

DECREASING DANGEROUS INFANT BEHAVIORS THROUGH PARENT INSTRUCTION

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One adult and three adolescent mothers with 1-year-old infants were taught to reduce their infants' potential for injury in the home. After being taught to increase their positive interactions with their infants, the mothers were taught to child-proof the home, to use playpen time-out for potentially dangerous behaviors, and to give positive attention for safe behaviors. A multiple baseline design across subjects was used to evaluate functional control. Potentially dangerous behaviors, observed during 10 min of free play, decreased from variable and, at times, high rates during baseline to stable near-zero rates after treatment. These target behaviors remained low at a 7-month follow-up assessment.

DESCRIPTORS: injury control, adolescents, infants, prevention, time-out

Infants and toddlers 1 to 2 years old have the highest number of injuries of all children, theoretically due to increased exploration of the environment combined with inadequate motor coordination, poor impulse control, and inability to perceive danger (Zuckerman & Duby, 1985). For children, high frequencies of accidental injury have been associated with unsafe homes (Gallagher, Hunter, & Guyer, 1985), and parents who are young, punitive, not vigilant, or inconsistent in their discipline (Powers & Chapieski, 1986).

Although educational approaches have been successful in teaching parents to make their homes safer (Barone, Greene, & Lutzker, 1986), infants

and toddlers are continually exposed to unavoidable environmental hazards such as stoves and electrical cords. Consequently, educational strategies are needed to increase the safety of the home environment and decrease children's dangerous behavior.

There is little published research on parental management of the behavior of their infants and very young toddlers. Porterfield, Herbert-Jackson, and Risley (1976) reported using time-out with children as young as 1 year old, but its actual use was not evaluated. Powers and Chapieski (1986) reported that repeated maternal removal of 14-month-old infants from unsafe objects resulted in eventually keeping them away from the objects for 1 min 84% of the time, but they did not present follow-up data.

The present study was conducted to determine whether infants' potentially hazardous behavior could be decreased by teaching their mothers to use time-out for unsafe behavior, positive attention ("time-in") for safe behavior, and child-proofing the home.

METHOD

Subjects and Setting

Four mother/infant pairs were enrolled in this study. Table 1 presents demographics of each mother, infant, and home environment. When initially contacted, the parents were told that they

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Operational definitions of potentially hazardous behaviors, a list of specific potentially dangerous behaviors in which each child engaged, a description of the training procedure, results of training mothers to increase positive attention to appropriate child behavior, and copies of the time-out hand-out are available from E. R. Christophersen upon request.

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Table 1
Demographic Data of Mother, Infant, and Home Environment

	Mother/infant pair			
	1	2	3	4
Mother				
Age (years)	17	18	28	18
Employed?	yes	no	no	yes
Infant				
Age (months)	12	11	11	10
Home environment				
H.O.M.E. ^a	normal	normal	normal	normal

^a The Home Observation for Measurement of the Environment (H.O.M.E.) is a measure of opportunities for stimulating a child in the home environment (Caldwell & Bradley, 1979).

would be learning child management techniques and that we needed to observe them and their children before teaching them these strategies. Written informed consent was obtained from all four mothers. The parent-training sessions, observations, and interobserver reliability checks were conducted in the participants' homes.

Trainers and Observers

Trainers used standard protocols for instructing parents in positive interactions ("time-in") and time-out. A list of operational definitions for potentially hazardous behaviors was developed by the primary observer; this was given to the trainers and reviewed prior to each home visit. Initial training of the reliability observer included approximately 2 hr of review of the list of operational definitions, presentation of hypothetical behaviors in which the child might engage, and discussion of any discrepancies in scoring. Observers did not do parent training.

Measures

Potentially hazardous infant behavior. Presence or absence of dangerous infant behaviors was recorded in 30-s intervals during a 10-min period of free play. When the infant was sitting on his or her mother's lap or was in time-out during treatment, recording was temporarily discontinued. The specific behaviors were individually selected, depending on the home environment, parental con-

cerns, and dangers which have been found to be the most frequent causes of home injury or death in young children, as indicated by the National Safety Council (1985).

Parent satisfaction. At the end of the study, each mother completed a questionnaire in which she was asked to evaluate the usefulness of the techniques, observations of changes in her infant's behavior, and specifics of the study itself.

Design and Conditions

The experimental design was a multiple baseline across subjects. A follow-up visit was made 7 months following the end of treatment.

Baseline. During 10 min of free play, the mother was instructed to engage in an activity that was not primarily child centered (e.g., doing the dishes, talking to the trainer, reading a magazine). However, she was also instructed to monitor her infant and to intervene whenever she felt it was appropriate.

Intervention. Prior to intervention for dangerous behaviors, each mother was taught to praise and describe her infant's appropriate behavior. Each mother was required to increase positive statements to approximately 10 per min and to decrease negative statements to approximately 2 per min before intervention began. During the first treatment session, child-proofing was taught by giving the mother information and subsequent feedback about ways to make her home environment safer. As hazards were noted, the mother was given feedback throughout the remainder of intervention. Feedback was also given after administration of a home hazard inventory (Barone *et al.*, 1986).

