

# Understanding Unintentional Injury-Risk in Young Children I. The Nature and Scope of Caregiver Supervision of Children at Home

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**Objective** To examine the supervision that young children routinely receive when awake and at home with a parent. **Methods** Mothers were trained to complete continuous recordings about supervision of their young child (2–5 years) when at home on each of 10 randomly selected days within a 3-week period. **Results** Children were supervised more often than unsupervised but were completely out of view of supervisors about 20% of their awake time, and supervision was poorer when out of view of supervisors. Older children (4–5 years) were unsupervised (8% of awake time) more often than younger children (2–3 years; 1%), were more often out of view of supervisors than younger children, and received poorer supervision than younger children when out of view of supervisors. Few sex differences were found. **Conclusions** These data provide insights into the nature and scope of supervision that young children routinely experience when at home. Implications of these findings for identifying patterns of supervision that elevate children's risk of injury are discussed.

**Key words** home injuries; supervision; young children.

Unintentional injuries are a leading cause of death and disability for children (Baker, O'Neil, Ginsburg, & Li, 1992; Canadian Institute of Child Health, 1994; Rodriguez, 1990). Estimates indicate that one of four children experience a medically attended injury each year in the United States (Scheidt et al., 1995) and that direct and indirect costs because of injuries total at least \$174 billion per year (National Safety Council, 1991). For toddlers and preschool-aged children, the greatest risk of injury is in their homes (Rivara, 1995; Shannon, Brashaw, Lewis, & Feldman, 1992). In fact, estimates indicate that fully 90% of injuries to young children occur in or around their home (National Safety Council, 1991; Rivara, Calonge, & Thompson, 1989). Recent studies reveal also that at least 90% of such injuries to young children are preventable (Rimsza, Schackner, Bowen, & Marshall, 2002). Caregiver supervision that is inadequate and allows children exposure to hazardous events or situations may be a contributing factor to injury risk for young children.

Although there has been considerable speculation about the relation between supervision and young children's risk of injury (Garbarino, 1988; Peterson & Stern, 1997; Peterson, Farmer, & Mori, 1987; Saldana & Peterson, 1998; Stratton, 1985) and many studies of children's injuries mention lapses in supervision as a potential contributing factor (Alwash & McCarthy, 1987; Brayden, MacLean, Bonfiglio, & Altemeier, 1993; Landen, Bauer, & Kohn, 2003), few studies have examined this issue directly. Moreover, there is virtually nothing known about the nature and scope of supervision that young children routinely experience when at home with a caregiver. The aim of this study was to address these gaps in knowledge. This report focuses on the nature of the supervision young children receive, with an emphasis on providing a contextual analysis of supervision (e.g., who is supervising, where, how much of the time are children unsupervised) and examining how supervision varies as a function of a child's sex and age. The report following this one examines how child and

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parent attributes relate to the supervision that caregivers provide young children in the home and considers how child attributes, parent attributes, and supervision directly influence child-injury risk (Morrongiello, Corbett, McCourt, & Johnston, submitted for publication).

To date, most research on supervision has interviewed parents about their typical practices (Peterson, Ewigman, & Kivlahan, 1993; Pollack-Nelson & Drago, 2002) or presented parents with hypothetical situations (Garling & Garling, 1993a; Morrongiello & Hogg, 2004) or videotaped vignettes (Morrongiello & Dawber, 1999) and asked them to report on how they might supervise. Asking parents to report on *typical* patterns of supervision can be problematic, however, because accuracy is much poorer when adults give *typical day* estimates as opposed to actual time estimates about events (Juster & Stafford, 1985). Responses to hypothetical situations are similarly problematic and prone to misrepresent how parents supervise, particularly if parents have limited real-world experience to support judgements about their behaviors and those of their children in the hypothetical situation. Ideally, direct measurement of supervision is the most likely methodology for promoting our understanding of parent behavior and child-injury risk. However, few studies have utilized such an approach.

Naturalistic observations of parents and children in grocery stores (Harrell, 1994, 2003) and parks (Morrongiello & House, 2004) reveal that children are routinely left unattended some of the time, though whether and how much this varies due to a child's age remains to be determined. Observations of mothers and young children in a laboratory situation having contrived hazards that would appear to pose a risk of injury to children indicated that mothers do not more closely supervise children with a history of prior injuries (Cataldo et al., 1992; Morrongiello & Dawber, 1998). Of course, the extent to which mothers and their children behaved in this contrived setting as they would in a highly familiar setting was not addressed and may contribute to explain why mothers did not appear to differentially moderate supervision based on children's injury histories.

