuries happen will then be analyzed for the effects of child gender and injury history to determine whether children's attributions vary systematically on the basis of group status (i.e., gender, infrequent injuries versus frequent injuries). The final set of analyses will explore the effect of children's knowledge about the acceptability of their pre-injury behavior and their post-injury emotions on the assignment of cause to the injury. The study is a process analysis of children's minor injuries because it addresses the question of how children come to make attributions about their minor injuries and considers both situationally stable characteristics (e.g., child gender) and unstable characteristics that can vary within each injury episode (e.g., pre-injury behavior, post-injury feelings).

Method

Participants

Sixty-one mother-child pairs participated in the year-long interview study of children's naturally occurring minor injuries. Of the 66 parent-child dyads that began the research project, the final sample who fully completed the study was comprised of 30 girls and 31 boys (age range at start of project: 8 years 3 months to 9 years) and their mothers (average age at start of project: 36.6 years; range: 27–46). All families included in this study completed the full research cycle, including an orientation meeting and 22 biweekly interviews. Duncan's revised socioeconomic index (Hauser & Featherman, 1977) ranged from 7.1 to 92.1, with a mean of 54.8, indicating that the participants were primarily middle class; 97% of the participants were Caucasian and 3% were African American, similar to the local community. A secondary analysis of family socioeconomic status (SES) using Hollingshead and Redlich's two-factor index (1958) also revealed 58% of the sample as middle class (Peterson et al., 1996). Participants earned one dollar for each day of their participation in the study.

Home-based interviews were conducted with mothers and children every 2 weeks for 1 year in order to learn about the cognitive, social, and emotional characteristics of children's injuries. Six graduate students uninformed about the general injury literature worked with the same small group of families (10 or 11) for the duration of the study.

The primary unit of analysis for the study was a minor injury, defined as a discrete event resulting in either pain lasting a minimum of 15 minutes and/or tissue damage that had a specific time of onset and was discernible for at least one hour. Pain or tissue damage resulting from the summed effect of a series of events (e.g., a blister slowly developing on a child's heel) or contact with a toxic agent having an unknown time of onset (e.g., poison ivy) were not included in this analysis.

The Interview. Mothers and children were trained intensively to complete the injury monitoring data sheets immediately after a child's injury. During training, mothers and children learned how to describe the details of the child's injury, to record their
emotional response to the injury, and to mark on a silhouette of a child figure the exact location of the injury. After the injury-monitoring training was complete, the 60- to 90-minute home interviews began and took place every other week for approximately 1 year. Mothers and children were interviewed independently. The original study goals were more likely to be achieved with independent interviews rather than through parent-child co-construction of the injury event.

Each home interview was based, in part, on the mother and child injury-monitoring data from the previous 2 weeks. Additionally, a set of injury-specific questions was administered and resulted in over 100 pieces of information on the social (e.g., who was present?), affective (e.g., ratings of relevant positive and negative emotions), and cognitive (e.g., "Why do you think the injury occurred?"") antecedents and consequences of the injury. Thus, whenever a parent or child reported an injury, the interviewer first asked for a stream of consciousness description of the injury (e.g., "Help me see it like I am seeing it on TV"). Then, the interviewer began asking progressively more detailed injury-related questions. For a full description of the questions and coding categories, see Peterson et al. (1995).

This study focuses on the children's personal injury-monitoring data representing the negative emotions they experienced after the injury and two pieces of information gathered during the home-based interview: the acceptability of the children's pre-injury behavior and the children's attributions about the cause of the injury. Only children's reports of the injuries are examined because of the study's ultimate goal of transferring children's "firsthand" accounts of their injury experiences to parents and other adults who make child safety and supervision decisions. Additionally, previously published reports of these data indicated that mothers were present at only 8.6% of the total injuries that children reported and were informed of the injury 64.8% of the time (Peterson et al., 1995). Thus, restricting the available attribution data to the child's cognitions alone will provide a sharper image of how school-age children process their risky experiences. Mothers were the most frequently cited "caregiver" during the injury events (48% of the time); however, in combination with the data presented above, the resulting picture is of a child who is injured out of the direct vision or hearing of the mother.

