

THE MODERATING ROLE OF MATERNAL SUPERVISION IN THE
SOCIAL ECOLOGY OF CHILDREN'S UNINTENTIONAL INJURIES

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DEDICATION

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Abstract

Unintentional injuries are the leading cause of death for young children in the United States. Unfortunately, we lack a comprehensive understanding of the factors contributing to children's injuries, particularly with regard to the role of maternal behaviors. Gaining a better understanding of the ways in which maternal behaviors relate to children's injuries may help researchers develop effective strategies for preventing childhood injuries. The present study examined whether levels of maternal supervision moderated the relation of child and social-ecological variables (i.e., maternal, intrafamilial, and extrafamilial factors) in children's environments to children's injury frequencies and severities. The study also examined whether the moderating effects of supervision on the relation of child and social-ecological variables to child injuries were due to between-mother differences in typical supervision levels or due to individual mothers' own fluctuations in supervision across time periods. Primarily upper-middle class Caucasian mothers of 170 toddlers were interviewed biweekly about their children's injuries and their own supervisory behaviors over a 6-month period. The mothers also completed questionnaires assessing variables in their children's social ecologies.

The results showed that maternal supervision levels moderated the effects of maternal locus of control and marginally moderated the effect of maternal marital/partner relationship satisfaction on children's injury frequencies. Surprisingly, however, higher levels of supervision were related to higher frequencies of child injuries for mothers at nearly all levels of locus of control and marital/partner relationship satisfaction. Maternal supervision also moderated the effect of child gender on injury severities, such that

higher supervision was protective for boys but not girls. Within-mother time-period-specific changes in supervision levels moderated relations between the same variables, indicating that findings were due to changes in mothers' time-period-specific supervision levels rather than differences between mothers' typical supervision levels. Nevertheless, typical supervision did moderate the relation of child externalizing behavior to injury frequencies. Replication of this research is needed with a sample of mothers who supervise at lower levels and who have higher levels of injury risk factors to more clearly understand the role of supervision in children's unintentional injuries.

CHAPTER 1

INTRODUCTION

The Moderating Role of Maternal Supervision in the Social Ecology of Children's Unintentional Injuries

Unintentional injuries are the leading cause of childhood deaths in the United States. Young children are particularly at risk for serious harm from injury, as unintentional injuries account for one third of fatalities in 1- to 4-year-old children (Martin, Kochanek, Strobino, Guyer, & MacDorman, 2005). Furthermore, nonfatal unintentional injuries have significant financial ramifications for our society. Families in the United States pay heavily in medical bills and lost wages due to children's unintentional injuries, particularly when parents stay home from work to care for injured children (Osberg, Kahn, Rower, & Brooke, 1996). Moreover, researchers have estimated that unintentional injuries sustained by children in the United States in a single year will result in \$50 billion in medical costs and lost productivity over the course of the injured children's lifetimes (Finklestein, Corso, & Miller, 2006).

In an effort to develop interventions to reduce the frequency of childhood unintentional injuries, several investigators have attempted to identify correlates of children's injuries. These investigators have found that key individual child (e.g., externalizing behavior) and social-ecological variables (e.g., maternal psychological symptomatology, family relations, extrafamilial stress) are related to higher frequencies of unintentional injuries in children. In addition, research has indicated that mothers' direct behavioral interventions with children, particularly maternal supervision, may protect children from unintentional injuries (Morrongiello & House, 2004; Morrongiello,

Midgett, & Shields, 2001; Roday, Damashek, Borduin, & Peterson, 2005; Schwebel & Bounds, 2003; Schwebel, Brezaussek, Ramey, & Ramey, 2004; Wills et al., 1997).

Moreover, recent evidence suggests that maternal supervision may serve as a protective factor for children who are already at higher risk for injury due to their individual characteristics. For example, Schwebel et al (2004) found that maternal time resources moderated the effect of children's hyperactivity on unintentional injury frequencies; hyperactive children whose mothers had more time to spend with the children sustained fewer injuries than those children whose mothers had less time to spend with them.

Maternal supervision may also serve a protective function for children who are subject to other individual and social-ecological risk factors, such as younger age, maternal psychological symptomatology, low socioeconomic status, or extrafamilial stress.

However, no research to date has examined maternal supervision as a moderator of these other risk factors.

The present study investigates whether maternal supervision moderates the relation of individual child and social-ecological variables to children's unintentional injury frequencies and severities. If maternal supervision does moderate the relation of individual and social-ecological variables to children's injuries, then interventions that increase maternal supervision may help to mitigate the effect of risk factors on injuries. The next section of this proposal begins with a discussion of methodological problems in the unintentional childhood injury literature and is followed by a review of substantive findings. The hypotheses and methodology of the study are presented after the literature review.

LITERATURE REVIEW

Methodological Issues

Before turning to a review of substantive findings, some of the measurement and design issues that are commonly encountered in this area of research are discussed.

Measurement Issues

Measurement problems in the child unintentional injury literature include a selective focus on injuries treated at hospitals, the use of retrospective reports of children's injuries, an exclusive focus on injury frequency as the sole dependent variable, and inconsistent measurement of maternal supervision across studies.

Focus on injuries treated at hospitals

The majority of studies have examined only those child injuries that were treated at hospitals (Hambridge, Davidson, Gonzales, & Steiner, 2002). Typically, researchers have gathered data on unintentional injuries by obtaining hospital records or by asking mothers to recall (e.g., for the past year) the number of injuries for which their children received hospital care. However, focusing only on injuries treated at hospitals is problematic because families often seek treatment from primary care settings rather than hospitals (Hambridge et al., 2002). In addition, many child injuries do not receive any medical attention despite the fact that these injuries may be just as severe as those that do receive medical attention. Indeed, some mothers, particularly those from ethnic minority backgrounds, may avoid seeking treatment for their children's injuries due to a lack of insurance or money to pay for services (see Overpeck, Jones, Trumble, Scheidt, & Bijur, 1997). Thus, examining only injuries that were treated in hospitals likely underrepresents children's frequencies of injuries.

Retrospective reports

Many investigators (e.g., Kohen, Soubhi, & Raina, 2000; Matheny, 1986; McCormick, Shapiro, & Starfield, 1981; Schwebel, Binder, Sales, & Plumert, 2003) have also relied on mothers' retrospective reports of their children's frequencies of unintentional injuries (e.g., number of injuries over the previous year). However, there is some evidence that mothers' memories of past injury events are inaccurate (Harel et al., 1994; Peterson, Moreno, & Harbeck-Weber, 1993). For example, Peterson et al (1993) found that mothers of 8- to 11-year-old children were more likely to remember medically attended injuries (i.e., those injuries that were treated at hospitals) than non-medically attended injuries, indicating that mothers' recall may be somewhat selective. Selective memory for medically attended injuries makes it difficult for investigators to gather accurate reports on other injuries, which are important for the reliable assessment of children's injury risk.

Focus on injury frequencies

Most studies have examined unintentional injury frequencies as a dependent variable, to the exclusion of injury severities. Investigation of injury severities as an outcome variable could help to clarify which factors put children at risk for the most harm from injuries and, consequently, which factors are the most important to target in prevention efforts. Furthermore, examining factors related to injury severities may allow prevention researchers to design interventions that limit the physical impact of injuries, even when injuries are not entirely prevented.

Measurement of maternal supervision

Measurement of maternal supervision in the literature has been inconsistent because of varying definitions of the construct (Morrongiello, 2005; Saluja et al., 2004). Some researchers have measured supervision very generally, either as the physical presence or absence of a caregiver when a child injury occurred (Wills et al., 1997) or in terms of one-time measures of global supervisory style across injury contexts (Morrongiello et al., 2001). Other investigators have examined supervision levels that are specific to injury events (Peterson, DiLillo, Lewis, & Sher, 2002). Although assessing global supervisory style is less time-consuming and more efficient than measuring mothers' supervision for each injury event, important data may be lost when using only one measure of supervision. Research is needed to clarify whether one-time measures of supervision are equal to or stronger predictors of injury outcomes than are time-period-specific measures of supervision. Research indicating that one-time measures of supervision are equal or stronger predictors of injury might allow some investigators to use more efficient measures of supervision. Alternatively, research indicating that time-period-specific measurement of supervision is a stronger predictor of injury would suggest that researchers should use detailed measures of supervision when possible.

Another problem with measurement of maternal supervision is that some investigators have asked mothers to report how closely they would supervise their children in hypothetical situations (Morrongiello, Onjeko, & Littlejohn, 2004b). However, measures of supervision in hypothetical situations may be inaccurate reflections of caregivers' actual behavior because mothers might provide socially desirable responses (Saluja et al., 2004). In addition, many other variables (e.g., maternal

intoxication, environmental noise) that would not typically be assessed in hypothetical situations might also influence mothers' ability to supervise their children (Damashek, Williams, & Sher, 2003; Damashek, Williams, Ronis, & Borduin, 2005).

Design Issues

Most unintentional injury studies have been correlational and cross-sectional. Thus, it has been difficult to determine whether a given risk factor led to a higher frequency of injuries or whether the risk factor simply co-occurred with high injury frequencies because of unknown third variables. Prospective and longitudinal designs would help researchers to make more valid inferences about causality. Longitudinal designs that follow children for a period of years might also allow investigators to examine whether the relation of injury risk factors to injury outcomes changes as children develop both cognitively and physically.

Substantive Findings

The discussion of substantive findings in the present review is divided into three sections. The first section presents research on the relation of child and social-ecological variables to unintentional injury frequencies and severities. Next, literature examining the protective role of maternal supervision on children's injury frequencies and severities is discussed. Finally, evidence suggesting that maternal supervision might moderate the effect of child and social ecological variables on injury frequencies and severities is examined.

The literature in the present review will be organized using a social-ecological model of child development. Bronfenbrenner (1979) and Belsky (1984) have posited that children are embedded within several levels of systems in their environments and that

these systems have direct and indirect influences on children's development. As can be seen in Figure 1, the innermost level, or the "microsystem," includes the child's individual characteristics, as well as relationships between the child and significant others (e.g., family members, teachers). The next level is the "mesosystem," which includes transactions between two or more microsystems, such as between children's parents or between family members and school personnel. Next, the "exosystem" includes settings in which children do not actively participate but may affect or be affected by events that occur in these settings (e.g., a parent's work place, a sibling's peer group). Finally, the "macrosystem" includes the child's broader social context, including the society's cultural beliefs and practices. In the present study, variables have been chosen to represent several levels of children's social ecologies, including child and maternal factors (i.e., "microsystems"), intrafamilial factors (i.e., "microsystems" and "mesosystems"), and extrafamilial factors (i.e., "exosystems").

The Relation of Child and Social-Ecological Variables to Injury Outcomes

The injury literature links child, maternal, intrafamilial, and extrafamilial variables to children's unintentional injury frequencies and severities.

Child Factors

Three child variables (i.e., gender, age, and externalizing behavior) are associated with injury frequencies and severities.

Child gender. The injury literature indicates that boys sustain a higher number of unintentional injuries (Baker, O'Neill, Ginsburg, & Li, 1992; Morrongiello, Onjenko, & Littlejohn, 2004a; National Safety Council, 2001; Rosen & Peterson, 1990) and more severe injuries than do girls (Rivara, Bergman, LoGerfo, & Weiss, 1982). One possible

reason for gender differences in injury frequencies and severities is that boys engage in more risk taking behaviors than do girls (Ginsburg & Miller, 1982; Morrongiello et al., 2004a). Indeed, in one of the few observational studies to examine gender differences in injury risk, Morrongiello and Dawber (1998) found that boys approached and touched simulated hazards in a laboratory setting more often than did girls. Other research has found that boys perceive lower risk of injury in potentially hazardous situations than do girls, which may account for boys' tendency to take more risks (Hillier & Morrongiello, 1998).

Child age. Research suggests that toddlers are at higher risk for unintentional injury than are older children (excluding adolescents) and that these injuries tend to be more severe than for older children. For example, Laflamme and Eilert-Petersson (1998) found that 1- and 2-year-old boys and girls in Sweden sustained more injuries in the home than did children who were 3 to 6 years old. Similarly, other researchers have found that child age is inversely related to risk for injury (Bradbury, Janicke, Riley & Finney, 1999) and to rates of mortality from injury (Baker et al., 1992; Centers for Disease Control and Prevention, 2006; Fingerhut & Kleinman, 1989).

Child externalizing behavior. Several studies have found that children (ranging in age from 2 to 8) with behavior problems are at greater risk for unintentional injury than are children without behavior problems. For example, children diagnosed with Attention Deficit Hyperactivity Disorder or Oppositional Defiant Disorder have been found to sustain more injuries than have children without these diagnoses (DiScala, Lescohier, Barthel, & Guohua, 1998; Rowe, Maughan, & Goodman, 2004; Schwebel, Speltz, Jones, & Bardina, 2002). Similarly, other studies have found that children who are more active,

oppositional, or impulsive are at higher risk for injury than are children who are less so (Bradbury et al., 1999; Bussing, Menvielle, & Zima, 1996; Davidson, Taylor, Sandberg, & Thorley, 1992; Jaques & Finney, 1994; Matheny, 1987; Schwebel & Plumert, 1999).

Maternal Factors

Evidence suggests that maternal characteristics, including psychological symptomatology and parental locus of control, are linked with children's unintentional injuries.

Psychological symptomatology. Several studies have indicated that maternal psychological symptomatology is related to unintentional injuries in young children. An early study (Brown & Davidson, 1978) found that infant to 16-year-old children of mothers who met (or almost met) criteria for various psychiatric disorders had higher rates of medically attended injuries than did children of mothers who did not meet such criteria. More recently, other researchers have found that maternal depression in particular is related to maternal-reported rates of serious injuries in low-income, minority infants (Harris & Kotch, 1994) and to medically attended injuries in Caucasian preschool children (Russell, 1998). Similarly, Bradbury et al. (1999) found that levels of self-reported maternal anxiety predicted injury frequencies over a 1-year period in 5- to 11-year-old children. Mothers who are suffering from psychological distress may not realistically appraise the risk of injury to their children and, thus, may not engage in appropriate safety behaviors. These mothers may also lack the energy or concentration necessary to implement injury prevention measures.

Maternal locus of control. Locus of control refers to people's beliefs about their agency to influence the events in their lives. Persons with an external locus of control feel

somewhat powerless to influence life events. Conversely, persons with an internal locus of control believe in their ability to change or affect their life circumstances (Lefcourt, 1982). In the same vein, parental locus of control refers to parents' perceptions of their ability to influence their children's behavior or outcomes in their children's lives (Campis, Lyman, & Prentice-Dunn, 1986). An external parental locus of control has been linked with several childhood psychosocial problems among children ages 2 to 12, including oppositional behavior, internalizing symptoms, and low social competence with peers (Hagekull, Bohlin, & Hammarberg, 2001; Mouton & Tuma, 1988; Roberts, Joe, & Rowe-Hallbert, 1992). It would stand to reason that mothers with an external parental locus of control may also feel powerless to protect their children from injuries and that their children may thus have higher frequencies of injuries.

Intrafamilial Factors

Several studies have investigated the relation of intrafamilial factors (i.e., characteristics of the family and relationships within the family) to child injury frequencies and severities. Intrafamilial variables that are particularly important to the study of child unintentional injuries include family socioeconomic status (SES), maternal marital/partner relationship satisfaction, and mother-child relationship quality.

Socioeconomic status (SES). A large body of research indicates that family SES is related to child injury frequencies. Several studies have found that children from poor families or disadvantaged neighborhoods are at greater risk for medically attended injuries as assessed by maternal report (Schwebel et al., 2004) or official records (Durkin, Davidson, Kuhn, O'Connor, & Barlow, 1994; Faelker, Pickett, & Brison, 2000; Haynes, Reading, & Gale, 2003; Hippisley-Cox et al., 2002; Joly, Foggin & Pless, 1991; Laing &

Logan, 1999; Pless, Verreault, & Tenina, 1989; Pomerantz, Dowd, & Buncher, 2001; Reading, Langford, Haynes, & Lovett, 1999; Rivara & Barber, 1985; Walker & Raines, 1982; Walsh & Jarvis, 1992) than are children from wealthier families. Children from lower SES families are also at greater risk for sustaining severe (Hippisely-Cox et al, 2002; Reading et al., 1999; Walsh & Jarvis, 1992) or deadly injuries (Nersesian, Petit, Shaper, Lemieux, & Naor, 1985; Sharples, Storey, Aynsley-Green, & Eyre, 1990; Scholer, Mitchel, & Ray, 1997) than are children from middle to upper SES families. For example, Nersesian et al. (1985) found that children whose parents were involved in social welfare programs were 2.6 times more likely to die from unintentional injuries than were other children. Children from lower SES backgrounds might be at greater risk for injuries because their parents are less likely to be able to afford safety equipment (e.g., stair gates) or may work longer hours and have less time and energy available to focus on injury prevention.

Maternal marital/partner relationship satisfaction. Investigators have found that higher levels of family conflict (i.e., aggression, conflict, overt anger) are related to higher unintentional injury frequencies among infants (Harris & Kotch, 1994). However, researchers have not yet specifically investigated the relation of marital conflict to children's injury frequencies. It seems likely that marital or romantic discord would cause mothers to feel emotionally and physically depleted. Conflict in marriages or romantic relationships might also result in spouses or partners being less available to help with household and family-related tasks. In either case, mothers might have less attention and energy to devote to injury prevention behaviors with their children.

Mother-child relationship quality. There is some evidence to suggest that mother-child relationship quality is related to children's unintentional injury frequencies. Using naturalistic observations, Morrongiello and House (2004) found that parents' engagement (i.e., time spent actively playing) with their 2- to 5-year-old children on a playground was negatively related to the frequency of parent-reported severe child injuries. Similarly, based on mothers' reports of relationship quality, other studies have found that 3-year-old (Schwebel & Brezaussek, 2007) and 5- to 12-year-old (Christoffel, Donovan, Schofer, Wills, & Lavigne, 1996) children who experienced less parental emotional support, infants who experienced more family conflict (Harris & Kotch, 1994), or 5-year-olds who had less positive time with their parents (e.g., going on outings, playing games with them; Schwebel et al., 2004), had more medically attended injuries than did other children. It seems likely that mothers who have poor relationships with their children may be less motivated than other mothers to invest time in child injury prevention behaviors. Children with poorer relationships with their mothers might also be less likely to seek proximity to their mothers because such interactions may be less rewarding than for other children.

Extrafamilial Stress

In perhaps the only study to specifically examine the relation of extrafamilial stress to unintentional injury frequencies in children, Christoffel et al. (1996) found that 5- to 12-year-old children who experienced more stressful life events outside of their immediate families (e.g., death of an extended family member) were more likely to be seen at a hospital for a pedestrian injury than were children who reported fewer stressful events. It seems highly plausible that mothers of children who experience frequent

stressful extrafamilial events (e.g., death of a family friend) are likely, as are their children, to be emotionally upset by these events. Mothers who are emotionally upset from stressful events may be distracted from engaging in injury prevention behaviors with their children. Mothers may also be distracted by tasks that are required of them as a result of dealing with stressful events (e.g., providing emotional support to the family of a deceased friend).

The Relation of Maternal Supervision to Injury Outcomes

A relatively small body of research has helped to explain the relation of maternal supervision to child injury outcomes. As noted previously, some researchers have used one-time global indices of supervision, while others have used injury or time-period-specific measures of supervision.

In a study that used a global indice of maternal supervision (i.e., general supervisory style as measured by a self-report instrument), Pless et al. (1989) found that closer supervision was related to lower frequencies of police- and hospital-reported serious injuries in children below age 15. Other studies using global indices have found similar results for less serious injuries reported retrospectively by mothers of 4- to 6-year-old children (Morrongiello et al., 2001) and prospectively by mothers of 2- to 3-year-old children (Morrongiello et al., 2004b). Similarly, Schwebel et al. (2004) reported that 6- to 36-month-old children of parents who used less restriction (i.e., allowed their children to explore more) and who spent less time with their children had a higher risk of retrospective parent-reported medically attended injuries.

Other investigators have found that the mere presence or absence of a caregiver is related to unintentional injuries. Using medical records, police reports, and parent and

child interviews about child pedestrian-vehicle injuries (i.e., pedestrians struck by cars), Wills et al. (1997) found that the majority of 5- to 12-year-old children who were treated at hospitals were also unsupervised (i.e., no adult was present) at the time of their injuries. Similarly, Morrongiello et al. (2004b) found that child injury frequencies were prospectively linked with the length of time that mothers reported they would leave their 2- to 3-year-old children alone in high-risk rooms (i.e., bathroom and kitchen).

Three studies have used measures of maternal supervision that were specific to each unintentional injury event. Using mothers' diary reports of their children's injuries, Morrongiello et al. (2004b) found that lower levels of mother-reported supervision (i.e., self-reported visual and auditory monitoring of children) were prospectively related to 2- to 3-year old children's minor injury frequencies. In another study of 2- to 5-year-old children, Morrongiello, Corbett, McCourt, and Johnston (2006) found that mothers' diary records of supervision were related to maternal reports of *medically attended* injuries but not non-medically attended injuries. Similarly, in a methodologically sophisticated study using observational measures of maternal supervision on the playground, Morrongiello and House (2004) found that levels of maternal supervision were inversely related to mothers' reports of serious injuries in 2- to 5-year-old children.

Only one study to date has examined the relation of maternal supervision to children's injury severities. Roday et al. (2005) found that laboratory observations of maternal supervision were related to lower injury severities in 15- to 36-month children's homes and other community settings. Maternal supervision may be important for mitigating the impact of injuries once they occur because mothers can intervene in a more immediate way to lessen the severity of injuries.

*Maternal Supervision as a Moderator of the Relation of
Child and Social-Ecological Risk Factors to Injury*

To date, there have been few studies that have explicitly examined maternal supervision as a moderating variable in the relation of injury risk factors to children's injury outcomes. However, a growing body of research findings point to the potential moderating role of maternal supervision in the relation of individual child and social ecological variables (maternal, familial, and extrafamilial) to children's injury frequencies and severities.

Child Characteristics

Some studies have examined the potential role of maternal supervision in moderating the relation of child characteristics (i.e., gender, age, and externalizing behavior) to child injury outcomes.

Child gender. As noted earlier, boys typically sustain a higher frequency of injuries and more severe injuries than do girls (Baker et al., 1992; Rosen & Peterson, 1990). In addition, mothers have indicated that they are more able to prevent risky behavior in 6- to 10-year-old girls than in boys (Morrongiello & Hogg, 2004) and that they allow 2- to 9- year-old boys more independence than girls (Morrongiello & Dawber, 1999, 2000; Soori & Bhopal, 2002). Moreover, evidence from an observational study suggests that male toddlers may be less compliant than are female toddlers with their mothers' attempts to direct them away from hazards (Morrongiello & Dawber, 1998). Taken together, these studies suggest that maternal supervision may interact with child gender, such that supervision may be more effective in preventing injuries among girls than among boys.

Child age. Younger children are naive about the inherent dangers in their environment. For example, Hillier and Morrongiello (1998) found that 6-year-old children identified fewer risk factors in photographs of potentially hazardous play situations (e.g., a child going down a slide with another child standing at the bottom of the slide) than did 10-year-old children. Younger children also tend to be less physically coordinated (Clark & Phillips, 1993) and less realistic about their abilities than are older children, putting younger children at greater risk for injury (Plumert, 1995; Plumert & Schwebel, 1997). Thus, maternal supervision may be particularly important for helping younger children to navigate their environments safely and for preventing injuries.

Child externalizing behavior. As noted, active, impulsive, aggressive, and noncompliant children, above age 5, are at higher risk for injury than are other children (Bradbury et al., 1999; Bussing et al., 1996; Rowe et al., 2004; Schwebel & Plumert, 1999). Thus, children with such characteristics may need closer maternal supervision and intervention to keep them from behaving in ways that are hazardous. Indeed, Schwebel et al. (2004) found that among 5-year-old children who displayed higher levels of hyperactivity, those children who spent more time with their parents had fewer injuries than did those children who spent less time with their parents. Similarly, in an observational study, Schwebel, Hodgins, Bart, and Sterling (2006) found that mothers' ignoring of risky behavior among 5- to 11-year-old children with histories of externalizing behavior was positively correlated with child injury history. Of note is that the majority of studies in this area have included children over age 5; however, it is reasonable to expect that younger children with high levels of externalizing behavior would also benefit from higher levels of maternal supervision.