The most compelling evidence that supervision contributes directly to children's risk of injury is provided by a recent study that used a prospective longitudinal design and involved maternal reporting about injury events and supervision at the time of injury. Examining the patterns of supervision provided to 2- to 3-year olds in the home at the time of injury revealed five levels of supervision, and as supervision level decreased there was an increase in injury risk (Morrongiello, Ondejko, & Littlejohn, 2004b). Though these findings provide the

first *direct* evidence that supervision level relates to injury-risk level, the lack of information about how parents typically supervise young children in the home makes it difficult to discern how frequently children actually experience these reduced levels of supervision during the course of their day. If reduced supervision (e.g., child out of view) occurs infrequently and uniquely at the time of injury, then it is highly meaningful. However, if children are routinely left unsupervised or receiving reduced levels of supervision, then other factors (e.g., child behaviors, level of environmental risk) must be interacting with these patterns of supervision to create risk of injury for young children some of the time.

This study sought to address some of these gaps in knowledge. Building on the success of the participant's event-monitoring methodology (Morrongiello, 1997; Morrongiello, Ondejko, & Littlejohn, 2004a; Peterson & Tremblay, 1999; Peterson, DiLillo, Lewis, & Sher, 2002), mothers were trained to complete diary sheets to provide continuous records of supervision during the entire time the child was awake for each of 10 days, including weekdays and weekends; prior research reveals the importance of sampling both weekdays and weekends when one wants to obtain accurate estimates of typical levels of time-use activities (Juster & Stafford, 1985). The records provided information about time the child was left unsupervised versus supervised, who was the primary supervisor, the location and activities of the supervisor and child when together and apart, and level of supervision provided under different circumstances (e.g., child in view versus out of view of supervisor, child alone versus with peers).

A primary aim of this study was to assess for age and sex differences in supervision. Though self-report data suggest that parents believe they less closely supervise older than younger children (Peterson et al., 1993), there is virtually nothing known about the accuracy of this perception and the extent to which supervision actually declines with children's development. Similarly, some findings suggest that boys are given more freedom to roam (Newson & Newson, 1976; Saegert & Hart, 1976) and have more opportunities to play alone than girls (Fagot, 1974, 1978). However, virtually no studies have directly assessed whether the nature or scope of supervision differs for boys and girls.

A secondary aim of this study was to determine whether any specific self-report questions could be identified that would provide reasonable estimates of supervision for use in future research. Toward this aim, after each recording day, mothers completed a retrospective estimate of supervision, and these were then compared

with estimates derived from the actual time-use supervision diary sheets. Prior research on estimations of time use suggests that one can obtain reasonably accurate reports within a 24-h period (Juster & Stafford, 1985). Hence, we sought to evaluate this possibility with regard to self-report estimates of supervision by caregivers.

## Method

### Participants

The sample comprised two groups: the *young* group included 40 mothers of female ( $N = 18$ ) and male ( $N = 22$ ) toddlers, approximately 2 and a half years of age ( $M = 31.34$  months,  $SD = 4.58$  months), and the *older* group consisted of 28 mothers of females ( $N = 15$ ) and males ( $N = 13$ ), approximately 5 years of age ( $M = 57.40$  months,  $SD = 4.95$  months). An additional 15 participants began the study but then dropped out.<sup>1</sup> Participants were randomly selected from an existing database of families who had indicated a wish to participate in research on child development. The annual family income for the sample was as follows: 12% earned less than \$40,000, 32% earned between \$40,000 and \$59,999, 28% earned between \$60,000 and \$79,999, and 21% earned over \$80,000. Five mothers did not wish to disclose family income. For maternal education, 10% had completed high school, 74% had some or had completed university or college, and the remainder had graduate training and/or post-university education. There was virtually no ethnic diversity, nearly all mothers were Caucasian. All participating families were two-parent homes; no additional caregivers lived in the home. Any mother who worked did so for less than 20 h per week. The study was reviewed and approved by the university Research Ethics Board.

### Measures

Mothers completed diary recording sheets to provide continuous records of supervision, an end of day form to provide information on their estimates regarding supervision that day, and periodic unscheduled telephone interviews about supervision; additional measures of child and parent attributes were also completed, and the findings are reported elsewhere (Morrongiello et al., submitted for publication).

