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Factors Related to Earthquake Preparedness among Child Care Professionals: Theory and Policy Implications*

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With increasing numbers of children enrolled in child care, the safety of the child care environment and the preparedness of personnel to prevent injuries and fatalities in the event of natural disasters becomes an important public policy issue. In this study, earthquake preparedness and its correlates were examined in 25 child care centers located in a southern California community adjacent to the San Andreas Fault. Extensive survey, interview, and on-site observational data were collected. Findings indicated a wide range of preparedness in child care centers. Half of the child care centers lacked basic essentials required to cope in the aftermath of a major quake. Several hazards were also common: unsecured bookcases, open shelves, rolling furniture, large and unprotected windows, and heavy objects stored on high shelves. In addition, many directors had misconceptions about the role of local agencies (e.g., fire department, police, Red Cross) following an earthquake. Findings are considered in terms of risk assessment theory and implications; public policy and legislative courses of action are discussed.

In 1984, legislation was passed in California "to minimize loss of life and disruption during an earthquake" by mandating all public and private elementary and secondary schools to establish an "earthquake emergency system" (West's Annotated California Education Codes 1991), thus reflecting the public's concern about the safety and welfare of school-age children throughout the state in the event of an earthquake. Put briefly, all public and private K–12 schools were required to develop protective measures to take before, during, and after an earthquake that would involve school staff and school children. In addition, regular earthquake drills were required for students.

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Although this legislation represented an important step in earthquake preparedness efforts with respect to children, this particular mandate did not address the nearly 800,000 youngest and most vulnerable population of children in the state—namely the infants and young children being cared for in licensed child care centers and family day care homes (State of California Health and Welfare Agency 1995). This oversight is particularly problematic for a host of reasons. First, statistics reveal that among children 15 years and younger, preschoolers and infants are at highest risk for death and physical injury in the event of nonintentional accidents or other disasters (National Center for Health Statistics 1984). Second, preschoolers may also be at greater risk for emotional trauma in the event of a natural disaster (Federal Emergency Management Agency 1985). Third, recent studies reveal that preschool children and infants represent the fastest growing segment of children being enrolled in child care today. Nationwide, 52 percent of women who have children under the age of one year and 68 percent of women with school-age children are in the workforce. By the year 2000, 80 to 90 percent of women with school-age or younger children are predicted to be in the workforce (League of Women Voters of California 1988). Fourth, the child care environment poses certain unique structural and physical hazards to children (e.g., rolling pianos, large windows near napping areas) in the event of an earthquake. Fifth, although most states do have regulations requiring plans and drills for emergencies such as fire, no states require specific earthquake-related drills or plans in the child care setting. Plans and drills specific to earthquakes are particularly important in earthquake-prone regions because effective responses during an earthquake are very different from those commonly practiced for a fire or tornado emergency. Finally, research indicates that adequate preparation for natural disasters can significantly reduce the risk of death, injury, and property damage (Sims and Baumann 1972). Taken in combination, these factors make clear the need for more specific measures to ensure the safety and welfare of infants and young children in the child care setting in earthquake prone regions.

As Turner (1993) pointed out, compared to other natural disasters, social science research on earthquakes has had a relatively short and recent history. Nonetheless, studies on earthquake preparedness have begun to appear in increasing numbers in the psychological literature. For example, there is a growing literature on correlates of adults' perceptions about earthquake threat in both earthquake prone regions like southern California (e.g., Turner et al. 1986), as well as in regions of the Midwest that have a history of infrequent, though significant, risk of seismic activity such as New

Madrid, Missouri (e.g., Clark et al. 1993), and elsewhere around the world including rural Mexico (Ordono 1984) and Peru (Olson et al. 1989).

A growing number of researchers have focused on factors relating to perceptions of earthquakes and preparedness behaviors among adults (Davis 1989; DeMan and Simpson-Housley 1987; Edwards 1993; Farley et al. 1993; Lehman and Taylor 1988; Mileti and Fitzpatrick 1991; Mulilis and Duval 1990; Mulilis and Lippa 1990; Turner et al. 1986). This research reveals that among adults, awareness of risk does little to affect behavior. Moreover, when preparations are made, they are generally those requiring minimal effort.