Maternal Characteristics

The potential moderating role of maternal supervision in the relation of maternal characteristics (i.e., psychological symptomatology and locus of control) to children's injury outcomes has seldom been examined by researchers. However, the available evidence will be presented below.

Psychological symptomatology. Both maternal depression and anxiety have been found to be related to higher frequencies of children's injuries (Bradbury et al., 1999; Brown & Davidson, 1978). Children of depressed mothers may be at higher risk for injury because depressed mothers have been found to use more lax (i.e., permissive) parenting strategies (Dumas, Gibson, & Albin, 1989) in comparison to non-depressed mothers. Similarly, anxious mothers have been found to be less responsive toward their 9-month-old children (Nover, Shore, Timberlake, & Greenspan, 1984) and to monitor their 8- to 11-year-old children less closely than are non-anxious mothers. It would appear that depressed or anxious mothers who are lax or who monitor their children less closely put their children at higher risk for injuries. However, children of mothers who are able to maintain appropriate levels of supervision despite their depression or anxiety may be protected from increased injury risk. Indeed, Tiet et al. (2001) found that among 9-17-year-old children of mothers exhibiting various symptoms of psychopathology (e.g., depression, anxiety, substance abuse), close parental (i.e., maternal or paternal) supervision emerged as a protective factor in preventing child behavioral and emotional problems. Although these findings emerged for older children, it is possible that close supervision might also mitigate the effect of maternal psychopathology on younger children's injury frequencies and severities.

Locus of control. Given the fact that an external maternal locus of control is connected to a range of child psychosocial problems (Hagekull et al., 2001; Mouton & Tuma, 1998; Roberts et al., 1992), it seems reasonable to suggest that an external maternal locus of control may also be related to higher injury frequencies among children. Mothers with an external locus of control may lack confidence in their ability to prevent injuries in their children and, as a result, may not invest much energy in safety-proofing their homes or teaching their children safety rules. Therefore, children of mothers with external loci of control may particularly benefit from their mothers' use of close supervision and may be at lower risk for injury than are children of mothers with external loci of control who do not supervise closely.

Intrafamilial Factors

Some evidence points to the possibility that maternal supervision may also moderate the effect of family variables such as SES, maternal marital/partner relationship satisfaction, and mother-child relationship quality on children's injury frequencies and severities.

SES. As noted earlier, the relation between SES and child injury outcomes has been well established. Indeed, several investigations have indicated that parents from lower SES backgrounds engage in fewer injury prevention behaviors with their young children than do parents from higher SES backgrounds (Glik, Kronenfeld, & Jackson, 1993; Hapgood, Kendrick, & Marsh, 2000; Thuen, 1992). The relation between SES and children's injuries may also be due to lower SES mothers' inability to purchase safety devices for their children (e.g., stair gates), environmental hazards due to poor housing conditions (e.g., windows without screens), or lack of education about appropriate safety

devices to employ. In the absence of environmental safety devices in the home, maternal supervision may be particularly important in preventing injuries in low SES children.

Maternal marital/partner relationship satisfaction. A large literature suggests that marital conflict is related to parenting difficulties (see Engfer, 1988; Erel & Burman, 1995) and consequently to child psychosocial problems (Erel & Kissil, 2003; Kerig, 1998). Parents in conflict may be preoccupied with marital concerns and therefore may devote less attention to their children. Alternatively, some mothers engaged in marital conflict may devote more attention to their children to avoid interactions with spouses or to meet their own emotional needs. It is likely that children who experience a withdrawal of maternal attention as a result of marital conflict would receive less maternal supervision and sustain more injuries than would children who receive an increase in maternal attention as a result of marital conflict.

Mother-child relationship quality. As suggested by Dishion and McMahon (1998), mothers' motivation to supervise their children is likely related to the quality of the mother-child relationship. Although Dishion and McMahon (1998) draw their conclusions from research with adolescents, it is likely that mothers' motivation to supervise is also related to their relationships with younger children. Mothers who have a warm and loving relationship with their children seem likely to try to remain in close proximity to them and to supervise them closely. However, mothers who do not have a warm relationship with their children would seem more likely to withdraw attention from their children and to supervise them less closely (i.e., neglectful parenting). Or, these mothers might remain in close proximity to their children but engage in harsh and negative interactions with them (i.e., authoritarian parenting). Those children who have a

poor relationship with their mothers but who remain in close proximity to their mothers may sustain fewer injuries than those children who do not remain in close proximity to their mothers.

Extrafamilial Stress

There is some evidence that extrafamilial stress may distract mothers from their child-rearing responsibilities. For example, in a study of families with children below age 5, Glik et al. (1993) reported that mothers with higher levels of extrafamilial and intrafamilial stress engaged in fewer safety behaviors (e.g., supervision of children during bathtime) than did mothers with lower levels of such stress. However, it is not clear how much of the effect was uniquely due to extrafamilial stress because this study did not differentiate between stress from within versus outside of the family. Nevertheless, it seems reasonable to suggest that if mothers experiencing stress are able to continue to supervise their children carefully, these children should be at lower risk for injury than are those children who receive less supervision. Furthermore, children of mothers who supervise closely and have low levels of stress are likely to be at the lowest risk for injury overall.

Summary

A relatively sizeable body of research provides evidence that child (i.e., gender, age, externalizing behavior), maternal (i.e., psychological symptomatology, locus of control), intrafamilial (i.e., family SES, maternal marital/partner relationship satisfaction, mother-child relationship quality), and extrafamilial (i.e., stressful life events) variables are related to injuries in young children. In addition, several studies support the idea that maternal supervision is related to lower injury frequencies and severities in young

children. Moreover, evidence from one study suggests that the effect of child externalizing behavior on injury in young children is moderated by close maternal supervision. Since maternal supervision moderates the effect of child behavior on injuries, it is possible that mothers' supervision also moderates the relation of other child (i.e., gender, age) and social-ecological (i.e., maternal, intrafamilial, and extrafamilial factors) injury risk variables to children's injury outcomes (i.e., frequencies and severities).

Study Overview

The primary goal of the present study is to examine whether maternal supervision of young children (ages 15-36 months) moderates the relation of child and social-ecological variables to children's injury frequencies and severities. Figure 2 depicts the moderation model. Child variables include gender, age, and externalizing behavior. Social-ecological variables include maternal (psychological symptomatology, locus of control), intrafamilial (family SES, maternal marital/partner relationship satisfaction, mother-child relationship quality), and extrafamilial (life stress) factors. If supervision moderates the effects of child and social-ecological risk factors on child injury outcomes, then programs that increase supervision levels for mothers of at-risk children may mitigate the effects of risk factors, thereby lowering injury frequencies and severities.

A secondary goal of this study is to examine whether differences between mothers' typical supervision levels or within-mother changes in supervision across time intervals will account for the moderational effects of biweekly supervision on the relation of child and social-ecological variables to injury frequencies and severities. Examining whether differences between mothers or within mothers account for the moderating

effects of maternal supervision on the relation of child and social-ecological variables to children's injury outcomes may help to inform researchers as to whether time-period-specific measures of mothers' supervision levels or one-time measures of supervision should be used in future studies.

The present study attempts to address a number of the methodological limitations in prior research. First, this study uses a prospective method to investigate children's daily injury events and mothers' supervision behaviors. Second, the present study includes data about all child injuries over a 6-month period, regardless of whether the injuries received medical attention. Third, this study examines both the frequencies and severities of children's injuries. The following section presents the study's hypotheses.

Hypotheses

Based on findings from previous research, the following hypotheses were tested in the present study:

1. It was expected that levels of maternal supervision would be inversely related to children's unintentional injury frequencies and severities (e.g., Morrongiello et al., 2006; Pless et al., 1989; Romay et al., 2005).
2. It was expected that child and social-ecological variables, including (a) male gender (e.g., Baker et al., 1992; National Safety Council, 2001; Rosen & Peterson, 1990), (b) younger child age (e.g., Bradbury et al., 1999; Laflamme & Eilert-Petersson, 1998), (c) higher levels of child externalizing behavior (e.g., Bradbury et al., 1999; Davidson et al., 1992; Rowe et al., 2004), (d) higher levels of maternal psychological symptomatology (e.g., Bradbury et al., 1999; Russell, 1998), (e) a more external maternal locus of control (e.g., Morrongiello, 2004a), (f) lower family SES (e.g., Durkin et al., 1994; Haynes et al.,

2003; Hippiisley-Cox et al., 2002; Walsh & Jarvis, 1992) (g) lower maternal marital/partner relationship satisfaction, (h) poorer mother-child relationship quality (e.g., Morrongiello & House, 2004; Schwebel et al., 2004), and (i) higher levels of extrafamilial stress (e.g., Christoffel et al., 1996) would predict higher injury frequencies and severities.

3. It was expected that maternal supervision would moderate the effect of child gender, such that higher levels of supervision would be related to lower injury frequencies and severities in girls than in boys.

4. It was expected that maternal supervision would moderate the effect of child, maternal, intrafamilial, and extrafamilial risk factors on children's injury frequencies and severities, such that children who were supervised closely and had injury risk factors including (a) younger age, (b) higher levels of externalizing behavior, (c) mothers with higher levels of psychological symptomatology (d) mothers with a more external loci of control, (e) lower family SES, (f) mothers with lower marital/partner relationship satisfaction, (g) poorer relationships with their mothers, and (h) higher levels of extrafamilial stress would sustain fewer and less severe injuries than would children who were not supervised closely and had any of the preceeding risk factors.

5. It was expected that fluctuations within individual mothers' supervision across time periods would be stronger moderators of the effects of child and social-ecological variables on injury outcomes than would differences between mothers' typical supervision levels.

CHAPTER 2

METHOD

Participants

Data for the present study were collected as part of the Toddler Injury Observation Study, a larger project designed to examine the antecedents and consequences of minor injuries in toddlers (Peterson et al., 2002). Participants for the present study were 170 mothers of 15- to 36-month-old children (92 boys, 78 girls).

The mean age of mothers in the sample was 28.8 years ($SD = 4.36$; range = 17 to 39). The mothers were primarily Caucasian (91%); the remainder were African-American (5%), Asian (1%), Hispanic (1%) or did not specify their ethnicity (2%). The mothers were of mostly upper-middle SES; their mean social status score was 46.4 (class II; Hollingshead, 1975). The majority of the mothers were married (83%); the rest of the mothers had never been married (8%), were divorced (5%), or were living with a partner (4%). Nearly half (42.4%) of the mothers were employed 30 or more hours per week. Mean family income was \$35,000 to \$40,000. The largest proportion (46%) of participants were college graduates; other participants had received some post-college education (18%) or some college education (20%), were high school graduates (8%), had completed some high school (3%), or had “other” education (5%).

Potential participants were identified using a list of child patients from a local pediatric clinic and were recruited via telephone by research assistants using a standard script (see Appendix A). The study was also advertised in local newspapers and by word of mouth. Mothers were eligible to participate if (a) they had only one child (unless the second child was more than 10 years older than the target child), (b) the child had not

been hospitalized overnight for an injury, (c) the child did not have a developmental disability, and (d) English was the mother's primary language. These criteria were employed to reduce birth order effects and to reduce the chance that mothers might be unduly influenced by salient injury events from their child's past or by unusual child physical vulnerabilities. These criteria also helped to ensure that mothers could understand interviewer questions and accurately describe their children's injury events. At the beginning of the study, 181 mothers were enrolled; however, 11 mothers dropped out before the study was completed due to lack of time or motivation to participate.

Procedure

Before data collection began, the primary investigator (Lizette Peterson) for the larger project applied for and received human subjects approval from the Campus Institutional Review Board of the University of Missouri-Columbia. Next, five full-time bachelor's level staff and one part-time graduate student were each trained for approximately 40 hours to administer semi-structured interviews to participants. Training consisted of detailed instruction in the interview procedures and several practice interviews with other staff and volunteer mothers.

Biweekly interviews (see Appendix B) were conducted with mothers in their homes for a period of 6 months. Interviews were audiotaped and checked periodically by the project coordinator for interview protocol adherence. The first interviews began with an introduction, during which the mothers were told that they were participating in a study about unintentional injuries and were asked to sign an informed consent form (see Appendix C). The interviewers also trained the mothers to use monitoring sheets (see Appendix D) that requested information about their children's behaviors and locations

during injury events. Information from the monitoring sheets was later used during interviews to prompt mothers' recall of injury events. The mothers were also instructed to ask their children's other caregivers about injury events that may have occurred when the mothers were not present and to record those events on monitoring sheets; however, only injury events for which the mothers were supervising their own children (i.e., 73% of injury events) were used in the present study.

Mothers were interviewed on 12 separate occasions, with each interview lasting 2 hours. When any interviews lasted less than 2 hours, interviewers asked mothers to complete questionnaires about various aspects of their own mental health, their roles as parents, and their family relationships. This procedure was used to assess key maternal and family variables and to prevent mothers from attempting to shorten the interviews by underreporting injury events. Questionnaires (including those used in the present study) that were considered to be more central to the goals of the larger study were completed during the first several months, whereas other questionnaires were administered later if time allowed. Mothers were each paid \$596.00 for their participation in the study. Half of this amount was paid in monthly checks (approximately \$50 per month); the remaining amount (\$298.00) was paid at the end of the study to reduce the likelihood of attrition.

Measures

The data in the present study had a nested (i.e., multilevel) structure because some of the variables were measured repeatedly for each child, while other variables were measured only once. Variables that were measured repeatedly (i.e., injury frequencies, injury severities, and maternal supervision) were designated as level 1. Other variables that assessed more stable child or social-ecological factors (e.g., child age, maternal

psychological symptomatology, parent-child relationship quality) and were measured on only one occasion were designated as level 2.

Outcome Variables

Two outcome variables (i.e., injury frequencies and injury severities) were used in the present study. Both were level 1 variables.

Injury frequencies

Children's injury frequencies were assessed every 2 weeks during interviews with mothers. Thus, each injury frequency observation refers to each child's number of injuries for a given two-week period. The total number of injury frequency observations for each child equals the number of 2-week periods that the child was enrolled in the study (typically 12). Thus, for children who were enrolled in the study for the total 6 months, they had 12 observations of injury frequency in the data set. The total number of injury frequency observations in the data set is 12 times the number of children (i.e., $12 \times 170 = 2,040$).

Mothers reported how often their children received several different types of injuries (classified according to 18 different categories; see Appendix B). An injury was defined as any physical injury to the child's body that (a) resulted from an unintentional event and (b) could be felt by the child (e.g., a sprained muscle) or seen (e.g., cut, bruise) by a child or an adult (e.g., parent, child care provider) for a minimum of 24 hours. To assess the reliability of mothers' reports about the number of injuries that children received, 44 mothers from the study were randomly chosen to participate in an additional interview. Each of these mothers repeated one of their biweekly interviews with a second interviewer during a given 2-week period. Reliability (intraclass correlation) for the

number of injuries that mothers reported per interview was .91. In all of the analyses for the present study, injuries that mothers indicated were intentional (e.g., injuries caused by other children; $n = 116$; 4.6%) were excluded. Injuries for which mothers were not the primary supervisors ($n = 677$; 28.5%) were also excluded.

Injury Severities

Trained undergraduate research assistants rated the severity of each injury event using the Minor Injury Severity Scale (MISS; Peterson, Saldana, & Heiblum, 1996; see Appendix E), an empirically based coding system developed for laypersons. The MISS includes separate coding criteria for 19 different categories of injuries (e.g., animal/human scratch/bite; bruise/bump; eye injury) that were derived from injury events sustained by 8-year-old children (Peterson, Brown, Bartlestone, & Kern, 1996). All but one of the injury categories (i.e., “firearm/bow”) was relevant to the present sample. The MISS coders (i.e., research assistants) relied on information that mothers recorded about the physical characteristics of each injury (e.g., size, shape, depth, color). Mothers used colored pencils, crayons, or markers to draw the exact size, shape, and color of all physical injuries after they occurred, and to mark their location on front or back view diagrams of a child’s body. Using the mothers’ drawings and other information regarding the characteristics of injuries (e.g., amount of blood loss, length of time for bruise to heal), raters coded injury severities using a 7-point Likert scale (0 = no tissue damage lasting 24 hours, 6 = a disabling injury or death). Reliability (intraclass correlations) between pairs of raters ranged from .79 to .92. Injury severity was coded for each injury event; thus, the number of injury severity observations for each child is equal to the total

number of injuries each child received in the entire study. The number of injury observations for the entire data set is 1,692.

Predictor Variables

Predictor variables for the present study included child gender, child age, child externalizing behavior, maternal psychological symptomatology, maternal locus of control, family SES, maternal marital/partner relationship satisfaction, mother-child relationship quality, extrafamilial stress, and maternal supervision. Each of these variables, with the exception of maternal supervision, was a level 2 variable.

Child Variables

Gender and age. Child gender and age were recorded by mothers on a demographic questionnaire (see Appendix F).

Externalizing behavior. The Externalizing Scale of the Child Behavior Checklist for Ages 2-3 (CBCL/2-3; Achenbach, 1992) was used to measure child behavior problems. Mothers used a 3-point scale to rate the extent to which 100 behaviors were characteristic of their child (i.e., 0 = not true, 1=somewhat or sometimes true, 2 = very true or often true). Mean test-retest reliability has been reported to be high for the Externalizing Scale over a 1-week interval ($r = .84$; Achenbach, 1992). The scale has also been shown to distinguish between clinical and non-clinical samples of children (Achenbach, 1992).

Maternal Variables

Maternal psychological symptomatology. Mothers completed the 53-item Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983), which assesses 9 categories of symptoms: somatization, obsessive-compulsive, interpersonal sensitivity, depression,

anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Mothers used a 0 to 4 Likert scale (e.g., 0 = not at all, 4 = extremely) to rate the degree to which they had been distressed by each symptom over the previous 7 days. To reduce the number of variables, the Global Severity Index (GSI) was used in the present study. The GSI is the sum of the individual items divided by the total number of items and represents the best single indicator of respondents' psychological functioning. Test-retest reliability of the GSI has been found to be high ($r = .90$ over a 2-week interval; Derogatis & Melisaratos, 1983). Moreover, subscales from the BSI have been found to correlate with clinical ratings and other standardized measures of dysfunction, such as the Minnesota Multiphasic Personality Inventory (see e.g., Boulet & Boss, 1991).

Maternal locus of control. Maternal locus of control was measured using the 47-item Parental Locus of Control Scale (PLOC; Campis et al., 1986). The PLOC assesses parents' beliefs about their ability to control their children's behavior. Mothers in the present study responded to each item (e.g., "What I do has little effect on my child's behavior") using a 1 to 5 Likert scale (i.e., 1 = "strongly disagree to 5 = "strongly agree"). A higher score indicates a more external locus of control, whereas a lower score indicates a more internal locus of control. The scale has been shown to have good concurrent validity ($r = .33$ with the Internal-External Locus of Control Scale), and high internal consistency ($\alpha = .92$; see e.g., Campis et al., 1986).

Intrafamilial Variables

Intrafamilial variables included family SES, maternal marital/partner relationship satisfaction, and mother-child relationship quality.

Family SES. Social class was based on parental educational and occupational classifications (Hollingshead, 1975), as assessed by the demographic questionnaire (see Appendix F). In two-parent homes, both of the parents' occupational and educational classifications were used in calculations, whereas only one parent's classifications were used in single parent homes.

Maternal marital/partner relationship satisfaction. The 32-item Dyadic Adjustment Scale (DAS; Spanier, 1976; Spanier & Thompson, 1982) was used to assess the mother's satisfaction with the spousal or partner relationship (if the mother was married or partnered). Using a combination of 5- and 6-point scales, mothers indicated the degree to which they agreed with their spouses or partners on certain topics (e.g., handling family finances, sex relations) and the frequency with which they engaged in certain behaviors (e.g., calmly discuss something, work on a project). Although the DAS contains four subscales (dyadic consensus, satisfaction, cohesion, and affectional expression), an overall score was used in the present study to reduce the number of variables. The DAS has been shown to have good internal consistency ($\alpha > .90$) and construct validity. It has also been found to be associated with other measures of relationship satisfaction (Spanier & Thompson, 1982) and has been used to assess marital satisfaction in mothers of infants and toddlers (Britner, Morog, Pianta, & Marvin, 2003).

Mother-child relationship quality. Mother-child relationship quality was measured using the sum of the "verbal responsivity," "acceptance of child's behavior," and "parental involvement with child" subscales from the 45-item Home Observation for Measurement of the Environment interview for infants and toddlers (HOME; Caldwell & Bradley, 1984). These subscales were combined because each measures a construct that

is related to mother-child relationship quality (correlations between the 3 subscales ranged from .21 to .40 in the present study). The HOME was completed by observing mother-child interactions in the home and interviewing mothers about the quality of their children's home environments. Interviewers recorded whether the families engaged in particular behaviors (e.g., "parent spontaneously praises child at least once," "mother reads stories to child at least three times weekly"). The three subscales have test-retest reliabilities ranging from .29 to .47 over a 6-month interval (Caldwell & Bradley, 1984).

Extrafamilial Stress

The Life Stress Scale of the Parenting Stress Index (PSI; Abidin, 1995) was used to assess mothers' reports of stressful events originating from outside of the family (e.g., the death of a friend, new job). Mothers were instructed to indicate whether each of 19 events had occurred to any members in their immediate family during the past 12 months. Of the 19 events, 7 (i.e., divorce, marital reconciliation, marriage, separation, pregnancy, alcohol or drug problem in immediate family, death of an immediate family member) were related to stress within the family and therefore were excluded from the analyses. Test-retest reliability for the Total Stress scale has been found to be .96 over a 1- to 3-month interval and .65 over a 1-year interval (Abidin, 1995). The PSI has also been found to be useful in measuring stress in other studies with parents of young children (e.g., Bigras, LaFreniere, & Dumas, 1996; Horowitz & Goodman, 2004).

Maternal Supervision

Mothers' levels of supervision for injury events were assessed by coding mothers' answers to two open-ended interview questions: (1) "Where were you at the time that your child got hurt?" and (2) "How closely were you supervising your child?" The

interviewers were trained to determine the mothers' locations (e.g., room of the house) and the distances (in feet) of the mothers from their children when the injuries occurred. Interviewers used information from both questions to code mothers' supervision levels on a 1 to 7 scale (1 = caregiver and child were less than 6 feet apart, with the caregiver not engaged in any other activity; 7 = caregiver had no visual or auditory contact and could not have reached the child within 30 seconds; see Appendix G) to assign a supervision score for each injury event. However, supervision was reverse scored for the present analyses so that higher numbers indicated higher levels of supervision. This single score was used as the measure of time-period-specific supervision in analyses predicting injury severities. A biweekly supervision mean was used when predicting biweekly injury frequencies to parallel the unit of analysis for injury frequencies (i.e., a 2-week period). This biweekly mean was calculated by adding the supervision scores for each injury event over a 2-week period and dividing by the total number of supervision scores over the same 2-week period. Interrater reliability for supervision coding was high; the median intraclass correlation between 6 interviewers was .97 and ranged from .91 to .99. Individual supervision scores for each injury event were used when predicting injury severity to match the unit of analysis for injury severity because an injury severity score was available for each injury event.

To examine the effect of measuring between-mother differences in typical supervision versus within mother time-period-specific fluctuations in supervision, two supervision scores were derived from the supervision measure: (1) To examine between-mother differences, an overall supervision mean was created to represent mothers' typical supervision levels by adding all of the supervision scores over the entire study (i.e., 12

months) for each mother and dividing by the total number of injuries for each mother's child; (2) to examine within-mother differences, a supervision deviation score was created by subtracting the mother's overall supervision mean from individual supervision scores (Burstein, 1980).