#### Diary Recording Sheets

Throughout the day, mothers completed the following sheets:

1. A *Time Use Sheet* was completed to record how the mother and child spent time at home together, with the major focus on supervision. From the moment the child and mother were both awake and continuing until the child's bedtime, the mother recorded the clock time whenever a child's activity or room changed, supervisor (i.e., person most responsible for the child) or type of supervision changed, or the parent or child left the home. For each entry, the mother indicated who was supervising, whether the child was in view of the supervisor and whether the supervisor and child were doing something together.
2. An *In-View Recording Sheet* was completed every time a "child in view of supervisor" entry was made on the *Time Use Sheet*. Parents indicated the room the child was in, who was supervising, and whether the supervisor was doing something with the child ("doing" versus "not doing"). If "doing," then parents indicated what type of activity the supervisor was engaged in with the child (e.g., helping or teaching, playing, spending nonplay time together, doing things like talking). If "not doing," then mothers used a Likert scale to indicate the level of supervision the supervisor was exhibiting (see *Data Reduction*).
3. An *Out-of-View Recording Sheet* was completed, if the mother indicated that the child was out of view of the supervisor. The mother indicated the rooms the child and supervisor were in, the activities in which each was engaged, and the level of supervision the supervisor was exhibiting (see *Data Reduction*).

#### End of Day Form

This form was completed at the end of each recording day. Mothers indicated the percentages of the total recording day that they believed they were watching their child, and they knew exactly what their child was doing. They also rated how attentive they were to the child (a five-point scale: 1, "generally, not attentive"; 5, "completely attentive") and how they supervised the child (a five-point scale: 1, "I didn't really need to supervise"; 5, "I supervised constantly today").

#### Telephone Interviews

To evaluate the reliability of maternal reporting on the diary sheets, we conducted random calls on 8 of the 10 data recording days and on 4 nonrecording days; we included nonrecording days to preclude the possibility that mothers would figure out the reason for the calls. Mothers believed that the calls were simply to obtain

<sup>1</sup>Numerous statistical comparisons of demographic information and supervision scores comparing those who dropped out with those who continued did not indicate any significant differences.

“snapshot” views of how parents and children spend time when at home. The decision to focus on 8 recording days was made to increase the likelihood that at least some entries on diary sheets would occur within the 5 preceding minutes of a call. During calls, mothers were asked questions regarding the level of supervision at the time of the call; these questions were identical to those on the *In-View* and *Out-of-View* sheets (see *Diary Recording Sheets*), so that direct comparisons could be made to estimate reliability of responding on the *Diary Sheets* based on calls made within 5 min of an entry being made.

### Procedure

During an initial one-and-a-half-hour home visit, mothers were given calendar pages to place on the refrigerator that showed their recording days, a binder containing diary recording sheets, and a clipboard with a pen attached to carry around the house to aid completing sheets on recording days. The mothers were familiarized with how and when to complete the sheets (i.e., every time there was an entry on the *Time Use Sheet*, the mother was to complete either the *In-View* or *Out-of-View Recording Sheet*, and all sheets had to be time synchronized with all time accounted for) and organize these within the binder. Mothers were told that we were interested in how parents and children spend their time at home and how parents balance promoting independence with monitoring their child.

Participants completed 10 days of recording (6 weekday, 2 Saturday, 2 Sunday) across a 3-week period, with days randomly selected by the research assistant with the constraint that there be at least 4 weekends. On a recording day, sheet completion was to begin when they and their child were both awake and was to end when their child went to bed at night; recording was to cease during periods when the mother or child left the house. The interviewer went through each type of sheet in the binder and how they were used, including completing several example sheets using information given by the mother about a typical day in her home. Interviewers then obtained information from the participants regarding their usual daily schedule, which was used by researchers to randomly select “usual at home” times to conduct brief telephone interviews with participants. After the study, an interviewer returned to the home to pick up the recording binder and give the mother a flowering plant and \$25 payment.

### Data Reduction

The *Time Use Recording Sheets* were used to determine the amount of time in different supervision circumstances (e.g., child in view versus out of view) and with different supervisors.

The *In-View Recording Sheets* were used to determine how much of the time a child and supervisor were in the same room and “doing something” versus “not doing something” together. Supervision when not doing something together was coded as 1, “not supervising” (i.e., not watching or listening for the child at all, e.g., mom was washing dishes and talking on the phone while the child played with toys out of view of the mother but somewhere in the kitchen); 2, “not watching but listening intermittently”; 3, “watching him/her intermittently and/or listening constantly”; 4, “have him/her within constant view”; 0, “don’t know” (e.g., mom is not the supervisor and she does not know the nature of the supervision being provided but she knows the child and supervisor are in the same room). Supervision when doing something together was coded as maximum supervision (i.e., 4).