Time-out in a playpen was taught for unavoidable dangers. Based on a handout given to the parents, time-out consisted of stating "no" firmly and immediately, picking up the infant facing away from the mother, and placing the infant in a playpen with soft toys until he or she was quiet for 5 to 10 s (see Christophersen, 1982). The mother was instructed to give the infant toys immediately following time-out. She was also instructed to monitor her infant closely and to touch him or her and give positive attention frequently when he or she

behaved appropriately. The procedure was first modeled by the trainer; then the mother put her infant in time-out and was given feedback on the accuracy of her technique as well as the appropriate use of time-out for potentially hazardous behavior. During instruction, the observer recorded the number of minutes the child was in time-out, the frequency of time-outs, and the reason for time-out. The number of intervals of potentially dangerous behavior, however, was only recorded for a 10-min period following instruction. During the observation the trainer continued to give the mother ongoing feedback if needed. The mother was asked to use time-out and time-in between sessions. Total instruction time was: Mother 1, 1 hr, 40 min; Mother 2, 1 hr, 50 min; Mother 3, 1 hr, 25 min; and Mother 4, 1 hr, 10 min. Training was discontinued when dangerous behaviors were low and stable.

Interobserver Reliability

Reliability was assessed for 21 of 72 observations (29.2%, with a range of 25% to 36.9% across subjects and conditions), with at least one reliability check during each condition and during all follow-up visits for each mother. All primary and reliability observations of dangerous behaviors were made in the home. Interobserver reliability was computed by calculating for both occurrence and nonoccurrence of dangerous behaviors per 30-s interval, by dividing the number of agreements by the number of agreements and disagreements and multiplying by 100. Reliability over all conditions and all subjects was 95.1% for occurrence of dangers (with a range of 91.7% to 98.5%) and 97.1% for non-occurrence of dangers (with a range of 95.0% to 98.3%).

RESULTS

Potentially dangerous infant behaviors decreased to a low and stable rate after intervention. Figure 1 shows the effect of time-out, time-in, and home child-proofing instruction on the percentage of time during a 10-min sample in which the four infants engaged in potentially dangerous behavior. During

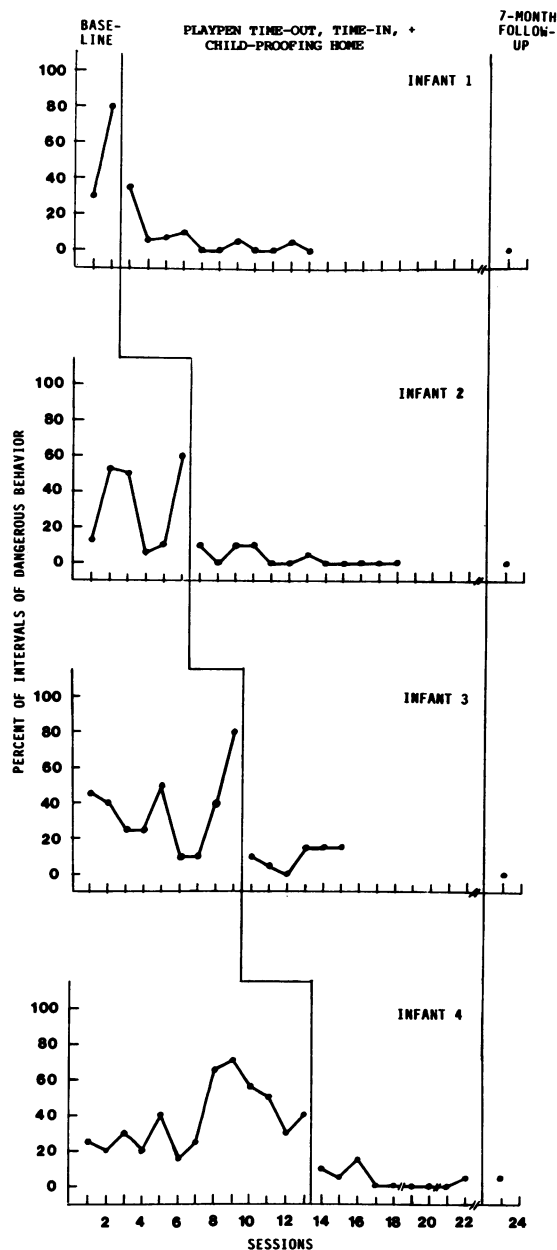


Figure 1. The effect of time-out, time-in, and child-proofing the home on potentially dangerous infant behavior.

baseline, all four infants showed wide variability, with potentially dangerous behavior occurring an overall average of 55.0%, 32.2%, 35.1%, and 37.3% of the observed intervals. Following treatment, the percentage of intervals with dangerous behavior decreased to near-zero stable rates aver-

aging 6.0%, 2.9%, 10.0%, and 3.9% of the observed intervals.