CHAPTER 3

RESULTS

Descriptive Statistics

The means and standard deviations for study variables are presented in Table 1. Mean injury severity was relatively low (i.e., less than 2.0 on a scale of 0-6), whereas mean supervision was high (5.74 on a scale of 1-7), indicating that mothers in this sample tended to supervise their children closely and that children's injuries were minor. Mean scores on child externalizing behavior, maternal psychological symptomatology, maternal marital/partner relationship satisfaction, mother-child relationship quality, and extrafamilial stress indicated that most of the mothers in the sample fell in the normative range on these measures. Furthermore, mean SES fell in the middle to upper middle class range.

Bivariate Correlations

Correlations were computed to examine relations between injury outcomes, supervision, and individual child and social-ecological variables (see Table 2). As noted previously, the individual child and social-ecological variables were measured on only one occasion and were designated as level 2 variables. In contrast, variables that were measured repeatedly for each child (i.e., injury frequencies, injury severities, and maternal supervision) were designated as level 1 variables. Although there were several data points for each family on level 1 variables, overall means for these variables (i.e., means for the entire study period) were used to simplify the correlational analyses. However, it is important to note that the correlations may not be a completely accurate

reflection of the relation between the level 2 variables and the original constructs of the level 1 variables that are represented by the level 1 variable means.

The correlations revealed that maternal supervision was associated with both injury frequencies and severities. Contrary to expectations, biweekly injury frequencies were positively related to supervision levels, such that injury frequencies increased as supervision increased. In accordance with expectations, injury severity was inversely related to supervision levels; injury severity decreased as supervision increased. In addition, supervision deviation was negatively related to injury severity, such that injury severity increased as supervision deviation decreased. Maternal supervision was also associated with several social-ecological variables. As expected, supervision was inversely related to child age. Supervision was also positively related to family SES and mother-child relationship quality, such that mothers in higher SES families or who had better relationships with their children supervised more closely.

Evaluation of Hypotheses

Repeated measurement of level 1 variables (i.e., supervision, injury frequencies, and injury severities) violates the regression assumption of independence among error terms because data points for the same mother-child dyad cannot be assumed to be independent of one another. Therefore, multilevel modeling, a technique that corrects for violation of the assumption of independence (Raudenbush & Bryk, 2002), was used in subsequent analyses. Multilevel models allow the investigator to simultaneously analyze the effects of repeated measures variables and those that are measured on only one occasion without requiring the investigator to aggregate the repeated measures variable.

Intraclass correlations (ICC's) were calculated to determine the amount of variance in the results that was due to between-subject variability, rather than within-subject variability. The ICC for injury severities was .04 and supervision was .06, indicating relatively small between-subjects effects. The multilevel model results are divided into two main sections. The first section examines the moderating effect of maternal levels of biweekly supervision on the relation of child and social-ecological variables to injury frequencies and severities. The second section examines the moderating effect of between-mother differences on typical (i.e., mean) supervision versus within-mother fluctuations in supervision (i.e., supervision deviation) on the relation of child and social-ecological variables to injury frequencies and severities.

Data Diagnostics

An important assumption in regression and multi-level models is that of normality, in which the distribution of errors of the outcome follow the shape of a normal curve. Non-normality refers to a condition in which the error distribution is skewed and does not follow a normal curve. A second important assumption in regression and multilevel models is that of homoscedasticity, or the assumption that the variance of the errors are constant (i.e., the same across all values of the predictors). Heteroscedasticity refers to a violation of the assumption of homoscedasticity, which can result in inaccurate statistical inferences, such as increased Type I error inflation, reduced statistical power, and inaccurate confidence intervals.

The data were inspected for indications of outliers and multilevel assumption violations (i.e., non-normality and heteroscedasticity) by examining plots of both level 1

and level 2 residuals by predictor values as well as level 1 and level 2 plots of residuals by normal quantiles. Four potential outliers were found when predicting injury frequencies and were omitted from the subsequent analyses. Two families had particularly high scores of life stress, one family had a high score on maternal psychological symptomatology, and one family had a high score on locus of control. Although evidence of outliers was not found when predicting injury severities, evidence of heteroscedasticity and non-normality (i.e., the distribution was bimodal) was found. To address the problem of heteroscedasticity, the analyses predicting injury severities were conducted using a sandwich estimator. A sandwich estimator estimates the standard errors without assuming homoscedasticity and is also robust to the assumption of nonnormality (Hayes & Cai, 2000; Long & Ervin, 2000; White, 1980). When assuming homoscedasticity, a variance/covariance matrix is used to estimate the standard errors. A sandwich estimator estimates the variance/covariance matrix using the OLS residuals as estimators of the errors.

Supervision Moderation Analyses

This section is divided into two subsections to reflect the two outcome variables that were predicted. The first subsection presents analyses predicting injury frequencies, and the second subsection presents analyses predicting injury severities. In each subsection 10 preliminary models were tested. Biweekly supervision was tested first to determine if it independently predicted the outcome variables (i.e., injury frequencies or injury severities). Next, each of the nine child or social-ecological variables and its interaction with supervision was tested in its own model. Then, final models (one for injury frequencies and one for injury severities) were built using the significant and

marginal main and interaction effects from the 10 single models. Combining significant predictors in each final model provided a way to counteract the potential effects of alpha inflation that may have contributed to significant findings in the single models. For each final model that included maternal marital/partner relationship satisfaction, an additional model was tested without maternal marital/partner relationship satisfaction in order to include data from mothers who were not married or partnered.

In the analyses that follow, the biweekly supervision mean was used to predict biweekly injury frequency so that the unit of analysis in the predictor variable would match the unit of analysis in the outcome variable. Supervision scores that were specific to the actual injury event were used to predict injury severities because injury severity ratings were available for each injury event.

Predicting injury frequencies

In accordance with Raudenbush and Bryk's (2002) recommendations for predicting count variables, a poisson model with a log-link function (i.e., $y = \text{the log of the event frequency}$) was used to examine whether supervision moderated the effect of child and social-ecological variables on injury frequencies. A poisson model is required because when predicting count variables, the distribution is non-normally distributed and is typically skewed to the left.

Results of preliminary models are presented in Table 3. In Model 1, supervision alone did not predict injury frequencies. Furthermore, in Models 2-10, there were no significant main effects for any of the child or social-ecological variables, except that supervision marginally predicted injury frequencies in the model containing SES (Model 7). However, two interactions emerged: Maternal locus of control interacted with

supervision (Model 6), and maternal marital/partner relationship satisfaction interacted marginally ($p < .10$) with supervision (Model 8). These interactions are described below in greater detail.

Interactions of supervision with maternal locus of control and maternal marital/partner relationship satisfaction were plotted in Figures 3 and 4, respectively, using Aiken and West's (1991) recommendations. With regard to locus of control (see Figure 3), contrary to expectation, children of highly supervising mothers had consistently high frequencies of injuries, regardless of mothers' loci of control. Children of mothers with internal loci of control and low supervision had the lowest frequencies of injury overall.

Figure 4 displays the effect of supervision on the relation of maternal marital/partner relationship satisfaction to child injury frequencies. Again, contrary to expectation, child injury frequencies were highest for mothers with both high supervision and high marital/partner relationship satisfaction. For children of mothers who supervised at low levels, injury frequencies were lowest and remained stable despite mothers' marital/partner relationship satisfaction.

All significant and marginally significant predictors from the 10 individual models were entered into a **final model**, which can be seen in Table 4. This final model included biweekly mean supervision, maternal locus of control, maternal marital/partner relationship satisfaction, an interaction between supervision and maternal locus of control, and an interaction between supervision and maternal marital/partner relationship satisfaction. There was a marginally significant effect ($p < .10$) for maternal locus of control, such that an externalizing locus of control was predictive of higher injury

frequencies. There was also a marginally significant interaction between maternal marital/partner relationship satisfaction and maternal supervision ($p < .10$). This interaction was described previously.

An additional model was tested that excluded the maternal marital/partner relationship satisfaction variable and included biweekly mean supervision, maternal locus of control, and an interaction between supervision and maternal locus of control. As presented in the right column in Table 4, maternal supervision interacted with maternal locus of control to predict injury frequencies. The nature of the interaction is identical to that described earlier.

Predicting Injury Severities

Maternal supervision ratings specific to injury events were used to predict injury severities. As shown in Table 5, supervision was initially tested alone (Model 1) and negatively predicted injury severities, such that more supervision predicted lower severities. Next, child and social-ecological variables and their interactions with supervision were each examined in separate models (Models 2-10). Child externalizing behavior was positively predictive of injury severities (Model 4), and a marginally significant interaction emerged between maternal supervision and child gender (Model 3), such that supervision was negatively predictive of injury severities for boys ($b = -.06$, $p = .00$) but not for girls ($b = -.02$, $p = .29$). This finding indicates that high supervision may reduce injury severities in boys but not in girls.

A **final model** predicting injury severities was built using significant and marginally significant findings from the individual models. As shown in Table 6, this final model included maternal supervision, child gender, child externalizing behavior,

and an interaction between child gender and maternal supervision. As before, higher child externalizing behavior predicted higher injury severities, and the interaction between child gender and maternal supervision remained marginally significant.

Mean Supervision and Supervision Deviation Moderation Analyses

The following analyses examined whether mean supervision (i.e., differences between mothers' typical supervision) or supervision deviation (i.e., differences within individual mothers' supervision between situations) moderated the effects of child, maternal, intrafamilial, and extrafamilial variables on child injury frequencies and severities. The results are again divided into two subsections to reflect the two outcome variables (i.e., injury frequencies and severities). In each subsection, 10 preliminary models were examined. The first model in each subsection investigated the effects of mean supervision and supervision deviation on injury frequencies or severities (Model 1). Next, the interactions of each child or social-ecological variable with both mean supervision and supervision deviation were examined in separate models (Models 2-10). All significant and marginally significant main and interaction effects were then entered into a final model for each of the two outcome variables. For final models that contained maternal marital/partner relationship satisfaction, an additional model was examined without this variable to include data from mothers who were not partnered or married.

Predicting injury frequencies

Results of 10 preliminary models can be seen in Table 7. As seen in Model 1, neither mean supervision nor supervision deviation predicted injury frequencies. Significant interactions emerged between child externalizing behavior and mean supervision (Model 4), maternal locus of control and supervision deviation (Model 6),

and maternal marital/partner relationship satisfaction and supervision deviation (Model 8).

The significant interactions were plotted in Figures 5 through 7. Figure 5 shows the interaction between mean supervision and child externalizing behavior. Children with high levels of externalizing behavior who had closely supervising mothers had fewer injuries than did those children with high levels of externalizing behavior and mothers who provided low or mean levels of supervision. These results indicate that maternal supervision may have mitigated the effect of higher child externalizing behavior on children's injury frequencies. However, for children with low levels of externalizing behavior, those with mothers who supervised more closely had higher injury frequencies than those with mothers who supervised less closely.

Figure 6 displays the interaction between maternal locus of control and maternal supervision deviation. As shown in Figure 6, injury frequencies were highest when supervision deviation was high regardless of mothers' locus of control. However, injury frequencies were lowest for mothers with internal locus of control when supervision deviation was low.

Finally, Figure 7 illustrates the interaction between maternal supervision deviation and maternal marital/partner relationship satisfaction. As shown in Figure 7, children had the highest injury frequencies when marital/partner relationship satisfaction and supervision deviation were high. However, injury frequencies were lowest when supervision deviation was low, and injury frequencies did not change based on mothers' marital/partner relationship satisfaction.

The **final model** predicting injury frequencies included the following main effects: mothers' mean supervision, mothers' supervision deviation scores, child externalizing behavior, maternal locus of control, and maternal marital/partner relationship satisfaction. The model also included the following interactions: mean supervision x child externalizing behavior, supervision deviation x maternal locus of control, and supervision deviation x maternal marital/partner relationship satisfaction. The middle column in Table 8 displays the estimates for each of these main effects and interaction terms. The interaction between mean maternal supervision and child externalizing behavior that was discussed earlier remained significant, and the interaction between maternal marital/partner relationship satisfaction and supervision deviation remained marginal. An additional model without marital/partner relationship satisfaction was again tested. As shown in the right column of Table 6, a significant interaction between maternal locus of control and maternal supervision deviation emerged. The nature of the interaction was described previously.

Predicting injury severities

As shown in Model 1 in Table 9, mean supervision and supervision deviation were inversely related to injury severities, such that higher supervision and supervision deviation predicted lower severities. In Models 2-10, none of the child or social-ecological variables predicted injury severities; however, child gender interacted with supervision deviation. Upon probing this interaction effect, the simple effect of supervision deviation was negative for boys ($b = -.062, p = .0007$) and positive but non-significant for girls ($b = .000, p = .995$), indicating that higher supervision deviation

predicted lower injury severities for boys but not for girls. Mean supervision did not interact with any child or social-ecological variables.

The **final model** predicting injury severities included maternal mean supervision, supervision deviation, child gender, and an interaction between supervision deviation and child gender. As shown in Table 10, the interaction between supervision deviation and child gender remained a significant predictor of injury severities. The nature of this interaction was described earlier.

CHAPTER 4

DISCUSSION

The primary goal of the present study was to examine whether maternal supervision moderated the effects of child and social-ecological variables on toddlers' daily injury frequencies and severities over a 6-month period. The results showed that maternal biweekly supervision moderated the effects of three variables on injury outcomes, although the nature of the moderation was somewhat different than what was predicted. Biweekly levels of maternal supervision moderated the effects of maternal locus of control on children's injury frequencies, such that at low levels of supervision, injuries were higher for mothers with an external locus of control than for mothers with an internal locus of control. However, high levels of supervision were related to higher injury frequencies regardless of mothers' loci of control. In addition, there was a marginally significant moderational effect of supervision on the relation of maternal marital/partner relationship satisfaction to children's injury frequencies, such that children of mothers with higher levels of maternal marital/partner relationship satisfaction and higher levels of biweekly supervision had the highest injury frequencies. There was also a marginally significant effect of maternal supervision on the relation of child gender to injury severities, such that higher levels of supervision were protective for boys but not for girls.

The study also investigated whether between-mother differences in typical (i.e., mean) supervision or within-mother fluctuations (i.e., supervision deviation) across time periods accounted for the moderational effects of biweekly supervision. Results showed that supervision deviation moderated the same variables as did biweekly supervision and

produced the same pattern of results as did the primary analyses. This finding suggests that the aforementioned moderational effects of supervision were largely due to individual mothers' time-period-specific fluctuations in supervision rather than differences between mothers' typical supervision levels. Finally, mean supervision moderated the effect of children's externalizing behavior on their injury frequencies such that higher supervision had a protective effect for children with higher levels of externalizing behavior. These findings will be addressed in greater detail in the next sections, followed by a discussion of limitations of the study and directions for future research.

Explanation of Findings

Contrary to expectations, the findings did not demonstrate that maternal supervision was protective for children who were at highest risk for unintentional injuries. The results showed that higher levels of maternal supervision were associated with higher injury frequencies at most levels of locus of control and all levels of maternal marital/partner relationship satisfaction. These unexpected findings may be partially explained by the limited range of responses on the supervision variable. Because of the relatively high mean and low standard deviation of the supervision variable, very few supervision scores fell within the low range of the scale. Thus, although the present study attempted to examine interactions of social-ecological variables across a range of level of supervision, it was not possible to investigate how levels of supervision that were lower on the supervision scale (i.e., 1 or 2) might interact with child and social-ecological risk variables. A sample of mothers with a wider range of supervision scores, perhaps including neglectful mothers, would permit a better test of the interaction between

supervision and social-ecological risk factors for injury. Another potential interpretation of the finding that higher supervision was related to higher injury frequencies might be that mothers were supervising more closely in response to a greater number of hazards in the environment. Such environmental hazards may have also caused children to sustain more injuries. Future research that includes a measure of situational hazard level might help to clarify the relation of supervision to injuries.

Also contrary to predictions, there was a marginally significant moderational effect of supervision on the relation of child gender to injury severities such that higher supervision predicted lower injury severities for boys but not for girls. Perhaps close levels of supervision are not needed more for boys than for girls because boys tend to take more risks than do girls (Morrongiello & Dawber, 1998). Moreover, girls have been found to be influenced more than boys are by their parents' attitudes when making decisions about risky behavior (Morrongiello & Dawber, 2004). Thus, perhaps girls internalize their parents' attitudes about safe behavior more than boys do and therefore need less supervision to prevent risky behavior.

It was also somewhat surprising that supervision did not moderate the effect of a greater number of child and social-ecological variables on injury frequencies and severities. The relative lack of moderational findings might have been due to the fact that most of the sample scored in the normal range on the child and social-ecological injury risk variables. A sample with a broader range of variance on injury risk variables (e.g., higher levels of maternal psychological symptomatology, lower family SES) might produce more evidence for the moderating effect of maternal supervision on injury risk variables. It is also possible that maternal supervision did not moderate the effects of

some social-ecological variables because supervision is a mediator, rather than a moderator, of the relation between these variables and injury outcomes (Saluja et al., 2004). For example, maternal psychopathology may increase children's risk for injury by decreasing mothers' ability to supervise closely. Some mothers with psychological problems (e.g., depression) may remain in close proximity to their children but may be too emotionally distraught to stop their children from engaging in risky behavior. Research investigating mediational models might help to clarify whether it is important for prevention researchers to focus on social-ecological injury risk factors (e.g., psychopathology) that interfere with mothers' ability to supervise their children closely rather than focusing on supervision per se.

A secondary goal of this study was to examine whether differences between mothers' typical supervision levels or individual mothers' own changes in supervision levels between time periods (i.e., supervision deviation) accounted for the moderational effects of supervision on the relation of child and social-ecological variables to injuries. In these analyses, supervision deviation produced a similar pattern of results as did biweekly and event-specific supervision. Namely, supervision deviation moderated the effect of maternal locus of control on injury frequencies and moderated the effect of child gender on injury severities. In addition, there was a marginally significant moderational effect of supervision deviation on the relation of maternal marital/partner relationship satisfaction to injury frequencies. These findings suggest that investigators examining the moderational effects of supervision on maternal locus of control and marital satisfaction need to assess mothers' time-period-specific supervision behaviors, rather than ratings of mothers' typical supervision levels.

Typical (i.e., mean) supervision (i.e., between-mother differences in supervision) did moderate the effect of child externalizing behavior on injury frequencies, such that externalizing children of mothers who supervised closely had lower injury frequencies than did externalizing children whose mothers supervised less closely. This may be an isolated finding, given that supervision did not moderate the effect of child externalizing behavior in the primary analyses. Nevertheless, this finding is consistent with past research which found that maternal time resources moderated the effect of children's hyperactivity on their injury frequency (Schwebel et al., 2004). It was somewhat surprising in the present study, however, that at lower levels of child externalizing behavior, children of mothers who provided more supervision sustained more injuries than did children whose mothers supervised less. Perhaps mothers who typically supervise very closely for children with low levels of externalizing behavior are somewhat overprotective or vigilant about injuries and report more injuries than do those mothers who typically supervise at lower levels.

Limitations

Several limitations of this study warrant comment. First, the data are based exclusively on maternal report and may have been influenced by socially desirable responding, resulting in underreports of injuries and social-ecological risk factors or exaggeration of supervision levels. In addition, mothers' levels of social-ecological risk factors may have affected their reports on outcome variables. For example, mothers with low levels of extrafamilial stress may have had more attention to devote to monitoring their children's injuries and therefore may have reported more injuries than mothers with high levels of stress. A multi-method study that included both maternal self-report and

observational data would allow investigators to counteract the effects of potentially biased self-report data.

Another limitation of this study is that the participants in this study were demographically homogenous; therefore, it is unclear whether the findings would generalize to populations that are more diverse with regard to gender, ethnicity and SES. In particular, this study did not examine the supervision behavior of fathers, despite the fact that fathers often contribute to children's development as secondary caregivers. It is possible that fathers may supervise differently than mothers due to divergent beliefs about the importance of supervision or injury prevention. Indeed, some research has found that fathers endorse more benefits of injuries to children (e.g., "toughening up") than do mothers (DiLillo, Lewis, & Peterson, 2004). It seems important to assess fathers' supervision behaviors to examine what role fathers play in children's unintentional injuries.

Finally, the present study included some limitations regarding measurement, particularly with regard to extrafamilial stress, maternal supervision, and injury frequencies. Extrafamilial variables in this study were limited to a subset of items from a parenting measure. Using a wider range of measures that were designed to assess extrafamilial factors (e.g., parents' social support, parent's work satisfaction) would have provided more information about extrafamilial stressors and their links to injury outcomes. In addition, the method used in this study to measure injury frequencies and supervision was somewhat limited because both variables were based on a 2-week time interval. Inasmuch as supervision ratings were not tied more directly to injury events, extra variability may have been included in the model. Nevertheless, this study represents

an advance over most studies that lack such detailed information about children's injury frequencies and mothers' levels of supervision.

Directions for Future Research

In order to examine the potential moderating role of maternal supervision on children's injuries in a more comprehensive fashion, future investigators may wish to include other social-ecological variables that have been found to be related to injury outcomes, such as maternal social support, neighborhood factors, and immediate environmental hazards (Harris & Kotch, 1994; Haynes et al., 2003; Morrongiello et al., 2004a). The moderational role of supervision on individual child risk variables may also be clarified by examining other variables found to be related to child injuries, such as child risk taking and sensation seeking behavior (Morrongiello et al., 2004a).

The moderational role of maternal supervision might be better explained by examining potential three-way interactions between supervision, child, and social-ecological variables in studies with larger sample sizes. For example, a previous study found that maternal locus of control moderated the effect of child externalizing behavior on child injury frequencies (Damashek, Williams, Sher, Peterson, Lewis, & Schweinle, 2005). It is possible that supervision has differential effects on the relation between locus of control and injury, depending on children's level of externalizing behavior. Perhaps supervision is particularly protective for families with both an external maternal locus of control and high levels of child externalizing behavior. Alternatively, supervision may be less effective for families that have both externalizing children and mothers with external loci of control. Studies investigating such interactions could shed light on this issue.

Another avenue for research would be to examine the injuries that were excluded from the analyses in the present sample for which mothers were not the primary supervisors. It would be interesting to investigate whether injury severities differed when children were under the care of other supervisors. It may also be of interest to examine whether others' (e.g., daycare providers, fathers) supervision moderated the effect of child risk variables.

Finally, future investigators may wish to conduct longitudinal studies to examine whether the role of maternal supervision in preventing injuries changes as children mature. As children develop and become more independent, other strategies (e.g., teaching) may become more effective than parental supervision because older children tend to spend less time in close proximity to their parents.

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Figure Captions

Figure 1. Bronfenbrenner's (1979) social-ecological model of child development in which the child is embedded within four levels of environmental systems.

Figure 2. Maternal supervision as a moderator of the effect of child, maternal, intrafamilial, and extrafamilial factors on child injury frequencies and severities.

Figure 3. The moderating effect of maternal supervision on the relation of maternal locus of control to child injury frequencies.

Figure 4. The moderating effect of maternal supervision on the relation of maternal marital/partner relationship satisfaction to child injury frequencies.

Figure 5. The moderating effect of mean maternal supervision on the relation of child externalizing behavior to child injury frequencies.

Figure 6. The moderating effect of maternal supervision deviation on the relation of maternal locus of control to child injury frequencies.

Figure 7. The moderating effect of maternal supervision deviation on the relation of maternal marital/partner relationship satisfaction to child injury frequencies.