The *Out-of-View Recording Sheets* were used to determine the nature of the activities of the child (i.e., to differentiate nap time from awake time periods) and supervisor (e.g., something to relax or for themselves, chore that involved another person such as changing the baby or talking with dad) and the level of supervision provided when constant supervision was not possible, because the child and supervisor were in different locations in the home. Supervision levels were coded as follows: 1, “not supervising” (i.e., not checking or listening in at all); 2, “only going to check on the child when he/she hears something that indicates the child needs to be checked”; 3, “checking every 10 min or longer”; 4, “checking every 8–9 min”; 5, “checking every 6–7 min”; 6, “checking every 4–5 min”; 7, “checking every 2–3 min”; 8, “listening in constantly”; 9, “watching constantly”; and 0, “don’t know.”

Mean supervision scores were calculated by averaging entries across all 10 days after excluding time when the child was napping ( $M = 10\%$  of the time) or mother coded “don’t know” (0.3% of all entries).<sup>2</sup>

### Results

For analysis of variance (ANOVA) tests, a Greenhouse–Geisser adjustment was applied to the degrees of freedom when the need for it was indicated in tests of sphericity. A Bonferroni adjustment for family-wise error rate was applied for all paired comparisons, and the results

<sup>2</sup>For averaging across *In-View* and *Out of View* sheets, supervision scores of 2, 3, and 4 on *In-View* sheets were multiplied by 2.25 to make the scale equivalent to the *Out of View* scale (i.e., range = 1–9).

reported reflect the level of significance obtained after applying the correction.

### **Reliability of Maternal Reporting**

To estimate reliability of supervision reports on the diary recording sheets, information from the telephone interview ( $M = 9.90$  calls per participant,  $SD = 2.78$ ) was compared with that reported on these sheets. Limiting the focus to those entries that had been made in the 5 min preceding a telephone call, reliability was quite good for the questions asked: what was the child doing (86% agreement), who was with the child (89%), who was supervising (96%), and measures of actual supervision (86%), with an overall agreement rate of 89%. These findings provide support for the utility of self-report measures of supervision, and they suggest that this results provide a reliable indication of how children are supervised at home.

### **Preliminary Analyses**

A preliminary analysis was conducted to determine if there were age or sex differences in children's awake versus sleeping times. Results of an ANOVA on these proportion scores revealed that younger children spent significantly,  $F(1, 66) = 49.79$ ,  $p < .001$ , more time napping than older children ( $M = 14$  versus 3% of the day,  $SD = 7$  and 6%, respectively). Because our interest was in home supervision of awake children, we limited our focus to child-awake times only in reporting results in the remainder of the report.

### **How Much of the Time are Children Supervised at Home and By Whom?**

In Table I, one can see that the amount of time that mothers and their children were awake and home together was approximately 6.50 h per day and that children spent this time in different types of supervision circumstances. Most of the time children were supervised in some fashion, though approximately 4% of the time they were left unsupervised.<sup>3</sup> An ANOVA with age  $\times$  sex as between-subject factors revealed that the proportion of time left completely unsupervised varied significantly with the child's age,  $F(1, 64) = 26.98$ ,  $p < .001$ . Younger chil-

<sup>3</sup>We defined *unsupervised* as the parent was not listening to or watching what the child was doing at all (e.g., child and parent were in the same room, but parent was unaware of the child's immediate activities, i.e., a code of 1 on the *In-View Recording Sheet*) and was not engaging in any intermittent checking (e.g., child and parent were in different rooms, and parent was unaware of child's immediate activities, i.e., a code of 1 on the *Out of View Recording Sheet*).

dren were left completely unsupervised less often than older children. An ANOVA on the proportion of time children were supervised by different individuals, with age  $\times$  sex  $\times$  supervisor (3, "mom"; "dad"; or "other") as factors, yielded only a significant main effect of supervisor,  $F(1.6, 106.0) = 400.63$ ,  $p < .001$ . Multiple comparisons revealed that mom was the primary supervisor, with dad falling at an intermediate level between mom and *other*; all paired comparisons were significant ( $ps < .05$  with Bonferroni  $t$  tests).

### **How Often do Supervisors Keep Children In View and What is the Nature of Their Activities?**

In Table II is shown the percentage of entries,<sup>4</sup> in which the child was in view versus out of view of the supervisor. An ANOVA on these data, with age  $\times$  sex  $\times$  location (2, "in view" and "out of view") as factors, revealed that all children were more often in view than out of view,  $F(1, 64) = 675.30$ ,  $p < .001$ . An age–location interaction was also revealed,  $F(1, 64) = 12.06$ ,  $p < .01$ . Follow-up ANOVAs revealed that older children were significantly more likely to be out of the view of their supervisors than younger children,  $F(1, 66) = 12.21$ ,  $p < .01$ .