In all of the above studies, however, preparedness behaviors and efforts were examined for individuals who would be concerned primarily with their own safety and well-being (i.e., college students, homeowners). Turner et al. (1986), however, found greater earthquake preparedness in homes with children present. To our knowledge, however, no studies have examined earthquake preparedness efforts as they apply to providers of child care for children. The purpose of this study was to examine current levels of earthquake preparedness among directors of child care centers in a seismically active region. A second purpose was to identify variables related to preparedness to determine whether children in certain types of facilities may be at higher risk in the event of an earthquake. To address these issues, extensive survey, interview, and on-site observational data were collected from child care center directors in a community at high risk for earthquake activity. Specifically, the community is located adjacent to the southern portion of the San Andreas Fault where the probability of sustaining a major earthquake 7.0 or greater on the Richter scale within the next 20 years has been estimated at 0.90 (Dieterich 1983). Results, discussed in terms of injury control research and psychological risk assessment theory, provide important public policy implications regarding earthquake preparedness efforts for children in the child care setting.

Method

Directors of the 32 child care centers listed in the telephone directory of a southern California community located adjacent to the San Andreas Fault were contacted via telephone and asked to participate in a study on earthquake preparedness and child care centers. Of the 32 directors, 25 (78%) agreed to participate in the study; most of the centers that did not participate were not year-round programs and had closed for the summer. Directors identified their child care facility as 33 percent proprietary, 33 percent church-affiliated, 29 percent government supported (e.g., Head Start cen-

ters), and 5 percent other. On average, child care centers were open 46.9 hours/week, had 5.5 teachers and 4.7 classrooms, served 72 children, and had been in operation for over 12.6 years. Director demographics were as follows: 97 percent were women and 50 percent had at least one child under 12 years of age, mean age = 42.7, mean years education = 15.1, mean years experience = 11.0, mean years residing in California = 27.6 years. Thus, the sample included relatively experienced child care professionals in well-established child care centers.

Directors were contacted by telephone and asked to participate in the study, which consisted of a survey and on-site visit. The survey was mailed to those consenting, and a subsequent appointment was arranged for an on-site visit and interview. The survey included questions regarding director and center demographics, sources of information about earthquakes, previous personal experiences and reactions to earthquakes, earthquake plans and level of preparation at the center and at the director's homes, directors' probability estimates of a major earthquake in the region within 6 months and 20 years (after Lehman and Taylor 1988), and director observations of children's earthquake reactions and experiences. In addition, 24 questions surveyed directors' knowledge about earthquakes, earthquake preparation, and beliefs about the role of public agencies. Finally, attitudinal coping strategies for earthquakes were assessed using the ten earthquake coping statements developed by Lehman and Taylor (1988). In their study, a factor analysis of these items resulted in two factors; the first factor reflected coping with earthquake threat by questioning the seriousness of the earthquake threat and doubting the veracity of the predictions ("Doubt"), while the second factor involved the coping strategy of ignoring the threat or fatalism ("Denial").

At the time of the visit, directors returned the completed survey. The on-site visit involved a detailed interview and visual inspection of the plans and preparations in place at the child care facility. Based on director survey responses and on-site observations, an earthquake preparedness index was computed for each child care center. The score was a weighted sum of 37 supplies or preparedness behaviors recommended by the American Red Cross and federal and local emergency agencies. Weights were assigned by the authors according to importance in preventing injury and fatality to children during the earthquake and coping in the aftermath of the earthquake. Weights ranged from 5 (for items such as having a plan, practicing drills, first aid skills, food, water, etc.,) to 1 (for items such as having extra batteries, candles/matches, broom). The possible range of scores on the earthquake preparedness index was 0 to 102.