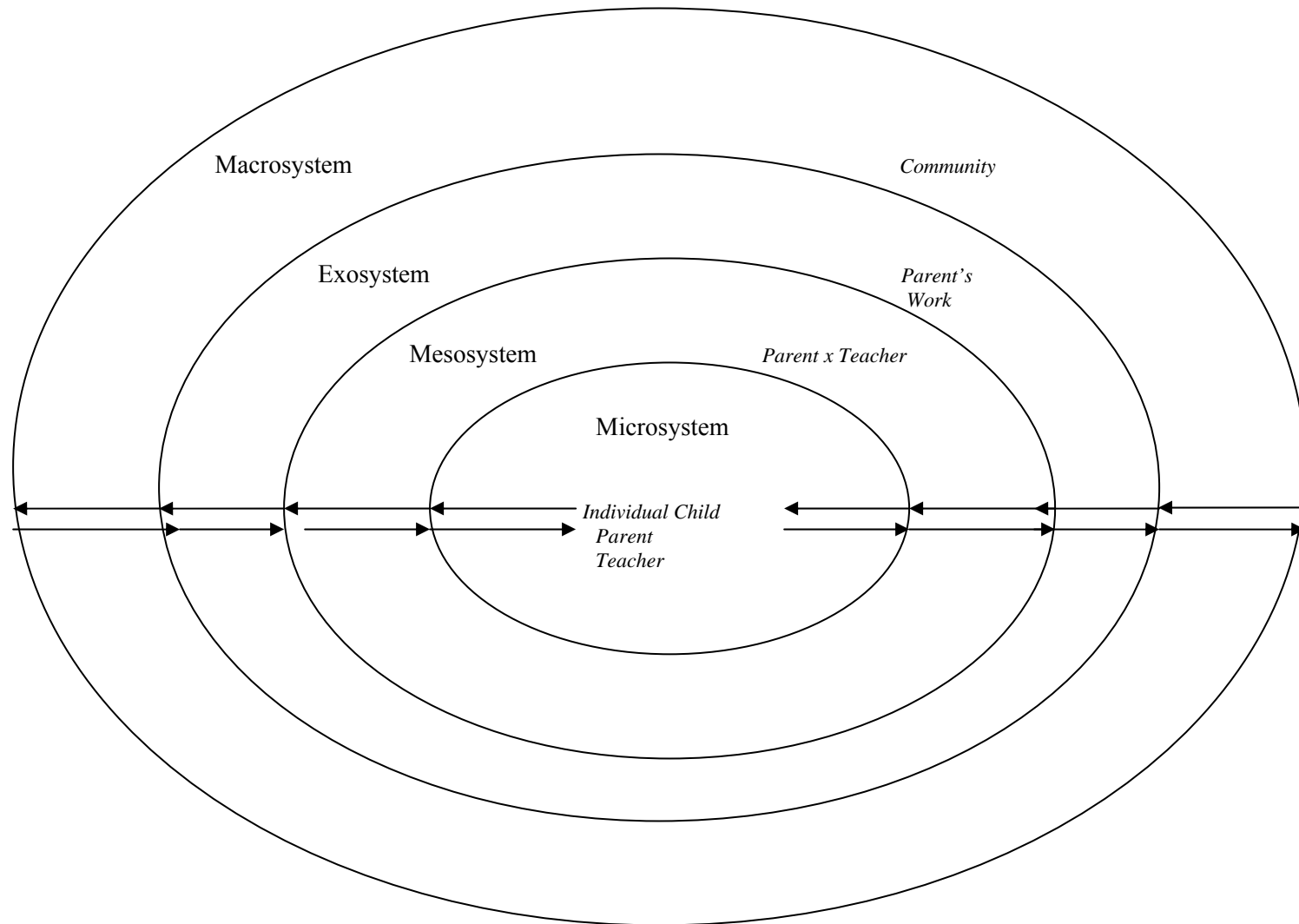
Figure 1

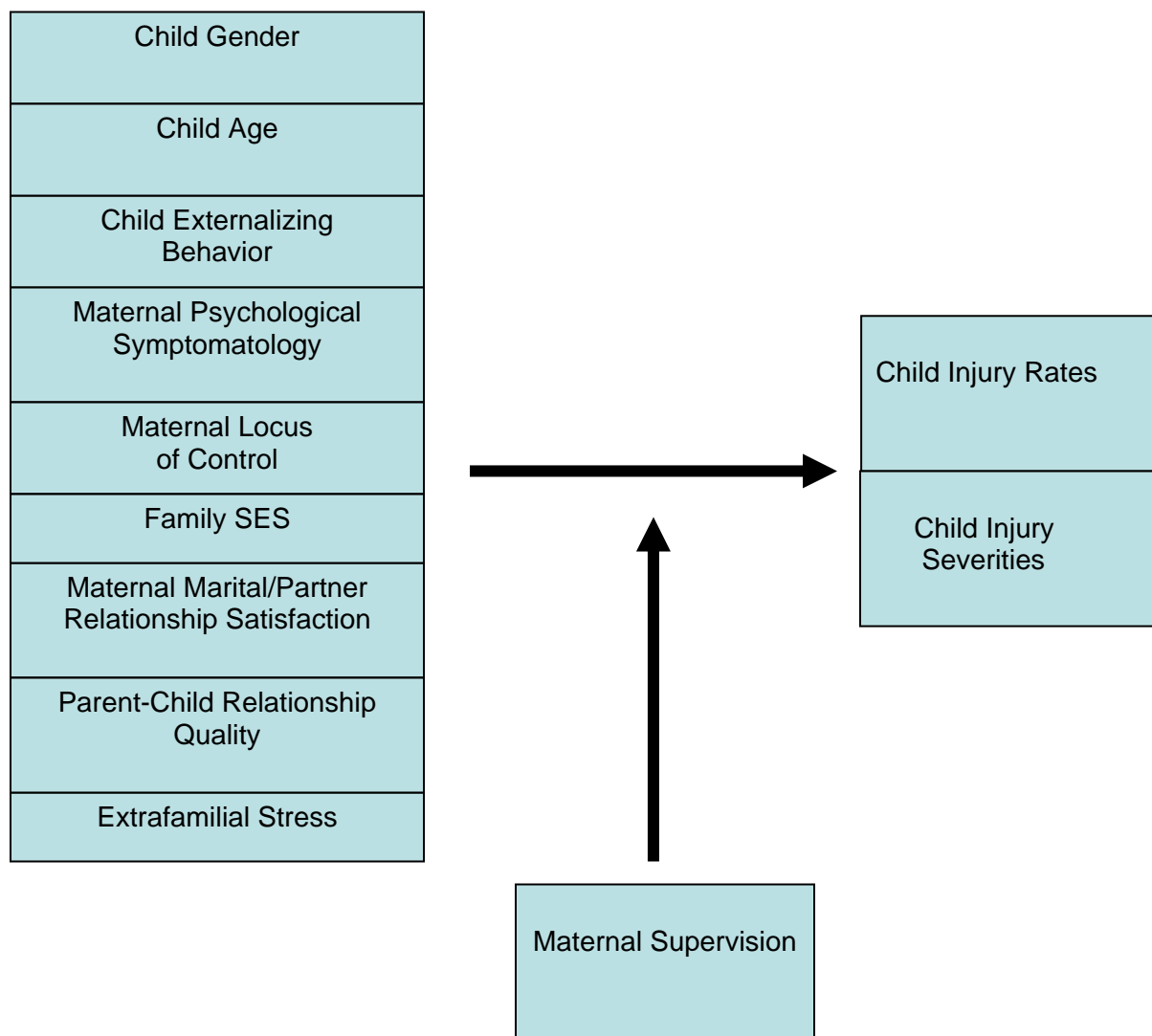
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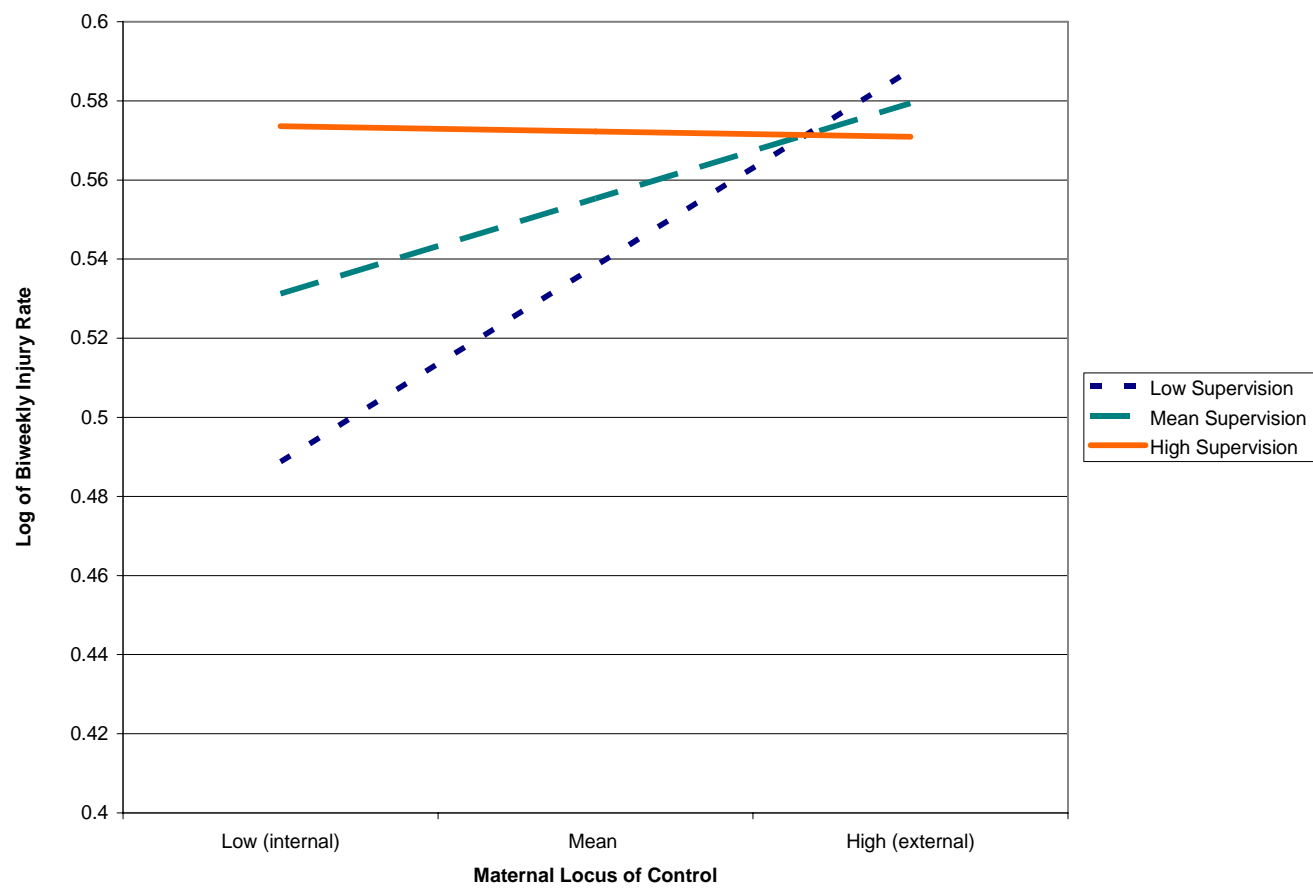
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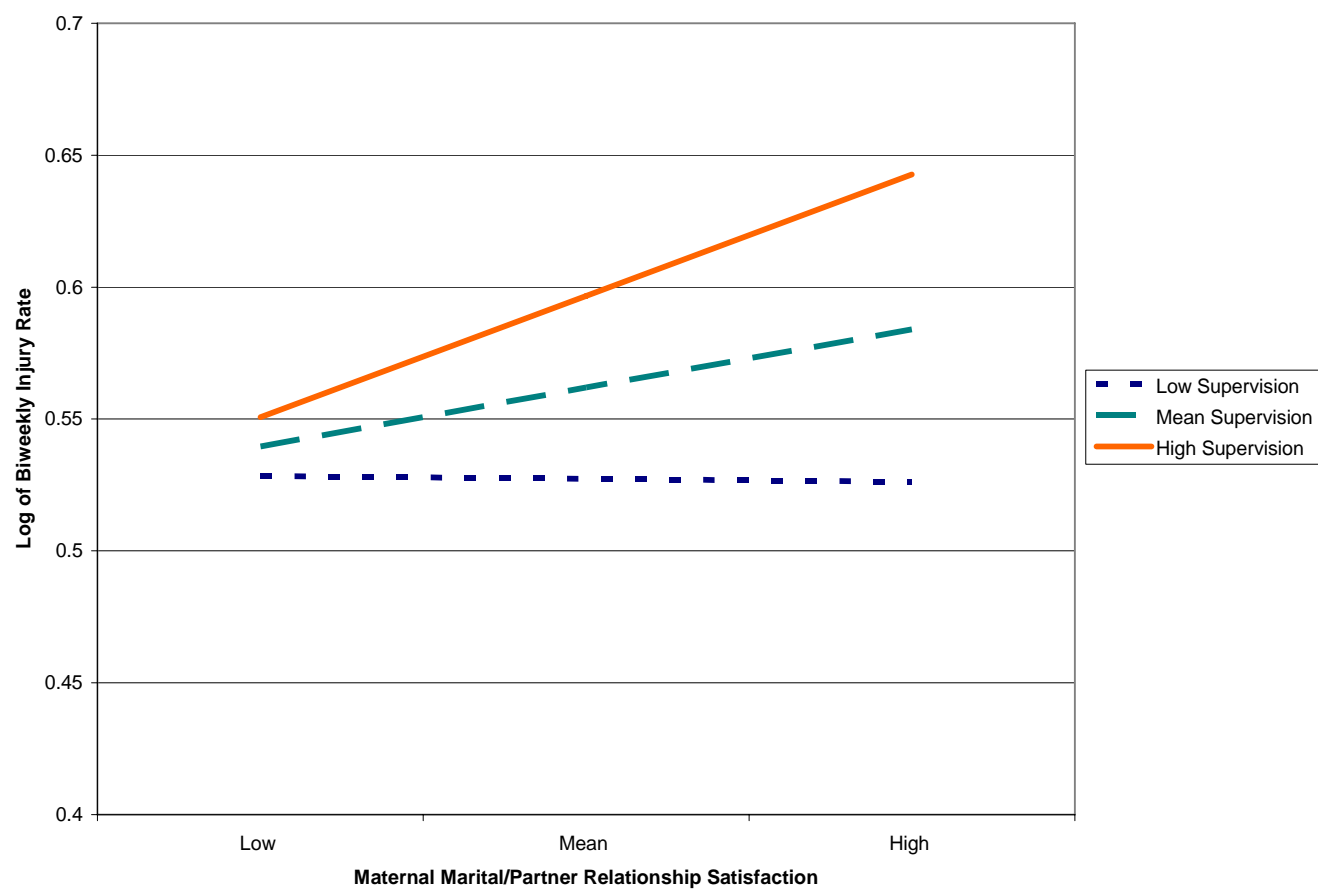
Figure 4

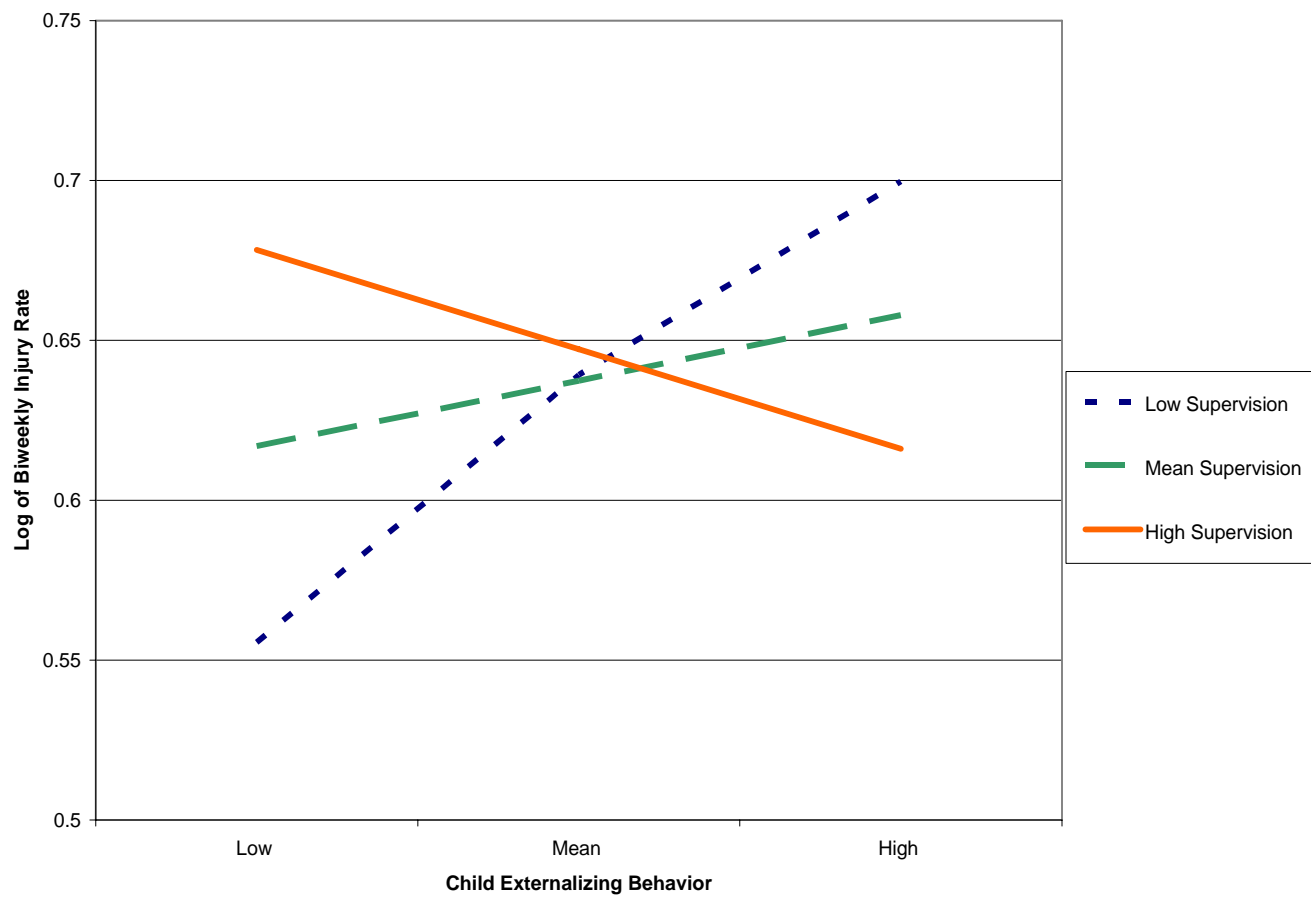
Figure 5

Figure 6

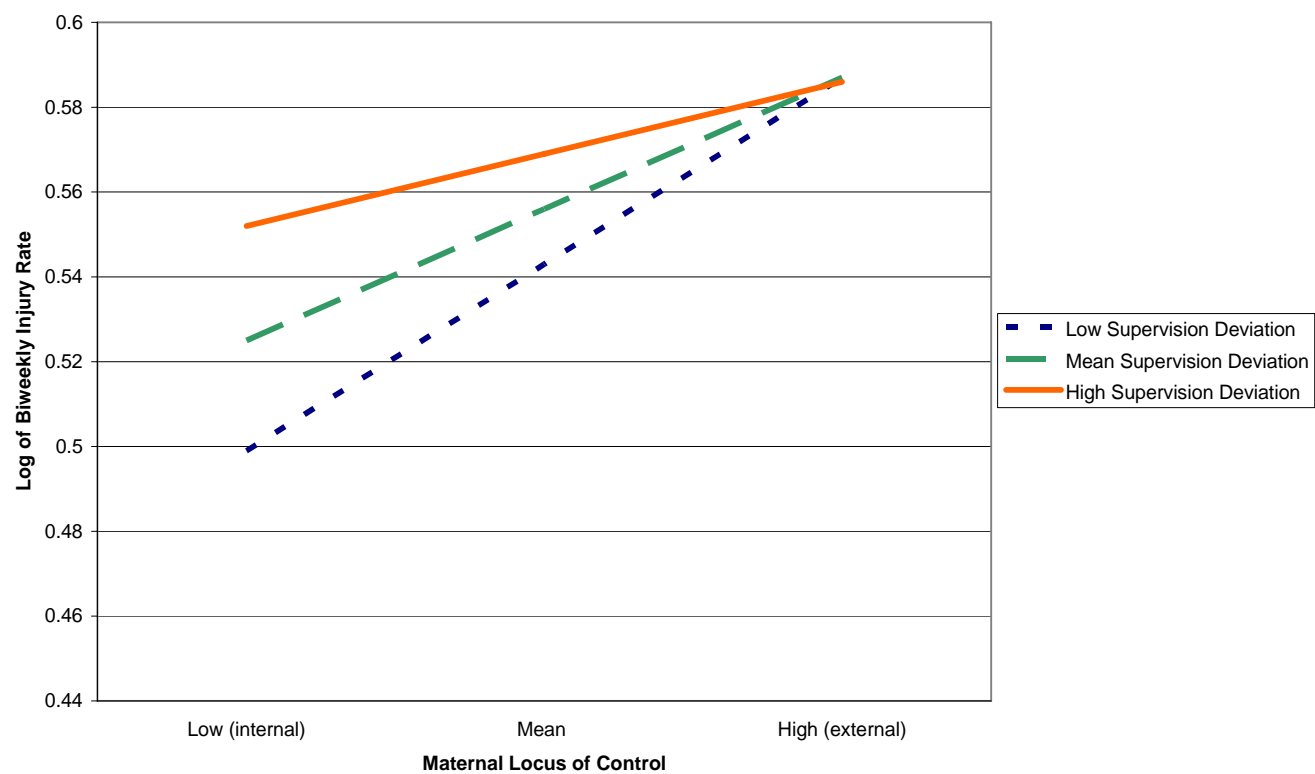


Figure 7

Table 1

Means and Standard Deviations of Child, Social-Ecological, and Outcome Variables

Variable	Mean (SD)	Range	n
Outcome variables			
Biweekly injury frequency	1.56 (.77)	1, 5	1,088
Injury severity	1.63 (.68)	1, 5	1,692
Supervision variables			
Biweekly supervision	5.74 (1.16)	1, 7	1,088
Supervision deviation	0 (.92)	-4.29, 2.69	1,694
Child variables			
Child age (in months)	24.20 (7.29)	15, 40	170
Child externalizing behavior	12.34 (5.81)	0, 30	167
Maternal variables			
Maternal psychological symptomatology	4.14 (3.33)	0, 17.40	166
Maternal locus of control	108.06 (15.82)	67, 165	165
Family variables			
Family SES	46.44 (10.95)	21, 66	164
Maternal marital/partner relationship satisfaction	110.57 (12.20)	34, 132	136
Mother-child relationship quality	26.54 (1.86)	15, 28	163
Extrafamilial variable (stress)	5.73 (5.30)	0, 24	164

Table 2

Bivariate Correlations of Child, Social-Ecological, and Injury Outcome Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Inj. Rate	----											
2. Inj. Sev.	-.024	----										
3. Sup.	.160*	-.214**	----									
4. Sup. Dev.	.105	-.167*	-.043	----								
5. Ch. Sex	-.077	.001	-.087	-.028	----							
6. Ch. Age	-.099	-.039	-.287***	.088	-.014	----						
7. Ext. Beh.	.111	.127	-.108	-.027	-.022	-.067	----					
8. M. Sympt.	.095	-.093	-.086	.040	-.089	.057	.300***	----				
9. MLOC	.073	-.006	-.098	.084	-.151	.002	.219**	.236**	----			
10. SES	.034	-.093	.225**	.078	-.079	.026	-.175*	-.297**	-.190*	----		
11. Rel. Sat.	.082	-.026	.072	.062	.003	-.052	-.197*	-.321**	-.209*	.375***	----	
12. M-C Rel.	.028	-.031	.251**	-.068	.044	-.070	-.140+	-.356***	-.254**	.221**	.145+	----
13. Stress	-.146	.123	-.095	.035	-.088	-.007	.080	.247**	.099	-.290**	-.223**	-.106

* $p < .05$. ** $p < .01$. *** $p < .0001$.

Note: Inj. Rate = injury frequencies ($n = 165$); Inj. Sev. = injury severities ($n = 165$); Sup. = biweekly supervision ($n = 165$); Sup. Dev. = supervision deviation ($n = 165$); Ch. Sex = child sex ($n = 170$); Ch. Age = Child age ($n = 170$); Ext. Beh. = child externalizing behavior ($n = 167$); M. Sympt. = maternal psychological symptomatology ($n = 166$); MLOC = maternal locus of control ($n = 165$); SES = family socioeconomic status ($n = 164$); Rel. Sat. = maternal marital/partner relationship satisfaction ($n = 136$); M-C Rel. = mother-child relationship quality ($n = 163$); Stress = extrafamilial stress ($n = 164$).