Also in Table II is shown the percentage of entries that the child was in view, and the supervisors were engaged in some activity either with the child or independently of the child. An ANOVA on these data, with age  $\times$  sex  $\times$  activity (2, "together" and "independent") as factors, revealed that supervisors spent more time engaged in activities with their children than they did engaged in independent activities when the child was within view,  $F(1, 64) = 223.91$ ,  $p < .001$ .

An ANOVA also was applied to the data regarding the activities in which children were engaged with the supervisor, with age  $\times$  sex  $\times$  mutual activity (4, "helping/teaching"; "playing together"; "sharing time together in a nonplay activity"; and "daily routines") as factors. Results revealed a significant main effect for mutual activity,  $F(2.33, 149.24) = 19.95$ ,  $p < .001$ ; these data

<sup>4</sup>For practical reasons, proportion of entries rather than proportion of time was used for this, and all subsequent analyses because these data had been directly entered, whereas, actual time had to be computed by hand. Hence, we examined actual time only for some aspects of the data (time together at home, time supervised versus not, time with each type of supervisor), and primarily for purposes of determining the relation between entries and time. Direct comparison of these two measures indicated that these were highly positively correlated (e.g.,  $\geq .95$ ). For example, the correlation between the proportion of entries in which mom was the supervisor and the proportion of actual time she was the supervisor was .95. Hence, proportion of entries was an excellent proxy measure for the proportion of time.

**Table I.** Average Time that Children Experienced Different Supervision Circumstances

Circumstance	Young group		Older group		Overall	
	Number of hours	% Time	Number of hours	% Time	Number of hours	% Time
Awake and at home	6.49 (1.74)	100	6.54 (1.31)	100	6.51 (1.56)	100
Supervised	6.41 (1.72)	99	6.01 (1.38)	92	6.25 (1.59)	96
Unsupervised	0.08 (0.18)	1	0.53 (0.81)	8	0.26 (0.57)	4
Supervisor						
Mom	5.00 (1.68)	78	4.64 (1.35)	77	4.85 (1.55)	78
Dad	0.96 (0.78)	15	1.15 (1.03)	19	1.04 (0.89)	16
Other	0.45 (0.58)	7	0.22 (.43)	4	0.36 (0.53)	6

Standard deviations are indicated in parentheses.

**Table II.** Percent of Entries that Children were in View Versus Out of View of the Supervisor

Circumstance	Group		
	Young	Old	Overall
In view	83.74 (7.20)	75.73 (11.68)	80.44 (10.05)
Doing something together	73.21 (10.62)	67.95 (11.60)	71.04 (11.25)
Helping/teaching	31.77 (12.02)	27.99 (17.14)	30.22 (14.35)
Playing	29.59 (9.65)	25.79 (10.58)	28.03 (10.14)
Sharing time together	13.34 (10.28)	13.38 (8.84)	13.36 (9.64)
Daily routines	25.29 (15.74)	32.84 (13.96)	28.40 (15.39)
Independent activities	26.79 (10.62)	32.05 (11.60)	28.96 (11.25)
Out of view	16.26 (7.20)	24.27 (11.68)	19.56 (10.05)
Alone	81.43 (24.93)	47.27 (24.21)	67.17 (29.76)
With others	18.57 (24.93)	52.73 (24.21)	32.85 (29.76)

Standard deviations are indicated in parentheses.

appear in Table II. Multiple comparisons revealed no significant difference between helping/teaching, playing, and daily routine activities. However, sharing time together in nonplay activities occurred significantly less often than the other 3 activities, with the largest difference seen between sharing time and teaching activities reaching significance,  $t(67) = 7.57, p < .001$ .

### **When Children Are Not In View of Supervisors, How Much of the Time are They Alone and in What Rooms Are They Likely to Be Left Alone and Unsupervised?**

As can be seen in the bottom of Table II, when children were not in view of supervisors their time was spent either alone or with others like friends. An ANOVA with age  $\times$  sex  $\times$  companion status (2, "alone" and "not alone") revealed a significant main effect for companion status, indicating children were alone more often than with friends when out of view of their supervisors,  $F(1, 63) = 21.41, p < .001$ . A companion status-age interaction was also revealed,  $F(1, 63) = 30.31, p < .001$ . Follow-up ANOVAs revealed that older children were more likely than younger ones to be with friends when out of view of their supervisors,  $F(1, 65) = 31.33, p < .001$ .

