Posttraumatic Stress Among Children in Automobile Accidents

by

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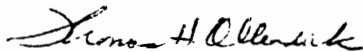Virginia Polytechnic Institute and State University

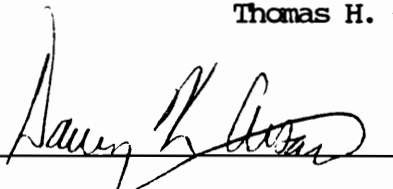in partial fulfillment of the requirements for the degree of
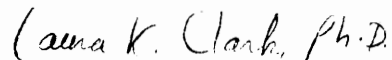
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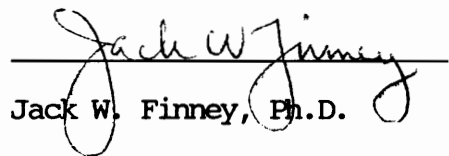
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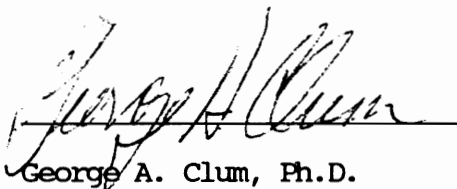
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Abstract

The posttraumatic symptoms of children (6-16 yrs) involved in automobile accidents were assessed an average of 9 months following the event. Measures included children's ratings of posttraumatic symptoms on the Reaction Index, the Impact of Events Scale, and the Diagnostic Interview for Children and Adolescents-Revised (DICA-R). Results indicated a range of posttraumatic symptomatology among accident victims. Despite low levels of physical injury, approximately one fourth of the sample children reported moderate to severe levels of trauma. As expected, higher injury levels were related to more PTSD symptoms on the diagnostic interview. When controlling for injury level, bicyclists and pedestrians reported higher levels of PTSD symptoms than motor vehicle occupants. Younger children reported higher levels and more frequent PTSD symptoms. As indicated on the diagnostic interview, prior history of an accident was related to <u>fewer</u> PTSD symptoms, suggesting a buffering effect of prior history. Also, children who reported higher levels of social support reported less frequent PTSD symptoms. Lastly, reciprocal processes of fear and avoidance were supported as greater self-reported fear was related to increased PTSD symptomatology. A discussion of the differences between self-report and interview measures of PTSD is included, as factors related to PTSD varied according to the measurement utilized. The importance of direct assessment of children's symptoms is stressed and areas of future research are suggested.

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It is to you that I dedicate this work.

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Introduction

By definition, Posttraumatic Stress Disorder (PTSD) results from a traumatic event that is "outside the range of usual human experience" (APA, 1987, p.247). This definition rules out the diagnosis for individuals suffering similar symptoms following more common events such as a chronic illness, business losses, or simple bereavement. The diagnosis has been applied to adults who are Vietnam combat veterans (Keane, 1989), survivors of natural disasters (Erikson, 1976; Gleser, Green, & Winget, 1981), survivors of rape (Burgess & Holmstrom, 1974; Kilpatrick, Veronen, & Best, 1984; Kilpatrick, Veronen, & Resick, 1982) and family members of homicide victims (Amick-McMullan, Kilpatrick, & Veronen, 1989; Rinear, 1984; Rynearson, 1984). From a nationwide general population survey, the prevalence of a history of PTSD is 1% in the total population, about 3.5% in civilians exposed to physical attack and Vietnam veterans who were not wounded, and 20% in veterans wounded in Vietnam (Helzer, Robins, & McEvoy, 1987).

In contrast to PTSD in adults, the diagnosis of PTSD in children is less well established. Nevertheless, there is growing recognition that traumatic events can have a severe and lasting impact on children (Lyons, 1987). One of the first systematic reports of "psychic trauma" in children involved 25 children in Chowchilla, California who were kidnapped at gunpoint from their school bus and held captive in a buried truck-trailer for 16 hours (Terr, 1979). The children, ranging in age from five to 14 years, were described as demonstrating psychological symptoms up to four

years after the trauma (Terr, 1983a). Some of the symptoms evident in these children included intense fears, persistent avoidance, recurrent nightmares, personality changes, decline in school performance, frequent re-enactments of the trauma in play, personality changes, and lowered expectations about the future (Terr, 1983a, 1983b, 1985a, 1985b). Terr's findings sparked the inclusion of age-specific features in the DSM-III-R description of PTSD. Although these data were drawn from unstructured interviews, subsequent research has attempted to define the phenomenon of PTSD in children through more systematic means such as structured interviews of children and their parents and standardized questionnaire data (McNally, 1991).

The most widely used structured interview for diagnosing PTSD in children is the Post-Traumatic Stress Disorder Reaction Index (Frederick, 1985a, 1985b, 1986). Using the RI, Pynoos et al. (1987) interviewed 159 children who were exposed to a fatal sniper attack on their elementary school playground. They found that 77% of children on the playground at the time of the attack had moderate to severe levels of PTSD. Structured diagnostic interviews have also been utilized in the assessment of childhood PTSD. Earls and colleagues (1988) administered a structured diagnostic interview, the Diagnostic Interview for Children and Adolescents (DICA; Welner, Reich, Herjanic, Jung, & Amado, 1987), to 100 children one year after being exposed to a flood in their community. While many children reported some PTSD symptoms, no children were found to meet the full diagnostic criteria (Earls,

Smith, Reich, & Jung, 1988).

Since Terr's early work, PTSD symptoms and in some cases, the full diagnostic criteria, have been reported in children exposed to a wide variety of traumatic events. Some recent examples include children exposed to sexual abuse (Finkelhor, 1986; Kiser et al., 1988; McLeer, Deblinger, Atkins, Foa, & Ralphe, 1988; Wolfe, Gentile, & Wolfe, 1989); natural disasters (Lonigan, Shannon, Finch, Daugherty, & Taylor, in press; McFarlane, 1987a); political unrest and war (Arroyo, & Eth, 1985; Saigh, 1989, 1991); transportation accidents (McCaffrey & Fairbank, 1985; Yule & Williams, 1990) and homicide (Malmquist, 1986; Pynoos et al., 1987; Pynoos & Nader, 1988b).

PTSD Symptoms and Related Features

According to the revised third edition of the Diagnostic and Statistical Manual (DSM-III-R; APA, 1987), the characteristic symptoms of PTSD disorder involve three clusters of symptoms (a) re-experiencing the traumatic event, (b) avoidance of stimuli associated with the event or numbing of general responsiveness, and (c) increased arousal. Re-experiencing symptoms include recurrent and intrusive thoughts, dreams, or flashbacks of the trauma. Re-experiencing may also include repetitive traumatic play or intense distress at reminders of the traumatic event. The re-experiencing symptoms are the hallmark of the disorder and distinguish it from other anxiety disorders. The characteristic symptoms of avoidance include: avoidance of thoughts and feelings associated with the trauma, avoidance of reminders of the event, an

inability to recall aspects of the trauma, decreased interest in significant activities (in children this may take the form of loss of previously acquired developmental skills), feeling detached or estranged from others, a restricted range of feelings, and a sense of a foreshortened future. The third class of symptoms, hyperarousal, is characterized by sleep difficulties, irritability, difficulty concentrating, hyper-vigilance, and physiologic reactivity to trauma-related stimuli. A diagnosis of PTSD requires the presence of at least one re-experiencing symptom, three avoidance symptoms, and two hyperarousal symptoms. In addition, these symptoms must persist at least one month following exposure to the traumatic event. If the onset of the symptoms is at least six months after the trauma, then delayed onset is specified (APA, 1987).

In addition to the three major categories of symptoms, research findings have documented other effects of trauma in children and adolescents. Groups of traumatized children have been found to have more trauma-related fears than normal non-traumatized children (Dollinger, O'Donnell, & Staley, 1984; Wolfe et al., 1989; Yule, Udwin, & Murdoch, 1990). Dollinger et al. (1984) also found increased levels of fear to other stimuli which were somewhat, but not directly related on a conceptual basis to the trauma. They studied the effects of a lightning strike on a soccer field. Children in the sample, aged 10-13 years, reported more fears of storms, sleep, animals, noise/disasters, supernatural, and death and dying than did matched controls. The authors discussed

these findings as resulting from classical conditioning of the fear
response. Other investigators have also identified increased fear
in traumatized children, particularly with respect to fears of
recurrence of the trauma (Pynoos & Nader, 1988a; Sullivan, Saylor,
& Foster, 1991). Reportedly, young children involved in a
hurricane show increased worry about light winds and drizzle
because they fear that these might be signs of an upcoming storm
(Saylor & Sullivan, 1991).

In addition to increased fears, traumatized children have been
found to demonstrate more behavioral disturbances than non-
traumatized children (Cohen & Mannarino, 1988; Friedrich, Urquiza,
& Beilke, 1986; Gomes-Schwartz, Horowitz, & Sauzier, 1985; McLeer
et al., 1988), but to evince fewer behavioral disturbances than
other clinic-referred children (Cohen & Mannarino, 1988; Gomes-
Schwartz et al., 1985). Moreover, they have not been found to
endorse more disturbance than normative samples on measures of
depression, (non-trauma related) anxiety, self-concept, or family
functioning (Cohen & Mannarino, 1988; Kiser et al., 1988; Wolfe et
al., 1989). Pynoos and Eth (1984), in interviews of children who
witnessed the homicide of a parent, reported a decline in
subsequent school performance. However, other researchers have not
found children to display changes in school functioning (Burke,
Borus, Burns, Millstein & Beasley, 1982; Terr, 1985a).

Some distinctions have been made between the posttraumatic
symptoms of children and adults. In contrast to adults,
psychological numbing is suspected to be less common in children

than in adults (Terr, 1991). Children have demonstrated the loss

of developmental skills in response to an overwhelming trauma.

Additionally, they have been reported to be less likely than adults

to experience flashbacks of the traumatic event (APA, 1987; Lyons,

1987). Terr (1983a) reported that children involved in the

Chowchilla kidnapping failed to indicate any flashback

experiences, and instead relived the traumatic event through

thematic play. This conflicts with the findings of Malmquist

(1986) who reported that 100% of a sample of children who witnessed

parental homicide reported flashback experiences. Research is

needed to clarify these differential findings.

<div align="center">Factors Affecting Symptom Expression</div>

The Traumatic Event

PTSD is categorized as an anxiety disorder and, according to

Barlow (1988), is the only psychological disorder that has a

clearly identifiable etiology. The nature of the traumatic

stressors vary tremendously. Some traumatic events are one-time

occurrences, referred to as acute or Type I traumas. Other

stressors are repeated, long-standing or chronic, referred to as

Type II traumas (Famularo, Kinscherff, & Fenton, 1990; Terr, 1991).

Terr (1991) suggests that children exposed to Type I traumas

evidence the typical PTSD symptoms of repetition, avoidance, and

hyper-alertness and are more likely to have intact recollections of

the traumatic events without amnesia. Children exposed to Type II

traumas, on the other hand, are more likely to demonstrate long-

standing characterological problems, increased detachment from

others, sadness, restricted range of affect, and dissociation.
Memories of Type II traumas are also less likely to be vivid, as
children are more likely to blur memories of events that occur
repeatedly over time.

Previous Traumatic Experiences

Prior experiences of traumatic or stressful events are likely
to have an impact on a child's adjustment. Rutter (1979)
suggested that the sheer number of stressors impinging on children,
their families, or their communities would increase the subjective
experience of distress in geometric rather than arithmetic
proportions. On the other hand, the experience of surviving or
mastering a potentially traumatic event, could have ameliorative
effects on future stressful events. A positive experience may tend
to inoculate against the negative effects of trauma.

Developmental Differences

Some research on PTSD in children indicates that children's
responses to trauma vary with age. For example, some findings
suggest that preschool children tend to show more internalizing
behaviors, such as separation anxiety and developmental regression
(Ayalon, 1982; Eth & Pynoos, 1985a), as well as more somatization
behavior (Gomes-Schwartz et al., 1985), than do older, school-age
children. Adolescents, on the other hand, have been noted to
exhibit both internalizing and externalizing behavioral problems
(Lyons, 1987). However, in most cases, symptomatic adolescents are
reported to be most likely to show aggressive behavior, substance
abuse, and acting-out behaviors (e.g., sexual acting-out in

sexually abused children) following traumatic events (Eth & Pynoos, 1985a, 1985b; Browne & Finkelhor, 1986; Gomes-Schwartz et al., 1985; Lopez, Boccellari, & Hall, 1988).

Predicting PTSD

Not all children exposed to "traumatic" events are traumatized. Some children exposed to traumatic events appear to be unaffected by such events and do not develop adverse symptoms. Other children and adolescents develop some post-traumatic symptoms. Still others exhibit all of the requisite symptoms, but demonstrate them only in the acute phase, with a diminution of symptoms over the course of several days or weeks following the traumatic event.