Results

Earthquake Preparedness Levels

The mean Earthquake Preparedness Index score was 70.2 (SD = 18.8; Minimum = 36; Maximum = 102) out of 102 points. To provide a clearer description of the preparedness status of the child care centers, table 1 displays the percent of centers in which various earthquake preparations were implemented. With respect to planning for an earthquake, plans specific to earthquake response were in place in only 50 percent of child care centers. In approximately one-third of the centers the plan was authored by the current director. Furthermore, in the vast majority of centers, teachers, staff, and parents were not provided with written information about the

Table 1. Earthquake Preparedness of Child Care Centers on Most Important Items

Preparedness Measure	Percent of Centers
Earthquake Plan:	
Had an earthquake emergency plan on file	50
Had developed floor plan with exits depicted	71
Had authored earthquake emergency plan on file	31
Had distributed earthquake plan to teachers	28
Had distributed earthquake plan to other staff	8
Had distributed earthquake plan to parents	8
Had coordinated earthquake plan with parents	46
Parents had inquired about earthquake plan	60
Earthquake Preparations:	
First aid training	83
Cardiopulmonary resuscitation (CPR) training	67
Practice "duck and cover" drills	88
Know how to shut-off gass and water utilities at facility	71
Water for 72 hours	50
Food for 72 hours	46
Battery-operated radio	67
Flashlight	79
Water heater secured to wall	58
Heavy/tall furniture secured to wall	25
Emergency evacuation bag	33
Heavy gloves	42

plan. Almost all directors with plans in place, however, reported that they had coordinated their plans with parents to some degree (although parents were not given an actual written copy of the director's plan). Finally, 60 percent of the directors reported that at least one parent of a child in their center had inquired about what would happen at the center in the event of an earthquake. However, the modal number of parents asking at each center was 0, and the maximum number of parental inquiries at any given center was 8. Thus, given that the average number of children at these centers surpassed 70, only a very small percentage of parents inquired about earthquake plans at the child care site.

There was considerable variability with respect to the specific preparations directors had taken. Table 1 displays the percentage of centers in which specific preparations were reported by directors or directly observed during the on-site visit. For example, the majority of directors reported possessing first aid and/or cardiopulmonary resuscitation (CPR) training, practicing "duck and cover" drills, and knowing how to shut off gas and water utilities at their child care facility. Nonetheless, many centers lacked basic essentials required to cope comfortably in the aftermath of a major quake predicted for the region. Of particular concern was the finding that about half of centers lacked recommended supplies of food and water. In many centers, children and/or staff would be at risk for physical injury during the seismic shaking due to falling water heaters or heavy or tall furniture. Heavy or tall furniture was secured to the wall in only 25 percent of centers.

Directors' Knowledge about Earthquakes and Earthquake-related Issues

As assessment was made of the center directors' knowledge about earthquakes and earthquake-related issues. The Earthquake Knowledge section of the survey consisted of 24 true-false items. The number correct ranged from 10 to 24, with a mean of 18.24 (SD = 3.55). Percentages of directors responding correctly to individual items are shown in table 2. Most directors were aware of the recommended actions during and following a temblor (e.g., items 1, 2, 5, 9, 10, 13, and 18). A misconception held by approximately one-third of directors was that they should telephone local public agencies for information concerning emergency procedures following an earthquake; in fact, telephone service is likely to be disrupted. In addition, approximately one-third of directors believed incorrectly that local agencies (e.g., Red Cross, fire, police) would evacuate children from child care facilities for relocation within 24 hours following a major earthquake. When contacted, these agencies indicated that their responsibilities included immediate response to crises (e.g., fire department and