To determine in which rooms of the home children were more likely to be left alone and unsupervised (see footnote 3), an ANOVA was conducted with age  $\times$  sex  $\times$  room (4, "kitchen/dining room/bathroom"; "bedroom, living/family room"; and "play room") as factors. As summarized in Table III, results revealed a main effect for room,  $F(2.5, 63.10) = 8.20, p < .001$ . Children were left alone without supervision more often in the living/family room than in either the kitchen/dining/bath room,  $t(28) = 3.33, p < .05$  or the play room,  $t(28) = 3.85, p < .01$ .

The overall analysis also revealed a room-sex interaction,  $F(2.5, 63.1) = 5.67, p < .005$ . Follow-up ANOVAs indicated that boys were left alone and unsupervised more often than girls in the living/family room,  $F(1, 27) = 12.41, p < .01$ .

**Table III.** Percentage of Entries that Boys and Girls were Left Alone and Unsupervised in Various Locations

Room	Boys	Girls	Overall
Bedroom	11.68 (16.58)	44.48 (42.68)	28.64 (36.29)
Living/family room	75.57 (35.28)	27.51 (41.14)	50.71 (44.96)
Kitchen/dining/bathroom	4.01 (8.43)	18.25 (37.32)	11.38 (27.96)
Play room	8.75 (22.25)	9.76 (26.26)	9.27 (23.98)

Standard deviations are indicated in parentheses.

**What is the Level of Supervision Provided Under Different Circumstances?**

In Table IV is shown the supervision score obtained for boys and girls in each age group as a function of different circumstances. An ANOVA, with age × sex × circumstance (2, “in view” and “out of view”) as factors, revealed a higher level of supervision when children were in view of their supervisors than when they were out of view,  $F(1, 63) = 244.96, p < .001$ . As well, a circumstance–age interaction,  $F(1, 63) = 5.35, p < .05$ , and follow-up ANOVA indicated that younger children experienced a higher level of supervision than older children when out of view,  $F(1, 63) = 7.67, p < .05$ . Hence, supervisors more closely monitored younger than older children when not with them.

An ANOVA with age × sex × companion status (2, “alone” and “with other child”) was applied to the out-of-view data in Table IV to determine whether supervision varied depending on whether the child was alone or with other children when they were out of view of supervisors. Results revealed no significant difference in level of supervision. Hence, supervisors did not demonstrate different levels of supervision depending on their child’s social context.

During the telephone interviews, mothers were asked to indicate how many minutes it had been since they last saw their child. An ANOVA with age × sex on these scores revealed that younger children had been seen by mothers within a shorter time interval than older children ( $M = 2.38$  versus  $4.40$  min,  $SD = 1.75$  versus  $2.19$ , respectively),  $F(1, 63) = 4.27, p < .05$ . Thus, a variety of aspects of the data reveal that children 2–3 years of age are more closely supervised than children 4–5 years of age.

**Evaluation of Potential Measures of Supervision for Future Research**

On the *End of Day Recording Sheet*, mothers estimated the percentages of time that she believed she was actually watching her child that day ( $M = 64\%$  of the time,

$SD = 16\%$ ) and knew exactly what her child was doing, because she was supervising in some fashion ( $M = 72\%$  of the time,  $SD = 17\%$ ). Estimates of the percentage of time watching the child during the day positively correlated with diary data on the proportion of time watching the child,  $r(68) = .35, p < .01$ . The percentage of time mothers reported they knew what their child had been doing that day also positively correlated with diary reports about time supervising and overall level of supervision by the mother,  $r(68) = .37$  and  $.49$ , respectively,  $p < .01$ .

Mothers also used a five-point Likert scale to indicate how attentive she was generally ( $M = 3.50, SD = .62$ ) and how closely she believed she supervised that day ( $M = 2.67, SD = .77$ ). Reports about attentiveness correlated with the proportion of time mothers indicated on the diary sheets they were watching their child throughout the day,  $r(67) = .35, p < .005$ , and the proportion of time the child was with the mother throughout the day,  $r(67) = .43, p < .001$ . Most importantly, retrospective ratings about how closely she believed she supervised that day highly positively correlated with diary-based indices of overall supervision level,  $r(67) = .60, p < .001$ .

**Discussion**

Though there has been increasing interest in identifying patterns of supervision that elevate children’s risk of injury (Morrongiello et al., 2004a, 2004b), there is surprisingly little known about the nature and scope of the supervision children routinely experience on a daily basis when at home with caregivers. This type of “baseline” information is essential to help distinguish those patterns of supervision that regularly occur and elevate children’s risk of injury from those that occur infrequently and elevate injury risk. This study is the first to provide such information. The findings also revealed that variation in supervision occurred as a function of child demographics (i.e., age and sex) and contextual factors (i.e., room in the home, presence of peers). Finally, the results also advance our understanding of measuring supervision and indicate possible ways to approach this issue in future research.