### Injury Descriptors

**Acceptability of Pre-Injury Behavior.** During the biweekly home interviews, children were asked to assess the extent to which their pre-injury behavior was, or was not, acceptable to their mother. These responses were made on a 5-point scale (1 = behavior completely acceptable to parents; 5 = behavior completely unacceptable to parents). Mothers' ratings of the acceptability of the child's pre-injury behavior will be considered as a reliability assessment of the child's ratings.

**Attributions About the Cause of the Injury.** Also during the biweekly home interviews, boys and girls were asked to directly indicate on a 5-point thermometer how much their behavior, the situation, and the role of fate played in the injury (1 = not at all the fault of the child, the situation, fate; 5 = entirely the fault of the child, the situation, fate). Each rating was made independently of the others (i.e., in theory, an event could be rated as a 5 for self, a 5 for situation, and a 5 for fate). This approach allowed the children to reason about the combined contribution of the three factors in explaining their injury.

**Post-Injury Negative Emotions.** As part of monitoring injuries, children were trained to rate on a 5-point scale their negative feelings (1 = no experience of the emotion; 5 = very intense experience of the emotion) immediately before and after the injury. For this study, the extent to which children felt scared, guilty, and angry after the injury was examined.

### Data Transformation

In an effort to increase the general reliability of the data, we recoded all variables from continuous ratings to categorical, event-level descriptors. These transformations were carried out for a number of reasons. First, in order to link this study of children's attributions to past studies of children's attributions, we presented the reasons and emotions reported by children as dichotomous (i.e., present versus not present) variables in order to correspond with measurement principles used in past research. Another goal of transforming the data was to create a system whereby the new variables represented had the same meaning for all of the children's injury reports. An attribution rating of 4 for one's own role in the injury may mean one thing to one child and something else to another child. However, if the rat-
Children's Attributions About Injuries

327

ning of 4 for one's own behavior was the highest attribution rating of the three possible causes for both children, one can safely conjecture that both accepted primary blame for the minor injury. This belief is allowed because of school-age children's ability to consider multiple sources of information at one time (Collins, Harris, & Susman, 1995).

Thus, the first transformation involved the children's three 5-point attribution ratings (i.e., child, situation, and fate). To examine the processes whereby children assigned cause to their injuries, we created seven mutually-exclusive event categories to represent children's reports of the primary reason for their injuries. These categories reflect the cause that children assigned the most responsibility to when they were asked to indicate why the injury occurred. The seven mutually exclusive categories include injuries that children believed were primarily (1) their own fault, (2) the fault of the situation, (3) the result of fate, or an (4) equal combination of self and situation, (5) self and fate, (6) situation and fate, or (7) equally the cause of self, situation, and fate. For example, if a child assigned a score of 4 when describing her own role in the injury, a score of 1 when describing the role of the situation, and a score of 4 when describing the role of fate, the injury event would be categorized as an equal combination of self and fate.

The pre-injury acceptability of child behavior variable and the post-injury negative emotion ratings were also transformed. We recoded these variables from continuous to dichotomous categories (i.e., yes or no). For example, when considering the ratings of maternal acceptance of the child's pre-injury behavior, we classified the child's 5-point ratings as either "clearly acceptable" (a rating of 1) or "questionable" (a rating of 2 or greater). Similarly, the 5-point ratings of negative emotion experienced after the injury event were recoded as either no experience of the emotion (a rating of 1) or some experience of the emotion (a rating of 2 or higher).

Reliability of Child's Pre-Injury Behavior Ratings

Establishing the reliability of the children's ratings of the acceptability of their pre-injury behavior required transforming maternal reports of the acceptability of children's pre-injury behavior into the same "clearly acceptable" or "questionable" classification system. Mothers reported 1,001 minor child injuries; 751 of these injuries were also reported by children and were thus considered the sample of injuries for the reliability check. Percentage agreement was calculated (i.e., the number of time that mothers and children agreed on the acceptability or unacceptability of the child's behavior divided by the total number of agreements and disagreements). Sixty-seven percent of the time mothers and children agreed about whether or not the child was engaged in acceptable or unacceptable behavior.