Table 2. Earthquake Knowledge of Child Care Center Directors

Item*	Percent Correct
1. If you are inside and feel the ground begin to shake, you should get out as soon as possible.	84
2. Following a major earthquake, you should always immediately turn off your gas service at the meter.	72
3. Many scientists predict that California will be divided at the San Andreas Fault and that the western portion will fall into the Pacific Ocean following the "Big One."	60
4. After a damaging earthquake, assistance from the fire and police will be immediately available for our schools and day care facilities.	80
5. During a major earthquake, when the ground is shaking, you should stand exactly where you are (if inside) until the shaking stops.	92
6. The Red Cross will come to schools and day care centers and take all children whose parents have not picked them up after 24 hours.	72
7. After a damaging earthquake, you should immediately telephone local public agencies for information concerning emergency procedures.	64
8. Giving preschool children earthquake drills will only frighten them and cause them to panic during the real thing.	100
9. During an earthquake, while the ground is still shaking, you should take cover under heavy furniture.	80
10. If children are outside playing when an earthquake occurs, they should immediately run to the building for protection.	88
11. The fire department will come and evacuate children following a damaging earthquake within 24 hours.	68
12. Teachers are legally bound to stay at school following a disaster until the situation is secured.	96
13. As long as your tap water runs following a damaging earthquake, it is safe to drink.	96
14. It is highly likely that numerous large and deep fissures or cracks in the earth will appear following a major earthquake.	56
15. Currently, scientists can predict when a major earthquake will happen within one or two weeks.	88
16. Following a major earthquake, separated family members may contact the Red Cross for information about their lost relatives.	92
17. The police department will take children to evacuation centers if their parents have not picked them up within 24 hours.	68
18. If children are outside playing when a major earthquake occurs, they should take cover under a tree for protection.	96
19. Following the main shock, you can be 95 percent certain that the worst damage is over and you are out of danger.	96
20. When a damaging earthquake occurs, the electric company automatically shuts off power to fallen lines.	80
21. Data are inconclusive in demonstrating that earthquakes are most likely to occur when the weather is hot, humid, and windless.	68
22. An earthquake measuring 6.0 on the Richter scale is twice as powerful as an earthquake measuring 3.0.	52
23. The San Andreas fault is the only fault in California that could cause extensive damage if involved in a major earthquake.	92
24. Buildings built on solid rock fare better than buildings built on softer ground in withstanding the force of a major earthquake.	52

*Items 9, 12, 16, 24 are true; all remaining items are false.

police) and setting up emergency shelters (e.g., Red Cross) and did not include evacuation or care of children in less than crisis situations. The directors generally fared poorly on items assessing factual and scientific information about earthquakes (e.g., items 3, 8, 12, 14, 15, 19, 21, 22, 23, and 24).

Correlates of Earthquake Preparedness

Characteristics of child care facilities and directors were examined as predictors of earthquake preparedness. Correlations between predictor variables and scores on the Earthquake Preparedness Index are displayed in table 3. Higher levels of preparedness were associated with larger centers (i.e., centers with greater number of teachers, classes, and children) and those which had been in operation longer. Moreover, a comparison of

Table 3. Correlations between Predictor Variables and Earthquake Preparedness Index

Predictor variable	*r*
Day care center demographics:	
Years in operation	0.43*
Weekly hours in operation	-0.12
Number of teachers	0.43*
Number of classes	0.37*
Number of children	0.57**
Director characteristics:	
Age in years	0.33^{+}
Years of education	0.34*
Years of work experience	0.28^{+}
Years residing in California	0.33^{+}
Knowledge about earthquakes, preparedness, etc.	0.48**
Self-appraisal of home preparedness	0.50**
Self appraisal of child care facility preparedness	0.70**
Cognitive coping strategy: Doubt	-0.07
Cognitive coping strategy: Denial	0.04
Worry	-0.04
Probability estimate of major earthquake within 6 mos.	-0.04
Probability estimate of major earthquake within 20 yr.	-0.14
Belief about destructiveness	-0.04
Belief about government preparedness	-0.10

$^{+}p < 0.10$; $*p < 0.05$; $**p < 0.01$.

Earthquake Preparedness Index scores among the three major categories of child care centers revealed significant differences ($F(1, 22) = 4.28$, $p < 0.05$): government-supported centers had the highest level of preparedness ($M = 82.43$, $SD = 17.24$), followed by church-affiliated centers ($M = 70.38$, $SD = 20.25$), and proprietary centers ($M = 57.25$, $SD = 10.47$).

In terms of director characteristics, several major findings emerged. First, as shown in table 3, directors with more years of education and greater knowledge about earthquakes and safety were significantly more prepared for earthquakes at their center. Second, directors' self-appraisals of preparedness, both at their own home and at the child care center, were positively and strongly related to actual preparedness at the center. Third, demographic variables such as director age, years of work experience, and years residing in California were related to increased preparedness at the center, $p < 0.10$.