Table 3

Model Building Results: Predicting Injury frequencies From Biweekly Supervision, Child, and Social-Ecological Variables

Variable	<i>b</i> (SD)	Variable	<i>b</i> (SD)
<u>Model 1</u>		<u>Model 6</u>	
Biweekly supervision	.015 (.010)	Biweekly supervision	.016 (.022)
		Maternal locus of control	.002 (.001)
		Supervision x locus of control	-.002 (.001)*
<u>Model 2</u>		<u>Model 7</u>	
Biweekly supervision	.014 (.010)	Biweekly supervision	.019 (.011)+
Child age	-.003 (.003)	Family SES	-.001 (.002)
Supervision x child age	.001 (.001)	Supervision x SES	-.000 (.001)
<u>Model 3</u>		<u>Model 8</u>	
Biweekly supervision	.023 (.014)	Biweekly supervision	.033 (.011)**
Child sex	-.044 (.043)	Marital satisfaction	.002 (.002)
Supervision x child sex	-.019 (.021)	Supervision x marital satisfaction	.002 (.001)+
<u>Model 4</u>		<u>Model 9</u>	
Biweekly supervision	.015 (.010)	Biweekly supervision	.015 (.011)
Child externalizing behavior	.005 (.004)	Mother-child relationship quality	.003 (.013)
Supervision x child ext. beh.	.002 (.002)	Sup. x mother-child rel. quality	-.008 (.006)
<u>Model 5</u>		<u>Model 10</u>	
Biweekly supervision	.016 (.010)	Biweekly supervision	.017 (.011)
Psych. symptoms	.009 (.007)	Extrafamilial stress	-.007 (.004)
Supervision x psych. symptoms	.003 (.003)	Supervision x extrafamilial stress	-.001 (.002)

+ $p < .10$. * $p < .05$. ** $p < .01$.

Note: child ext. beh. = child externalizing behavior; psych. symptoms = maternal psychological symptomatology; mother-child rel. quality = mother-child relationship quality.

Table 4

Final Model: Main and Interaction Effects of Biweekly Maternal Supervision, Child and Social-Ecological Variables on Children's Injury frequencies

Variable	<i>b</i> (<i>SD</i>)	<i>b</i> (<i>SD</i>) excluding DAS
Main Effects		
Intercept	.572 (.024)***	.555 (.022)***
Biweekly supervision	.033 (.011)**	.106 (.010)
Maternal locus of control	.003 (.002)+	.002 (.001)
Maternal marital/partner relationship satisfaction (DAS)	.003 (.002)	-----
Interactions		
Biweekly supervision x maternal locus of control	-.000 (.001)	-.002 (.001)*
Biweekly supervision x DAS	.002 (.001)+	-----

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$

Note. DAS = Maternal marital/partner relationship satisfaction.

Table 5

Model Building Results: Predicting Injury Severities From Supervision, Child, and Social-Ecological Variables

Variable	<i>b</i> (SD)	Variable	<i>b</i> (SD)
<u>Model 1</u>		<u>Model 6</u>	
Biweekly supervision	-.043 (.013)***	Biweekly supervision	-.043 (.013)***
		Maternal locus of control	.000 (.001)
		Supervision x locus of control	-.000 (.001)
<u>Model 2</u>		<u>Model 7</u>	
Biweekly supervision	-.044(.013)***	Biweekly supervision	-.044 (.013)***
Child age	-.002 (.003)	Family SES	-.003 (.002)
Supervision x child age	-.001 (.002)	Supervision x SES	.000 (.001)
<u>Model 3</u>		<u>Model 8</u>	
Biweekly supervision	-.109 (.039)**	Biweekly supervision	-.036 (.014)**
Child sex	-.017 (.041)	Maternal rel. sat.	-.000 (.002)
Supervision x child sex	.045 (.025)+	Supervision x maternal rel. sat.	.001 (.001)
<u>Model 4</u>		<u>Model 9</u>	
Biweekly supervision	-.042 (.013)**	Biweekly supervision	-.043 (.012)***
Child externalizing behavior	.006 (.003)*	Mother-child rel. quality	-.008 (.015)
Supervision x child ext. beh.	.001 (.002)	Sup. x mother-child rel. quality	.004 (.008)
<u>Model 5</u>		<u>Model 10</u>	
Biweekly supervision	-.040 (.012)**	Biweekly supervision	-.040 (.012)**
Psych. symptoms	-.003 (.006)	Extrafamilial stress	.005 (.004)
Supervision x psych. symptoms	-.002 (.003)	Supervision x extrafamilial stress	-.002 (.002)

+ $p < .10$. * $p < .05$. ** $p < .01$. $p < .001$.

Note: child ext. beh. = child externalizing behavior; Psych. symptoms = maternal psychological symptomatology; SES = family socioeconomic status; maternal rel. sat. = maternal marital/partner relationship satisfaction; mother-child rel. quality = mother-child relationship quality.

Table 6

Final Model: Main and Interaction Effects of Maternal Supervision and Child Variables on Children's Injury Severities

Variable	<i>b</i> (SD)
Main effects	
Intercept	1.66 (.062)***
Biweekly supervision	-.107 (.039)**
Child gender	-.016 (.041)
Child externalizing behavior	.006 (.003)*
Interaction	
Biweekly supervision x child gender	.045 (.025)+
Random components/variance	
Intercept (level 2)	.021 (.008)**
Residual (level 1)	.436 (.016)***

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 7

Model Building Results: Predicting Injury frequencies From Mean Supervision, Supervision Deviation, Child, and Social-Ecological Variables

Variable	<i>b</i> (SD)	Variable	<i>b</i> (SD)
<u>Model 1</u>		<u>Model 4</u>	
Mean supervision	.053 (.038)	Mean supervision	.055 (.039)
Supervision deviation	.012 (.012)	Supervision deviation	.012 (.011)
		Child externalizing behavior	.006 (.004)
		Mean supervision x ext. beh.	-.016 (.007)*
		Sup. dev. x ext. beh.	.003 (.002)
<u>Model 2</u>		<u>Model 5</u>	
Mean supervision	.036 (.041)	Mean supervision	.056 (.039)
Supervision deviation	.012 (.011)	Supervision deviation	.013 (.011)
Child age	-.003 (.003)	Psych. symp.	.009 (.007)
Mean supervision x child age	.005 (.006)	Mean supervision x psych. symp.	-.010 (.010)
Sup. deviation x child age	.001 (.002)	Sup. dev. x psych. symp.	.005 (.003)
<u>Model 3</u>		<u>Model 6</u>	
Mean supervision	.180 (.124)	Mean supervision	.051 (.040)
Supervision deviation	.033 (.033)	Supervision deviation	.014 (.011)
Child sex	-.040 (.044)	Locus of control	.002 (.001)
Mean supervision x child sex	-.085 (.077)	Mean supervision x LOC	-.002 (.002)
Sup. deviation x child sex	-.015 (.022)	Sup. deviation x LOC	-.001 (.001)*

(table continues)

Table 7 (*continued*)

Variable	<i>b</i> (<i>SD</i>)	Variable	<i>b</i> (<i>SD</i>)
<u>Model 7</u>		<u>Model 9</u>	
Mean supervision	.051 (.040)	Mean supervision	.038 (.040)
Supervision deviation	.016 (.011)	Supervision deviation	.013 (.011)
Family SES	-.001 (.002)	Mother-child relationship quality	-.003 (.014)
Mean supervision x SES	-.004 (.004)	Mean sup. x m-child rel. qual.	-.018 (.015)
Sup. deviation x SES	.000 (.001)	Sup. dev. x m-child rel. qual.	-.005 (.007)
<u>Model 8</u>		<u>Model 10</u>	
Mean supervision	.052 (.043)	Mean supervision	.038 (.040)
Supervision deviation	.032 (.012)**	Supervision deviation	.015 (.011)
Maternal rel. sat.	.002 (.002)	Extrafamilial stress	-.007 (.004)
Mean sup. x maternal rel. sat.	-.002 (.005)	Mean sup. x extrafam. stress	.005 (.008)
Sup. dev. x maternal rel. sat.	.002 (.001)*	Sup. dev. x extrafam. stress	-.001 (.002)

+ $p < .10$. * $p < .05$.

Note: ext. beh. = child externalizing behavior; psych. symp. = maternal psychological symptomatology; sup. dev. = supervision deviation; LOC = maternal locus of control; SES = family socioeconomic status; maternal rel. sat. = maternal marital/partner relationship satisfaction; Mean sup. = Mean supervision; m-child rel. qual. = mother-child relationship quality; extrafam. stress = extrafamilial stress.

Table 8

Final Model Results: Main and Interaction Effects of Mean Maternal Supervision, Supervision Deviation, Child, and Social-Ecological Variables on Children's Injury Frequencies

Variable	<i>b</i> (SD)	<i>b</i> (SD) excluding DAS
Main effects		
Intercept	.559 (.024)***	.548 (.022)***
Mean supervision	.069 (.045)	.057 (.040)
Supervision deviation	.032 (.012)**	.014 (.011)
Child externalizing behavior	.003 (.004)	.005 (.004)
Maternal locus of control	.003 (.002)+	.001 (.001)
Maternal marital/partner relationship satisfaction (DAS)	.003 (.002)	-----
Interactions		
Mean supervision x externalizing behavior	-.023 (.008)**	-.015 (.007)*
Supervision deviation x maternal locus of control	-.000 (.001)	-.001 (.001)*
Supervision Deviation x DAS	.002 (.001)+	-----

+ $p < .10$. * $p < .05$. ** $p < .01$.

Note. DAS = Maternal marital/partner relationship satisfaction.

Table 9

Model Building Results: Predicting Injury Severities From Mean Supervision, Supervision Deviation, Child, and Social-Ecological Variables

Variable	<i>b</i> (SD)	Variable	<i>b</i> (SD)
<u>Model 1</u>		<u>Model 4</u>	
Mean supervision	-.109 (.038)**	Mean supervision	-0.099 (.040)**
Supervision deviation	-.035 (.013)**	Supervision deviation	-.035 (.013)**
		Child externalizing behavior	.005 (.003)
		Mean supervision x ext. beh.	-.003 (.006)
		Sup. dev. x ext. beh.	.001 (.002)
<u>Model 2</u>		<u>Model 5</u>	
Mean supervision	-.122 (.040)**	Mean supervision	-.113 (.040)**
Supervision deviation	-.035 (.013)**	Supervision deviation	-.032 (.013)**
Child age	-.003 (.003)	Psych. symptoms	-.004 (.005)
Mean supervision x child age	-.000 (.001)	Mean supervision x psych. symp.	-0.010 (.011)
Sup. dev. x child age	-.000 (.002)	Sup. dev. x psych. symp.	-.001 (.003)
<u>Model 3</u>		<u>Model 6</u>	
Mean supervision	-.023 (.127)	Mean supervision	-.107 (.040)**
Supervision deviation	-.062 (.018)***	Supervision deviation	-.035 (.013)**
Child sex	-.024 (.041)	Locus of control	.000 (.001)
Mean supervision x child sex	-.058 (.077)	Mean supervision x LOC	-.001 (.002)
Sup. dev. x child sex	.062 (.026)**	Sup dev. x LOC	-.000 (.001)

(table continues)

Table 9 (*continued*)

Variable	<i>b</i> (SD)	Variable	<i>b</i> (SD)
<u>Model 7</u>		<u>Model 9</u>	
Mean supervision	-.102 (.041)**	Mean supervision	-.115 (.039)**
Supervision deviation	-.037 (.013)**	Supervision deviation	-.035 (.013)**
Family SES	-.003 (.002)	M-child rel.qual.	-.001 (.015)
Mean supervision x SES	-.004 (.004)	Mean sup. x m-child rel. qual.	-.001 (.021)
Supervision deviation x SES	.001 (.001)	Sup. dev. x m-child rel. qual.	.004 (.008)
<u>Model 8</u>		<u>Model 10</u>	
Mean supervision	-.075 (.046)	Mean supervision	-.107 (.013)**
Supervision deviation	-.031 (.014)*	Supervision deviation	-.032 (.013)**
Maternal rel. sat.	-.000 (.002)	Extrafamilial stress	.005 (.004)
Mean sup. x maternal rel. sat.	.003 (.005)	Mean sup. x extrafamilial stress	-.008 (.008)
Sup. dev. x maternal rel. sat.	.001 (.001)	Sup. dev. x extrafam. stress	-.001 (.003)

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Note: ext. beh. = child externalizing behavior; psych. symp. = maternal psychological symptomatology; LOC = maternal locus of control; SES = family socioeconomic status; maternal rel. sat. = maternal marital/partner relationship satisfaction; sup. dev. = supervision deviation; m-child rel. qual. = mother-child relationship quality; Mean sup. = Mean maternal supervision; extrafam. stress = extrafamilial stress.

Table 10

Final Model Results: Main and Interaction Effects of Mean Maternal Supervision, Supervision Deviation, Child, and Social-Ecological Variables on Children's Injury Severities

Variable	<i>b</i> (SD)
Main effects	
Intercept	1.65 (.027)***
Mean supervision	-.111 (.039)**
Supervision deviation	-.062 (.018)**
Child gender	-.025 (.041)
Interaction	
Supervision deviation x child gender	.062 (.026)*
Random components/variance	
Intercept (level 2)	.021 (.008)**
Residual (level 1)	.435 (.016)***

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Appendix A

Recruitment Script

When recruiting, be sure you have a copy of the recruitment letter, in case the family didn't receive it and would like to have it read to them. Remember to record each phone contact with a family in the recruitment log book.

FM: (Family Member) Hello.

I: (Interviewer) Hello, my name is _____. I am calling from the University of Missouri in regard to a letter you recently received from your pediatrician, Dr. _____. May I please speak with child's name's mother?

FM: (Any indication that she is **unavailable**)

I: When would be a good time for me to call back?

(If asked to identify yourself) My name is _____. I work on the Toddler Injury Project at the University of Missouri. I am calling to follow-up on a letter we sent to child's name's mother offering her nearly \$600 for participation in our study.

Is there a time I could call back to reach her?

(Fix a specific time if possible) Thank you. Good-bye.

FM: Thanks, but we are **not interested**.

I: Thank you anyway for considering the project. Just for our records, may I ask why you decided not to participate? *(Clear up any misconceptions the family member may have about participation in the project. If you are not speaking with the child's female guardian, ask permission to call back later when she might be available. Say)*

Because our study focuses on mothers and their children, would it be okay if I call back later to speak with the child's name's mother about participation? *(If the family member still decides not to participate or is adamant that you are not to call back, continue as follows)* I appreciate your taking time to speak with me. Thank you for considering the project. Good-bye.

FM: Child's name lives with me. Her **mother is not with us**.

I: I see. Just to make sure I understand-- you are saying that child's name does not live with a female guardian at this time?

FM: *(If the child does have a female guardian, even if not the biological mother, treat as above for "mother")*.

FM: No, child's name just lives with me right now.

I: Thanks for letting me know. I am sorry that we are not able to include fathers in our study right now. Although we are very interested in the parenting practices of both mothers and fathers, in this initial study we do not have sufficient funding to examine mothers and fathers. I appreciate your interest. Thank you anyway. *(Pause for response)*. Good-bye.

FM: **Yes**, we got the letter. Can you **tell me about the project**?

I: Basically, we will interview child's name's mother or female guardian every other week for 6 months. During the interview, we will ask her about the types of physical injuries or near injuries that child's name may have experienced. We also ask the mother about things she may have done - like installing latches - to keep the child safe. To assist with the interview, we ask the mother to keep daily written records of the times

when the child is physically hurt or almost hurt, and of times the mother engages in major efforts (something that takes longer than a few minutes) to prevent injury. We will pay the mother \$3 per day for participating. Accounting for one two-week vacation from interviews, this comes to a total of \$596. If you think child's name's mother might be interested, I would like to call back when she will be available, because she is the one who would be involved in our interviews. I have a number of questions I need to ask child's name's mother and some information I need to give her before we will be sure your family is eligible. When would be a good time for me to get back to her? (*Arrange a time*).

*(If **FM** refuses, say the following)*

I: Thank you anyway for considering the project. Just for our records, could I ask why you decided not to participate? (*Clear up any misconceptions about the project. If she still decides not to participate, continue as follows*) I appreciate your taking time to speak with me. Again, thank you for considering the project. Good-bye.

*When you do get the **Female Guardian** (FG):*

I: Is this child's name's mother?

FG: Yes (*or anything indicating female guardianship*).

I: I am glad I was able to reach you. Again, my name is _____. I am a research assistant at the University of Missouri. I work with Dr. Lizette Peterson-Homer and Dr. David DiLillo in the Department of Psychology. A few days ago, we sent a letter to you about the opportunity to earn \$596 for participating in a

special project on children's injuries. I am calling to talk more about the project. Are you interested in the discussing your possible participation?

FG: ***If not interested in participating.***

I: Thank you anyway for considering the project. Just for our records, may I ask why you decided not to participate? *(Clear up any misconceptions about the project. If she still decides not to participate, continue as follows.)* Again, thank you for considering the project. Good-bye.

FG: ***If did not get letter***

I: I'm sorry, the letter was mailed several days ago. Well, I can read it to you now or send you another copy. Which would you prefer? *(If they just want a summary, use the one given to family members. If mail, make sure we have the right address).*

FG: ***Yes, I would like to talk about participating.***

I: Is this a good time to talk about it? It will take about 10 - 15 minutes *(If no, get a call back time. If yes, continue).* I want to tell you about the project and answer any questions you may have. First, though, I need to ask you a few things about your family to make sure you are eligible to participate.

(Answer any other questions, when you get a "yes", continue).

First, are you child's name's mother? *(Again if no, ascertain permanent legal guardianship. Most people who are not biological parents know what "legal guardianship" is. If not, ask:*

Who has legal custody of the child? *(If the father is living with a stepmother, the stepmother is in fact the legal female guardian. If not, use ineligibility speech, page. If yes, continue).*

Is child's name your only child? *(If not, then)*

Are you planning to have any other children live with you full time or nearly full time during the next 6 months? *(If yes, go to ineligibility speech).*

Is English your primary language? *(If not, give ineligibility speech).*

Does child's name spend all seven days of the week in your home? *(If more than two days and nights for each two weeks are spent somewhere else, give ineligibility speech. If yes, continue).*

Do you work outside the home more than 20 hours a week or is your child out of your care for more than that number of hours even if you are in the home? *(If no, continue. If yes, give ineligibility speech)*

Are you planning to move either within or away from Columbia during the next six months? *(If there is any hesitation or hint that this may be so, add)* The way our data collection and reimbursement is set up, if you leave before the project is completed, we cannot use the information you have contributed and you will only partially be reimbursed for your time. If there is a better than 1 in 10 chance you will move in the next 6 months, it would not be in your best interest or ours for you to participate. *(If no, continue. If yes, ineligibility speech).*

Do you plan to take a vacation or go out of town in the next six months for a period that will last longer than two weeks? The agreement you would sign with us would state that you agree to be interviewed every other week with only one two-week period off for vacation. *(If no problem, continue. If yes, ineligibility speech).*

Would it be acceptable to have someone interview you in your home and on three occasions observe you and your child engaging in a few everyday activities? *(pause for response)* We would also come to your home on one occasion to assess your child's general motor and verbal skills. Additionally, we have a few questionnaires for you to complete on the weeks our interviews run short, and you would need to come just once to the University to be videotaped interacting with your child.

(If the mother asks why or what you do with the videotape, say) We are interested in how mothers interact with their children on a daily basis. We would tape you and your child in an everyday situation to learn about general patterns of mother-child relationships. That is, just how mothers interact with their children, so we would be looking at your tape to find out about such patterns.

Would that be okay? Finally, once every week, we will call you and ask you to record a few things about what is going on in your household at that moment. This will take 3 minutes or less. We do this to get an idea of what is usually going on, so we can compare it to the time the child gets hurt. Any questions? *(Pause for response and answer any questions. Then continue)*

Now I need to ask some questions about child's name. Has child's name ever had a major injury requiring overnight hospitalization? *(If yes, make sure the child was admitted and hospitalized overnight, not just emergency room treatment. If a hospitalized injury, go to ineligibility speech).*

Has child's name ever been diagnosed as mentally retarded, or had a behavioral disorder like autism that required treatment or will result in placement in a special classroom at school? *(If yes, ineligibility speech).*

Does child's name have any physical disabilities such as hearing impairment or motor problems like cerebral palsy that require special treatment? *(Glasses are OK, but if major problems go to ineligibility speech. If all these are no, continue)*

Excellent, you are eligible to participate if you choose to do so. Let me explain in more detail what we would be asking of you. Each time child's name has an injury or nearly gets injured,

we will ask you to keep a record of it. We will supply you with special forms on which you can jot down what happened, which will help you keep track of child's name injuries and near injuries. Then, every other week we will talk to you in detail about each injury or time your child was nearly injured. These interviews take about two hours. It is very important that you do not change what you normally do because of the records and the

interview, and that you tell us exactly what happened without worrying about how it sounds. In this research, we merely want to take a look through the window of your world and see how children and their mothers really deal with injuries, so it will not be necessary to change any of your day-to-day life. Some day our research may be used to decrease children's injuries, which are the leading cause of death among children in this country. As a parent, you may face the dilemma of wanting to keep your child safe, while at the same time providing your child the freedom to grow up to be a competent, independent adult. We want to learn how you balance safety and opportunities for growth with the rest of your activities. The only way we can do this is if you are completely open and honest with us, so it is important that you act the same as you would if you were not in the project. Do you think you can do this? *(Long pause here--this is important!)*

In addition to the 14 regular interviews, we will require that you repeat one bi-weekly interview, with two different interviewers. This allows us to check the accuracy of our interviews. On three occasions, we will also observe you and your child while you do normal household things together. Finally, at the end of the study, we will require you and your child to attend one session in our lab on the University of Missouri campus. In the lab, you and your child will be videotaped in a natural interaction. This concludes the requirements of the study. Now, are there any reasons you may not be able to participate in the interviews or lab session? *(Pause for response)*

(not willing to participate) Thank you anyway for considering the project. Just for our records, could I ask why you decided not to participate? *(Clear up any misconceptions about the project. If she still decides not to participate, continue as follows)* I appreciate your taking time to speak with me. Again, thank you for considering the project. Good-bye.

(willing to participate) I want to reassure you that our study focuses on groups of children. Although we intend to publish the results, we will be focusing on all families participating, never on a single child. Furthermore, we will use code numbers rather than names and thus neither your name nor your child's name will ever be reported as associated with the study.

I have told you a lot so far. Any questions? *(Pause for response)*

Here's how your payment works. You will receive \$3 a day for participating, which amounts to a total of \$596 for you for the six-month period (this accounts for one two-week vacation with no interview at \$3 a day - as well as the university visit). You will be paid half of the money over the course of the project on a monthly basis. In other words, every month you will be paid \$46.50. Then the other half will be paid as a lump sum of \$298 at the end of the study. This is because it is so very important that everyone finishes the whole project. If a family drops out early, they lose that last payment of \$298 and any remaining payments. But if you complete the project, you will earn a total of \$596.

In order to make the interviews go as smoothly as possible, both for us and for you, we ask that certain rules be followed. Please stop me if you have any questions. You will be asked to keep a record of each injury or near injury right after it occurs. Further, every week you will receive one phone call and will be asked to fill out the record as if an injury had occurred (this allows us a comparison for what is “usual” in your home). Then, every other week we will talk to you in detail about each of the records you have made.

Interviews will be conducted in the privacy of your home for your convenience. You will need to locate a quiet area for the interviews where you and I can speak privately. This needs to be a place without a TV or radio and without anyone talking on the telephone or interrupting.

Interviews will be scheduled exactly every 14 days. It is very important that families not request changes in the schedule, except for emergency situations. We have 200 families to interview in all, so switching schedules around is rather difficult for us.

During the interview, the person being interviewed cannot engage in other activities. This means that you will need to have someone take care of your child during the interview. However, if you are unable to do this, we will make every effort to have someone available to help you if you need child care during the interview.