**Routine Supervision Practices**

To examine the nature and scope of supervision that children routinely experience at home, this study sampled full-day supervision for 10 days, including weekdays and weekends. Prior research on estimating times for daily-life events indicates that this sampling approach should provide an excellent indication of the actual

**Table IV.** Average Supervision Score (Possible Range = 0–9) Under Different Circumstances

Circumstance	Group		Overall
	Young	Old	
In view	8.49 (0.35)	8.35 (0.30)	8.43 (0.34)
Doing something together	9.00 (0)	9.00 (0)	9.00 (0)
Independent activities	7.18 (0.90)	6.95 (0.76)	7.09 (0.85)
Out of view	5.72 (1.60)	4.60 (1.68)	5.25 (1.71)
Alone	5.54 (1.29)	4.23 (1.99)	4.79 (1.83)
With others	5.60 (1.49)	4.85 (1.94)	5.17 (1.78)

Standard deviations are indicated in parentheses.

supervision children receive at home by caregivers (Juster & Stafford, 1985). These results indicate that children are regularly left unsupervised for some portion of their awake time ( $M = 4\%$  of awake time), that they often are out of view of their supervisor and experience supervision from a distance ( $M = 20\%$ ), and that out-of-view supervision is significantly poorer than within-view supervision. In light of previous findings that failing to continuously monitor children elevates their risk of home injury, particularly for boys (Morrongiello et al., 2004a, 2004b), these results suggest that caregivers *routinely* supervise in ways that can lead to child injury, particularly for sons.

Such findings raise questions about the extent to which supervision per se can explain children's risk of injury. If children routinely experience lapses in caregiver supervision when at home, then other factors presumably interact with level of supervision to explain why children experience injuries only during *some* of these time periods. At the least, the results highlight the importance of considering other possible contributing child, parent, and environmental risk factors in studies seeking to relate supervision to child-injury risk (see Morrongiello, in press, for further discussion).

### **Supervision as a Function of Children's Age and Sex**

Prior research using scenarios that mothers reacted to and interview protocols provided evidence to suggest that supervision declines with increasing child age (Garling & Garling, 1993b; Pollack-Nelson & Drago, 2002). These results, however, provide important information on the extent and nature of this developmental based variation in supervision. Older children were unsupervised approximately 8% of the time they were awake, whereas younger children were left unsupervised only about 1% of the time. Older children were more often out of view of supervisors than younger children. Moreover, when supervision was provided with the child out of view, the level of supervision was significantly less for older than younger children. Finally, telephone-based reports about the last time they saw their child revealed that younger children had been seen by mothers within a shorter time interval than older children. Thus, the nature and extent of supervision varied considerably across the age range (2–5 years) of the children.

There were surprisingly few sex differences, but when differences emerged girls received closer supervision than boys. Previous research has found that different patterns of supervision were associated with injury to boys versus girls at these young ages. Specifi-

cally, boys required some form of *continuous* supervision, whereas intermittently checking on the child was a sufficient level of supervision to ensure girls' safety (Morrongiello et al., 2004a, 2004b). Hence, leaving boys unsupervised or with less than continuous supervision can substantially increase their risk of injury. This finding that boys are routinely left unsupervised in some locations of the home more often than girls may help to explain higher rates of injury to boys than girls (Baker et al., 1992; Canadian Institute of Child Health, 1994).

### **Supervision as a Function of Social-Contextual Factors**

The results also revealed age differences in how social context related to supervision. Older children were more likely to be with friends when out of view of their supervisors than younger children. However, supervision scores did not vary significantly as a function of whether or not a child was with others. Hence, caregivers did not interpret the presence of other children as a risk factor (i.e., necessitating closer supervision) or a protective factor (i.e., necessitating less supervision) for injury. Findings from research with school-age children indicate that peers are often a risk factor for injury (Christensen & Morrongiello, 1997; Morrongiello & Dawber, 2004; Morrongiello & Sedore, in press). In fact, some have argued that the greatest single risk factor for injury in school-age children is the presence of peers (Sandels, 1977; Wilson, Baker, Teret, Shock, & Garbarino, 1991). Whether this is true for preschool-age children has not been determined. Suffice it to say, these findings indicate that at these young ages, the presence of friends playing with their child at home did not impact on the level of supervision shown by caregivers, though it remains to be determined whether this social-contextual factor actually influences young children's risk of home injury.