Understanding and predicting the course of PTSD is one of the most difficult tasks facing researchers. Some of the major problems need to be noted. First, the influences on an individual's response to trauma incorporate historical, intrapersonal, situational, interpersonal, and sociocultural factors. Each of these factors are interrelated and transactionally influenced. Thus, it is difficult at best to decipher the relative contributions of each factor individually. Additionally, "pre"-trauma variables are assessed "post" trauma, or after the event, therefore introducing situational biases on historical data. Finally, the prediction of PTSD requires events which are multifaceted and, by definition dependent on the subjective interpretation of exposed individuals, to be quantified. Even if two people experience similar traumas, trauma-related

variables are likely to be very different for each person involved. In short, no two people experience the "same" event in the same way.

Despite these methodological challenges, there has been some progress in predicting the PTSD response, both in adults and to some extent in children. The work can be conceptualized into three distinct categories: pre-trauma variables, trauma-specific variables and post-trauma variables.

Pre-trauma factors

There is some evidence that premorbid factors affect PTSD development in adults. One study suggests that familial psychopathology may be related to PTSD development. Davidson and colleagues (1985) found that 66% of a group of veterans with chronic PTSD revealed family histories of psychopathology including alcoholism, depression and anxiety disorders. A positive family history of an anxiety disorder was significantly more common in patients with PTSD than in age-matched veterans with depression (Davidson, Swartz, Storck, Krishnan, & Hammett, 1985). A similar study with veterans found that rates of familial psychopathology were higher among those with PTSD than among those without PTSD (Foy, Resnick, Sipprelle, & Carroll, 1987). Additionally, when the groups were analyzed by the amount of combat exposure, the probability of a PTSD diagnosis in the low-exposure group was considerably higher when family psychopathology was present (Foy et al., 1987). In addition to these family history links, other pre-trauma characteristics have been found to relate to the development

of PTSD in adults. In a study of crime-related PTSD, for example, Kilpatrick and his colleagues found that PTSD was negatively associated with current age of the victim and years since the most recent crime. These two variables accounted for 7.6% of the total variance in crime-related posttraumatic stress disorder as measured by diagnostic interviews (Kilpatrick et al., 1989).

Although fewer investigations have been conducted on children, several pre-trauma variables in childhood PTSD have been identified. The relationship between the age of children and their symptoms is one pre-trauma factor which has gained attention. In some cases, younger children (generally defined as ten years or younger) are reported to be more likely to develop trauma-related symptoms. Pynoos and Nader (1988b), for example, examined the traumatic responses of 10 children, ranging in age from 5 to 17, who witnessed the sexual assaults of their mothers. Children's Reaction Index scores (that increase with severity of the response) were reported to be negatively correlated with age ($r = -.51$), indicating that as age increased, PTSD symptoms decreased.

In contrast, another investigation found a positive correlation between age and PTSD symptoms. Green et al. (1991) found that children aged 2 to 7 showed significantly fewer PTSD symptoms than children 8 to 11 and 12 to 15 in a review of the psychiatric reports of children involved in the slag dam collapse at Buffalo Creek, West Virginia. They hypothesized that the traumatic experience may not have been understood in a coherent, conceptual way by the young children. Therefore a more

generalized, disorganized posttraumatic state may have resulted (Green et al., 1991).

Also, the child's belief system has been found to have an impact on post-traumatic adjustment. Wolfe et al. (1989) studied 71 sexually abused children ranging in age from 5 to 16 years (mean age = 9.9). The authors found greater impairment in children who demonstrated a self-deprecatory attributional style, as measured by the Attributional Style Questionnaire for Children (Kaslow, Tannenbaum, & Seligman, 1978), as well as a belief that one is predisposed to negative life events and that similar things might happen again.

Characteristics of the Trauma

In addition to pre-trauma variables, characteristics of the trauma itself are consistently found to be predictive of PTSD. Kilpatrick et al. (1989) found that three crime characteristics: sustaining a physical injury during a crime, perceiving threat of serious harm or death during a crime, and being the victim of a completed rape, predicted 21% of the variance in symptoms. Similarly, for Vietnam veterans, participation in atrocities and cumulative exposure to combat stressors have been reported to predict PTSD (Breslau & Davis, 1987).

In children, trauma-related variables such as life threat and loss have been found to be associated with PTSD. Green et al. (1991) found trauma factors to be the primary predictors of PTSD symptoms in children involved in the Buffalo Creek disaster. Loss of life and the threat of loss of life predicted 22% of PTSD

symptoms. In another study, trauma factors were most predictive of elementary school children's responses following a fatal sniper attack resulting in the death of one student. Pynoos and colleagues (1987) assessed 159 children approximately one month after the attack. They found that as children's proximity or exposure to the event increased, so did the number of PTSD symptoms. The typical reaction for the children on the playground where the shooting occurred (and where the victim died) was severe PTSD as measured by the Reaction Index scale. Severe or moderate PTSD was experienced by 77% of the playground group and 67% of those in the school building, whereas mild or no PTSD was experienced by 74% of those children no longer at school and 83% of those on vacation. Also, within each exposure level, children who knew the victim well had significantly more severe symptoms (Pynoos et al., 1987).

Post-trauma Factors

Post-trauma factors, such as parental adjustment or social support, also appear to play an important part in predicting adjustment. In a longitudinal study of schoolchildren exposed to an Australian brushfire, McFarlane (1987b) found that mothers' responses to the disaster were better predictors of the presence of PTSD in the children than the children's direct exposure to the disaster. Both the experience of intrusive memories by the mothers and a changed pattern of parenting (e.g., overprotectiveness) seemed to account for this relationship. Additionally, separation from parents in the days immediately after the fire, continuing

maternal preoccupation with the disaster, and changed family functioning were more powerful determinants of posttraumatic phenomena in the children than were exposure to the disaster or the losses sustained. McFarlane suggested that children's ability to maintain a barrier against psychic trauma was critically dependent on their parents' response to the event. As young children are less familiar with the world around them, they rely on adult appraisals of threat and danger. It follows, then, that if parents communicate emotional distress to children, the children may be more likely to respond in kind (Milgram, 1989).

Other researchers have also suggested that the ability of significant adults to deal with the traumatic event may be the strongest outcome predictor for traumatized children (Benedek, 1985; Burke et al., 1982). Oftentimes adults are reluctant to discuss the trauma and are opposed to re-exposing the child to traumatic cues (despite the evidence for therapeutic benefits) (Eth, Silverstein, & Pynoos, 1985; Terr, 1983a). Such avoidance by the adults may reinforce the child's fear that the event is not masterable and deprive him/her of much-needed social support (Lyons, 1987).

In some cases, social support may act to buffer the development or course of PTSD. Existing evidence suggests that the broader and deeper the network of social support, the greater the chance of ameliorating the negative effects of stressful life events (Cohen & Wills, 1985; Fleming, Baum, Gisriel, & Gatchel, 1982). Investigations of the effects of witnessing acts of

violence or losing a family member to homicide have drawn attention
to the fact that in some cases the trauma-victim's plight only
begins with his or her involvement in the trauma (Janoff-Bulman &
Frieze, 1983). Following the homicide of a loved one, for example,
family members often confront external demands such as court
proceedings, police investigations, and the notification of other
family members and friends. Additionally, the process of
"secondary victimization" is often set into motion after a
traumatic event. Secondary victimization is the complex process in
which social stigma adheres to the survivor (Ayalon, 1983). Social
stigma is attached to many victims in our society, including those
affected by homicide, rape, and incest. Therefore, the post-trauma
environment is important to consider in predicting the adjustment
of children and adults following trauma. Although the effects of
social support may work to ameliorate or buffer PTSD symptoms, some
environments may continue or worsen the effects of the initial
trauma.

In summary, historical factors, trauma-related variables, and
the post-trauma environment have been found to be related to the
responses of adults and children to a variety of traumatic
experiences. In general, it can be stated that the more extreme or
severe the trauma, the more likely the development of PTSD. The
degree of exposure to trauma is not entirely predictive of
posttraumatic response, however, suggesting the influence of other
variables. Factors that have been found to be important include a
predisposition to anxiety disorders (family history), age, time

since the event, and a supportive post-trauma atmosphere to ameliorate negative effects and promote effective coping.

<div align="center">Automobile Accidents as Stressors</div>

In the present study, pre-trauma, trauma, and post-trauma variables were examined in children involved in a motor vehicle accident. Automobile accidents are a major killer and crippler in this country. The Center for Disease Control's Division of Injury Control (1990) reported that among children 0 to 19 years, injuries to motor vehicle occupants were the leading cause of death in the U.S., accounting for approximately half of all deaths due to injury. Pedestrian injuries ranked fifth among causes of injury deaths in children (Division of Injury Control, 1990). At a state level, 2,125 children 5 to 9 years of age and 2,510 children 10 to 14 years of age were reported injured in Virginia automobile crashes in 1990 (Virginia Department of Motor Vehicles, 1990).

Like crime victims, accident victims often suffer acute physical and emotional distress (Goldberg & Gara, 1990; Raymond, 1988), however very little attention has been given to these victims in the past (Dlugokinski, 1985). In one of the few studies of motor vehicle accident sequelae in adults, Goldberg and Gara (1990) reviewed the presentation and background circumstances of 55 adults who presented with lingering psychiatric post-accident distress. In a factor analysis, the authors reported four distinct groups of clinical symptoms, including a cluster of depressive symptoms and a cluster of PTSD symptoms. In a related study, bereaved spouses and parents of individuals killed in automobile

accidents were assessed between four and seven years after the accident (Lehman, Wortman, & Williams, 1987). Bereaved spouses were found to have poorer functioning than their controls in areas of general psychological well-being, depression, social functioning, reactivity to good events, and future worries, even when controlling for variables of family income and marital status. Additionally, a large percentage of respondents (from 30 to 85%) reported that they continued to ruminate about the accident or what might have been done to prevent it, and were unable to accept, resolve or find meaning in the loss.

In a treatment study, McCaffrey and Fairbank (1985) presented two case studies of adults who developed PTSD following transportation accidents. One of the cases was a 28-year-old female who had been involved in a series of four automobile accidents within a 14-month period. She presented with complaints of anxiety while driving (especially on interstate highways and on roads with frequent stop signs and/or traffic lights), riding with others, or thinking about driving. She also reported avoidance of driving whenever possible, intrusive and distressing thoughts of the accidents, guilt regarding her responsibility for the accidents, and sleep disturbances (i.e., nightmares of automobile accidents and insomnia). The authors reported that both subjects experienced a clinically significant posttreatment reduction in symptoms following sessions of relaxation training, implosive therapy, and self-directed in-vivo exposure.

Despite the prevalence of automobile accidents involving

children, and the known potential for resulting psychological sequelae from such trauma in adults, there has been no investigation of this topic with children. Therefore, the following study was undertaken. The primary purpose was to examine the psychological effects of automobile accidents in children of varying ages, with a particular focus on posttraumatic phenomena. It was hypothesized that children's responses to motor vehicle accidents would range from minimal to severe on measures of posttraumatic symptomatology, and that symptoms associated with PTSD, such as increased levels of trauma-related fear and anxiety would result for many children. A similar pattern was expected for parents of these children. That is, some parents were anticipated to report significant posttraumatic stress and fear, as well as increased accident-related anxiety as a result of the accident, while others would indicate minimal psychological effects.

The second purpose of the study was to investigate factors that predict symptoms of PTSD. It was hypothesized that trauma-related variables (e.g., the nature and severity of the accident) would be most predictive of increased symptomatology, but that post-trauma variables (such as social support, parental adjustment and parenting style) and pre-trauma variables (e.g., age and other stressful life events) would also contribute significantly to the prediction of children's responses.

In contrast to a comparison group, the target group was hypothesized to evince more posttraumatic symptomatology, generalized fear, and automobile accident-specific fear. No

differences in other measures of child emotional health or parental mental health (i.e., depression, trait anxiety) were anticipated. Due to the disparate findings of the effects of trauma on children's school performance, these data were collected in an exploratory manner. No specific hypotheses regarding school performance were generated.

Lastly, children were assessed at varying ages so that the relationship between age and symptom expression could be examined. It was hypothesized that younger children would be more symptomatic than older children.

Method

Subjects

Fifty children between 6 and 16 years of age (M = 11.6, SD = 3.2) who were injured in automobile accidents served as target subjects in this study. Interviews were conducted between 2 and 18 months after the accident, with an average lag time of 9 months (M= 9.5, SD = 4.5). A parent of each child, in most cases the mother (n = 44, 88%), also was interviewed. Twenty-nine of the children in the sample were boys (58%) and twenty-one were girls (42%). A majority of target subjects were white (n = 40, 80%), and in the middle income socioeconomic range on the Hollingshead four factor index (M = 44.0, SD = 14.0, Hollingshead, 1975).

A group of 25 children, along with one of their parents comprised a comparison group. Children in the comparison group did not differ from children in the accident group on the basis of age at the time of the interview, sex, race, or socioeconomic status (See Table 1).

Insert Table 1 About Here

Procedure

Police procedure requires that the names of persons injured in automobile accidents be recorded on accident reports. Due to the Freedom of Information Act (1968, c.479) of the Virginia Code, these accident records are part of public domain. Therefore, the names of all injured children in three southwestern Virginia

cities (Blacksburg, Christiansburg, and Roanoke) comprised the potential target population for this study.