Information about other indices of data quality (i.e., reliability and validity) have been reported elsewhere. Peterson et al. (1996) presented findings from a variety of reliability and validity tests and concluded that the self-monitoring strategy for gathering detailed information about children's minor injuries provides a unique, reliable, and valid window on the experience of a relatively infrequent event.

Results

Frequency of Injuries and Injury Attribution Categories

During the course of the year-long study, 61 children reported a total of 1,037 injuries. Based on the child reports, the most common types of injuries were minor cuts and scrapes (n = 310); the second most frequently occurring injuries were tripping and slipping injuries (n = 172). The least common injuries included choking on food (n = 1), problems with electrical fans (n = 1), and poisoning (n = 2). The average number of injuries reported per child during the year was 17.00 (SD = 6.81), with a range of 2 to 43 injuries. Extensive information concerning the children's injuries can be found in Peterson et al. (1995).

After we recoded the injuries into mutually exclusive attribution categories, one third of all injuries were attributed primarily to fate (n = 308; 30%) followed by injuries attributed mostly to the situation (n = 255; 25%), the child (n = 185; 18%), the situation and fate equally (n = 109; 10%), equally the child and the situation (n = 66; 6%), all three causes equally (6%), and least frequently to the child and fate equally (n = 49; 5%). A within-injuries analysis revealed that the distribution of the frequency of injury attribution types was significantly different in the total sample, F(6, 1031) = 92.52, p < .0001.
Table I. Mean Proportion of Injury Attributions by Gender (n = 31 boys, 30 girls)

<table>
<thead>
<tr>
<th></th>
<th>Boys' Injuries (n = 513)</th>
<th>Girls' Injuries (n = 524)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Child's fault</td>
<td>.17 (.38)</td>
<td>.19 (.39)</td>
</tr>
<tr>
<td>Situation's fault</td>
<td>.25 (.43)</td>
<td>.24 (.43)</td>
</tr>
<tr>
<td>Fate's fault</td>
<td>.31 (.47)</td>
<td>.28 (.45)</td>
</tr>
<tr>
<td>Child + situation</td>
<td>.07 (.26)</td>
<td>.06 (.23)</td>
</tr>
<tr>
<td>Child + fate</td>
<td>.04 (.19)</td>
<td>.06 (.23)</td>
</tr>
<tr>
<td>Situation + fate</td>
<td>.09 (.29)</td>
<td>.12 (.32)</td>
</tr>
<tr>
<td>All equal</td>
<td>.07 (.25)</td>
<td>.06 (.23)</td>
</tr>
</tbody>
</table>

Multivariate main effect of child's gender not significant, F(6, 1030) = 1.14; univariate comparisons not significant, F(1, 1035) = .54, .02, 1.71, .73, 2.35, 1.96, .53, respectively.

**Child Gender and Injury Attributions**

Table I presents the effect of child gender (31 boys and 30 girls) on the frequency of injury attribution types (boys reported 513 injuries; girls reported 524 injuries). To determine whether child gender affected the frequency of injury attributions, a 2 (gender) x 7 (injury attribution) MANOVA was computed. The multivariate main effect was not significant for gender of child, F(6, 1030) = 1.14, ns, and the univariate comparisons also revealed no significant effects of child gender within the seven injury categories, F(1, 1035) = .54, .02, 1.71, .73, 2.35, 1.96, .53, respectively, ns. In sum, we found no differences in the reasons boys and girls gave for their injuries.

**Child Injury Frequency and Injury Attributions**

To determine whether the frequency of child injury attribution types was affected by the number of injuries a child experienced during the year, we divided the children into three groups with different levels of injury. The first group included those children who experienced 12 or fewer injuries during the year (n = 15, 24%); the middle group included children who experienced more than 12 and fewer than 20 injuries (n = 29, 48%); and the third group included those children who reported more than 20 injuries during the course of the project (n = 17, 28%).

Next, a 3 (injury history) x 7 (injury attribution) MANOVA was computed to learn if the frequency of injury attribution categories was associated with the children's injury history. Table II shows that the multivariate main effect of injury history was nonsignificant, F(12, 106) = 1.02, ns, and, the within attribution category comparisons were also nonsignificant, F(2, 58) = .51, .56, .69, .27, 1.74, .60, 2.36, respectively, ns. Regardless of the number of injuries children experienced during the year, the distribution of injury attribution types remained the same across the three groups.