Interviews will always last the entire scheduled two hour period. If you finish our usual interview before the end of the hour, we will ask some other questions that do not directly pertain to injury but might be related to injury (one example might be asking your opinions about general parenting practices). Any questions on any of these rules for our interviews? *(Pause for response)*

Now, I would like to talk to you about your rights, if you choose to participate.

You can withdraw from the study at any time (although, as I indicated earlier, you would forfeit the final payment of \$298 and any reimbursement for the remaining interviews).

You have the right to have the things you tell us remain private. As I mentioned, in order to protect your privacy we will assign a code number to each family and only project staff working with you will know your names. Five years after the study is over, we will destroy the match between names and numbers. There is only one exception to your right of privacy: If the project director judges that the child is in imminent danger, and discussion with the parents fails to change the situation, the project director is bound by Missouri law to report the situation to the authorities.

We will give you a copy of all these rules in writing. We must also have you sign an official consent form before participating. Do you have any questions about your rights?

Any other questions about the study? *(Pause for response)*

Knowing what you know now, do you think you might be interested in participating in the project?

Is there anything that might keep you from being able to participate?

If you are fairly confident that you want to participate, I would like to set up a time to meet with you in your home to show you the forms you would be using and to get your signature. Do you want to set up a

time to meet with one of the project staff or do you need more time to consider this? *(Set up time to meet or time to call back for an answer).*

Finally, if you choose to be a part of this study, I need to emphasize once more how important it is that you are willing to be responsible for completing the records and interviews for the entire 6-month period. We cannot use information from families who fail to keep the records or who drop out before the end of the project. And a great deal of time and effort from your family and our staff goes into every interview. In fact, if you agree and drop out of the project, you are in effect taking the place away from someone else who might have wanted to participate. Please talk this over with your family or anyone else who might be influenced by your participation and carefully consider making this commitment before we meet. Do you have any other questions? *(Pause for*

response and answer questions. If no questions, continue.) I'll see you

_____.

[If recruiting for yourself]

Again, my name is _____ and I will be working with you during the project. Let me be sure that I have your correct address. Do you still live at _____? Good. I'll see you on _____ (date and time). Let me give you my office number in case you need to contact me before our appointment (573 - 884 - 1731). I look forward to working with you. Thank you. Good-bye.

[If recruiting for someone else]

For your information, the interviewer you will be working with is _____. Do you still live at _____? Good. (Interviewer's name) will see you on (date and time). Let me give you the number to reach (interviewer's name), should you need to contact her before the appointment. We look forward to working with you. Thank you. Good-bye.

Ineligibility Speech

Ineligibility Speech #1

Thanks for letting me know about that. I am sorry that we are not able to include **(fathers, aunts, temporary guardians, children in joint custody, children with learning disabilities, children with physical disabilities, mothers who do not use English as their primary language, children who are away from home more than one day per week, pregnant mothers)** in this first study in this area. It is not that such persons are not very important or that we are not interested in _____, but our funding allows only a small number of families and thus we can only include families who meet a very specific set of requirements to ensure that they are all similar. Thank you anyway. *(Pause for response)*. Good-bye.

Ineligibility Speech #2

*Note to interviewers: if family is ineligible because they have **more than one child**, use this script:*

Thanks for letting me know that you have more than one child. Currently, we are only including families with one child in our study. However, in the future we may also include families with 2 or more children. If that becomes the case, would it be okay to call you back to offer you a chance to participate? *[Get response and record in log book]*

Appendix B

Interview Script

Now, I want to talk to you about times child's name was injured or almost injured in the past two weeks. Let's talk about them one at a time [*encourage the mother to check the record for each incident type*].

*A:0. CAR-OCCUPANT

1. In the past two weeks, has your child ridden in a car, a truck, or a bus? *If yes*: When your child was in this car, truck, or bus, were there any times the vehicle had to stop or turn suddenly, hit something in the road or nearly hit something? *If yes*: Did this hurt or leave a mark on your child? (*Injury*). *If child was not hurt or injured*: (*code and probe as near injury*).

2. Were there any times your child fell or almost fell out of or off of a moving car, truck, or bus? *If yes*: Did this hurt or leave a mark on your child? (*Injury*). *If child was not hurt or injured*: (*code and probe as near injury*).

3. Were there other times your child was hurt in a car, truck, or bus? This could be anything like slamming his/her finger in the door or bumping his/her head getting in. [*If the car wasn't moving, skip to 'crushing injury' (q:o) category if closed finger in door; skip to 'bumps/bruises' (p:0) if bumped head*]
If yes: Did this hurt or leave a mark on your child? (*injury*).

*A:1. OTHER MOTORIZED VEHICLE-OCCUPANT

1. Were there any times in the past two weeks when your child was in a vehicle other than a car, truck, or bus? These vehicles include motorcycles, tractors, boats, motorized three-wheelers, etc.; anything that has a motor that you ride on/in and can go fast. *If yes:* Did that vehicle have to stop or turn suddenly, hit something in the road or nearly hit something? Did this hurt or leave a mark on your child? (*Injury*). *If child was not hurt or injured: (code and probe as near injury).*

2. Were there any times your child fell or almost fell off of or out of any of these vehicles? *If yes:* Did this hurt or leave a mark on your child? (*injury*)

3. Were there any other times your child was hurt or nearly hurt on or in one of these vehicles? *If yes:* Did this hurt or leave a mark on your child? (*Injury*). *If child was not hurt or injured:: (Code and probe as near injury). [If near or actual injury belongs to another category like "crush", "cut", or "bump", go to that category.]*

*B:0. CAR-PEDESTRIAN

1. When your child was crossing a street or playing in places where cars go, were there any times someone had to stop their car fast or swerve to keep from bumping or hitting your child? Were there any times that your child was actually bumped or hit by a car? *If*

yes: Did this hurt or leave a mark on your child? (*Injury*). *If child was not hurt or injured: (Code and probe as near injury).*

***B:1. OTHER MOTORIZED VEHICLE-PEDESTRIAN**

1. Were there any times that someone in a vehicle other than a car, truck, or bus had to stop fast or swerve to keep from bumping your child? Again, these other vehicles are things like motorcycles, tractors, boats, three-wheelers, etc. Were there any times that your child was actually bumped by someone in one of these vehicles? *If yes: Did this hurt or leave a mark on your child? (Injury). If child was not hurt or injured: (Code and probe as near injury).*

***C:0. TRICYCLES OR “BIG WHEELS” + VEHICLES**

1. Has your child ridden a trike or big wheel in the last two weeks? *If yes: Were there any times when your child was riding a trike or big wheel that someone in a vehicle such as a car, truck, motorcycle, etc. had to stop fast or swerve to keep from bumping your child? If yes: (Code and probe as near injury). Were there any times your child was actually bumped? If yes: Did this hurt or leave a mark on your child? (Injury). If child was not hurt or injured: (Code and probe as near injury).*

2. Did your child have to stop fast or swerve to keep from getting in the way of a moving vehicle like a car, truck, or motorcycle? *If yes: (Code and probe as near injury).* Were there any times while your child was riding a trike or big wheel that your child actually bumped against a vehicle? *If yes: Did this hurt or leave a mark on your child? (Injury). If child was not hurt or injured: (Code and probe as near injury).*

C:1. TRIKE OR “BIG WHEEL” ALONE

1. Were there any times while riding a trike or big wheel that your child had to stop fast, or your child skidded? Were there any times that the trike/big wheel your child was on hit a bump or a curb that caused your child to fall? Were there any other times your child fell while riding a trike or big wheel? Were there any other times your child got hurt while he/she was on a trike/big wheel? *If yes: Did this hurt or leave a mark on your child? (Injury).*

2. Were there any times that someone on foot, on a bike, or on another trike/big wheel ran into your child or nearly ran into your child while your child was on a trike/big wheel? *If yes: Did this hurt or leave a mark on your child? (Injury).*

D:0. BABY WALKERS

1. Was your child in a baby walker in the past two weeks? *If yes: Were there any times that the walker hit a bump or a curb that caused your child to fall?*

2. Were there any other times that your child lost his/her balance while in the walker or while outside the walker pushing it? *If yes: Did this hurt or leave a mark on your child? (Injury).*

*E:0. BURNS[FOOD]

There is a lot of hot stuff around that could burn your child. Some things we can get burned on are food items, such as hot drinks, hot foods from the stove top, or hot tap water.

1. Has your child, in the past two weeks, been close enough or actually touched food so hot that he/she pulled away quickly or had to spit it out of his/her mouth, but there was no red mark or white mark afterward? *If yes: (near injury)*
2. Has your child been burned by any food items in the last two weeks so that it left a mark on his/her tongue or body? *If yes: (Injury).*

*F:0. BURNS [NON-FOOD]

Other stuff that is not food can burn your child also-things like heaters, wood-burning stove, matches, fireworks, gasoline, charcoal grills, fires, irons, and other things.

1. Has your child gotten close enough to any of the non-food items I just mentioned that he/she had to pull his/her hand or body away quickly? *If yes: (near injury).*
2. Has your child been burned by any of the non-food items I mentioned in the last two weeks so that it left a mark on your child? *If yes: (Injury).*

G:0 POISON

There are lots of things that aren't good for a child if he/she swallows them, sprays them on him/herself, or breathes them. These are things like medicine, cleaners, liquor, and other stuff like that.

1. Has your child swallowed any stuff like that? *[Not medicine administered by a parent, or a single vitamin.] If yes, ascertain amount, and if not trivial, go to probes. (injury).*

2. Has your child breathed anything that hurt him/her? These are things like poisons, insecticides, fertilizers, paints, etc.. *If yes, ascertain amount, and if not trivial, go to probes. (Injury).*

3. Did your child get anything on his/her skin that stung, burned, or hurt your child?*If yes:*
Did this hurt or leave a mark on your child? *(Injury).*

H:0.FALLS INSIDE

1. Were there any times that your child fell from anything in the house that is taller than him/her? *If yes: Did this hurt or leave a mark on your child? (Injury).*

H:1 FALLS OUTSIDE

1. Were there any times that your child fell from anything outside like playground equipment, trees, or ladders? *If yes: Did this hurt or leave a mark on your child? (Injury).*

I:0. CHOKING [FOOD]

1. Were there any times in the past two weeks that your child had any kind of food, including gum, candy, and ice, stuck in his/her throat that made him/her not be able to breathe? *If yes, After your child coughed for more than 60 seconds, did he/she still have trouble breathing? If yes, assume injury, go to injury probes.*

I:1. CHOKING [NON-FOOD]

1. During the past two weeks, did your child chew or suck on anything that was not gum, candy, ice, or food? These could be things like a marble, paper, the top of a pen, etc. *If yes: Did anything like this cause your child to cough or choke, not being able to breathe for more than a minute? If yes, injury probes.*

*J:0. DROWNING

1. Were there any times your child was in water more than six inches deep without an adult present?

2. Did your child breathe any water into his/her lungs -- that is, actually aspirate the water so he/she had water in his/her lungs, not just cough or sputter? *If yes: probe as injury. If just cough and sputter, do not probe as either injury or near injury.*

3. Did your child fall while in the water so that he/she could have hit his/her head, or go under the water and have to struggle to get out of the water? *If yes: probe as near injury.*

Interviewer: If the parent or caregiver assisted the child from the water, it was a prevented injury. Also, if child falls into a water container that is empty (e.g., an empty bathtub) and bumps his head, count as a bump. Any water, accompanied by a fall that could have bumped the child's head, count as a near drowning.

***K:0. FIREARMS**

1. In the past two weeks, did your child touch a gun at all, whether loaded or unloaded?

By gun I mean any handgun, rifle, shotgun, BB gun, or automatic weapon. *[Code as near injury]*

2. Was your child in the vicinity where guns were being fired. *If yes: Was your child within 50 yards (half a football field) of where any bullets hit? [Code as near injury].*

3. Did your child get hurt in any way while he/she was around a gun? This could include being shot or grazed by a bullet, having a fired gun “kick back” or recoil into his/her body, or having his/her hearing damaged by the noise from a fired gun *[Code as injury]*

***L:0. ELECTRICITY**

1. In the last two weeks, did your child touch something electric when his/her hands or body were wet? *If yes: Did your child get shocked so that he/she felt a tingling sensation?*

If yes: (Code as near injury) Did the shock cause pain greater than a tingle, or did it leave a mark? If yes: (Code as injury).

2. Did your child touch any wires or the inside of anything that plugs into a wall like a toaster, electric drill, hair-dryer, or a TV? *If yes:* Did your child get shocked so that he/she felt a tingling sensation? (*Code as near injury*). Did the shock cause pain greater than a tingle, or did it leave a mark? *If yes: (Code as injury)*.

3. Did your child get any shocks, see sparks fly, or have anything else happen that would mean something electrical caused your child to feel a tingling sensation? *If yes: (Code as near injury)* Did this hurt more than just a tingle or leave a mark? *If yes: (Injury)*.

M:0 ELECTRIC FANS

1. Have there been any times your child has touched a fan, and had his/her fingers, hair, or other body part hit the blades? *If yes: (Injury)*

N:0. TRIPS & SLIPS (FALLS FROM THE SAME LEVEL)

1. Did your child slip or fall from anything, no matter how tall? This could be outside or in the house, like in the bathroom. [*If in water, go to J:0.*] *If yes:* Did this hurt or leave a mark on your child? (*Injury*).

2. When on an even level, did your child slip or fall when he/she was just walking or running? *If yes:* Did this hurt or leave a mark on your child? (*Injury*).

O:0. CUTS/SCRAPES

1. Did your child get any cuts or scrapes, or get stuck with anything such as a nail or dart? *If yes: Did this hurt or leave a mark on your child? [Paper cuts that do not draw blood do not count; paper cuts that draw blood do count.] (Injury).*

2. Did you notice any cuts on your child, even when you did not know where they came from? *[If origin is truly unknown, don't probe but note the injury number as if it were a probe, and that cause is unknown.]*

P:0. BUMPS/BRUISES

1. Did your child hit anything hard enough to have caused a bruise or raised a bump? *If yes: Did this hurt or leave a mark on your child? (Injury).*

2. Did anything hit your child hard enough to have caused a bruise or raised a bump? *If yes: Did this hurt or leave a mark on your child? (Injury).*

3. Did you notice any bumps or bruises on your child, even if you didn't know where your child got them? *[If origin is truly unknown, don't probe but note number and that cause is unknown.]*

Q:0. CRUSHING INJURY

1. Has any part of your child's body been caught in something that could have pinched, cut, or crushed your child? These are things like the child catching his/her finger in a car door or dropping a hammer on his/her toe. *If yes: Did this hurt or leave a mark on your child? (Injury).*

R:0. STING/BITE/SCRATCH FROM ANIMALS OR BITES FROM PEOPLE [*This does not include minor itchy insects like mosquito bites, chiggers, or poison ivy.*]

1. In the last two weeks, has your child been stung or bitten by anything like a bee or a horsefly? *If yes: Did this hurt or leave a mark on your child? (Injury).*

2. Has your child been bitten or scratched by anything like a dog or a cat? *If yes: Did this hurt or leave a mark on your child? If yes: (Injury) [if origin is truly unknown, don't probe, but note number and that cause is unknown.]*

3. Has your child been bitten by a person such as another child so that it left a mark? *If yes: (Injury)*

S:0. EYE

1. Did your child get anything in his/her eye in the last two weeks that caused or would have caused redness, stinging, watering, or otherwise hurt? *If yes: Did this hurt or leave a mark on your child? (Injury).[if chemical, go to G:0. If allergy, record under illness category.]*

2. Has anything bumped your child's eye so your child got a black eye or just had his/her eye hurt? *If yes: Did this hurt or leave a mark on your child? (Injury).*

3. Has anything else hurt your child's eyes in the last two weeks? *If yes: Did this hurt or leave a mark on your child? (Injury).*

T:0. MUSCLE/JOINT/BONE

1. Did your child strain, pull, tear, stress any muscles or joints (this includes things like twisting his/her ankle or hurting his/her back lifting something), or break any bones? *If yes: Did it hurt, swell, or look bruised? (Injury). If broken bone: Do you know if it was a greenstick, single fracture, or compound fracture?*

U:0. SPLINTER/THORN/NEEDLE

1. Has your child had anything stuck into him/her like a sewing needle, thorn, or splinter? *[Note: to count in this category, the point of entry must be very small/only slightly visible; otherwise if it is a hole you can see, count this as a cut (puncture wound)]. If yes: Did it hurt or leave a mark? (Injury).*

V:0. ASPHYXIATION/STRANGULATION

1. In the past two weeks, has your child had anything wrapped around his/her neck or over his/her head that restricted his/her breathing in any way? These things could include cords, ropes, pacifier strings, and plastic bags. *If yes: Did this occur for less than 3*

minutes and was your child able to free him/herself? *If yes:* Did this occur for more than 3 minutes or were there signs of lack of oxygen, such as blue lips, face, or fingernails? *If yes: (Injury)*

*W:0. MISCELLANEOUS

1. Did anything else happen that hurt your child that we have not already talked about? *If yes:* Did this hurt or leave a mark on your child? *(Injury).*

TIOS INJURY PROBES

4. Was this the result of an act intended to hurt the child (like another child hitting your child) or was it an unintentional injury?

5. ANTECEDENTS: (A-Q)

A. Where was your child when he/she got hurt? (So, your child was at _____'s house [*or park, street, garage*] in the [*name of room or specific area*] by the [*furniture, playground equipment, lawn mower*]?). [*inside/outside, specific location*]

Use this only for training: Part of what happens is the activity. In this example, chasing a ball is the behavior or activity [*show child chasing ball sheet*]. Part of what happens is the situation or circumstance, or all of the things around that make chasing the ball different this time than for all other times. For example, the child in the street, friends in the yard, and a car in the road. [*Overlay the situation transparency on the activity sheet.*] Now, think about what your child was doing when he/she got hurt. Part of what happened was the activity and part was the circumstances, the way things were all around the activity. [*If mother still does not understand, incorporate part of the story he/she has told you back into the explanation.*]

B. What was your child doing at the exact moment when he/she was injured? [*Write mother's answer, including safety equipment used*]

C. Was your child's behavior unusual or pretty typical of your child?

(*If typical, skip to E, if unusual ask*) How unusual was it for your child to _____? On our unusualness scale, 1=slightly unusual, does this occasionally to 5=extremely unusual, has never done this behavior this way before.

D. What made the behavior unusual?

E. Has your child ever been hurt doing this before? No Yes *If yes: Why do you suppose he/she did it again?*

F. Was the situation or were the circumstances unusual or pretty typical for your child?
(*If typical, skip to H, if unusual ask*) How unusual were the circumstances? 1=slightly unusual to 5=very unusual.

G. What made the circumstances unusual?

H. [*Ask H & I only if behavior was unusual*].

Would it be okay with you for child's name to activity again exactly the way he/she was when he/she got hurt? 1=absolutely not allowed to 5=perfectly okay.

I. [*If child has never done behavior before, record a 6 on the data sheet*]

Would it be okay with you for child's name to activity again in the way he/she has done in the past? 1=absolutely not allowed to 5=perfectly okay.

J. [*Ask only if circumstances were unusual*]

Would it be okay with you for child's name to activity again under the circumstances that existed at the time of the injury? 1=absolutely not allowed to 5=perfectly okay.

K. [*Always ask*]

Would it be okay with you for child's name to activity in the future under normal or typical circumstances? 1=absolutely not allowed to 5=perfectly okay.

L. [*Always ask*] How likely is it that your child will _____ again in the future under normal or typical circumstances, whether you allow it or not? 1=will never do it again to 5=will do it frequently.

M. If your child were to do the same thing again under the same circumstances, would he/she be likely to get hurt again? 1=very unlikely to 5=very likely.

N. How bad would it be if he/she did? 1=no big deal to 5=very upsetting; should be prevented at all cost.

O. Is there something you usually do to prevent this injury that you didn't do this time?

No=0 *If yes, go to no-brainer codes*

Now, I want to ask about some things in the situation:

P. Was the TV on in the room where the child was injured? [*If injury occurred outdoors or in a room without a TV, code as NA.*]

Q. How noisy was it when your child was injured? 1=very quiet, 5=very noisy

R. Were there other things your child had immediate access to that he/she could play with or do in the situation? 1=nothing else to manipulate or play with to 5=had over a dozen other things could have played with.

S. How many other children were in the same area around your child when he/she got hurt? Who were they? [*List up to four*]. How many adults were in the same area around your child when he/she got hurt? Who were they? [*List up to four*]

T. When your child got hurt, were there any pets or animals that were nearby or interacting in some way with your child? [*Record number*]

U. Who was taking care of your child at the time that he/she got hurt? [*Adult/child, gender, relation, age*]

V. Were there any demands on (whoever was taking care of the child) at the time of the injury that influenced his or her ability to supervise the child? 1=nothing else going on to

5=dealing with something which occupied all of caregiver's attention (e.g., something burning on the stovetop).

W. Would increased supervision or partial intervention have made a difference in this injury? 1=no difference to 5=would have completely prevented the injury.

X. Did your child have anything other than _____ [*for operating activity*] in his/her hands at the time of the injury? [*Number of hands free*]

Y. (*Interviewer: Any safety equipment applicable? See list below. If no, skip to BB*)

Yes No

CAR: car seat or seat belt?

BOATS: a life jacket?

PEDESTRIAN AT NIGHT: light colored reflective clothing?

TRICYCLE/BIG WHEEL: a helmet?

BACK OF ADULT'S BIKE: a helmet?

Z. [*If so, list which one(s) on data sheet*]

AA. Was your child using _____ [*Safety Equipment*]?

BB. [*Interviewer, Any barriers applicable? If no, skip to EE*] Yes No

CC. [*If so, list which one(s) on data sheet*]

DD. Was _____ [*the barrier*] being used?

EE. Was the caregiver ill at the time of the injury? 1=perfectly healthy to 5=very ill (e.g., throwing up, fever, etc.)

FF. Why do you think that your child got hurt?

[*If the mother gives part of the injury sequence, e.g., "my child got hurt because he/she fell down,"*] Why did he/she fall down? [*Look for a causal answer.*]

Write down exactly what the mother describes, not what you can imply from the description.

6. CONSEQUENCES:

A. How serious do you think this actual injury (or injuries) was (were)? 1=not at all to 5=very, very serious

B. How serious could it have been at its worst? 1=not at all to 5=very, very serious

C. Where were you (or the person who was taking care of your child) at the time your child got hurt? (*Get location and number of feet away from child*)

D. How closely were you (or the caregiver) supervising the child? [*Write down enough information to be able to code*]

E. *If caregiver other than mother:* Did that person know your child got hurt? [*Code yes if they ever found out*]

F. How did you find out? [*If mother suggests intervention, probe to see if failed, partial, etc.*]

G. How soon after your child got hurt did you find out your child had been hurt?

H. *How informed is mom about this injury?* [*Rate on 1-5 scale as: 1=First hand information, was present, 3=Second hand information, child or other caregiver described in some detail, 5=Knows only that there is an injury, nothing else*]

I.a. Please describe how you were feeling just before the injury happened?

I.b. Now, using these scales, point to the number that best describes how you felt just before the injury occurred? [*Hand mother the emotion scales*]

J.a. Please describe how you were feeling just after the injury happened?

J.b. This time, do the same thing, only use these scales to tell me how you felt right after your child was hurt?

K. I want to go back for a minute. Had you used any alcohol, medication, or drugs in the past 24 hours? Remember, this answer is entirely confidential. *If yes:* What type of substance was it? [*Drugs, alcohol*]

L.a. *If yes to alcohol:* How many drinks had you had? On our scale 1 drink = 12 oz. of beer, 6 oz. of wine, or 1 oz. of hard liquor like whiskey or gin.

L.b. *If yes to drugs:* What were you taking? (*try to get most precise estimate. If prescription, ask to see bottle and write down drug name and mg*) How many pills did you take?

M.a. What time did you start drinking/taking the drugs?

M.b. What time did you stop drinking/last use the drug?

M.c. Did you feel high, drunk, or have any other trouble thinking just before the injury occurred? *If yes:* 1=very slight to 5=very high, drunk, or lots of trouble thinking

7. TREATMENT:

A. Tell me about what happened to help your child get better after he/she got hurt. Did someone do something to help it get better? Yes or No

B. Who helped it get better? [*Adult, child, relation, age*]

C. How many times did an adult look at, or treat this injury?

D. *If the child saw a physician:* After the first time that your child received treatment for this injury, how many more times did your child visit the doctor, or someone else like a doctor?