Because the original referral was for crying and the infant showed a dramatic increase in crying during Sessions 5 and 6, Mother 3 was taught to use time-out for crying in a separate session. She did not report using time-out for any other behaviors, nor was she observed to do so during subsequent home visits. Dangerous behavior increased dramatically after the child ceased to cling to her mother and cry.

Follow-up observations showed three of the children did not engage in any potentially dangerous behavior during a 10-min observation; the fourth child engaged in one dangerous behavior. During the first intervention session, the infants went into time-out an average of five times and spent an average of 17 min total in time-out. Over all subsequent sessions, infants went into time-out an average of nine times and quieted within 2 min. Sessions were conducted approximately every 4 days, lasting a total of 2 to 2.5 months for three mother/child pairs. Due to illness, the mother's work schedule, and a high cancellation rate, the fourth mother/child pair was seen over a much longer period (approximately every 12 days), lasting a total of 10.5 months.

All four mothers reported that they found the procedure useful, saw improvements in their infant's behavior, and would continue to use the techniques.

DISCUSSION

After being taught to increase their positive interactions, one adult and three teenage mothers were taught to decrease potentially dangerous behavior in their infants aged 1 year or younger. With the introduction of playpen time-out, positive attention (time-in), and child-proofing the home, potentially dangerous behaviors in all four infants decreased from variable and, at times, high rates during baseline to low stable levels following instruction, and remained at near-zero levels at a 7-month follow-up.

Interestingly, the children engaged in potentially

dangerous behaviors during as much as 80% of the intervals observed during baseline. The rates varied greatly, however; lower rates appeared to be associated with crying and clinging behavior in the child, whereas higher rates appeared to be associated with maternal inattention or attention to inappropriate behavior. Recording maternal behaviors (including appropriate use of the three components) and the injury history for each infant would provide useful information in future studies. While not measured directly, it appeared that, unlike the findings of Powers and Chapieski (1986), dangerous behavior did not decrease substantially when mothers repeatedly removed infants from the danger during baseline.

Because the treatment package included three components, it is impossible to determine what specifically accounted for the change in behavior. A component analysis, in which each component is introduced separately, would be a valuable contribution to the injury prevention literature. The collection of normative data among infants and toddlers of various ages would help address questions linking reduced dangerous behavior to maturation.

While the management strategies were primarily used for dangerous behaviors, all four mothers reported using them occasionally for other behaviors such as crying, hitting, biting, and throwing objects. Careful explanation and ongoing support from the trainer was particularly important, because all of the mothers reported that they found the infant's crying during the initial introduction of time-out to be distressing.

The inclusion of one adult mother in the study provided an interesting comparison. There was essentially no difference in the rate of dangerous behaviors of the infants. The three teenage mothers were equally (if not slightly more) effective as the adult in decreasing their infants' dangerous behavior. However, the older ages of the teenagers and the fact that all three were married and had family support lessened their risk of poor parenting. In addition, because the adult mother had been referred to the clinic, she does not represent the norm in ability to manage an infant. Normative data on

nonreferred infants of adult mothers would provide an interesting comparison.

One caution in drawing conclusions from the data presented is the problem of reactivity. The primary observer was present at all sessions, and at times there were as many as three adults in the home. It is possible that the infant and mother behaviors were influenced by this. In addition, the infant's behavior might have been influenced by the amount of time he or she was allowed to explore the environment outside of the observed free play period, by the frequency of maternal monitoring, or by the consistency of parental discipline in general. Follow-up research should address these questions.

Although this study spanned several months and required frequent home visits, the actual training time was less than 2 hr per family. Initial introduction of time-out was long, but each child quieted rapidly in time-out after the initial session. This suggests that this intervention could be used effectively and economically by an experienced clinician. Thus, this study demonstrated a cost-effective combination of parent training and child-proofing of the home for reducing the potentially dangerous behaviors of older infants.

REFERENCES

- Barone, V. J., Greene, B. F., & Lutzker, J. R. (1986). Home safety with families being treated for child abuse and neglect. *Behavior Modification*, *10*(1), 93-114.
- Caldwell, B. M., & Bradley, R. (1979). *Home observation for measurement of the environment*. Little Rock, AR: University of Arkansas.
- Christophersen, E. R. (1982). *Little people: Guidelines for common sense child rearing*. Shawnee Mission, KS: Overland Press.
- Gallagher, S. S., Hunter, P., & Guyer, B. (1985). A home injury prevention program for children. *Pediatric Clinics of North America*, *32*(1), 95-112.
- National Safety Council. (1985). *Accident facts—1985 edition*. Chicago: National Safety Council.
- Porterfield, J. K., Herbert-Jackson, E., & Risley, T. R. (1976). Contingent observation: An effective and acceptable procedure for reducing disruptive behavior of young children in a group setting. *Journal of Applied Behavior Analysis*, *9*(1), 55-64.
- Powers, T. G., & Chapieski, M. L. (1986). Childrearing and impulse control in toddlers: A naturalistic investigation. *Developmental Psychology*, *22*(2), 271-275.
- Zuckerman, B. S., & Duby, J. C. (1985). Developmental approach to injury prevention. *Pediatric Clinics of North America*, *32*(1), 17-29.

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