**Acceptability of Child Behavior and Injury Attributions**

Table III shows the results of examining the effect of acceptable versus questionable pre-injury behavior on the frequency of child injury attribution types. Results from a 2 (acceptable versus question-
Table IV. Mean Proportion of Injury Attributions and Post-Injury Experiences of Negative Feelings

<table>
<thead>
<tr>
<th>Attributions</th>
<th>Scared (515 injuries)</th>
<th>Not scared (522 injuries)</th>
<th>Guilty (336 injuries)</th>
<th>Not guilty (701 injuries)</th>
<th>Angry (547 injuries)</th>
<th>Not angry (490 injuries)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Child's fault</td>
<td>.20 (.40)</td>
<td>.16 (.37)</td>
<td>.27 (.44)</td>
<td>.14 (.34)**</td>
<td>.19 (.39)</td>
<td>.17 (.37)</td>
</tr>
<tr>
<td>Situation's fault</td>
<td>.26 (.44)</td>
<td>.24 (.42)</td>
<td>.19 (.40)</td>
<td>.27 (.44)**</td>
<td>.26 (.44)</td>
<td>.23 (.42)</td>
</tr>
<tr>
<td>Fate's fault</td>
<td>.29 (.45)</td>
<td>.31 (.46)</td>
<td>.23 (.42)</td>
<td>.33 (.47)**</td>
<td>.26 (.44)</td>
<td>.33 (.47)**</td>
</tr>
<tr>
<td>Child + situation</td>
<td>.06 (.24)</td>
<td>.06 (.25)</td>
<td>.08 (.27)</td>
<td>.06 (.23)</td>
<td>.09 (.28)</td>
<td>.04 (.19)**</td>
</tr>
<tr>
<td>Child + fate</td>
<td>.04 (.20)</td>
<td>.05 (.22)</td>
<td>.05 (.22)</td>
<td>.04 (.21)</td>
<td>.05 (.21)</td>
<td>.05 (.22)</td>
</tr>
<tr>
<td>Situation + fate</td>
<td>.09 (.28)</td>
<td>.12 (.33)*</td>
<td>.09 (.29)</td>
<td>.11 (.31)</td>
<td>.09 (.29)</td>
<td>.12 (.32)</td>
</tr>
<tr>
<td>All equal</td>
<td>.07 (.25)</td>
<td>.06 (.23)</td>
<td>.09 (.29)</td>
<td>.05 (.22)*</td>
<td>.06 (.23)</td>
<td>.07 (.25)</td>
</tr>
</tbody>
</table>

*p < .05.
**p < .01.
***p < .001.

able) × 7 (injury attribution) MANOVA show that the overall multivariate effect was significant for the acceptability of child pre-injury behavior on child attributions, F(6, 1030) = 7.98, p < .0001. Additionally, univariate tests revealed significant differences in the proportions of injuries that were predominantly the child's fault, F(1, 1035) = 16.40, p < .0001, the fault of the situation, F(1, 1035) = 6.32, p < .05, caused by fate, F(1, 1035) = 6.60, p < .01, equally the fault of the child and the situation, F(1, 1035) = 17.75, p < .001, and attributed equally to the situation and fate, F(1, 1035) = 5.55, p < .05. Significant increases in child-attributed injuries and injuries attributed equally to the child and the situation were revealed when children were engaged in unacceptable pre-injury behavior. Parallel decreases resulted for injuries attributed to the situation, fate, and equally the situation and fate when children were engaged in unacceptable behavior before the injury. Thus, when children are acting in ways that they know are wrong and become injured, they are more willing to accept responsibility for the injury than when they are engaged in behavior that is acceptable.

Post-Injury Negative Emotion and Injury Attributions

After being injured, children reported feeling scared 50% of the time (n = 515), feeling guilty 32% of the time (n = 336), and feeling angry 53% of the time (n = 547). Univariate comparisons determined whether the proportion of injury attributions differed by the experience of post-injury negative emotions; findings are presented in Table IV.