The names of all injured children in these municipalities were obtained periodically over the course of two years (1989-1991). Addresses of the children were not indicated on the police reports unless the child was operating the vehicle. Therefore, names and addresses of vehicle operators in conjunction with the names of the injured children were used to locate subjects in local telephone directories.

From a total of 275 potential study participants, 105 families were able to be contacted by telephone. Phone contact was attempted in order to obtain permission to send an information letter about the project and to secure a correct mailing address. The letter detailed the requirements and purposes of the project (see Appendix A-1). About a week later, another phone call was made to solicit participation. Fifty-nine of the 105 (56%) families agreed to participate in the study; however, only 47 of 59 families actually did so.

For the 170 families for whom a telephone number was unavailable, a different letter was mailed in which the study requirements and purposes were explained (see Appendix A-2). Additionally, a stamped, pre-addressed postcard was attached on which parents were asked to indicate their desire for more information, their willingness to participate, or their unwillingness to participate in the project. The three families obtained using this method, together with the 47 families contacted

by telephone, comprised the target sample of 50 families.

In order to address potential selection biases, the child's degree of injury recorded by police officers at the scene (see below for further explanation) was examined in the 170 families who were unable to be reached by telephone and the 105 families who were able to be contacted by phone. No differences in injury severity were found between these two groups. Similarly, police injury ratings of children who participated in the study (n = 50) were no different from those who could be reached by telephone, but whose parents declined participation (n = 55). Thus, the severity of accidents sustained by children in this sample appears to be representative of the population from which they were drawn.

Families in the comparison group were obtained using various recruitment procedures. First a peer nomination strategy was implemented in which target families nominated another family in which there was a child within one year of the target child's age. Potential comparison children were excluded, however, if they had ever been involved in an automobile accident. The peer nomination strategy assumes that nominated families would be similar to target families on many demographic dimensions such as race, age, and socioeconomic status. Unfortunately, the use of this strategy was less successful than originally anticipated, as many of the target families failed to generate a nominee. Also, if they were able to nominate a family, many of the nominated children had to be excluded because of previous involvement in an automobile accident. Due to these complications, only 4 comparison families

were generated using the peer-nomination strategy. The remaining 21 families were solicited from other sources including scout troops, swim teams, and adult education classrooms.

Target and comparison families were encouraged to participate in the study in order to increase scientific knowledge about children's responses to stressful events. As an incentive, parents were given individual feedback on their child's responses to the various assessments, and in some cases, advice about how to handle accident-related sequelae. Referrals for psychological treatment were made when necessary or when requested by individual families.

Participating target families met locally (either in Blacksburg or Roanoke) with study investigators for approximately three hours. The procedures for the study were explained to the parents and children and informed consent was obtained (see Appendix A-3). Then, parents and children were interviewed separately, completing the three sections of the protocol: a structured accident interview (45 minutes), a diagnostic interview (1 hour) and various self-report measures (1 hour). Breaks in the protocol were scheduled to avoid fatigue.

A similar procedure was used with the comparison families (see Appendix A-4 for consent forms for comparison subjects). Since they did not complete the structured interview about the accident, however, the time necessary for them to complete the assessments was approximately 2 hours.

<div align="center">

Measures

</div>

Child Reports

Accident-Specific Information. Target children completed a
Structured Accident Interview in which they responded to open-ended
probes about the accident (e.g., "Tell me about the accident,"
"What happened next?", "Then what did you do?") and to various
questions about specific details of the accident (see Appendix B-
1). Information obtained from the interview included: whether the
child or other family member had ever been in a serious automobile
or bike accident before; the extent to which the child felt
responsible for the accident (Self-blame); how often the child
discussed the accident or accident-related events with his or her
parents (Talking); and whether the child noticed any behavioral
changes in himself or herself as a result of the accident. Using a
5-point Likert scale from very helpful or positive (1) to very
hurtful or negative (5), target children also rated the responses
of various persons following the accident (e.g., police, hospital
attendants, peers) in order to obtain their perceived degree of
social support in the hours during and after the accident (Social
Support (c)). To assess perceived changes in parenting style,
children were asked two questions similar to those used by
McFarlane (1987b) in his study on children in an Australian
brushfire. These questions were, "Do you think that your parents
worry more about you now than they did before the accident?", and
"Do you think your parents need to know where you are more than
they did before the accident?" (Parenting Style). Finally, in

order to assess the degree of perceived vulnerability, children rated the likelihood that something like the accident would happen to them or to a member of their family at some point in the future (not at all likely (1) to very, very likely (5)) (CLikely).

Diagnostic Data. Diagnostic information about the children was obtained from the child or adolescent revised version of the **Diagnostic Interview for Children and Adolescents** (DICA-R; Reich & Herjanic, 1989). The DICA-R is a structured interview for schoolaged children and adolescents, patterned after the National Institute of Mental Health Diagnostic Interview Schedule (DIS) and based on DSM-III-R criteria. The DICA-R includes two separate interviews: DICA-R-C, a child interview, and the DICA-R-P, a parent interview. In the child version, children respond to questions which relate to 18 of the diagnostic categories in the DSM-III-R. Questions elicit information necessary to fulfill symptoms required for a diagnosis of a present or past disorder, and in some cases, to determine symptom severity. Thirteen of the 18 diagnostic categories were assessed in the present study: attention deficit/ hyperactivity disorder; oppositional/ defiant disorder; conduct disorder; substance abuse; major affective disorder; dysthymic disorder; bipolar disorder; separation anxiety disorder; avoidant disorder; overanxious disorder; simple phobia; obsessive-compulsive disorder; and posttraumatic stress disorder. The inter-rater agreement for the major diagnostic categories was acceptable, with a Kappa coefficient (Cohen, 1960) of .78. Twenty percent of the total number of interviews were scored by a second rater in order

to obtain this reliability coefficient. Portions of the DICA-R have been used in two other studies of children's reactions to disaster (e.g., Earls et al. 1988; Stoddard, Norman, & Murphy, 1989).

Posttraumatic Symptomatology. In addition to measuring PTSD symptoms on the diagnostic interview, two self-report measures of PTSD symptoms were also administered. First, target children completed a self-report version of the Reaction Index (RI; Frederick, 1985b; see Appendix B-2). The RI lists 20 statements which refer to a particular stressful life event (for target subjects, the automobile accident). Children indicated how much of the time a statement about the event was true for them, with choice points ranging from none of the time (0) to most of the time (4). Examples of items include: "I feel afraid or upset with thoughts about the accident" and "I go over in my mind what happened, keep seeing the pictures or hearing the sounds". Slightly different forms of the RI have been used to assess symptoms after exposure to a broad range of traumatic events including a sniper attack on a schoolyard in Los Angeles (Pynoos et al., 1987) and child sexual molestation (Frederick, 1986). Frederick (1985b) reported correlations between RI scores (defined by the total number of symptoms endorsed) and confirmed cases of PTSD of .95 with adults and .91 with children. Pynoos and Nader (1988b), using an observer-rater RI (which included the frequency rating scale described above) reported the following guidelines for interpretation of scores: scores of 12 to 24 indicate a mild level

of PTSD; 25 to 39 a moderate level; 40 to 59, severe; and >60, very severe. The self-report version of the RI has been used with children who experienced a natural disaster (Lonigan et al., in press). An alpha coefficient of .83 was reported for that sample. The Reaction Index showed good internal consistency with participants in this study (alpha = .85).

A second measure of PTSD symptomatology, initially developed for adults, was also used with target children in this study. The Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979; see Appendix B-3), a 15-item self-report instrument, was used to measure two components of PTSD: event-related intrusion (e.g., intrusively experienced ideas, images, feelings, or dreams; 7 items) and event-related avoidance (consciously recognized avoidance of certain ideas, feelings, or situations; 8 items). Target children indicated the frequency with which they had experienced each item during the preceding week. Total scores as well as intrusion and avoidance scores were obtained by adding the value of item responses (not at all (0), rarely (1), sometimes (3), and often (5)). The IES intrusion items (alpha = .85), avoidance items (alpha = . 83) and total score (alpha = .89) showed good internal consistency with study children. The IES has been used in two other studies of traumatized children (Malmquist, 1986; Yule & Williams, 1990), however reliability coefficients were not reported.

Other Self-Report Measures for Children. The State-Trait
Anxiety Inventory for Children (Speilberger, 1973) was utilized to
examine anxiety in target children. The STAIC is comprised of two
separate, 20-item scales: a trait anxiety and a state anxiety
scale. On both scales, children respond by selecting one of three
choices for each item. Each choice receives a value of 1, 2, or 3,
with total scores ranging from 20 to 60. On the Trait scale,
children respond to items by indicating the frequency of occurrence
of the behavior described by that item. For example, for Item 6,
children respond to the item "I worry too much" by circling hardly
ever (1), sometimes (2), or often (3). On the State Anxiety scale,
children are asked how they feel at a particular moment in time.
For the purpose of assessing children's subjective anxiety to the
accident, target children were asked to complete the scale based on
how they felt when they think about the accident. The stem for the
State anxiety scale is "I feel". Thus, target children would
respond to "When I think about the accident, I feel..." to each
item (e.g., very calm (1), calm (2), not calm (3); and very upset
(3) upset (2) not upset (1)).

The STAIC has been reported to have reasonably good internal
consistency with a coefficient alpha of .82 for males and .87 for
females on the State anxiety scale, and .78 for males and .81 for
females on the Trait anxiety scale. The internal consistency for
this sample was somewhat higher for the event-specific state scale
(alpha = .95) but similar to the earlier samples for the Trait
anxiety scale (alpha = .80). As recommended by Speilberger (1988),

the scales were read to children who were younger than eight years
of age.

Children also completed the **Fear Survey Schedule for Children-
Revised** (FSSC-R; Ollendick, 1983), an 80-item list of potentially
fear-producing items (such as riding in a car, snakes, giving an
oral report) to which children are asked to report their level of
fear ranging from none (1) to a lot (3). Test-retest reliability
has been found to range from .81 to .89 for a one week interval and
from .58 to .62 for a 3-month interval. The internal consistency
has been found to range from .92 to .95 (Ollendick, 1983). The
coefficient alpha was also found to be high in the present study
(alpha = .96). The FSSC-R has been found to be positively related
to trait anxiety (r=.46) and inversely related to self-concept (r =
-.69) and internal locus of control (r = -.60) in normal children
(Ollendick, 1988).

Although some items on the FSSC-R are related to automobile
accidents (e.g., riding in the car or bus, having to go to the
hospital, death or dead people, fire or getting burned, being hit
by a car or truck, the sight of blood, and loud sirens), 9
additional items were added to further assess accident-specific
fears (**Accident-related fears for children**; see Appendix B-4).
These additional items include: seeing or hearing automobiles,
thinking about riding in a car, seeing a car in a magazine or on
t.v., thinking about my parents riding in a car, thinking about
going someplace, leaving mom or dad, police/ ambulances, being
trapped in a car, motorcycles/ bicycles. Using the same metric as

the FSSC-R, children's accident-related fear scores ranged from 9 to 27 on this accident-related fear scale. The coefficient alpha for children's Accident-related fears was .67.

Children also completed the **Children's Depression Inventory** (CDI; Kovacs, 1985). This scale consists of 27 items that describe a variety of depressive symptoms (including sad mood, hopelessness, suicidal ideation, sleep disturbance, appetite loss, and poor school performance). Each item consists of three sentences that range from normal to clinically significant symptoms (scored 0 to 2), and children choose the sentence that best describes them for the past two weeks. Total CDI scores range from 0 to 54. An average score of 9 ($\underline{SD}$ = 7) has been reported for a nonpsychiatric population, and a suggested clinical cutoff score of 19 has been recommended (Smucker, Craighead, Craighead, & Green, 1986). Previously reported test-retest reliability data vary, however, most recent data indicate 2-week test-retest reliability of .82, 4-week of .66, and 6-week of .67 in a sample of 108 normal children (Saylor, Spirito, & Finch, 1984). An alpha coefficient of .76 was obtained for children in the present sample.

Children completed the **Hopelessness Scale for Children** (Kazdin, French, Unis, Esveldt-Dawson, & Sherick, 1983). This instrument was developed from an adult measure of hopelessness, and has been shown to be associated with depression and suicidal intent in children. The scale consists of 17 items to which children indicated that the item was true or false. Scores ranged from 0 to 17, with higher scores indicating hopelessness or

negative expectations for the future. Despite the moderately high internal consistency reported previously (.75) (Kazdin et al., 1983), the alpha coefficient for this sample was prohibitively low (.40). Thus, this scale was excluded from further analyses.

Children's coping was assessed using the **Schoolagers Coping Inventory** (COPING; Ryan, 1989). This instrument assesses the frequency and effectiveness of various coping strategies which were reported by a group of 8 to 12 year-old children to be useful in times of stress. On the frequency scale, children indicate how often they use each of 26 coping behaviors by endorsing one of three choice points ranging from never (0) to most of the time (3). Children then indicated on the effectiveness scale, if they engaged in a particular activity, how well the coping activity worked for them in terms of reducing their perceived stress. Choices ranged from never do it (0) or does not help (1) to helps a lot (3). The list of coping behaviors on both the frequency and effectiveness scales are identical and range in scope from avoidant activities (e.g., run or walk away, try to forget about it), to emotive behaviors (e.g., cry, get mad) to aggressive behaviors (e.g., fight with someone). Internal consistency of this coping measure was high for the present study, with a coefficient alpha of .94.