Discussion

A sobering finding of this study is that, at best, only about half of the day care facilities were even minimally equipped to handle the crises associated with a major earthquake. Of particular interest was the large range of variability in preparedness levels observed among the different types of child care centers. Larger, government-supported centers, such as Head Start preschools, were the most prepared. This was found to be the result of specific state regulations requiring earthquake plans, drills, and preparations. Directors at these centers had developed and implemented extensive, detailed, and often creative response plans for securing and storing supplies, as well as training personnel, parents, and children. On the other hand, the smaller proprietary centers, operating without similar earthquake regulations, were significantly less prepared for coping with a significant temblor. Across this entire sample, only 50 percent of the child care centers had earthquake disaster plans on file. Many of these plans were minimal at best. Furthermore, where they existed, these plans were not coordinated with or widely disseminated among staff, parents, and/or local emergency agencies (e.g., fire department, police, Red Cross). Fully half of the preschools did not have on-site the recommended quantities of basic supplies, such as food and water. Finally, a number of additional hazards typical of child care facilities were observed: unsecured furniture and other items (e.g., tall or heavy bookcases, moveable shelving units, water heaters, rolling items such as pianos, television/VCR carts), heavy or hazardous objects stored on high shelves (e.g., large, heavy cans of supplies, paints, or cleaners), and unsecured breakable items (e.g., computers, aquariums, ceiling lighting fixtures,

and large unprotected windows near high traffic or napping areas). All of these hazards could be eliminated or at least reduced with a minimum of effort and expense (Federal Emergency Management Agency 1985). Director characteristics were also found to be associated with higher levels of preparedness. Directors who were older, had more years of work experience, and had lived in California longer tended to have better-prepared centers.

Unlike previous research examining earthquake attitudes and behavior (Farley et al. 1993; Lehman and Taylor 1988; Turner 1993), director cognitive coping strategies, beliefs about the destructiveness of a major earthquake, perceived level of government preparedness, and probability estimates of a major earthquake were not related to level of organizational preparedness. One exception to this pattern was that directors' knowledge about earthquakes and earthquake preparedness efforts were strongly associated with greater implementation of earthquake safety measures at the facility. However, given the correlational design of this study, it is impossible to determine the direction of the relation between knowledge of safety and actual preparation behaviors. Finally, directors' *self-appraisal* of preparedness at their center was highly associated with their *actual* level of observed preparedness, indicating that directors were aware of whether or not their preparations were adequate. A caveat is that some of the these data were self-reported by directors (e.g., practice of "duck and cover" drills at the site, knowledge of first aid, coordination of plans with parents) and thus may represent a best-case scenario.

Taken together, these findings indicate that in spite of caring for a very young and vulnerable population of children, about half of child care center directors in this study had not implemented earthquake safety plans. The level of inadequate preparation is striking, especially in view of (a) the high risk area in which these centers were located; (b) the occurrence of the highly publicized Whittier-Narrows quake a few months earlier that caused major damage to a community less than 50 miles away; (c) the responsibility that directors bear in terms of caring for large numbers of highly dependent infants and young children; and (d) the fact that most of the directors were women and parents of young children (factors usually associated with preparedness).

Relation of Findings to Risk Assessment Research and Theory

When interpreting risk data, individuals tend to focus on the potential for personal gain or loss. Individual decision-making is subjective and prone to several biases that lead to divergence from rationality. For example, Jeffery (1989) cited research indicating that individuals have a fore-

shortened time perspective and value benefits that are immediate rather than in the distant future (10 to 15 years is cited as the uppermost limit). With respect to earthquake preparedness among child care directors, this finding may help explain low levels of response; earthquake forecasts are often reported in terms of probabilities of occurrence over periods ranging to 20 years or more. When earthquake forecasts are presented in such long-term frames, directors may minimize the need to prepare now.