Table IV indicates that the proportion of equal blame to the situation and fate varied significantly by the experience of fear. Significantly fewer attributions were made to the situation and to fate when children experienced post-injury fear than when they did not, M = .09 and .12; F(1, 1035) = 4.22, p < .05.

Children's reports of feeling guilty after an injury produced a number of differences in the proportion of injury attribution categories. Children's experiences of guilt are reflected in significantly more injuries classified as the child's fault and all reasons being equal, F(1, 1035) = 27.81, 6.01, p < .0001 and .05, respectively. Children's reports of post-injury guilt revealed significantly reduced numbers of injuries categorized as blame to the situation and blame to fate, F(1, 1035) = 7.41, 12.06, p < .01, .001, respectively.

The effect of children's reports of post-injury anger and children's injury attributions are also presented in Table IV. Children who experienced angry feelings more often made equal attributions to themselves and the situation, M = .09 and .04; F(1, 1035) = 9.71, p < .01, than when they did not experience anger. Additionally, feelings of post-injury anger were associated with reduced attributions to fate, M = .26 and .33; F(1, 1035) = 6.34, p < .01.

Discussion

The primary goal of this research was to further understanding of how children explain injuries by examining the interplay of social and emotional factors in school-age children's attributions about their own naturally occurring minor injuries. Past research suggests that parents reduce socialization
efforts focused on safety during early childhood (Gralinski & Kopp, 1993) and intervene infrequently with remediative efforts after school-age children's injuries (Peterson et al., 1995). Together, these studies yield little insight into how children think about risky situations or how they may be learning from their own injuries. Thus, this project sought to illuminate how children explain their behavior in potentially risky situations with the ultimate goal of informing parents and practitioners about some of the essential elements of socializing safe behavior in children.

A number of meaningful findings emerged. First, a comparison of the reasons offered by children for their injuries revealed that most often children assigned fate as the primary reason for their minor injuries. Nearly one third of the time (30%) children reported that they became injured primarily due to reasons out of their control. The 8-year-olds who participated in this study are nearing adolescence. Current research shows that from age 10 to 18, children's time with family and siblings decreases significantly and becomes filled with time spent alone, time spent with friends, and time spent late at school (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996). Missouri law states that children can legally be without adult supervision at 8 years of age (Masters, 1978). Thus, the opportunity to experiment with risky behavior outside of adult supervision starts for this group at age 8. With this early history of believing that injuries and risk of personal harm are often outside of the individual's control, the results of this study lead one to wonder how children will make informed decisions about their own health and safety.

Two related findings suggest the significance of safety-oriented communications between parents, adult caregivers, and children about what constitutes acceptable and unacceptable behavior. First, the frequency with which children assumed primary responsibility for injuries increased significantly when children acknowledged having been engaged in behavior unacceptable to their mothers. This finding speaks to the importance of parental information sharing with children about what kinds of behaviors are acceptable and unacceptable and to establishing family safety rules. A recent study by Peterson and Saldana (1996) reported that the number of injuries children experienced was negatively related with the number of safety rules endorsed by the family; children from families with more safety rules were injured less often. Moreover, school-age children do have the ability to articulate the causal relations between preventive measures and behavioral safety (Coppens, 1986). Thus, by establishing safety rules and talking with school-age children about how the rules are intended to prevent harm, parents may ensure that children more readily see the connection between their own behavior and their own safety. However, an important caveat to the findings reported in the current study concerns the fact that children rated injury attributions and acceptability of pre-injury behavior at the same time; thus, the reports may be confounded.

Children's immediate experience of post-injury guilt and their later reasons for the injury also revealed an increase in the children's willingness to assume primary blame for the injury. Guilt begins to develop in the second and third year (Lewis, 1992), and individual differences in children's experience and expression of guilt are believed to be the result of parental socialization efforts (Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). A study with school-age children reported that 8-year-olds associated their guilty feelings with violating norms of social behavior (Ferguson, Stegge, & Damhuis, 1991). Consequently, the experience of guilt is linked with engaging in behavior that the individual recognizes as wrong. The results from the current study support the significance of parents providing children with knowledge concerning what is appropriate and inappropriate behavior. When one believes oneself to be the cause of something, personal responsibility for future behavior will likely increase (Weiner, 1993). Perhaps the child's guilt indicates an understanding that his or her behavior was careless and that future injury situations may be avoided with more careful and thoughtful behavior (e.g., Weiner, 1986).