To assess attributional style, children completed the **Children's Attributional Style Questionnaire** (KASTAN-R CASQ; Kaslow, Tannenbaum, & Seligman, 1978). The KASTAN-R CASQ assesses the typical ways in which children attribute causality for good and bad events. On each of the 48 items, a situation (e.g., "You get

good grades") is presented along with two possible attributions to
explain why the situation occurred (e.g., "I am a hard worker" vs.
"School work is simple"). Children were instructed to choose the
response that best described why the event happened to them.
Sixteen questions pertain to each attributional dimension
(internality, stability, globality) with half of the situations
representing "good" outcomes and half representing "bad" outcomes.
The lower the difference score between the good events and the bad
events, the more depressiogenic the attributional style.
Unfortunately, the internal consistency of attributions for
positive (.57) and negative (.29) events for this sample was
unacceptably low. Therefore, this measure was also excluded from
further analyses.

Parent Reports

Accident-Specific Information. Parents of target children
responded to a parent version of the **Structured Accident Interview**
which assessed details about parents experiences during the time
prior to, during, and after the automobile accident (see Appendix
B-5). Parents were asked some of the same questions that were
posed to their children, as well as additional accident-related
facts which their children may not have reported accurately (e.g.,
how long the parent and child were separated following the accident
(**P & C Separated**), was the driver of the child's car exceeding the
speed limit, etc.). Information obtained from the parent interview
included: whether the child or other family member had ever been in
an automobile accident before (**Accident History**); whether the

courts were involved in the case; the extent to which the parent felt responsible for the accident (**Self-blame**); how others at the scene and in the hours following the accident responded to (were supportive of) the parent (**Social Support (p)**); and whether the accident affected the parent's marital relationship, the family's financial situation, or the parent's employment. Target parents were also asked their perceptions of how their child responded to the crash (e.g., did the child exhibit behavioral changes following the accident), the frequency with which they discussed the accident with their children (**Talking**), and their perception of the likelihood that another motor vehicle accident would happen to a member of their family at some point in the future (**PLikely**). Finally, like in the children's interview, the parent interview also contained the questions: "Since the accident, do you worry more about the possibility of harm coming to your children" and "Since the accident, do you need to know where your children are more than before" (McFarlane, 1987b) (**Parenting style**).

Diagnostic Data. DSM-III-R diagnostic information about the children was obtained from the revised parent version of the **Diagnostic Interview for Children and Adolescents** (DICA-R; Reich & Herjanic, 1989). As in the child interview, the parent responded to questions relating to the presence or absence of symptoms from thirteen DSM-III-R diagnostic categories: attention deficit/ hyperactivity disorder; oppositional/ defiant disorder; conduct disorder; substance abuse; major affective disorder; dysthymic disorder; bipolar disorder; separation anxiety disorder; avoidant

disorder; overanxious disorder; simple phobia; obsessive-
compulsive disorder; and post-traumatic stress disorder. Inter-
rater reliability for the major diagnostic categories was high,
with a Kappa coefficient of 1.0.

     Posttraumatic Symptomatology. Posttraumatic symptomatology in
the parents themselves of the target and comparison groups were
assessed using the PTSD section of the **Anxiety Disorders Interview
Schedule-Revised** (ADIS-R; DiNardo, Barlow, Cerny, Vermilyea,
Himadi, & Waddell, 1985). The ADIS-R is a structured interview
that provides detailed symptom ratings for DSM-III-R diagnostic
criteria. Studies indicate good reliability for diagnoses of
anxiety disorders in various groups of subjects (Klosko, DiNardo, &
Barlow, 1988; Silverman & Nelles, 1989).

     PTSD symptoms were also assessed with the **Impact of Events
Scale** (IES; Horowitz, Wilner, & Alvarez, 1979). As mentioned
previously, the IES measures the degree of subjective stress
experienced as a result of a specific event. Target parents rated
their reactions to their child's automobile accident by indicating
the frequency with which they had experienced each item during the
previous week. Items related to two of the three PTSD criteria,
intrusion and avoidance, and received scores ranging from 0 (not at
all) to 3 (often). In some cases, the parent experienced the
automobile accident directly, whereas other parents based their
ratings on their reactions to their child's accident. Horowitz et
al. (1979) reported high split-half reliability (r = .86) and
internal consistency (alpha: intrusion = .78 and avoidance = .80)

for the scale. In this sample, the coefficient alpha for the
intrusion (.85) and avoidance (.83) were somewhat higher.

Other Self-Report Measures for Parents. The State-Trait
Anxiety Inventory (Speilberger, Gorsuch, & Lushene, 1970), from
which the STAI-C was derived, was used to assess anxiety in the
parents of target and comparison subjects. On the transitory, or
state anxiety scale, target parents rated their level of anxiety as
they thought about the car accident. On the trait anxiety scale,
parents rated how they generally feel, or their relatively stable
level of anxiety. Both State and Trait scales contain 20 items,
with scores ranging from 1 to 4 for each item. The stability of
the trait scale as measured by test-retest correlation coefficients
ranges from .73 to .86 for one hour to 104 days. The test-retest
stability for the state scale, on the other hand, is low which is
considered to be appropriate for a measure designed to be sensitive
to fluctuations in anxiety resulting from situational stress.
Previous studies of the factor structures of the items of the
scales indicate that state and trait items consistently load on
distinctive factors. The internal consistency of the State (.94)
and Trait (.93) scales were high for participants in this study.

The Fear Survey Schedule III (Wolpe & Lang, 1964), a 76-item
questionnaire, was used to measure the type and intensity of
irrational fears in the adults. Parents were asked to endorse each
item using a 5-point Likert scale, indicating the degree to which
the object or situation causes fear or discomfort. FSS items have
been grouped, using face-valid criteria, into the following

stimulus categories: a) animal b) social and interpersonal c) tissue damage d) noises e) other classic phobias, and f) miscellaneous. Internal consistency for the total fear score in this sample was high (alpha = .97).

As in the children's fear survey, nine items relating specifically to automobile crashes were added to the adult FSS (Accident-related Fears for Parents; see Appendix B-6). These items were: seeing or hearing automobiles, thinking about riding in a car, seeing automobile ads, thinking about my children riding in a car, thinking about going someplace, traveling, police/ ambulances, motorcycles/ bicycles, and being trapped in a car. A coefficient alpha of .88 suggested high internal consistency the Accident-fears for parents.

Depressive symptomatology in parents was measured by the **Beck Depression Inventory** (Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961). The BDI is a 21-item measure that presents four alternative statements relating to manifestations of depression in adults. Responses range from not present or mild to moderate or severe degrees of symptom expression (scored as 0, 1, 2, or 3). Similar to previous reports of high internal consistency (alpha = .87), the BDI was also internally consistent for the present sample participants (alpha = .82).

The **Mental Health Inventory** (MHI; Veit & Ware, 1983) was administered to the parents. The MHI is a 38-item measure of psychological distress and well-being which was developed for use in general populations. The measure yields scores on five factors

(anxiety, depression, emotional ties, general positive affect and loss of behavioral/emotional control) which are added together to comprise two higher order factor scores of psychological distress and well-being. The difference of psychological distress and well-being comprise the total MHI score. The instrument has shown high internal consistency (ranging from .83 to .96) and stability over a 1 year period. The alpha coefficient for the present sample ranged from .81 to .92 on the five individual factors, .94 for the distress factor, .93 for the wellness factor, and .96 for the total score.

Other Parent-Reports of Children's Functioning. To assess the presence of other stressors in a child's life, parents completed the Coddington Life Events Scale (CLE; Coddington, 1972). Based on a survey of over 3,500 healthy children, the Life Events Scales (Elementary and Junior High School) are comprised of a variety of events which require "social readjustment" in children. Events listed on the scales include desirable events (e.g., outstanding personal achievement), undesirable events (e.g., serious illness of child requiring hospitalization), gains (e.g., the birth of a brother or sister), and losses (death of a parent). The impact of the event is measured in life change units (LCUs) which are summed to comprise a total score. LCUs are weighted differently according to the age of the child. For example, the item "increase in number of arguments between parents" receives a weighting of 51 for children in elementary school and 48 for children in junior high. Similarly, beginning another school year receives a weighting of 27

for younger children and 45 for older children. The weightings are based on the ratings of these events by various adult groups (Coddington, 1972). Thus, the total Life Events score reflects a weighted sum of the events experienced by a child within a given time frame. In this sample, the Life Events score was divided into two sections for the target parents. They completed a "Before" Life Events scale, for the period of time within one year prior to the accident, and an "After" Life Events scale, for the period of time since the accident.

Finally, parents completed the **Child Behavior Checklist-Parent Report Form** (CBCL; Achenbach & Edelbrock, 1983) in order to obtain behavioral data about sample children. On the CBCL, parents indicate how well 118 behaviors describes their child using a three point scale ranging from never does it (0) to very true or often true (2). The empirically derived behaviors and normed scoring scales are designed to compare children with normal age-mates in terms of clinically significant syndromes and competencies. Scores also place each child along broad-based dimensions of internalizing (CBCL Internalizing) and externalizing (CBCL Externalizing) behaviors which are used to view children's problems in terms of global distinctions. Test-retest reliability of the scale is generally high (e.g., between .80 and .90) (Achenbach & Edelbrock, 1983).

Archival data

School Records. Report cards for each child were obtained to document their academic performance. For target children, an

average QCA prior to the stressful event (QCA Before) and an
average QCA after the stressful event (QCA After) were computed.
The difference scores between these two averages were used as an
indicator of the child's adjustment to the automobile accident
(QCA Difference).

Medical Records. As previously indicated, a degree of injury
rating was obtained from police records (Injury). The police
officers, at the time of the accident, recorded the names of
injured persons and coded their degree of injury on a 1 to 4 scale.
Injuries were coded as Level 1 if the child died before the report
was completed (not applicable to this study); Level 2 if there were
visible signs of injury such as bleeding wounds &/or distorted
limbs or if the child had to be carried from the scene; Level 3 if
other visible signs of injury were present such as bruises,
abrasions, swelling, limping, etc.; and Level 4 if there was no
visible injury but the child complained of pain or momentary
unconsciousness.

In addition to police records, emergency room records
(Emergency Room Injury Code) were obtained to document more
precisely the severity of injury incurred by accident victims.
Ratings of injury severity were obtained using a Severity Rating
Scale (Appendix B-7). Two medical professionals served as
independent raters. With the second rater examining 50% of the
medical records, high inter-rater reliability (r = .94) was
obtained. Parents also completed a medical/psychological screening
to obtain information about previously identified psychological

disturbances in the sample children (**Child Psyc History**) and/or family histories of anxiety disorders or other psychiatric disorders (**Family Psyc History**).

<u>Conceptualization and Organization of Measures</u>

The measures were grouped in manner consistent with the conceptualization of previous findings in the PTSD literature (see Table 2). The independent variables were separated into three major categories: pre-trauma, trauma, and post-trauma. Pre-trauma variables were further divided into three subgroups: demographic characteristics (e.g., age, gender, socioeconomic status), pre-trauma child variables (e.g., involvement of the child in a prior automobile accident, prior history of psychiatric treatment in the child, trait anxiety), and pre-trauma parent variables (e.g., family history of psychiatric disturbance, parental trait anxiety). Trauma variables, obtained from the target sample, included aspects of the automobile accident itself (e.g., the severity of the child's injury, the mode of injury). Post-trauma variables served as additional independent variables which were separated into two categories: child post-trauma variables (e.g., parent ratings of behavior problems, state anxiety of the child, fear survey schedule scores) and parent post-trauma variables (e.g., parental state anxiety, parental fears). While some of the measures were collected from the target sample only (as indicated in Table 2), other self-report measures were obtained from both target and comparison samples.

A total of six subgroups of independent variables were then

used in correlation and regression analyses in the target sample.
These subgroups were regressed onto dependent variables measuring
children's responses to trauma (e.g., Reaction Index (RI), Impact
of Events Scale (IES), and PTSD symptoms on the Diagnostic
Interview for Children and Adolescents-Revised, Child Version
(DICA-R-C PTSD).

Results

Results are organized into four major sections. In the first
section, descriptive statistics about the children and parents in
the target sample are provided, as well as accident-specific data.
Secondly, relationships between measures of posttraumatic
symptomatology and pre-trauma, trauma, and post-trauma variables
are discussed. In the third section, multiple regression analyses
are conducted to predict children's posttraumatic responses. In
the final section, children in the target sample are contrasted
with the children in the comparison sample on diagnostic
information. Then, the target sample is subdivided into groups of
high vs. low traumatized children, and contrasted with the
comparison group.

Description of Target Sample

Types and Severity of Accidents

Target children were involved in several different types of
motor vehicle accidents. The largest number of the 50 children
were passengers in an automobile ($\underline{n}$ = 35, 70%), while 10 children
(20%) were struck by a car while on bicycles or mopeds, and 5
children (10%) were pedestrians struck by an automobile.