Additional research demonstrates that individuals hold an "optimism bias" or a tendency to underestimate health risks to themselves (Tversky and Kahneman 1974). This bias may serve to preserve the individual's sense of psychological well-being and may also result form a tendency to over-generalize from past personal history. Directors in this study may be especially prone to this bias because they had previously experienced earthquakes with little or no adverse effects. Hence, they may reason that recommended earthquake preparations are not necessary, because they have not needed them in the past.

A third bias affecting individuals' assessment of risk is the tendency to discount very small probabilities (Tversky and Kahneman 1974). Short-term probability estimates of major earthquake tend to be very low; for example, an estimate of two percent probability for a major earthquake within five months in this region has been cited by Lehman and Taylor (1988). If statistics such as these are publicized, many directors may tend to minimize or disregard the earthquake threat.

Adopting a population perspective, rather than an individual perspective, may yield more fruitful avenues for effective intervention. Jeffery (1989) described the population perspective as focusing on rationalistic principles with the goal of maximizing population gain (e.g., reducing the number of injuries and fatalities in the child care setting) when interpreting risk data. Therefore, intervention strategies (such as economic incentives, legislation) using a population perspective are most effective when (a) there is a distinct environmental context in which the target behavior occurs; (b) the environmental context is in the public realm; and (c) it is economically and politically feasible to intervene. These guidelines seem quite applicable to the issue of earthquake preparedness in the child care setting. Not only is there a distinct environmental setting in the public realm, but legislative intervention in similar school environments has already been enacted (e.g., California's 1984 mandate for K–12 schools to develop earthquake response plans and practice drills). In addition, many preparedness measures involve either no or minimum financial cost and are relatively easy to

implement, such as securing bookcases, installing safety latches, practicing duck and cover drills.

Public Policy Implications and Actions

Public interest in earthquakes has been shown to rise and fall over time and as a function of forecasts or recent experiences with earthquakes (Farley et al. 1993; Showalter 1993; Turner et al. 1986). Moreover, both classic and more recent studies (Farley et al. 1993; La Piere 1934) have shown that the links between *cognition*—believing in the validity of earthquake predictions, *behavioral intentions*—steps taken in planning for safety measures, and *actual behavior*—ultimately implementing the safety measures, are neither direct nor guaranteed. Thus, merely raising public awareness about earthquake preparedness does not necessarily translate into actual behavioral changes as research amply demonstrates.

Given these decision-making biases, individual-perspective interventions such as educational efforts will be most effective when the following conditions are met: (a) benefits are immediate and certain; (b) response cost is low, relative to expected benefits; and (c) benefits to the individual are substantial. Applying these principles to the issue of earthquake preparedness among child care center directors, it is clear that not all of these conditions are met. For example, the benefits associated with preparedness are neither immediate nor certain. In addition, as previously discussed, response costs associated with implementing and maintaining an earthquake preparedness plan at a child care facility, while not excessive, would require some level of ongoing effort. Thus, while purely educational interventions aimed at child care directors may be helpful, given the foregoing biases, interventions at this individual level would not be the most effective or optimal strategy for increasing earthquake safety measures in the child care setting.

Based on the foregoing analysis, educational interventions targeting individual directors would not be optimally effective in promoting earthquake preparedness in the child care setting. Indeed, Mileti and Sorensen (1987) have argued that the most effective precautions against earthquakes "are not ones taken by individuals but those legislated or adopted by communities and nations" (p. 191). Similarly, Berke and Beatley (1994) in their recent book provide a useful conceptual model showing that earthquake mitigation practices and policies are embedded within a larger, complex decision-making process that is strongly influenced by at least two independent factors. The independent factors include "internal" factors (e.g., participant interactions, presence of earthquake safety advocates, availability of resources such as funds, personnel) and "external" factors

(e.g., the role played by stakeholders such as the public, elected officials, real estate interests, the occurrence of a recent earthquake, the political culture, socioeconomic conditions). Viewed from this larger systems context, so long as earthquake preparedness efforts continue to focus solely on individual responsibility, then effective disaster preparedness will continue to compromised by other competing factors. Thus, combining intervention measures that rely on both the individual perspective (educational measures) and the population perspective (legislative measures) would be the optimal strategy in preventing future injuries and fatalities to infants and young children in the child care setting. Legislative measures have proven effective in protecting infants and children in a variety of contexts, including, for example, the passage of automobile passenger restraint seat laws for children (Guerin and MacKinnon 1985; Insurance Institute for Highway Safety 1987), mandates for the installation of window guards on New York City high-rise residential buildings (Speigel and Lindaman 1977), and the requirement of childproof caps on medicine bottles (Christophersen 1989).