8. PHYSICAL CONSEQUENCES:

A. How much pain or hurt did your child feel when the pain was at its worst? 1=very little pain, 5= extreme pain.

B. How long did your child's worst pain last? [<1 minute, <5 minutes, <1 hour, etc.]

C. How upset or worried does your child still feel because of this injury? Again, 1=not at all upset or worried to 5=extremely upset or worried.

D. Did anyone give any lectures, discipline, take away special privileges, change the environment, or anything because of this injury? *If MOM says yes:* Okay, we will talk about that when we discuss interventions. *(Make a note to do so).* *If CAREGIVER did something:* What did he/she do?

E. Do you feel your child has changed his/her behavior as a result of this event? [*Specify what changed*]

F. How likely is it that your child will be injured in this same manner again? 1=not at all likely to 5=almost certainly

G. Could this injury have been prevented? 1=No, this was bound to happen to 5=yes, this injury could readily have been prevented

H. How many days of normal activity (like play with friends or preschool) did your child miss because of this injury?

I. Because of this injury, was it hard or impossible for your child to do any of the things that he/she normally would do, this could even be play, or small things (like bathing, brushing teeth, getting dressed, eating, etc.)? *If yes:* Tell me about that. *(Write down the specific circumstances of the disability)* Ask mother to rate 1 = no difficulty in child's daily life to 5 = total disability.]

J. How long did this last? [*Brief treatment, some activities or all activities for the rest of the day or week, etc.*]

9. ATTRIBUTION:

I have just a couple more kinds of questions about this injury. First, I want your opinion on the cause of your child's injury. There are four (4) kinds of things that can make your child get hurt. One is what your child does - your child's behavior and the choices he/she makes. Another is things you do and choices you make. The third is stuff your child cannot control in the situation -- the weather, the room he/she is in, who else is there and all that kind of stuff. The last one is chance or fate - it means sometimes even when what your child does is safe and the situation is safe, things can still go wrong. Sometimes things just happen.

A. Keeping these four (4) things in mind, how much of what happened was due to your child's behavior? 1=contributed none at all to 5=contributed greatly

B. Even though you did not hurt the child, how much of the injury do you feel was due to you?

1=contributed none at all to 5=contributed greatly

Explain why to me?

C. How much of this injury do you think was caused by the situation or circumstances outside of your child's control? 1=contributed none at all to 5=contributed greatly

D. How much of this injury do you think was because of chance or because things just went wrong? 1=contributed none at all to 5=contributed greatly

E. To what extent do you feel this injury taught your child a lesson? 1=not at all, he/she is likely to do it again to 5=completely, he/she will never get injured that way again.

F. Why do you feel your child did (*if E is 4 or 5*) or did not (*if E is 1, 2, or 3*) learn a lesson from this?

10. EMOTION RATINGS:

A. [*Get out laminated child emotion scales*] Now, using the following emotion scales, point to the number on each scale that best describes your child's feelings just before the injury occurred. [*Go through each scale*]

B. Now, using the same emotion scale, point to the number that best describes how you think your child was feeling right after the injury occurred. [*Go through each scale*]

C. Was your child ill at the time of the injury? 1=perfectly healthy to 5=very ill (high fever, throwing up, etc.)

D. What kind of illness was

Appendix C

Parent Consent Agreement

I hereby agree to participate in the childhood injury research to be conducted by Dr. Lizette Peterson-Homer, and sponsored by the National Institute of Child Health and Human Development and the Psychology Department of the University of Missouri-Columbia. I have been fully informed of all expectations of me.

Specifically, for six months, I will keep a daily record of my child's injuries and nearly occurring injuries. Every other week I will make a record at an appointed time of what activities the family is engaged in, and every two weeks I will engage in a 2-hour interview in my home regarding the daily injury record. Someone will come to my home once to assess my child's general motor and verbal skills. Finally, sometime after completing the initial six-month phase of the project, I may be asked to take my child to the UMC research laboratory, where my child and I will be videotaped in a typical interaction. I will also fill out several questionnaires regarding my child's behavior. I will be paid \$3 per day for the six months' participation, and \$25 for completing all the project questionnaires. This will be paid to me upon completion of all 12 in-home interviews. In addition, should it occur, I would be paid \$25 for my visit to the lab. Thus, I will be paid up to \$596 in all. Half of the daily payments will be paid in monthly payments of about \$45.60 and the remaining half will be paid at the conclusion of the project.

I understand that the results of the research will be coded in such a manner that neither my identity nor my child's will be attached physically to the data that we contribute. The key listing our identity and subject code number will be kept separate

from the data in a locked file accessible only to the project director. Our names will be known only to the project directors and the interviewer who will work

directly with us. This key listing subjects' identities will be physically destroyed within approximately one year after the project's conclusion. Five years after the publication of the last report of the project findings, all of the written records will be destroyed. In addition, I realize the purpose of this project is to examine the performance of groups of individuals, not to evaluate the performance of a particular individual.

Confidentiality will be maintained within the limits of the law. There are some legal exceptions to confidentiality. For example, if the interviewer ascertained the child to be in clear and present danger and discussion with the parent did not remove this concern, the project director would be bound by Missouri law to report the situation to the relevant authorities. Similarly, project staff, like all individuals who work with children in this state, are required to report child abuse and neglect. Note that spanking administered in a reasonable manner does not constitute abuse. Another exception to confidentiality would occur if a court of law subpoenaed the project records for a child, the project director would be bound to release the records for that child.

The research project is expected to help identify the factors that lead to accidental injury in children and to evaluate methods of preventing such injury.

I understand that results of this research may be published or reported to government agencies, funding agencies, or scientific bodies, but that my family will not be identified in any such publication or report.

I understand that participation is voluntary, that there is no penalty for refusal to participate, and that my child and I are free to withdraw our consent and discontinue our participation at any time. I understand that should I choose to discontinue participation before the project's conclusion, I will lose the \$273 to be paid at the end of the project and any remaining monthly payments, the final session payment, and the \$25 lab session payments. I understand that I can request that any prior records of our interviews or laboratory videotape be destroyed if I decide to discontinue participation.

I understand that this project is not expected to involve risks of harm any greater than those ordinarily encountered in daily life. I also understand that it is not possible to identify all potential risks in an experimental procedure but that all reasonable safeguards will be taken to minimize the potential risks.

If at any time my child and I have questions about any procedure in this project, I understand that I may contact one of the project directors at 882-6083 or 884-1732.

Parent's Signature

Date

Parent -- Print Name

MOTHER SELF-MONITORING RECORD OF INJURY/NEAR INJURY ID# _____

Helpful Definitions: **Injury** - anything deliberate or unintentional that causes your child tissue damage (e.g., a cut, bruise, etc.) **Near Injury** - any event which occurs in which your child could have been hurt, nothing you have done previously prevents the hurt (e.g., a childgate or latch) but through good luck the child is not actually hurt. An event must occur. Almost coming near the wood burning stove is not an event. Having boiling water narrowly miss your child's hand in the sink is a near injury. Please note that we only code near injuries for injuries involving moving vehicles (being an occupant in a near car or motorcycle crash, having a near pedestrian injury, or almost contacting a moving car while on a tricycle or big wheels), burns, drowning, firearm, and electricity. These near injuries can be very serious, but are easier to judge and less work to record than when your child falls down and doesn't get hurt, for instance.

1. DATE: Monday Tuesday Wednesday Thursday Friday Saturday Sunday

TIME: _____

(circle one) a. INJURY b. NEAR INJURY c. RANDOM PHONE CALL

DESCRIBE WHAT HAPPENED: _____

TYPE OF HURT: _____ CAREGIVER: 1 2 3 4 5

Vigilant

Close enough
To see child

Gone
+1min

YOUR FEELINGS BEFORE THE INJURY/NEAR INJURY: _____

YOUR FEELINGS AFTER THE INJURY/NEAR INJURY: _____

CHILD'S FEELINGS BEFORE THE INJURY/NEAR INJURY: _____

CHILD'S FEELINGS AFTER THE INJURY/NEAR INJURY: _____

Appendix E

Minor Injury Severity Scale (MISS)

OVERVIEW

This categorization system is meant to be used by laypersons with no medical training, but who are thoroughly familiar with these scales.

Injury types were derived empirically, from our minor injury data base of injuries actually incurred by eight-year-old mid-western children (see Peterson, Brown, Bartelstone, & Kern, Health Psychology, 1996). Thus the system may not include all possible injuries. Injuries are listed in alphabetical order. There is no presumption that the scales are completely parallel (e.g., a "2" rating for a cut is not presumed to be exactly the same level of seriousness as a "2" for burn, although both are viewed as very minor damage.) In contrast to most injury severity scales, the sensitivity of this scale is on the lower (less severe) end. Because the scale is empirically derived, not all possible injuries are represented here. Future research may contribute descriptions of additional parameter and types of injuries.

SPECIFIC RULES

Only near injuries in our project were coded 0. All events categorized as injuries were rated 1 or greater. An injury is an event with a distinct onset. Thus, tissue damage such as sunburn or poison ivy are not regarded as injuries. Attached to the back of these scales you will find the record form children and parents used, as well as some tools which can allow informants to quantify aspects of the injury (e.g., the bumpometer allows a rating of how raised a bump is.)

If two separate areas are involved (two bruises or two separate scrapes) that are rated at the middle or top of the same level (e.g., both rated a clear 2, almost 3), rate the entire injury at one higher level (e.g., 3). If both are barely at a given level, (e.g., just barely a 2), and both together still fit that criteria, rate it at the same level (e.g., 2). If two injuries are rated at different levels (e.g., one rated 1, one rated 3), rate only higher level injury (e.g., 3). If more than two sites are involved, you must make a decision concerning what the sum of the injury should be. Exception - a bite mark with several punctures - seriousness of each = 2, rate a 3. Bites are conservatively scaled, so if more than 1 scratch, rate higher. Where the term "or" is used (e.g., "the injury may show a white or a red mark"), an injury may have either characteristic or both. Body site often influences rating. However, there are no separate body/face distinctions for ratings of 6, as all of these refer to internal organ injuries.

Occasionally, some characteristics of an injury would yield one rating and other characteristics would yield another (e.g., according to size, a cut would be rated 2 but in terms of bleeding, it would be rated a 3). In such cases, use the following decision rules:

1. Any injury that breaks the epidermis gets rated over other injuries (e.g., if a scrape and a bruise are present on a single site, and are of equal severity, only the scrape would get rated).
2. If no information is present, assume lesser rather than greater damage (e.g., if no swelling is reported, assume none occurred).
3. Joint/Bone/Muscle is the only category that emphasizes the pain ratings. This is because that are sometimes no external signs for minor injuries to use for these ratings.

4. When size/swelling and bleeding characteristics are inconsistent, use size/swelling to dictate rating.
5. When size/swelling and pain ratings are inconsistent, use size/swelling to dictate the rating.
6. When size/length and bumpometer are inconsistent, use size/length to dictate the rating.
7. When size/swelling and discoloration are inconsistent, use size/swelling to dictate the rating.
8. When discoloration are bumpometer are inconsistent, use discoloration to dictate the rating.
9. If there are two separate injuries in the same event that would be rated the same on different scales, rate the one involving epidermal damage. However, if the non-epidermal injury is more severe, rate that injury.
10. If a facial injury involves the tissue next to the eye (within 1/4 in. of upper or lower lashes) score next highest number if injury < 4.

GUIDELINES FOR CATEGORIZATION

A. Animal/Human Scratch/Bite

0 = Rating of Animal/Human Scratch/Bite

Body - None

Face - None

1 = Rating of Animal/Human Scratch/Bite

Body - Skin not punctured

May show a white or a red mark

Only epidermis involved

No swelling

Face - Rated > 1 unless so slight cannot be seen unless attention is called to it

2 = Rating of Animal/Human Scratch/Bite

Body - Skin punctured to $\leq 1 / 8$ in. in depth

Bleeding or reddening around cut

If length is ≥ 1 in., but otherwise would be rated severity of 2, rate as a 3

Face - Skin red or only slightly broken

No swelling

3 = Rating of Animal/Human Scratch/Bite

Body - Damage $1 / 8$ in. $< x \leq 1 / 2$ in. in width or depth

If length is > 2 in., but otherwise would be rated severity of 3, rate as a 4

Face - Skin punctured $1 / 16$ in. $\leq x < 1 / 8$ in.

Bleeding or redness

If length is > 1 in., but otherwise would be rated severity of 3 rate as a 4

4 = Rating of Animal/Human Scratch/Bite

Body - Damage into the dermis

If length is > 3 in., but otherwise would be rated severity of 4, rate as a 5

Face - Damage $1/8$ in. $< x < 1/2$ in. in width or depth

If length is > 2 in., but otherwise would be rated severity of 4, rate
as a 5

5 = Rating of Animal/Human Scratch/Bite

Body - Mild or temporary injury to vital organs

Damage to joint space

Face - Damage into Dermis

6 = Rating of Animal/Human Scratch/Bite

Body/Face - Permanent scarring or muscle damage

Vital organs permanently damaged

B. Bruise/Bump

0 = Rating of Bruise/Bump

Body - None

Face - None

Eye - None

Head - No

1 = Rating of Bruise/Bump

Body - No immediate bruise discoloration

Only mild discoloration or red mark of an area ≤ 1 in. in diameter
lasting over one hour

Bruise results with clear discoloration in an area $\leq .56$ in.

No later swelling

Bumpometer = 0

Face/Head - Facial bruising rated > 1 unless the discoloration is so mild

it cannot be seen until attention is called to it or a red mark $\leq .14$.

sq. in. lasting over one hour

Bumpometer = 1 or 2

Head bruising rated > 1 unless the discoloration is so mild that it

cannot be seen until attention is called to it or a red mark $\leq .14$ sq.

in. lasting over one hour.

Eye - No discoloration or swelling

Only tenderness

2 = Rating of Bruise/Bump

Body - Bruise results with clear discoloration in an area $.56 \text{ sq. in.} < x \leq$

3.52 sq. in. , mild discoloration $<$ to parallel rating of 1 severity or a

red mark $.56 \text{ sq. in.} < x \leq 9 \text{ sq. in.}$ that lasts over 1 hour

Bumpometer rating = 1 or 2

Face/Head - Mild discoloration of an area $< .56 \text{ sq. in.}$ or a red mark $.14$

Sq. in $< x < 3.52 \text{ sq. in.}$ lasting more than one hour

Bumpometer rating = 3 or 4

Minimal bleeding from nose, and/or mouth where nose and/or

mouth was point of contact

Eye - Very mild swelling (1 or 2 on bumpometer)

Mild or no later discoloration

3 = Rating of Bruise/Bump

Body - May have some immediate swelling

Bumpometer rating = 3 or 4 with substantial discoloration

Area 3.52 sq. in. $< x \leq 9$ sq. in. that lasts more than one hour

Face/Head - Clear discoloration in an area .56 sq. in. $< x \leq 3.52$ sq. in.

Red mark > 3.52 sq. in that lasts more than one hour

Bumpometer rating = 5 or 6

Moderate/severe bleeding from nose, and/or mouth where nose and/or mouth was point of contact

Eye - Bumpometer = 3 or 4 or some later bruising (slight "black" eye)

4 = Rating of Bruise/Bump

Body - Substantial swelling

Discoloration of a large area > 9 sq. in.

Any mild or temporary injury to an internal organ (blood in urine from blow to kidney) or bone bruising

Face/Head - Bumpometer = 7 or 8

Substantial discoloration of area 3.52 sq. in. $< x \leq 9$ sq. in.

Any head bump resulting in brief loss of consciousness (< 1 min.) with no sequelae (i.e., no permanent symptoms or problems)

Bleeding from nose, and/or mouth even if the nose or mouth was not the point of contact

Difficulty breathing lasting more than 10 seconds

Eye - Bumpometer = 5, 6, 7, 8, or 9 or substantial later bruising directly around the eye (clear "black" eye)

5 = Rating of Bruise/Bump

Body - Contusion causing significant but not permanent injury to internal organs (symptoms may include light-headedness after abdominal injury, blood in urine for more than one day, etc.)

Face/Head - Substantial bruising of large area

Mild or temporary internal injury (concussion, little internal swelling)

Any head bump resulting in loss of consciousness > 7 minutes or symptoms of blurred vision, headache, nausea, vomiting, excessive somnolence (sleepiness) or behavioral irritability which is subsequently resolved without permanent sequelae

Small fracture to the skull

Bumpometer = 9

Eye - Eye swollen shut

Substantial bruising, not just a "black" eye but larger area or both eye tissue discolored

Blowout fracture with entrapment

6 = Rating of Bruise/Bump

Body, Face, Eye/Head - Any contusion permanently injuring any vital organ such as the brain, eye, heart, liver, bones, kidney, spinal cord, etc.

C. Burn

0 = Rating or Burn

Body - None

Hand - None

Face - None

Eye - None

1 = Rating of Burn

Body - Reddening of the skin only in the area $\leq .04$ sq. in. wide.

No blistering

Hand - Rated > 1 unless very small area ($\leq .02$ sq. in.), no blistering

Face - Rated > 1 unless very small area ($\leq .004$ sq. in.), no blistering

Not within 2 in. or eye

Mouth/Tongue - Ingestion of hot solid/liquid food with no blistering or

later difficulty in eating, but with discomfort lasting > 1 hour

Eye - Burns to the eye all rated ≥ 3

2 = Rating of Burn

Body - Reddening of the skin only in an area $.04$ sq. in. $< x \leq 2$ sq. in.

Blistering or skin sloughing $\leq .04$ sq. in.

Hand - Reddening only $.02$ sq. in. $< x \leq .056$ sq. in.

Blistering $\leq .02$ sq. in.

Face - Reddening only $.004$ sq. in. $< x \leq .04$ sq. in.

Not within 2 in. of eye or > 2

Mouth/Tongue - Ingestion of hot solid/liquid food with the burn showing

blistering or whiteness $\leq .009$ sq. in.

May be some difficulty (not just discomfort) later with eating or drinking

Eye - Burns to the eye all rated ≥ 3

3 = Rating of Burn

Body - Skin reddening 2 sq. in. $< x \leq 9$ sq. in.

Blistering .04 sq. in. $< x \leq .56$ sq. in.

Hand - Reddening of skin only in area .056 sq. in. $< x \leq 4$ sq. in.

Skin blistering or sloughing .02 sq. in. $< x \leq 2$ sq. in.

Face - Reddening of skin only in area .04 sq. in. $< x \leq 2$ sq. in. or in small area ($< .56$ sq. in.) near eye

Blistering or skin sloughing .009 sq. in. $< x \leq 1$ sq. in.

Mouth/Tongue - Ingestion of hot solid/liquid food with clear blistering or skin sloughing .009 sq. in. $< x \leq 6$ sq. in. in mouth

Eye - Burn the size of a pinhead or smaller, vision not affected. All other burns to the eye are rated > 3

4 = Rating of Burn

Body - Area of reddening > 9 sq. in.

Blistering and skin sloughing area .56 in. $< x \leq 9$ sq. in.

Partial thickness over less than 10% of body

Hand - Reddening 4 sq. in. $< x \leq$ one entire hand

Blistering 2 sq. in. $< x \leq 6$ sq. in.

Face - Reddening 2 sq. in. $< x \leq$ most of face

Blistering 1 sq. in. $< x < 4$ sq. in.

Mouth/Tongue - Ingestion of hot solid/liquid food with clear blistering or skin sloughing > 6 sq. in. in mouth

Eye - Eye burned, any size larger than the head of a pin

Vision not affected

5 = Rating of Burn

Body - Blistering > 9 sq. in.

Partial thickness over 10-30% of body

Hand - Entirely red on both hands

Blistering and skin sloughing area 6 sq. in. $\leq x <$ blistering over
one entire hand or more

Face - Redness > 6 sq. in.

Blistering and skin sloughing area 4 sq. in. $\leq x \leq$ entire face

Eye - Eye burned sufficiently for vision to be temporarily affected

6 = Rating of Burn

Body/Hand/Face/Eye - Full thickness burn > 30% of the body which is
expected to result in significant scarring of the face

Scarring which decreases functional ability of the hand or mobility
of other body parts such as limbs

Loss of vision or hearing due to burn or scarring

Partial thickness over > 30% of the body

D. Choke/Drown

0 = Rating of Choke/Drown

None

1 = Rating of Choke/Drown

Choke rated > 1

Brief and inconsequential interruption of oxygen supply

2 = Rating of Choke/Drown

Interruption of oxygen supply ≤ 10 seconds

No cyanosis (bluish or purplish discoloration of skin or lips)

3 = Rating of Choke/Drown

Interruption of oxygen supply $10 < x < 60$ seconds

Possibly slight cyanosis

No loss of consciousness

4 = Rating of Choke/Drown

Interruption of oxygen supply $60 \text{ seconds} < x \leq 3 \text{ min.}$

May include cyanosis

Brief loss of consciousness

5 = Rating of Choke/Drown

Interruption of oxygen supply $> 3 \text{ minute}$

Cyanosis

Must include loss of consciousness

No permanent sequelae (i.e., no permanent symptoms or problems)

6 = Rating of Choke/Drown

Permanent brain damage

E. Crushing Injuries

0 = Rating of Crushing Injuries

Any location - No injury

1 = Rating of Crushing Injuries

Body - No immediate discoloration

Only mild discoloration appearing later of an area ≤ 1 in. in diameter

Small amounts of torn tissue with minimal bleeding or small blood blister $\leq 3/16$ in.

Face/Feet/Hands - No discoloration

No later swelling

Joint pain < 2 after one hour

Very small (pencil lead or less) torn tissue or blood blister

2 = Rating of Crushing Injuries

Body - Bruise results, with clear immediate discoloration in an area

1 in. $< x \leq 2 \frac{1}{2}$ in.

Bumpometer rating = 1 or 2

Torn tissue with minimal bleeding or blood blister $\leq 1/2$ in.

Face/Feet/Hands - No immediate discoloration and only mild discoloration

appearing later of an area ≤ 1 in. in diameter

Torn tissue with minimal bleeding or blood blister $\leq 3/16$ in.

3= Rating of Crushing Injuries

Body - May have some immediate swelling

Bumpometer rating = 3 or 4 with substantial discoloration or area

$2 \frac{1}{2}$ in. $< x \leq 4$ in.

Clear discoloration

Torn tissue with minimal bleeding or blood blister 1.75 cm

Face/Feet/Hands - Bruise results

Clear discoloration in an area $1 \text{ in.} < x \leq 2 \frac{1}{2} \text{ in.}$

Bumpometer rating = 1 or 2

Torn tissue with minimal bleeding or blood blister $\frac{3}{16} \text{ in} < x \leq \frac{1}{2} \text{ in.}$

4 = Rating of Crushing Injuries

Body - Substantial swelling and immediate discoloration in large area $>4 \text{ in.}$

Any mild or temporary injury to an internal organ (blood in urine from blow to kidney) or bone bruising

Face/Feet/Hands - May have some immediate swelling

Bumpometer rating = 3 or 4 with substantial discoloration or area $2 \frac{1}{2} \text{ in.} < x \leq 4 \text{ in.}$ in clear discoloration

Crush fracture of distal phalanges (one of the bones of the fingers or toes)

5 = Rating of Crushing Injuries

Any location - Crush causing significant but not permanent injury to internal organs

Includes non-circumferential crush fracture of long bones

6 = Rating of Crushing Injuries

Any location - Any crush permanently injuring any vital organ such as brain, eye, heart, liver, bones, kidney, spinal cord, etc.

Crush fracture involving any joint, skull, or facial bones

Circumferential crush fracture of any bone (not including distal phalange)

F. Cut

0 = Rating of Cut

Body - None

Hand/Foot - None

Face/Hand - None

Joint - None

1 = Rating of Cut

Body - Shallow laceration $\leq 1/16$ in. in either width or depth

Little bleeding

If length is ≥ 1 in., but otherwise would be rated severity of 1, rate as a 2

Hand/Foot/Joint/Head - Rated > 1 unless very small [$1/32$ in.]