Since children's names were not recorded on police accident
reports unless they were injured, all of the children in the target
sample sustained some type of physical injury. The severity of
their injuries was determined in two separate ways. First, police
officers rated children's injury at the scene of the accident. As
indicated on the accident reports, ratings ranged from severe (2)

to moderate (3) to mild (4), with a fairly even distribution of children in each of the three categories (see Table 3). Injury severity was also rated by a medical professional who examined the reports of emergency room staff and family physicians. Using the rating scale shown in Appendix B-7, the ratings of the medical professional ranged from injuries requiring no medical intervention (0) to injuries judged to be of moderate severity (5), with 75% of the children receiving ratings of 0 or 1 and their injuries requiring little or no medical attention (see Table 3).

Insert Table 3 About Here

Police ratings of injury showed a significant association with ratings of the medical professional (r = -.42, p < .01). An inverse relationship was obtained because the scoring of the scales was reversed.

Accident Interview Data

Tables 4, 5, and 6 summarize information obtained from the parent and child structured accident interviews. From parent reports, 34% of the target children had been in a previous automobile accident, and about 52% of the children had a family member who had been in an accident. In most cases, the present accident had not been litigated (78%), although some parents reported financial loss (20%), disruption of employment (16%), and marital discord as a result of the accident (20%).

Insert Table 4 About Here

Approximately half of the sample of children and parents reported that parents worried more about their children as a result of the accident (see Table 5). A somewhat smaller percentage of each group reported an increase in the parents' need to know their children's whereabouts more than they did prior to the accident. Parents more often reported blaming themselves, at least to some extent, for their child's accident than did children, but about an equal number reported asking rhetorical questions such as "Why did this happen to me (my child)?". Of those that asked this type of question, only a few were able to resolve the issue with a satisfactory answer. Nonetheless, most of the parents and children were able to see some good outcome as a result of the accident.

Insert Table 5 About Here

While a majority of the target children reported some behavioral changes as a result of the accident, many of these changes were positive (e.g., being more careful, using seatbelts more frequently). Fewer sample children discussed negative changes (e.g., increased fears when riding in a car, being too fearful to ride a bike) as a result of the accident. Table 6 indicates the percentage of children reporting disturbances in areas of functioning including academic performance (22%), sleeping (18%)

and eating (14%) habits, relationships with friends (12%) and
relationships with parents (14%).

Insert Table 6 About Here

Lastly, as an indication of perceived social support at the
time of the accident, target children and their parents rated the
responses of various persons involved at the scene of the accident
or shortly thereafter (e.g., police, hospital attendants, peers).
Children and their parents reported generally positive feelings
about others' reactions. With scores ranging from very positive or
supportive (1) to very hurtful or negative (5), the mean rating
for children was 1.6 ($\underline{SD}$ = .57) while the mean rating for the
parents was 1.9 ($\underline{SD}$ = .57).

Diagnostic Data

Target children's responses on the Diagnostic Interview for
Children and Adolescents indicated that 14% ($\underline{n}$ = 7) of the target
children met DSM-III-R criteria for Posttraumatic Stress Disorder
as a result of the automobile accident. Of these seven children (4
boys, 3 girls), 3 were passengers in automobiles, 3 were on
bicycles or mopeds, and 1 was a pedestrian. Another child met the
diagnostic criteria for PTSD as a result of a previous incident,
unrelated to the automobile accident. Whereas seven children were
diagnosed with accident-related PTSD according to the child
diagnostic interview, only two of these seven children met the
diagnostic criteria for PTSD on the basis of the parent diagnostic

interview. No other children, other than these two, met diagnostic criteria for PTSD on the basis of parent report.

Although a majority of the sample did not meet diagnostic criteria for PTSD, many of the target children endorsed at least some of the symptoms of PTSD ($\underline{M} = 3.1$, $\underline{SD} = 3.6$). Table 7 presents the number of children who endorsed symptoms from the three PTSD symptom clusters (i.e., re-experiencing, avoidance, and hyperarousal). As indicated, the most frequently endorsed symptoms were the re-experiencing symptoms (e.g., recurrent recollections of the accident, distressing dreams of the accident, flashbacks of the accident), followed by avoidance symptoms (e.g., avoided thinking about the accident, avoided activities or situations that reminded them of the accident, diminished interest in significant activities), and symptoms of increased arousal (e.g., difficulty falling or staying asleep, irritability, problems concentrating, hypervigilance, physiological reactivity upon exposure to accident-related events).

_____

Insert Table 7 About Here

_____

Tables 8 through 10 show the number of children endorsing symptoms from each of three symptom clusters of PTSD. The most frequently endorsed symptoms were: thinking about the accident $\underline{a}$ $\underline{lot}$ (34%), avoiding situations related to the accident or other reminders of it (34%), and amnesia or forgetting aspects of the accident (36%). Only two children endorsed a sense of

foreshortened future as a result of the accident (e.g., decreased expectations about their futures), and no children reported subsequent psychological numbing (decreased interest in people or significant activities).

Insert Tables 8, 9, & 10 About Here

Other Measures of PTSD Symptomatology

In addition to variation in PTSD criteria as indicated by responses on the DICA-R, responses to PTSD rating scales also reflected a broad range of scores. Target children's Reaction Index (RI) scores ranged from 4 to 59, with a mean of 20.8 ($\underline{SD}$ = 12.9). Using the suggested interpretation of these scores (Pynoos & Nader, 1988b), 12 (24%) children fell in the no trauma range with scores from 0 to 11, 24 (48%) children fell in the mild trauma range with scores from 12 to 24, 8 (14%) children scored in the moderate trauma range of 25 to 39, and 6 (12%) children's scores indicated severe trauma in the 40 to 59 range. Table 11 shows the range of RI scores for this sample and the range of scores for a small sample of children ($\underline{n}$ = 10) who witnessed the sexual assault of their mothers for comparison purposes (Pynoos & Nader, 1988b). As can be seen from the table, a greater range of scores and a smaller percentage of severe reactions was obtained in the sample of accident victims in contrast to the sample who witnessed sexual assault.

Insert Table 11 About Here

Similar to the RI, scores on the Impact of Events Scale (IES) indicated varied reaction by target children. Children's IES scores ranged from 0 to 52. The mean score for the target sample was 16.2 ($\underline{SD}$ = 14.8). By way of comparison, the mean for the present sample was lower than that reported for a group of seven children involved in a ferry disaster, as reported by Yule and Williams (1990). Assessed 3 to 6 months after the boat accident, the average score for their group was 46.9. Twelve to 15 months afterwards, boys scores still averaged 34.1, while girls averaged 43.8 (Yule & Williams, 1990). Thus, the ferry disaster appears to have caused more symptoms of intrusion and avoidance as measured by the IES than automobile accidents when assessed up to 15 months later.

Four of the seven children who met diagnostic criteria for PTSD on the DICA-R-C reported RI scores in the severe range, whereas the other three children who met PTSD diagnostic criteria scored in the moderate range of severity on the Reaction Index. IES scores of children with PTSD ranged from 3 to 50, with a mean of 30. It is difficult to compare these results to those of other studies as diagnostic interviews are typically not administered. In investigations which did include a structured diagnostic interview (Earls et al., 1988; Stoddard, Norman, & Murphy, 1989), self-report measures were omitted.

PTSD Symptoms Among Parents

In addition to children's symptoms, parent PTSD symptoms were also examined. On the ADIS-R, a diagnostic interview for adults, four parents met diagnostic criteria for PTSD on the basis of the accident. One parent met the criteria for the disorder demonstrating symptoms as a result of her daughter's bike accident, while the other three parents were driving the car when the accident occurred. Because only 17 parents in the sample of 50 were present during their child's accident, three parents with PTSD indicates a rate of 17%. This finding indicates that PTSD was as prevalent for parents involved in accidents (17%; 3 of 17) as it was for children (14%; 7 of 50).

In addition, parents also indicated the extent of PTSD symptoms on the Impact of Events Scale. As hypothesized, target parents' responses varied widely. On the Impact of Events Scale, parent scores ranged from 0 to 42, with a mean score of 13.8 (SD = 15.3). This mean is below the mean reported for a group of adults exposed to a recent significant life event (M = 39.5, SD = 17.2; Horowitz et al., 1979).

Correlations Among Measures of PTSD and Other Variables

Pearson correlation coefficients were used to assess the relationship among dependent and independent variables. As multiple comparisons were conducted, a Bonferoni approach to setting individual test statistical significance levels was taken to protect against inflation of Type I error rate (Harris, 1975). Table 12 shows the relationship among the three measures of

posttraumatic symptomatology. The three variables were found to be significantly related at a p < .001 level (using a Bonferoni correction, see Table 12).

Insert Table 12 About Here

Correlations among each of the dependent variables and the pre-trauma, trauma, and post-trauma variables are shown in Tables 13 through 16, respectively. Using the Bonferoni correction, only two significant correlations were found between pre-trauma and criterion variables. Specifically, target children's socioeconomic status showed a significant negative correlation with their Reaction Index scores (see Table 13). Lower socioeconomic status was associated with higher levels of posttraumatic symptomatology. This relationship, albeit non-significant, was consistent across the other two measures of PTSD. Another negative correlation was noted between children's age at the time of the accident and their reported PTSD symptoms. Younger children tended to report more posttraumatic symptomatology on all three dependent measures. This relationship was statistically significant, however, only with PTSD symptoms reported on the children's Impact of Events scores (see Table 13).

Insert Table 13 About Here

In contrast, several significant correlations between trauma

and criterion variables were found (see Table 14). First, the ratings of injury severity reported by medical professionals were significantly correlated with children's Reaction Index scores (using Bonferoni correction, $p < .007$). Children who suffered more serious injuries tended to report more symptoms on the Reaction Index. Positive relationships between injury severity and the other two dependent measures were also found but were non-significant. Interestingly, the relationship between police ratings of injury severity and dependent variables was weak. In fact, the direction of the relationship was inconsistent, with a positive relationship between injury ratings and IES scores and negative relationships between injury ratings and RI and DICA-R-C PTSD symptoms.

Secondly, the type of accident was significantly correlated with children's responses. Higher RI scores were associated with bicycle, moped and pedestrian accidents. This relationship was significant at a $p < .007$ level, using the Bonferoni correction. A positive correlation between type of accident and IES and DICA-R-C PTSD symptoms was also found, although these relationships were non-significant.

The third significant relationship between criterion and trauma-related variables was that between children's perceptions of social support and IES scores. Feeling less supported by others at the time of the accident was associated with higher PTSD symptoms on the IES. Perceptions of social support were much less related to the other dependent variables (see Table 14).

Insert Table 14 About Here

Lastly, Pearson correlation coefficients were used to assess the interrelationship among child and parent post-trauma variables and criterion variables (see Tables 15 and 16). Children's accident-related fear and state anxiety scores were found to be significantly correlated with all three criterion variables ($p <$ .003). The Fear Survey Schedule for Children was also significantly correlated with RI and IES (using Bonferoni correction, $p < .003$). No other significant correlations were found.

Insert Tables 15 & 16 About Here

Prediction of Posttraumatic Symptomatology

A series of stepwise multiple regression equations were conducted separately for the three dependent variables (RI, IES, & DICA-R-C-PTSD). Predictor variables were grouped theoretically, as shown in Table 2, and regressed onto each of the dependent variables. Therefore, three pre-trauma regressions, one trauma regression, and two post-trauma regressions were preformed, yielding a total of six regression equations for each criterion variable. The results of these analyses are shown in Tables 1 to 9 in Appendix C. The significant predictors from each of these regression equations are presented and discussed below. Summary

regressions for each of the dependent variables follow.

<u>Reaction Index Regression Equations</u>

Table 17 shows the seven variables that entered as significant predictors of children's Reaction Index scores. In the pre-trauma regression, three variables added significant unique variance to the prediction of RI scores. Children's socioeconomic status, trait anxiety, and age at the time of the accident combined to account for 43% of the variance in RI scores. In the regression of trauma variables, one variable entered the equation as a significant predictor. The mode of accident (e.g., car vs. bike and pedestrian) predicted approximately 23% of the variance in RI scores. In the post-trauma regression, three variables, children's state anxiety, fear survey schedule scores, and parent-reported CBCL externalizing T-scores, were significant predictors of RI, accounting for approximately 50% of the total variance.

Insert Table 17 About Here

<u>Impact of Events Scale Regression Equations</u>

Fewer variables entered as significant predictors of children's Impact of Events scores (see Table 18). In the pre-trauma regression, the age of the child at the time of the accident predicted 24% of the variance in IES, with no other significant pre-trauma predictors. Similarly, the only significant trauma-related variable was child social support (i.e., average ratings of support from persons at the scene of the accident on a scale of

very helpful or positive (1) to very hurtful or negative (5)) which accounted for 14% of the variance in IES scores. In the post-trauma regression, children's accident-related fear and state anxiety scores combined to predict 36% of the total variance in children's scores on the IES.