A number of nonsignificant findings also emerged. Specifically, gender was not associated with the assignment of attributions to injury, nor did children's injury experience affect the reasons provided for injuries. There are no studies that document differences between boys' and girls' experience of minor injuries. However, the attribution literature has reported that assigning cause to various situations varies by gender, especially in the case of personal failure (e.g., Burgner & Hewstone, 1993). Perhaps the lack of attribution differences by child gender can be explained by the uniqueness of the setting; little research has been completed concerning school-age children's attributions concerning their own safe and risky behavior.
Another nonsignificant finding was the lack of association between children's injury frequency and attribution assignment. A recent study examined risk for childhood injury by comparing one's self-reports of physical ability to the physical demands of a task and reported that 8-year-olds benefited from success and failure experiences during practice trials and, as a result, were able to more accurately estimate their physical abilities during real trials (Plumert, 1995). Thus, associations between the differential experience of many or few injuries and the way that children thought about their injuries were expected. For instance, we anticipated that children with the highest frequency of injuries would assign blame to fate and to external reasons more than children who were injured less frequently. On the other hand, some risk takers may self-attribute injury to their risk-taking and other frequently injured children may regard themselves as "clumsy," and also self-attribute, thus canceling out the expected effect.

In any case, this hypothesis was not supported by the data. One reason concerns the complexity of childhood injuries. How children think about their own injuries is probably a reflection of the combined influence of parental and peer socialization efforts about safe behavior and innate characteristics of the child. Current theory regarding the development of conscience reveals the complex yet systematic interplay of parenting styles and child characteristics (Kochanska, 1993). An earlier report indicated that within this sample, parents engaged in very little remediation after their children's injuries (Peterson et al., 1995). Perhaps if there was an indication that parental socialization efforts toward safe behavior varied more widely, significant differences may have emerged by children's injury frequency. However, children's injury experiences may be more heavily influenced by innate characteristics of the child. One study reported systematic differences in childhood injury rates on the basis of child activity level (Langley, McGee, Silva, & Williams, 1983). These nonsignificant findings suggest that future research should address the interplay of parental socialization efforts and innate child characteristics in determining how children think about their behavior during risky situations.

Thus, the absence of anticipated findings reveals the limitations of this study. One limitation concerns the nature of the sample. The mothers and children who participated in this study represent a group of Caucasian, middle-class families. The results are generalizable only to the same population. Interviewing more than one group of families, for example, a low-income sample, may reveal group differences in how a child's gender or injury history predicts children's thoughts about the cause of their injuries.

In summary, the findings revealed speak directly to the significance of establishing and communicating safety rules to school-age children. Additionally, talking with children after their injuries, especially about their feelings, may be a way to further promote family rules about safe behavior. Assisting children to interpret their experiences may facilitate adaptive socialization of prevention and safe behavior (Friedberg & Dalenberg, 1991). However, much research is still needed in the area of socializing safe behavior in children and youths. In closing, the current study provides basic information for parents and practitioners to use when assisting children to make informed decisions about their behavior in potentially risky situations.

Acknowledgments

We thank the project coordinator, Jane Downing; interviewers: Jamie Bartelstone, Ellen Glover, Paul Goddard, Deirdre Kanakis, Lisa Teegarden, and Michelle Zink; coders: Michelle Beabout, Sherie Cain, Kelly Conforti, Steve Deimeke, Doug Flora, Dan Jenkins, Karen Lieberwitz, Stacey Marshall, Luke Messer, Rochelle Moore, Steve Pascoe, Jill Quick, Mark Richmond, Vicki Riney, Brenda Schick, Dena Solomon, and Heather Washburn; and the families who contributed to this project. Tyeece Little and Tammy Brazeal deserve special thanks for their work with data handling and analysis. This research was sponsored by the National Institute of Child Health and Human Development grant RO1 HD25414 to Lizette Peterson.

Received August 20, 1997; accepted March 18, 1998
References