### **Methodological Issues and Advancements**

As recent reports in the child-injury literature have indicated, developing methods to study caregiver supervision is quite a challenge (Morrongiello, in press). Observational indices can be useful but knowledge that they are being observed can lead to significant distortions in caregiver behavior, producing results that represent *best* behavior rather than *typical* behavior. This fact, coupled with the extensive practical difficulties of conducting observations, has often resulted in investigators utilizing self-report measures of caregiver behavior. Attempts at establishing the validity of these self-reports are scarce, but there is evidence indicating relatively good agreement



between what caregivers report and how they behave for other parenting behaviors. For example, one study compared self-reports with observations in a laboratory setting and found that maternal self-reports were quite accurate and valid indicators of numerous caregiver parenting behaviors (Kochanska, Kuczynski, & Radke-Yarrow, 1989). Similarly, a study comparing maternal self-reports about supervision with unobtrusively observed supervision in park settings supported the validity of using maternal self-reports about supervision (Morrongiello & House, 2004). In this study, we addressed this issue by conducting random telephone calls to gather periodic reports of supervision during the study. Comparing these reports with diary entries completed in the 5 min preceding a call revealed relatively good agreement (89%), suggesting that this type of participant event-recording methodology involving diary recordings of supervision is useful as a means of reliably studying this aspect of caregiver behavior in the home.

This study also suggests that maternal retrospective reports of supervision in the preceding 24-h period can be useful in studies of caregiver supervision, though some questions tapping retrospective reports of supervision revealed closer relations to actual supervision scores than others. Specifically, we obtained a moderate-size positive correlation (.60) between diary indices of actual supervision and parent reporting of how closely the child was supervised the preceding day. It is noteworthy also that the single supervision score that relates to various indices of injury risk is how much of the time the parent had the child in view (see Morrongiello et al., submitted for publication), and mothers' retrospective reports about this aspect of supervision also positively related to actual supervision scores. Hence, these questions might be useful to ask in future studies that seek to relate supervision to children's risk of injury, if the current methods and/or direct observations are not feasible.

Prior research indicates that time-use data is much poorer when adults are asked to give "typical day" estimates as opposed to actual time estimates based on the earlier 24-h period (Juster & Stafford, 1985). Moreover, although actual time-use diaries yield the most accurate data, retrospective reports have been found to be off by no more than 10%, particularly for estimates about the preceding 24-h period (Juster & Stafford, 1985). These findings, in concert with those from this study, suggest that caregiver estimates about actual supervision can be reliable and valid, particularly if one limits the focus to reporting about the preceding 24-h period of supervision.

### ***Limitations and Directions for Future Research***

There are several limitations of this study that merit consideration in the design of future studies. First, one must be cautious about the generalizability of the results. The sample was relatively small, no mother worked full-time outside the home, and participation in this study required a tremendous commitment of time and energy. This level of motivation may indicate that this was a unique sample of parents. Indeed, 15 participants dropped out after beginning the study. Although there were no identifiable differences between those who dropped out and those who continued to complete the study (see footnote 1), it is possible that those who completed the study are somehow not representative of the more general population of parents of young children. In future research, this issue may be addressed by utilizing less burdensome data gathering measures (e.g., 24-h retrospective reports about supervision), so that a much larger sample can be surveyed about caregiver supervision, and the drop-out rate would likely be reduced. Generalizability is constrained also by virtue of the demographic characteristics of the sample, which was limited to primarily Caucasian, educated, and middle-class families. Thus, generalizability of the results is an important limitation to acknowledge.

Second, although every effort was made to establish the validity of the diary data and the method used would have made it easy to identify mothers who were not completing diaries as instructed, there is no way to confirm that these data accurately reflect the supervision provided to young children. We initially planned to have a second parent who independently complete some diary forms, but based on poor participation by fathers in other research, we decided against this because we feared it would indeed lead to a nonrepresentative sample of participants. The fact that mothers readily report leaving their child unsupervised and out of view a considerable amount of time and that supervision indices were related to injury history scores suggest that mothers were being honest and accurate in their reporting. Nonetheless, we cannot know this with certainty. Future research should incorporate an observational component for the purposes of comparing diary-based with observation-based data about supervision to further confirm the validity of the participant-event recording methodology.

### **Conclusion**

Using a participant event-recording methodology, this study provides important information about how caregivers

routinely supervise young children at home. Supervision varied as a function of the child's age, with younger children (2–3 years) being more closely supervised than older children (4–5 years). Few sex differences in supervision emerged, though girls received closer supervision than boys when there were sex differences. The results reveal that children are routinely left unsupervised for portions of their time awake, are often out of sight of their supervisor, and that supervision of children who are out of view is poorer than that provided when the child is in view. This constellation of findings suggests that caregivers routinely supervise in ways that can elevate young children's risk of home injury.

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