Insert Table 18 About Here

PTSD Diagnostic Interview Regression Equations

Predictions of PTSD symptoms on the diagnostic interview are shown in Table 19. One significant predictor was indicated in the pre-trauma regression. Accident histories of the child accounted for 13% of the variance in PTSD symptoms. No demographic variables were significant predictors of this dependent variable. In the regression of trauma variables, ratings of injury severity (made by a medical professional) predicted 11% of the variance in reported DICA-R-C PTSD symptoms. In the regression of post-trauma variables, children's state anxiety scores accounted for 48% of the total variance in PTSD symptoms, with perceptions of increased parental supervision and worry accounting also adding significantly to the equation. A total of 54% of the variance was accounted for by these two variables in the regression of post-trauma variables.

Insert Table 19 About Here

<u>Combination Regression Equations</u>

Prediction equations were computed by regressing the combination of all significant predictor variables (e.g., those from the pre-trauma, trauma, and post-trauma regressions combined) onto each of the three criterion variables. The results of these regression equations can be found in Tables 20 through 22.

Insert Table 20 About Here

<u>Impact of Events Scale Combination Regression</u>. In a similar manner, the four previously identified significant pre-trauma, trauma, and post-trauma predictors of children's IES scores, were combined into one regression equation. As shown in Table 21, the most significant contribution to the prediction equation was made by the Fear Survey Schedule, followed by age at the time of the accident, state anxiety and social support. These variables combined to predict 50% of the variance in IES scores.

Insert Table 21 About Here

<u>PTSD Diagnostic Interview Combination Regression</u>. Four significant pre-trauma, trauma, and post-trauma predictors of DICA-R-C PTSD symptoms were regressed simultaneously. The results, as shown in Table 22, indicate that the best predictor of a diagnosis a PTSD was state anxiety scores, followed by children's perceptions of parenting style post-trauma. Parenting style was

defined by combining the responses of children to two questions: "Do your parents need to know where you are more than they did before the accident?" and "Do your parents worry more about the possibility of harm coming to you now than they did before the accident?" Interestingly, it was the children's report of their parent's style, as opposed to the parent's report of their parenting style, which predicted children's reaction. Children's accident history also added significantly to the prediction of PTSD symptomatology. These three variables combined to account for 60% of the total variance in children's DICA-R-C PTSD symptoms. Injury severity ratings failed to add significantly to the prediction equation.

Insert Table 22 About Here

Additional Exploratory Analyses

In this final section, additional group comparisons are reported. First, diagnostic data are contrasted across target and comparison samples. Second, children in the target sample are divided into groups: High traumatized versus Low traumatized children. Analyses contrasting the parent and child data from these three groups are then discussed. Finally, as the age of the child was highly related to some of the criterion variables, the three groups are again compared, controlling for the effects of age.

<u>Target Versus Comparison Samples</u>

Table 23 shows the incidence of DSM-III-R diagnoses among children in target and comparison groups. Based on previous reports that parents are more accurate reporters of externalizing symptomatology (Silverman & Eisen, 1992), parent diagnostic interview data were used to assess Attention Deficit/Hyperactivity Disorder, Oppositional Defiant Disorder, Conduct Disorder and Substance Abuse. As children are more accurate reporters of internalizing disorders (Silverman & Eisen, 1992), child diagnostic interview data were used to assess the remaining (internalizing) disorders.

Although it appears that children involved in accidents were more likely to meet diagnostic criteria for many emotional disorders, there were no significant differences in the prevalence of DSM-III-R disorders between the groups (see Table 23). Several diagnoses applied to children in the comparison sample including separation anxiety disorder (2), attention deficit disorder (1), oppositional/ defiant disorder (1), conduct disorder (1), and overanxious disorder (1). One comparison child also met diagnostic criteria for Posttraumatic Stress Disorder as a result of the homicide of a family member. DSM-III-R diagnoses of simple phobia (14), separation anxiety (9), posttraumatic stress disorder (8), attention deficit disorder (7), and overanxious disorder (5) were the most frequently observed disorders among the target sample.

Table 23 also shows the results of comparing children's reports to parent's reports for each diagnostic criteria. The

percent of agreement between parent and child reports ranged from 66% to 100%, with the lowest percentage of agreement in the reports of simple phobia and separation anxiety. The percent of agreement between parent and child reports for PTSD was 88%. As percentage of agreement does not account for agreement due to chance, the more conservative Kappa statistic was also computed. As shown, Kappa coefficients ranged from .01 (simple phobia) to 1.00 (obsessive compulsive disorder). These findings are consistent with previous reports suggesting that parents are often unaware of their children's internalizing symptoms (Silverman & Eisen, 1992).

Insert Table 23 About Here

Low Traumatized vs. High Traumatized vs. Comparison Groups

To further explore the responses of children to automobile accidents, target children were divided into two groups: Low and High traumatized children. As the RI is the most widely used measure of posttraumatic response in children, Low traumatized children were those whose RI scores fell in the none to mild trauma range ($\underline{n}$ = 36), while High traumatized children's RI scores fell in the moderate to severe trauma range ($\underline{n}$ = 14).

Table 24 shows the means, standard deviations, and ANOVA comparisons of child variables in the Comparison group, Low traumatized, and High traumatized groups. High traumatized children and comparison children were found to be similar in age, while the low traumatized group was significantly older than the

high traumatized group. High traumatized children reported significantly more trait anxiety than comparison children. Similarly, High traumatized children reported significantly higher levels of fear, both general and accident-specific fear than did Low traumatized children and comparison children (see Table 24). These effects remained significant when controlling for age.

Insert Table 24 About Here

As shown in Table 25, there were no significant differences between high, low, and comparison groups on any of the characteristics of parent functioning including trait anxiety, depression, general mental health, or family psychiatric history.

Insert Table 25 About Here

Discussion

The results of this study indicate a wide range of posttraumatic symptomatology among accident victims. Approximately 26% percent of sample children reported moderate to severe levels of trauma on the Reaction Index (Frederick, 1985b), with similar findings on the Impact of Events Scale. In addition, seven children, 14% of the sample, met DSM-III-R criteria for Posttraumatic Stress Disorder (PTSD) as a result of their accidents. Because these assessments were obtained an average of nine months after their accidents, these findings indicate persistence of serious symptoms in some children. The next section discusses each of the PTSD symptom clusters including re-experiencing, avoidance and hyperarousal.

Specific Posttraumatic Symptoms

Based on structured diagnostic interviews, 44% of the children endorsed at least one PTSD re-experiencing symptom. From this diagnostic cluster, the most frequently endorsed symptom was intrusive memories of the accident. Intrusive recollections were typically triggered by cues present at the scene of the accident. For example, one child reported that every time she rode by the street where the accident occurred, she started thinking about it and feeling scared. Another child said that he thought about the accident every time he saw a truck (similar to the one that hit him) on the road. Other children reported thinking about the accident during quiet times at home or when they saw automobile crashes on television. Contrary to reports that children do not

re-live traumatic events in the form of flashback experiences
(Terr, 1979), eleven children (22%) in this sample vividly
described flashback-type experiences. They reported "seeing" the
accident happen again, "hearing" the sounds of the crash, and
"feeling" the impact of the other car hitting them at times when
they were riding in a car, working at school, or lying in bed.

Approximately 20% of the sample reported at least three
symptoms from the avoidance cluster of the PTSD diagnostic
criteria. The most common symptom reported was forgetting aspects
of the traumatic event such as what kind of car hit them or what
police officers at the scene said to them. In most cases, children
cited their confusion (shock) at the scene or the suddenness of the
accident as reasons for their amnesia. For three children who
endorsed this symptom, mild concussions at the time of the
accident may account for their memory loss. The second most
frequently endorsed symptom from this cluster was an avoidance of
automobile-related situations. Some children avoided riding in a
car, riding bikes, or riding near the accident scene. One of the
most traumatized children refused to "trick-or-treat" on Halloween
because of his fears of "big streets". Children also avoided
thoughts about the accident. Some children said that they avoided
thinking about it because it made them feel sad or scared. Others
demonstrated their reluctance to think about the accident in the
interview itself. These children responded without difficulty to
questions that were not accident-specific, but when asked about
their physical injuries or feelings at the time of the accident,

they used evasive tactics such as changing the subject or directing their attention to objects in the room. One 8-year-old child participated without difficulty for much of the interview but refused to answer questions about the accident unless he could sit with his mother during the interview. When she joined him, he sat in her lap or held her hand, and required much verbal encouragement to respond to questions. Only a few children in the sample described the final avoidance criteria of emotional numbing or foreshortened future. Two children reported lowered expectations for the future. This finding supports the report of Terr (1979) who documented this phenomenon in the children involved in the Chowchilla kidnapping. With respect to a reduced range of expressed emotion, emotional "numbing", none of the children reported this symptom. It may be that children are more resilient to such events and continue to express a variety of emotions. On the other hand, the emotional responsiveness of children to their environment may preclude sustained emotional withdrawal.

For the hyperarousal cluster, 18% of children endorsed the symptoms required for the diagnosis of PTSD. Sleeping difficulties were the most frequently reported hyperarousal symptom. Sleeping was difficult for some children as they reported lying awake at night with memories of the trauma. Other investigators have found that sleep disturbance was a common problem for children who experienced a ferry boat disaster (Yule & Williams, 1990). A second common symptom of hyperarousal for the children in this sample was hyperalertness. Parents and children relayed stories

of the children slamming their feet on the floorboard of the car as if to "put on the brakes" when the car needed to slow down. Other children reported that they frequently told their parents to "watch out" or to slow down when driving. Similarly, many children became more "safety-conscious", telling family members, friends, and in some cases strangers about the virtues of wearing a seatbelt.

Similar to children, parent's posttraumatic symptoms ranged from mild to severe. While the majority of parents were not traumatized by the accident, 4 parents met PTSD diagnostic criteria. These parents reported re-experiencing the trauma, avoiding thoughts and situations reminiscent of the accident, and increased distress when in the presence of accident-specific cues. One parent, who had previously driven his sales route alone, reported that he had to carpool with a workmate because his fears and hypervigilance while driving made it unsafe for him to continue to drive.

The number and severity of posttraumatic symptoms found among children and parents in the present study stands in sharp contrast to the relatively low levels of physical injury and other accident sequelae sustained in the accidents. Ratings of physician's records suggested that many of the sample children suffered minimal injuries requiring no invasive medical treatment. Only three children received injuries of moderate severity. Also, in a majority of the sample (at least 80%), families were not involved in litigation, nor did they experience financial loss, marital disruption, or loss of employment. Nevertheless, automobile

accidents were experienced by parents and children as potentially life threatening events with resulting anxiety and fear.

Parent vs. Child Report of PTSD Symptoms

Substantial discrepancies were found between children's reports of posttraumatic symptoms and their parents' reports of children's symptoms. As reflected in the diagnostic interviews, parents underestimated the effects of the accidents on their children and minimized the severity of their children's responses to the accident. The underreporting of PTSD symptoms by parents may be attributable to the nature of the PTSD symptoms. Parents may underreport the internalizing symptoms of re-experiencing and avoidance because of a general tendency, noted earlier, for parents to be less accurate reporters of internalizing symptoms in children (Silverman & Eisen, 1992). In addition, parents may tend to deny children's symptoms in order to maintain a sense of control over their children's well-being (e.g., "I can take care of my child") or to reduce their own anxiety (particularly if the accident was their fault) (e.g., "I didn't cause harm to my child"). Finally, as avoidance is one of the symptoms of PTSD, parents may likely avoid thoughts of the child's symptoms because they remind of them of their own fears. Parental avoidance of their own symptoms may be particularly relevant in this study as 17% of the parents who were involved in the accident with their children also demonstrated symptoms consistent with a PTSD diagnosis. These data provide support for the clinical hypotheses of other investigators (Yule & Williams, 1990) who have advocated direct

assessment of children's experiences, as opposed to relying solely on parental reports.

Factors Related to PTSD Symptoms

Consistent with calls for the use of multiple methods of assessment (Garmezy & Rutter, 1985; Keane, Wolfe, & Taylor, 1987), PTSD in this study was assessed using two self-report measures and a diagnostic interview. The first self-report measure, the Reaction Index (RI; Frederick, 1985b), focused on two of the three symptom clusters of PTSD, re-experiencing and hyperarousal symptoms, with only one of the 20 items on the RI specifically assessing avoidance. The IES, in contrast, was developed to measure re-experiencing and avoidance symptoms, and no hyperarousal symptoms were included on this measure.

The DICA-R-C, unlike the two self-report measures, is a structured diagnostic interview. Children answer questions about various PTSD symptoms and these behavioral reports are evaluated by the interviewer. A symptom is identified only if the behavioral descriptions are judged to meet the symptom criteria of the DSM-III-R. Thus, this measure is the most behaviorally-based of the measures of posttraumatic symptomatology and relies less on self-perceived evaluation of symptoms. Because of the conceptual differences underlying these three measures, there were differential predictors for each measure. The factors relevant to the prediction of each measure of posttraumatic symptoms are discussed in the next section.

Reaction Index. With respect to the Reaction Index (RI),

younger children, children from lower socioeconomic families, and children with higher trait anxiety reported more posttraumatic symptoms. These relationships may be explained by the focus on hyperarousal symptoms in the RI. Children who are trait anxious are more likely to be vigilant to potential threats in their environments. This heightened vigilance may generalize to a state of hyperarousal. Likewise, the lack of resources available to children in lower socioeconomic levels and the potential oppression may predispose the children to hypervigilance and hyperarousal.