Face - Scored > 1

2 = Rating of Cut

Body - $1/16$ in. $< x \leq 1/8$ in. in depth or width

Some bleeding

If length is > 2 in., but otherwise would be rated severity of 2, rate as a 3.

If ≤ 2 in., rate severity of 2.

Hand/Foot/Joint/Head - Shallow laceration

$1/32$ in. $< x \leq 1/16$ in. in either width or depth

Little bleeding

If length is > 1 in., but otherwise would be rated severity of 2, rate as a 3.

If ≤ 1 in., rate severity of 2.

Face - $< 1/32$ in. in width or depth

If length is > 1 in. but otherwise would be rated severity of 2, rate as a 3.

If ≤ 1 in., rate severity of 2.

Little bleeding

3 = Rating of Cut

Body - $1/8$ in. $< x < 1/4$ in. in depth or width

Moderate bleeding

If length is > 3 in., but otherwise would be rated severity of 3, rate as a 4.

If ≤ 3 in., rate severity of 3.

Hand/Foot/Joint/Head - $1/16$ in. $< x \leq 1/8$ in. in depth or width

Some bleeding

If length is > 2 in., but otherwise would be rated severity of 3, rate as a 4.

If ≤ 2 in., rate severity of 3.

Face - $1/32$ in. $\leq x \leq 1/16$ in. in depth or width

If length is > 2 in., but otherwise would be rated severity of 3, rate as a 4.

If ≤ 2 in., rate severity of 3.

Some bleeding

4 = Rating of Cut

Body - Deep cut into dermis

Only subcutaneous fat or muscle involved (< 1 in. deep or wide)

If length is > 4 in., but otherwise would be rated severity of 4, rate as a 5.

If ≤ 4 in., rate severity of 4.

Hand/Foot/Joint/Head - $1/8$ in. $< x \leq 1/2$ in. depth or width

Moderate bleeding

If length is > 3 in., but otherwise would be rated severity of 4, rate as a 5.

If ≤ 3 in., rate severity of 4.

Moderate bleeding

Face - $1/16$ in. $< x \leq 1/8$ in. in depth or width

If length is > 3 in., but otherwise would be rated severity of 4., rate as a 5.

If ≤ 3 in., rate severity of 4.

Moderate bleeding

5 = Rating of Cut

Body - Deep laceration involving ligaments, peripheral nerve, or

Substantial portion of muscle

Head/Foot/Joint/Head - Deep into dermis

Subcutaneous fat or muscle involved

Scraping of bone/skull

Face - 1/4 in. in depth or width of any length

6 = Rating of Cut

Any location - Significant laceration of a vital organ or functional body part.

Examples include laceration of the eye, brain, liver, spinal cord, disfiguring lacerations of the face

G. Electricity

0 = Rating of Electricity

None (a tingle that does not hurt in not an injury)

1 = Rating of Electricity

No lasting mark

May be a tingle that does hurt or result in temporary reddening of skin

2 = Rating of Electricity

Visible mark beyond mere temporary reddening

3 = Rating of Electricity

Small electrical burn < 1 in. in diameter

4 = Rating of Electricity

Brief loss of consciousness (< 1 minute) or burn > 1 in. but not extensive

5 = Rating of Electricity

Electrical burn extensive but no scarring

Acute renal failure when resolves

Loss of consciousness > 1 minute

6 = Rating of Electricity

Cardiac arrest

Any permanent damage to vital organs or disfiguring scars due to burning

H. Eye

0 = Rating of Eye

None

1 = Rating of Eye

No abrasion or swelling

Slight discoloration of eye for a short amount of time (may have watering of eye, but no substantial discoloration/reddening)

2 = Rating of Eye

Reddening of the eye itself

3 = Rating of Eye

Slight observable and distinct scratch in eye

4 = Rating of Eye

Sizable observable and distinct scratch or very mild laceration to cornea

5 = Rating of Eye

Abrasion or more serious lacerations to the cornea

May have some bleeding (e.g. corneal scratch with blood)

6 = Rating of Eye

Permanent damage to eye or tissue structure around eye affecting acuity or cosmetic appearance

I. Firearm/Bow

0 = Rating of Firearm/Bow

None

1-2 = Rating of Firearm/Bow

All Firearm/Bow injuries rated ≥ 3

3 = Rating of Firearm/Bow

Skin cut (grazed)

4 = Rating of Firearm/Bow

Damage to the dermis or muscle tissue

5 = Rating of Firearm/Bow

Any damage to any vital organ

Non-permanent

6 = Rating of Firearm/Bow

Any permanent disability due to wound or permanent damage of vital organ

J. Floor/Rug "Burn" (Friction Burn)

0 = Rating of Floor/Rug "Burn"

No injury

1 = Rating of Floor/Rug "Burn"

$\leq 1/2$ in. square of epidermis damaged with scale formation or longer area with only slight reddening of area

No bleeding

Epidermis still intact

2 = Rating of Floor/Rug "Burn"

1/2 sq. in. $< x \leq 3$ sq. in. of epidermal damage with scab formation

No free bleeding

3 = Rating of Floor/Rug "Burn"

3 sq. in. $< x < 7$ sq. in. of epidermal damage with scab formation

May be a few drops of blood which come to surface at the time of injury

4 = Rating of Floor/Rug "Burn"

Epidermal damage 7 sq. in. $< x \leq 30\%$ of the body

Damage below the epidermis, code as scrape

5 = Rating of Floor/Rug "Burn"

Epidermal damage over $> 30\%$ or body

6 = Rating of Floor/Rug "Burn"

Because floor burns by definition involve only the epidermis, they are never coded as 6

K. Joint/Bone/Muscle

0 = Rating of Joint/Bone/Muscle

Discomfort lasts less than 30 minutes

1 = Rating of Joint/Bone/Muscle

Little detectable swelling of the joint or around a ligament

Little internal tenderness suggesting no to slight internal swelling

If tenderness/pain in only index, rate 1 if worst pain reported lasted < 30 min. and discomfort (1 or 2 on tenderness scale) lasted a longer period of time.

2 = Rating of Joint/Bone/Muscle

External swelling = 1 or 2 on bumpometer or mild internal tenderness indexed by pain on tenderness scale = 1 or 2 on use within 24 hours of injury but over 1 hour (doesn't include time of injury itself)

If tenderness/pain is only index, rate 2 if worst pain reported lasted ≥ 1 hour and discomfort (1, 2, or 3) lasted a longer period of time.

3 = Rating of Joint/Bone/Muscle

First degree sprain lasting < 2 weeks

Swelling = 3 or 4 on bumpometer or internal swelling indexed by pain 4 or 5 on use within 24 hours but over 1 hour

"Nursemaids elbow" (the bone is pulled out of the socket in the joint; it is painful and child can't bend wrist or elbow)

4 = Rating of Joint/Bone/Muscle

Dislocated finger

First degree sprain lasting ≥ 2 weeks

Greenstick fracture (heal within 2 weeks, no cast)

Nose or finger broken

K. Joint/Bone/Muscle (continued)

5 = Rating of Joint/Bone/Muscle

Linear fracture of skull

Fracture of the long bones, ribs, spine

Tearing of ligament

Shoulder dislocation, patellar dislocation, elbow dislocation

Partially ruptured muscle

6 = Rating of Joint/Bone/Muscle

Fracture involving a growth plate and disrupting bone growth (salter 4 or salter 5)

Fracture of the pelvis

Fracture resulting in non-union

Third degree sprain (completely torn ligament)

Completely ruptured muscle

Crush fracture of skull

L. Loss of Consciousness

0 = Rating of Loss of Consciousness

No injury

1 = Rating of Loss of Consciousness

Dizziness \leq ten minutes

2 = Rating of Loss of Consciousness

Dizziness $>$ ten minutes

Brief (less than 2 min.) loss of consciousness

3 = Rating of Loss of Consciousness

Fainting due to hyperventilation or vasovagal response (e.g., from standing up quickly or moving from a hot to a cold location)

Loss of consciousness $2 \leq x < 10$ min.

4 = Rating of Loss of Consciousness

Loss of consciousness for $10 \leq x < 30$ minutes (may be intermittent)

5 = Rating of Loss of Consciousness

Loss of consciousness for ≥ 30 minutes

6 = Rating of Loss of Consciousness

Loss of consciousness resulting in any subsequent loss of motor or
cognitive functioning

M. Paper Cut

0 = Rating of Paper Cut

No injury

Shallow cut with no bleeding

1 = Rating of Paper Cut

Shallow laceration $\leq 1/16$ in. deep

Few drops blood (remember, a paper cut that does not bleed does not
constitute an injury)

2 = Rating of Paper Cut

$1/16$ in. $< x \leq 1/8$ in. in depth

Some bleeding

3 = Rating of Paper Cut

$1/8$ in. $< x \leq 1/4$ in. in depth

Bleeding (NOTE: a paper cut this deep is highly unlikely)

4, 5, 6 = Rating of a Paper Cut

If depth greater than $1/4$ in., code as a cut, not as a paper cut

N. Poison

0 = Rating of Poison

Contact with skin - None

Ingestion - None

Inhalation - None

Eye - None

1 = Rating of Poison

Contact with skin - Reaction is ≤ 3 in. sq. and is slight (e.g. reddening but not irregular, raised rash)

Ingestion - None

Inhalation - None

Eye - None

2 = Rating of Poison

Contact with skin - Rash or clear skin involvement of > 3 in. of reddening of skin up to 6 in. in diameter

Ingestion - None

Inhalation - None

Eye - Reddening only $\leq 1/2$ hr.

3 = Rating of Poison

Contact with skin - Large area ($x \leq 30\%$ of body) affected
Clear reaction

Ingestion - Immediate spitting out or vomiting

No subsequent illness lasting over 1 hour

Inhalation - Burning or dizziness lasting for $\leq 1/2$ hr.

Eye - Reddening or continued watering $1/2$ hr. $< x \leq 24$ hours

4 = Rating of Poison

Contact with skin - Obvious rash/skin damage > 30% of body area
affected

Ingestion - Illness < 24 hours after ingestion

Inhalation - Symptoms lasting $1/2 \text{ hr.} < x \leq 24 \text{ hrs.}$

Eye - Redness or watering > 24 hours

Vision not affected

5 = Rating of Poison

Contact with skin - Illness lasting 2 days to 2 weeks or skin damage
lasting > 2 weeks

Ingestion - Illness > 24 hours

Inhalation - Illness > 24 hours

Eye - Damage 1 day $< x \leq 2 \text{ weeks}$

Vision affected temporarily

6 = Rating of Poison

Contact with skin - Permanent disability due to poisoning

Ingestion - Ingestion resulting in any permanent disability due to
poisoning

Inhalation - Inhalation resulting in permanent disability due to poisoning

Eye - Any permanent disability due to poisoning or lengthy difficulty with
vision.

O. Puncture/Splinter

0 = Rating of Puncture/Splinter

Body/Eye - None

1 = Rating of Puncture/Splinter

Body - Pin-size in width

[<pin in length>]

Splinter no deeply embedded or absent

Eye - Eye always ≤ 4

2 = Rating of Puncture/Splinter

Body - Very small splinter (pin size width, 1/8 in. in length) deeply embedded

Wider splinter (pencil lead size) shallowly embedded or absent or wider puncture (pencil size) not through the epidermis (< 3 drops of blood)

Eye - Eye always ≤ 4

3 = Rating of Puncture/Splinter

Body - Moderate (pencil lead) deeply embedded or large (pencil size)

Shallowly embedded splinter, or wider puncture (pencil size, $\leq 1/4$ in deep)

Eye - Eye always ≤ 4

4 = Rating of Puncture/Splinter

Body - Large splinter substantially embedded (usually splinter is rated < 4 on severity scale)

Very wide puncture (object larger than diameter of pencil)

Less than 1/4 in. deep, or side puncture (pencil size) greater than
1/4 in. deep

Eye - Very small (pencil lead or smaller) object embedded in eye

5 = Rating of Puncture/Splinter

Body - Clear and substantial damage to the dermis or underlying tissue

Eye - Object larger than pencil lead embedded in eye

6 = Rating of Puncture/Splinter

Body - Permanent disability or damage to vital organ

Eye - Permanent disabling damage to eye

P. Scrape

0 = Rating of Scrape

Body - None

Face/Head - None

1 = Rating of Scrape

Body - $\leq 1/2$ in. sq. of exposed skin, or a scratch ≤ 4 in.

No free bleeding

Red mark ≤ 4 in. sq.

Face/Head - Facial scrapes and scratches rated > 1 unless so small that
cannot be seen until attention is called to it.

Red mark $\leq 2 \frac{1}{2}$ in. sq.

2 = Rating of Scrape

Body - $1/2$ in. sq. $< x \leq 2 \frac{1}{2}$ in. sq. of mild epidermal damage

A scratch > 4 in.

A few drops of blood

Red mark 4 in. sq. $< x \leq 8$ in. sq.

Face/Head - $\leq 1/2$ in. sq. of exposed skin, or a scratch ≤ 4 in.

No free bleeding

Red mark $2 \frac{1}{2}$ in. sq. < 4 in. sq.

3 = Rating of Scrape

Body - $2 \frac{1}{2}$ in. sq. $< x \leq 6$ in. sq. of epidermal damage or deep scrape into the dermis of any size

Slight bleeding across scrape or slight swelling of scrape

(bumpometer ≤ 2)

Red mark > 4 in. sq.

Face/Head - $1/2$ in. sq. $< x < 2 \frac{1}{2}$ in. sq., or a scratch > 4 in.

A few drops of blood

Red Mark > 4 in. sq.

4 = Rating of Scrape

Body - Tissue damaged into the dermis (deep scrape, with exposed tissue) or area over $2 \frac{1}{2}$ in.

Face/Head - $1/2$ in. sq. $< x \leq 6$ in. sq. of epidermal damage or deep scrape into the dermis (on head, scraping the skull) of ≤ 2 inches

Slight bleeding across scrape or slight swelling of scrape

(bumpometer ≤ 2)

5 = Rating of Scrape

Body - Muscle or bone, tendon, and ligament involved

Face/Head - Tissue damaged into the dermis (deep scrape with exposed tissue) area over 2 in

6 = Rating of Scrape

Body - Below the dermis and affecting vital organ or permanently injuring muscle tissue

Face/Head - Permanent and significant scarring of the face

Stings

0 = Rating of Stings

Body/Face/Eyes/Lips/Head - None

1 = Rating of Stings

Body/ Head - No swelling or reddening other than immediate area
(diameter of a pencil eraser around sting)

No burning sensation

Face - Same as above but not within 2 in. of eye or lips

No burning sensation

Eyes/Lips - None

2 = Rating of Stings

Body/Face/Head - Mild swelling, reddening, or burning sensation

Bumpometer = 1 or 2

Eyes/Lips - No swelling or reddening

3 = Rating of Stings

Body/Face/Head - Clear swelling (bumpometer = 3 or 4) or reddening
over a 2 in. area

Eyes/Lips - Near eye or lips with mild swelling (bumpometer = 1 or 2),
reddening, burning

4 = Rating of Stings

Body/Face/Head - Substantial swelling (bumpometer = 5,6,7,8, or 9), or
allergic reaction involving whole body or breathing for < 4 hours

Eyes/Lips - Clear swelling (bumpometer = 3 or 4), or reddening over 2 in.
area

5 = Rating of Stings

Any body part - Permanent disability due to reaction

R. Testicle Impact

0 = Rating of Testicle Impact

No injury

1 = Rating of Testicle Impact

Pain < 20 minutes

No swelling or later discomfort

2 = Rating of Testicle Impact

Pain < 40 minutes

Later discomfort less than 1 hour

No swelling

3 = Rating of Testicle Impact

Pain < 1 hour

Later discomfort less than 5 hours

Mild or no swelling

4 = Rating of Testicle Impact

Pain > 1 hour

Later discomfort > 5 hours or considerable swelling

5 = Rating of Testicle Impact

Blood in urine

Considerable swelling over 1 day

Marked discoloration or any non-permanent damage

6 = Rating of Testicle Impact

Any permanent damage to testicles

S. Tooth Injuries

0 = Rating of Tooth Injuries

No injury

1 = Rating of Tooth Injuries

Area around tooth sore

Not chipped or loose

2 = Rating of Tooth Injuries

Baby tooth slightly loose

3 = Rating of Tooth Injuries

Small (pencil lead or less) chip to baby tooth or baby tooth very loose

Permanent tooth slightly loose

4 = Rating of Tooth Injuries

Major chip or loss of baby tooth

Permanent tooth very loose or slight chip

5 = Rating of Tooth Injuries

Multiple baby teeth lost

Major chip or loss of one permanent tooth

6 = Rating of Tooth Injuries

Multiple permanent teeth lost or broken

T. Torn Fingernails or Toenails

0 = Rating of Torn Fingernails/Toenails

No injury

1 = Rating of Torn Fingernails/Toenails

Folding nail back $\leq 1/4$ of the nail/tissue area

Little or no bleeding

2 = Rating of Torn Fingernails/Toenails

Folding nail back $\leq 2/3$ of the nail/tissue or tearing off $1/2$ of the nail

≤ 1 tsp. of blood

3 = Rating of Torn Fingernails/Toenails

Lose most of nail or bleeding ≤ 1 Tbs. of blood

4, 5, 6, = Rating of Torn Fingernails/Toenails

Nail tears are < 4

U. Nose Bleeds

0 = Rating of Nose Bleeds

No injury

1 = Rating of Nose Bleeds

Nose bleed - no swelling

Pain ≤ 2

2 = Rating of Nose Bleeds

Nose bleed - no swelling

Pain ≤ 2

3-6 = Rating of Nose Bleeds

All nose bleed injuries rated ≤ 2

Appendix F

DEMOGRAPHIC MEASUREMENT OF SUBJECT SAMPLE

Interviewer ID#: _____ Family ID#: _____

Date of Interview:

_____/_____/_____

=====

=====

In our research study, we need to be able to accurately describe our families as a whole. In order for us to do so, we need you to answer a few questions about yourself and your husband/partner. This information is totally confidential and will only be used to get an overall picture of our participating families. Thank you very much for your cooperation.

1. Marital status: *(Please circle one)*

1 = Married

4 = Separated

2 = Living with partner

5 = Never married

3 = Divorced/annulled

6 = Widowed

2. Race: *(Please circle one)*

1 = Caucasian

4 = Hispanic

2 = African-American

5 = Other - Please specify:

3 = Asian-American

3. Describe your child (*that is, the child in the study*):

GENDER AGE DATE of BIRTH HEIGHT WEIGHT

M₍₁₎ F₍₂₎

_____/_____/_____

4. Describe the other members (adults and children) of your household (include yourself and husband/partner please). Please include all members living in your household at least 50% of the time.

RELATION TO CHILD IN STUDYGENDERAGEHEIGHTWEIGHT

M₍₁₎ F₍₂₎

M₍₁₎ F₍₂₎

M₍₁₎ F₍₂₎

_____ M₍₁₎ F₍₂₎ _____

5. Do any of the people you have just listed have chronic health problems of any sort? This might mean asthma, diabetes, allergies in the springtime, etc.? If yes, which person and what is the chronic condition?

Relation to child in study _____ - Health problem _____

Code: _____

Relation to child in study _____ - Health problem _____

Code: _____

Relation to child in study _____ - Health problem _____

Code: _____

6. What time does your child usually:

a. Get up in the morning? _____ (24 hr clock)

b. Nap? _____ (24 hr clock)

c. Go to bed at night? _____ (24 hr clock)

7. How regular are his/her sleeping habits? 1 2 3 4 5
 every day every day
 is the same is different

8. Where do you live? (*Please circle one*)

1 = Rural area

4 = Trailer Court

2 = Subdivision

5 = Other -Please specify:

3 = City

9. What type of dwelling do you live in? (*Please circle one*)

1 = Apartment

3 = House

5 = Other

2 = Duplex

4 = Trailer/Mobile Home

10. What is your educational level? (*Please circle one*)

- | | |
|--------------------------|----------------------------------|
| 1 = Grade school | 5 = College graduate |
| 2 = Some high school | 6 = Post undergraduate education |
| 3 = High school graduate | 7 = Other - Please specify: |
| 4 = Some college | |
-

11. Do you have a husband or live-in childcare partner? *If yes*, what is this person's educational

level? (*Please circle one*)

- | | |
|--------------------------|----------------------------------|
| 1 = Grade school | 5 = College graduate |
| 2 = Some high school | 6 = Post undergraduate education |
| 3 = High school graduate | 7 = Other - Please specify: |
| 4 = Some college | |
-

12.a. What is your employment status?

- | | |
|---------------------------------------|-----------------------------|
| 1 = Employed full-time (30+ hrs./wk.) | 6 = Disabled, not employed |
| 2 = Employed part-time (<30 hrs./wk.) | 7 = Homemaker |
| 3 = Unemployed | 8 = Student |
| 4 = Retired | 9 = Other - Please specify: |
| 5 = Self-employed | |
-

12.b. *IF EMPLOYED*: What is your job title?

Code: _____

12.c. What is the nature of your job?

Code: _____

12.d. How many hours per week do you work (normally)? _____

12.e. What type of daycare do you use (normally)? _____

Code: _____

12.f. Approximately how many hours (on average) per work day is your child cared for by:

You: _____
 Husband/live-in partner: _____
 Other relatives: _____
 Neighbors: _____
 Daycare: _____

Babysitter: _____
 Other: _____

IF APPLICABLE:

13.a. What is your live-in partner's employment status? (**NOTE:** If you do not have a live-in partner but you receive child-care or alimony payments, please answer this section based on the person you receive payments from).

- | | |
|---------------------------------------|-----------------------------|
| 1 = Employed full-time (30+ hrs./wk.) | 6 = Disabled, not employed |
| 2 = Employed part-time (<30 hrs./wk.) | 7 = Homemaker |
| 3 = Unemployed | 8 = Student |
| 4 = Retired | 9 = Other - Please specify: |
| 5 = Self-employed | |
- _____

13.b. *IF EMPLOYED:* What is his or her job title? _____
 Code: _____

13.c. What is the nature of his or her job? _____
 Code: _____

14. What is your gross annual income, from all sources combined, of your household?

- | | | |
|------------------------|------------------------|------------------------|
| 01 = Less than \$5,000 | 05 = \$20,000-\$24,999 | 09 = \$40,000-44,999 |
| 02 = \$5,000-\$9,999 | 06 = \$25,000-29,999 | 10 = \$45,000-49,999 |
| 03 = \$10,000-\$14,999 | 07 = \$30,000-34,999 | 11 = \$50,000-\$54,999 |
| 04 = \$15,000-\$19,999 | 08 = \$35,000-\$39,999 | 12 = \$55,000+ |

Appendix G

Supervision Coding Scale

How closely was the caregiver supervising the child?

1 = caregiver and child are less than 6 feet apart (mother not engaged in other activity)

2 = caregiver and child are less than 6 feet apart (mother engaged in other activity)

3 = caregiver and child are greater than 6 feet apart (child has full attention)

4 = caregiver and child are greater than 6 feet apart (not paying attention)

5 = caregiver and child are greater than 6 feet apart (no visual contact but is auditory contact)

6 = no visual or auditory contact (could reach the child in 30 seconds)

7 = no visual or auditory contact (could not reach the child in 30 seconds)

VITA

Dr. Amy Damashek attended the University of Illinois in Champaign/Urbana and graduated with a Bachelor of Science in Psychology in 1996. She then pursued her doctorate in child clinical psychology at the University of Missouri-Columbia and graduated in December 2007. Dr. Damashek completed her clinical internship at the University of Oklahoma Health Sciences Center (OUHSC). She currently is completing a Postdoctoral Fellowship in Child Maltreatment at the Center on Child Abuse and Neglect at OUHSC. Dr. Damashek's graduate research focused on the role of maternal supervision in preventing unintentional childhood injuries. Currently, she is pursuing research on home-based child maltreatment prevention programs. Dr. Damashek is also pursuing research on unintentional injuries and caregiver supervision in families at high risk for child maltreatment. Clinically, Dr. Damashek specializes in treating children with a history of trauma, children with behavior problems, and children displaying inappropriate sexual behaviors.