As a direct result of this data, in February 1995, the first author, working with a nonprofit child advocacy organization in Sacramento, wrote and introduced Assembly Bill 1723 into the California State Legislature (sponsored by Assembly Member Diane Martinez, District 49). In its original form, AB 1723 *would have required* all licensed day care providers operating day care facilities and family day care homes in the state to undertake specific earthquake preparedness measures. Testimony was presented to the Assembly Human Services Committee in April of 1995, at which time, the bill under attack, was pulled in committee to await voting as a two-year bill in 1996. This outcome was the result of a number of factors including the recent, volatile political upheavals affecting leadership positions in the California legislature, as well as partisan negative reactions to increased governmental regulation and economic concerns. Indeed, as Berke and Beatley (1994) have recounted, this scenario is not uncommon when seismic regulations are being considered for adoption. For example, they described a case study of a Palo Alto seismic retrofit-of-older-buildings proposal that began as a mandatory regulation applying to six types of buildings that was eventually reduced to a voluntary requirement for three types of buildings as a result of pressure from real estate interests and building tenants. Consequently, earthquake mitigation policies are subject to rejection for technical and political reasons even in the face of a recent earthquake or an obvious need.

Similarly, in the face of conservative, partisan opposition, as well as resistance from the Department of Social Services (DSS) to being held

accountable for verifying earthquake preparedness at the child care site (workload and cost concerns), the much reduced AB 1723 now would mandate all directors of child care facilities and providers in family daycare homes to complete a DSS Earthquake Preparedness Checklist form (EPC) at the time of licensure or renewal. The EPC would be kept on file with DSS and made available to parents at the child care site and would indicate what, if any, earthquake preparedness measures the child care provider had implemented (check off items on the list include measures such as development of a coordinated plan, minimization of nonstructural earthquake hazards, storage of emergency supplies, the use of bimonthly duck and cover drills).

As of this writing, this reduced version of AB 1723 was passed successfully by both the State Assembly, as well as by the Senate's policy committee, with little or no opposition. Should the bill be approved by the full Senate, it could go the Governor's desk later this summer for possible approval. Thus, in effect, this diluted bill, if passed, would fulfill a primarily educational function for child care providers, as the bill requires neither the provider, nor DSS to evaluate, police, or be held accountable for the level of earthquake preparedness at the site. In the absence of a DSS mandate or penalties, it remains unclear if merely educating all child care providers throughout the state about an earthquake preparedness in the form of filling out a checklist will increase actual preparedness behaviors. Nonetheless, in light of some of the research on the efficacy of educational interventions on behavior (see Jeffery 1989), some increase in earthquake preparedness may result from passage of this bill.

Infants and young children in child care settings have escaped the trauma of a major earthquake in the most recent series of significant tremors in California (e.g., Loma Prieta and Northridge earthquakes) because the temblors have occurred during nonoperational or nonpeak hours. Unfortunately, the outcome for children in future earthquakes may not be so benign. In sum, based on our survey, interview, and observational data, and in light of previous research and theory on injury control and risk assessment, we recommend an approach that includes interventions aimed at both the individual and population level. Ideally, steps should be taken to adopt legislation *requiring* the establishment of earthquake response plans among licensed child care centers and/or daycare homes, similar to that currently in place in California for grades K–12. In addition, educational efforts should continue to increase the dissemination of educational materials designed specifically for use with infants and young children in the child care setting (Guerin and Junn 1991; Junn and Guerin 1992). Given the

current gap in state mandates protecting these youngest children, the large numbers of children potentially affected, and the fact that studies show that people look disproportionately to government to prepare them for and restore order following a major earthquake (Turner 1993), earthquake legislation in the area of child care settings seems both timely and compelling.

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