One trauma variable, the mode of the accident (car vs. other) was also significantly related to the RI scores. This relationship may result from the increased perception of life threat among bicyclists and pedestrians. Without the feeling of protection provided by the body of the car, these children may have felt more vulnerable and therefore responded with a greater degree of hypervigilance and hyperarousal. It should be noted that while these children suffered greater injuries, the effect of the mode of the accident was significant even when controlling for the degree of injury. Thus, the perception of vulnerability in bikers and pedestrians translated to higher levels of hyperarousal regardless of their actual injury level.

Finally, RI scores were predicted by scores on measures of state anxiety, fear, and externalizing behavior. Feelings of fear and anxiety may prompt increased vigilance and hyperarousal.

Impact of Events (IES). In contrast to the other measures of posttraumatic symptoms, the IES emphasizes self-perceived

avoidance. Findings on the IES indicated that younger age in children was associated with increased symptoms of avoidance. In comparison to older children, young children may experience more affect and less cognitive control following traumatic events. This is consistent with the reports of others that as individuals approach adulthood, they develop greater capacities to cope with stressful events, and are therefore less likely to be traumatized (Van der Kolk, 1985). As younger children do not have the coping resources of older children, they may resort to simple denial and avoidance of the traumatic event. This avoidance may result in intrusive memories of the event, and intrusive memories may prompt anxiety and greater avoidance. Older children may experience a similar process but their capacity for using sophisticated mechanisms of coping such as talking it through or problem solving may counteract tendencies toward avoidance.

The social support that children experienced immediately after the accident was negatively related to avoidance. Those children who found a supportive environment tended to respond less with avoidance after the accident. This finding suggests that providing a means of social support may preempt the primitive defense of avoidance in children. Lastly, the finding that accident fears were associated with avoidance may reflect reciprocal processes. Fear may lead to avoidance of related stimuli, and avoidance of feared stimuli may inhibit opportunities for mastery of fears.

DICA-R-C PTSD Symptoms. The last measure of posttraumatic symptomatology was the DICA-R-C. Because this measure is a

structured interview that requires the interviewer to judge the validity of children's descriptions of behavior as PTSD symptoms, and to determine whether the symptom has occurred for at least one month, it was the most stringent criterion measure of posttraumatic symptoms used in this study. In comparison to the other two measures, the DICA-R-C is less a measure of self-perception and more of an evaluation of reports of behavior.

Among pre-trauma variables, accident history of the child was the only significant predictor of PTSD on the DICA-R-C. Children who had experienced an accident previously were <u>less</u> likely to show behavioral symptoms of PTSD. It appeared that the previous experience of an accident inoculated the child against negative effects of the current accident. Among trauma variables, injury severity was the most significant predictor, with more symptoms of PTSD noted in children with more serious injuries. Finally, child reports of increased parental overprotection and worry predicted PTSD symptoms on the diagnostic interview. This relationship may reflect parental responses to their child's behavioral symptoms. Conversely, parental overprotection may serve to maintain or escalate children's symptoms. In one way, children who perceive parental concern may respond with increased symptomatology because it is legitimized by their parents. In another way, children's symptoms may persist because of the reinforcing effects of increased parental attention and concern. At some level, these effects are undoubtedly transactional, with one affecting the other and vice versa.

Interestingly, the responses of children appeared to have little relationship with indices of the mental health of their parents. Measures of parent's general mental health, depression, and trait anxiety were <u>not</u> found to be related to children's responses. Additionally, the more specific measures of parental PTSD were unrelated to children's posttraumatic symptoms. Specifically, parent's PTSD symptoms on a structured diagnostic interview (ADIS-R), their state anxiety (when thinking about the accident), their self-reported fears, as well as their accident-related fears were not predictive of children's PTSD symptoms.

The lack of parental influence observed in this sample contradicts the conclusion by McFarlane that "children's long-term adjustment has more to do with the reaction of the adults responsible for their care than with the children's exposure to danger or destruction" (p. 210, 1987b). McFarlane's conclusion is based, however, on <u>parental reports</u> of their own symptoms as well as <u>parental reports</u> of their children's symptoms. Parents who perceive themselves as emotionally distressed or traumatized may project these reactions onto their reports of child's reactions to trauma. In the current study, however, PTSD in children was assessed by their own reports. As discussed earlier, these reports are likely to provide more of an accurate reflection of the symptoms (Silverman & Eisen, 1992).

<u>Contrasts among High, Low, & Comparison Groups</u>

Children who reported more PTSD symptoms also reported more fears in general and more accident-specific fears than did non-

traumatized children in the accident sample and children in the comparison sample. High traumatized children also reported significantly more trait anxiety than did the comparison sample. As anticipated, traumatized children were not different from the other groups on measures of depression, coping resources, or behavior problems, however. Thus, as was found in other studies (Kiser et al., 1988; Wolfe et al., 1989), PTSD is a unique diagnostic entity and must be evaluated specifically.

Limitations

While this study advances the understanding and prediction of PTSD in children, several limitations should be mentioned. First, many of the participants in this research were not seriously injured. In many cases, the accidents would not qualify as an event "outside the realm of usual human experience" (APA, 1987). Because the limited severity of the accident reduced the rate of PTSD in the sample, the lack of severity may have attenuated correlations among and predictions of the PTSD response.

Second, a majority of the measures were obtained months after the accident occurred. Thus, the accuracy of information about symptoms and/or aspects of the trauma may have declined. Subjects could have forgotten important information, or more importantly, they could be recreating the events to reflect their current symptomatology. One check on the latter possibility was the rating of degree of injury from independent sources. While the ratings of injury might be exaggerated to match the psychological sequelae, the records of physical exam provide a non-retrospective measure of

injury level.

A third possible limitation is that the use of self-report data may have been influenced by social desirability. It should be noted, however, that parents were told that a range of response to accidents was included in the present study. Consequently, there was no inherent set or expectation to overreport or underreport symptoms.

Finally, a sample selection bias may have existed in this study, which may limit the generalizability of the findings. A relatively low number of families participated in the study, relative to the large number of potential subjects. As a low response rate was anticipated, however, families who refused to participate were asked to give their reasons for declining participation. No pattern was identified in the reports of families who refused to participate. That is, while several families reported that discussing the accident would be too painful, an equal number of families declined because they considered their child's reaction to be too routine to spend the time being interviewed. The large majority of the families declined participation because of the time commitment required.

Future Research

The results of this study point to several directions for future work in the area. First, an important finding from this study was the differential associations among independent variables and the three measures of PTSD. This finding suggests the possibility for separate etiological processes operating to induce

avoidance and hyperarousal symptoms. Further research targeting the symptom clusters would help to identify or to "track" the PTSD processes.

Secondly, the prevalence of PTSD in children and the lack of parental awareness of children's symptoms found in this study suggest that the incidence of PTSD in children may be underreported. Parents who are unaware of their children's symptoms are unlikely to refer their children for treatment. It may be that medical and school professionals could screen children to identify PTSD symptoms. Medical professionals have the opportunity to screen children at follow-up visits. School psychologists could interview children following traumatic events (and/or at regular intervals) to identify posttraumatic symptomatology. As PTSD is a unique diagnostic entity, a specific screening measure targeting specific PTSD symptoms (e.g., the RI, IES, or DICA-R-C) rather than other more global self-report or parent-report measures should be used.

Thirdly, as social support was found to be a significant predictor of posttraumatic avoidance in children, this factor could be a major focus of intervention teams and could be manipulated to determine which aspects of social support are most beneficial and what types of children they benefit. For example, when called to the scene of a disaster or other traumatic event, mental health professionals could provide various types of support (e.g., express concern and empathy, give practical assistance, or provide useful information) to the children on the scene. These methods of

social support utilized, as well as the persons providing the
support, could be counterbalanced and the effects of these
interventions measured by children's self-reported PTSD.

Regarding the study of automobile accidents in particular,
the finding that bicyclists and pedestrians were more traumatized
than occupants of automobiles suggests further research into the
idiosyncratic features of the different types of trauma. Similarly,
more investigation is needed to test the hypothesis that a history
of a prior accident inoculates children against negative effects of
future accidents. It is likely that this finding is conditional
upon the nature of the previous trauma. If children experienced a
severe accident, with threat of loss of life, this experience may
predispose them to negative sequelae rather than inoculate against
them.

Finally, different sampling procedures may improve future
studies of automobile accidents. The accidents studied in this
project occurred on city streets, where the speed limit typically
ranged from 25 to 45 mph. If accident records were obtained from
highway patrol stations, for example, subjects may be involved in
more severe accidents (as cars travel at greater speeds on the
highway) and may be at a greater risk for subsequent PTSD symptoms.

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Table 1

Demographic Variables by Group

Demographic Variable	Group			
	Accident ($\underline{n}$ = 50)		Comparison ($\underline{n}$ = 25)	
	Mean	(SD)	Mean	(SD)
Age at event (in months)	131.1	(38.1)	122.2	(32.5)
Socioeconomic status	44.0	(14.0)	47.7	(13.7)
	$\underline{n}$	%	$\underline{n}$	%
Sex				
Male	29	58%	18	72%
Female	21	42%	7	28%

Note. Accident and comparison groups were not significantly
different on any of the demographic characteristics.

Table 2

Variables Categorized by Pre-Trauma, Trauma, and Post-Trauma Phases

Pre-Trauma	Trauma	Post-Trauma
<u>Demographic</u>	Lag Since Accident*	<u>Child</u>
Age	Injury Rating*	Accident Fears
Sex	ER Injury Rating*	Fear Survey
Socioeconomic Status	Car vs. Other*	State Anxiety*
<u>Child</u>	P & C Separated*	Life Events After*
Accident History*	Social Support (c)*	CBCL Internalizing
Psychiatric History	Social Support (p)*	CBCL Externalizing
Life Events Before		Self-blame*
Coping Resources		Talking*
Trait Anxiety		Parenting Style*
Child Depression		Vulnerable (Clikely)*
<u>Parent</u>		<u>Parent</u>
Family Psyc History		Accident Fears
Trait Anxiety		Fear Survey
Beck Depression		State Anxiety*
Mental Health Inventory		Self-Blame*
		Talking*
		Parenting Style*
		Vulnerable (Plikely)*

* Variables apply to target sample only.

Table 3

Injury Ratings by Police and Medical Professionals for Children in
Automobile Accidents

Severity Rating	n	Percent of Total
Police		
Mild	19	38%
Moderate	15	30%
Severe	16	32%
Total	50	100%
Medical Professional		
No injury	11	22%
Minor injury		
No treatment needed	25	50%
Minor treatment needed	9	18%
Invasive treatment needed	2	4%
Moderate injury	3	6%
Total	50	100%

Table 4

Frequencies of Pre-Trauma, Trauma, and Post-Trauma Variables

Reported in Structured Accident Interview by Parents

Structured Interview Variable	$\underline{n}$	Percent of Total
Pre-trauma		
History of prior accident		
Child	17	34%
Family member	26	52%
Trauma		
Parent involved in accident	17	34%
Parent injured in accident	8	16%
Post-Trauma		
Court involvement	11	22%
Financial loss	10	20%
Marital disruption	10	20%
Loss of employment	8	16%
Sought professional help	7	14%
Talked about the accident		
Weekly to every couple of weeks	14	28%
Several times after accident only	13	23%
Not since it happened	19	38%

Table 5

Frequencies of Post-Trauma Variables Reported in Structured

Accident Interview by Parents and Children

| Structured Interview | Respondent | | | |
| | Parent | | Child | |
Variable	$\underline{n}$	%	$\underline{n}$	%
Increased parental worry	28	56%	26	52%
Increased parental supervision	17	34%	26	52%
Another accident likely	33	66%	24	48%
Self-blame (some to a lot)	17	34%	9	18%
Asked "Why me"	18	36%	17	34%
Resolved "Why me"	6	12%	5	10%
Saw positive side	36	72%	29	58%

Table 6

Frequencies of Post-Accident Sequelae in Children by Category

Category of Functioning	n	Percent of Total
Academic decline	11	22%
Sleep disturbance	9	18%
Eating disturbance	7	14%
Peer relationship disturbance	6	12%
Parent relationship disturbance	7	14%

Table 7

Number of Children Endorsing PTSD Symptoms

PTSD Symptom	Number of Symptoms				% of total meeting criteria[a]
	1	2	3	4	
Re-experiencing	22	15	7	2	44%
Avoidance	24	14	9	4	18%
Hyperarousal	17	9	4	2	18%

Note. In the DSM-III-R criteria, one re-experiencing symptom is necessary, three avoidance symptoms are required, and two hyperarousal symptoms are necessary for the diagnosis of Posttraumatic Stress Disorder.

[a] Percent of total refers to the percentage of children meeting the necessary number of symptoms for each diagnostic criterion.

Table 8

Frequencies of Children's PTSD Re-experiencing Symptoms as Reported by Children in Automobile Accidents on the DICA-R-C

Re-experiencing symptom	$\underline{n}$	% of total
Intrusive recollections	17	34%
Thinks about it when tries not to[a]	11	22%
Dreams about the accident over and over	4	8%
Dreams about other scary things[b]	9	18%
Flashbacks	11	22%
Becomes upset with reminders[b]	14	28%

Note. A duration of at least one month was necessary for each of the above noted symptoms.

[a] Item considered an avoidance symptom in the DICA-R-C.

[b] Item not used in DICA-R-C to diagnose PTSD.

Table 9

Frequencies of Children's PTSD Avoidance Symptoms as Reported by

Children in Accident Sample on the DICA-R-C

Avoidance symptom	n	% of total
Avoids thoughts about the accident	11	22%
Avoids accident-related situations	17	34%
Amnesia for parts of the accident	18	36%
Decreased interest in activities	5	10%
Decreased interest in people	0	0%
Decreased positive feelings toward others	0	0%
Foreshortened future	2	4%

Note. A duration of at least one month was necessary for each of the above noted symptoms.

Table 10

Frequencies of Children's PTSD Hyperarousal Symptoms as Reported by

Children involved in Automobile Accidents on the DICA-R-C

Hyperarousal symptom	n	% of total
Sleeping difficulty	8	16%
Increased irritability[a]	5	10%
Increased temper	7	14%
Decreased concentration	6	12%
Increases restlessness	3	6%
Hyperalertness (more jumpy)	7	14%
Physiological reactivity	3	6%

Note. A duration of at least one month was necessary for each of

the above noted symptoms.

[a] Item not used to diagnose PTSD on the DICA-R-C.

Table 12

Correlations Among Criterion Variables

	Reaction Index	IES
Children's Impact of Events	.65**	
DICA-R-C PTSD Symptoms	.64**	.44**

** p < .001.

Table 13

Correlations of Pre-Trauma Variables with Criterion Variables

Pre-Trauma Variable	Criterion		
	RI	IES	DICA-R-C-PTSD
Demographic			
Age	-.36	-.49**	-.13
Sex	.19	.14	.05
SES	-.39**	-.15	-.15
Child			
Accident History	-.16	-.28	-.36
Child Psyc History	-.08	-.12	-.17
Life Events Before	-.01	.04	-.04
QCA Before	-.01	.20	-.29
Coping Resources	-.08	.26	-.16
Trait Anxiety	.38	.25	.15
Children's Depression	.31	.07	.18
Parent			
Family Psyc History	.07	.09	-.11
Trait Anxiety	.14	.01	.09
Beck Depression	.09	.04	-.01
Mental Health Inventory	.04	-.00	.02

** p < .004.

Table 14

Correlations of Trauma Variables with Criterion Variables

	Criterion		
Trauma Variables	RI	IES	DICA-R-C-PTSD
Lag	-.20	-.17	-.06
Injury	-.03	.21	-.01
ER Injury Rating	.36**	.15	.34
Car vs. Other	.48**	.23	.30
P & C separated	-.17	-.24	.10
Social Support (c)	-.03	-.37**	.02
Social Support (p)	-.09	.05	-.02

** p < .007.

Table 15

Correlations of Child Post-Trauma Variables with Criterion
Variables

Child Post-Trauma Variable	Criterion		
	RI	IES	DICA-R-C-PTSD
Accident Fears	.45**	.54**	.41**
Fear Survey	.50**	.44**	.27
State Anxiety	.53**	.46**	.69**
QCA After	.02	.26	-.30
Life Events After	-.18	-.13	-.04
CBCL Internalizing	.22	.01	.03
CBCL Externalizing	.25	.01	.09
Self-blame	.10	.07	-.03
Talking	.25	.20	.02
Parenting Style	.29	.10	.26
Vulnerability	.20	.02	.24

** $p < .003$.

Table 16

Correlations of Parent Post-Trauma Variables with Criterion
Variables

	Criterion		
Parent Post-Trauma Variable	RI	IES	DICA-R-C-PTSD
Accident Fears	-.00	.04	.06
Fear Survey	.24	.18	.23
State Anxiety	.03	-.08	.17
Self-blame	-.07	-.04	.04
Talking	-.15	-.05	-.12
Parenting style	.12	-.12	.09
Vulnerability	-.16	-.04	-.15

Note. None of the correlations between criterion variables and
parent post-trauma variables were significant at $p < .003$.

Table 17

Summary Table of Significant Predictors of Children's Reaction
Index Scores by Pre-Trauma, Trauma, and Post-Trauma Regressions

Variable	Increment			R^2
	F-value	R^2	p	
Pre-Trauma Regression				
Socioeconomic Status	6.807	.152	.013	.152
Children's Trait Anxiety	8.388	.157	.006	.309
Age at time of Accident	7.461	.119	.010	.427
Trauma Regression				
Car vs Bike and Pedestrian	12.681	.228	.000	.228
Post-Trauma Regression				
Children's State Anxiety	15.199	.280	.000	.280
Fear Survey for Children	7.343	.116	.010	.397
CBCL Externalizing T-Score	7.098	.097	.011	.494

Table 18

<u>Summary Table of Significant Predictors of Children's Impact of</u>
<u>Events by Pre-Trauma, Trauma, and Post-Trauma Regressions</u>

	Increment			
Variable	F-value	R^2	p	R^2
Pre-Trauma Regression				
Age at time of Accident	11.892	.238	.001	.238
Trauma Regression				
Social Support (child)	6.927	.139	.012	.139
Post-Trauma Regression				
Children's Accident Fears	16.000	.291	.000	.291
Children's State Anxiety	4.462	.074	.041	.365

Table 19

<u>Summary Table of Significant Predictors of the Number of DICA-R-C</u>

<u>PTSD Symptoms by Pre-Trauma, Trauma, and Post-Trauma Regressions</u>

Variable	Increment			
	F-value	R^2	p	R^2
Pre-trauma Regression				
Children's Accident History	5.252	.133	.028	.134
Trauma Regression				
Emergency Room Injury Rating	4.919	.115	.033	.115
Post-Trauma Regression				
Children's State Anxiety	32.791	.477	.000	.477
Parenting Style (Child)	4.589	.061	.039	.537

Table 20

Multiple Regressions on Child Reaction Index Scores Using the

Previously Identified Significant Predictors[a]

Variable	F-value	Increment R^2	p	R^2
Children's State Anxiety	15.979	.280	.000	.280
Car vs Bike and Pedestrian	8.698	.128	.005	.409
Fear Survey for Children	10.259	.123	.002	.532
Socioeconomic Status	5.937	.063	.020	.595
Age at time of Accident	2.876	.029	.098	.624
CBCL Externalizing T-Score	3.328	.032	.076	.656

[a] Significant predictors shown in Table 17.

Table 21

Multiple Regressions on Children's Impact of Events Scores Using
the Previously Identified Significant Predictors[a]

		Increment		R^2
Variable	F-value	R^2	p	
Accident Fears of Children	19.692	.291	.000	.291
Age at time of Accident	7.227	.094	.010	.385
Children's State Anxiety	5.706	.068	.021	.453
Social Support (Child)	3.685	.041	.061	.495

[a] Significant predictors shown in Table 18.

Table 22

Multiple Regressions on the Number of DICA-R-C PTSD Symptoms Using
the Previously Identified Significant Predictors[a]

	Increment			
Variable	F-value	R^2	p	R^2
Children's State Anxiety	36.434	.477	.000	.477
Parenting Style (Child)	5.113	.061	.029	.537
Child Accident History	6.207	.065	.017	.602
Emergency Room Injury Rating	1.137	.012	.293	.614

[a] Significant predictors shown in Table 19.

Table 23

Incidence of Child Disorders by Group and Comparisons between
Parent and Child Reports on the DICA-R-C

| Diagnosis | Incidence by Group | | | Parent/Child Report | |
	Accident ($\underline{n}$ = 50)	Comparison ($\underline{n}$ = 25)	Chi Square[a]	Percent Agreement[b]	Kappa
Attention Deficit[c]	7	1	2.23	91%	.77
Oppositional Disorder[c]	4	1	0.60	91%	.40
Conduct Disorder[c]	3	1	0.21	97%	.64
Substance Abuse[c]	1	0	1.77	98%	.66
Major Depression	1	0	0.57	97%	.66
Bipolar Disorder	0	0	0.00	100%	1.00
Dysthymia	2	0	1.84	98%	.66
Separation Anxiety	9	2	1.80	84%	.33
Avoidant Disorder	1	0	0.60	96%	.49
Overanxious Disorder	5	1	1.18	86%	.12
Simple Phobia	14	5	0.86	66%	.01
Obsessive Compulsive	0	0	0.00	100%	1.00
Posttraumatic Stress	8	1	2.59	88%	.20

[a] Groups did not differ on any of the diagnostic categories.

[b] Ratio of agreement between parents and children.

[c] Diagnoses based on parent report.

Table 24

ANOVAs Across Traumatization and Comparison Groups-Child Variables

| Variable | Comparison Group(1)[a] | Traumatization Group | | Tukey Contrast |
		Low(2)[b]	High(3)[c]	
Interview Age (Months)	129.8	148.5	120.7	2 > 3
	(32.0)	(38.3)	(32.8)	
Trait Anxiety of Child	30.9	31.2	36.0	3 > 1
	(6.2)	(6.5)	(6.0)	
Child Psych. History	.160	.222	.143	ns
	(.374)	(.422)	(.363)	
Life Stress	71.9	132.2	132.4	ns
	(60.6)	(108.8)	(125.1)	
Coping	16.5	17.0	16.1	ns
	(10.5)	(10.2)	(14.0)	
Child Depression	5.68	6.31	8.79	ns
	(3.46)	(4.85)	(5.03)	
Fears of Child	121.8	124.8	153.9	3 > 2,1
	(28.1)	(23.0)	(22.5)	
Accident Fears of Child	12.2	11.7	14.6	3 > 2,1
	(2.4)	(1.8)	(3.2)	
CBCL-Internal	52.4	53.4	55.6	ns
	(8.3)	(11.0)	(10.4)	
CBCL-External	51.0	53.5	55.5	ns
	(8.7)	(9.3)	(9.7)	

[a] n =25. [b] n = 36. [c] n = 14.

Table 25

ANOVAs Across Traumatization and Comparison Groups-Family Variables

Variable	Comparison Group(1)[a]	Traumatization Group Low(2)[b]	High(3)[c]	Tukey Contrast
Socioeconomic Status	47.7	45.3	40.9	ns
	(13.7)	(14.3)	(13.4)	
Family Psych. History	.280	.500	.429	ns
	(.458)	(.507)	(.512)	
Parental Depression	6.38	5.96	6.21	ns
	(5.62)	(5.49)	(5.47)	
Parental Mental Health	169.5	165.9	170.9	ns
	(27.1)	(26.6)	(33.6)	
Trait Anxiety of Parent	36.8	37.0	39.9	ns
	(8.4)	(11.2)	(11.6)	
Accident Fears of Parent	2.56	4.31	4.76	ns
	(4.13)	(6.18)	(5.76)	
Fears of Parent	48.7	61.3	77.8	ns
	(33.6)	(42.8)	(47.4)	

Note. Chi-square analyses were conducted to determine differential proportions across the three groups on this table for the variables of gender and parent PTSD diagnosis. Neither of these tests were significant, $p < .05$.

[a] $n = 25$. [b] $n = 36$. [c] $n = 14$.

Index to Appendices

Appendix A-1: Information Letter Following Phone Contact

Dear (Parent's Name),

   We are writing to ask for your help in a project about children who have been in car accidents. We learned that (child's name) was in an accident from the Roanoke (Christiansburg or Blacksburg) Police Department records, which as you may know, are available to the public. You and your child can help us learn more about how to help children who have been involved in accidents by talking with us and completing some surveys.

   Our project will look at how children react to being in an accident. Over 5,000 children under 15 years of age are injured in accidents each year in Virginia alone. Almost all children see a doctor if they have physical injuries or other medical problems resulting from the accident. But most children do not see a doctor if they have other kinds of reactions. For example, some children may have increased fears, worries, sleep problems, nightmares and bad memories of the accident. Other children, however, may have little or no reaction. We want to find out more about how children react after an accident and what makes children react so differently. We will also want you to answer some questions about you and your child's reactions to the accident.

   To be involved in the project, it will be necessary for you and your child to meet with us for about 3 hours at the Roanoke Valley Graduate Center (or the Psychological Services Center), at a time that is convenient for you. While this is a lot of time, it is very important that we learn all that we can about your child's experience. If transportation is a problem, we can help out. All interview information will be kept <u>strictly confidential</u>.

   The session will allow you the opportunity to talk about the accident, something that many people find helpful. In addition, we can give you our impressions of how (child's name) is adjusting and what factors might lessen the impact of the event.

   We will be calling you in the next couple of weeks to answer any questions you might have and see if you would like to participate. We hope that you will be able to do so. If you have any questions before then, please feel free to call us at the Psychological Services\Child Study Center at 231-6914. We will be happy to talk with you at anytime.

                              Sincerely,

Jane M. Keppel-Benson, M.S.   Thomas H. Ollendick, Ph.D.
Clinician, Child Study Center   Licensed Clinical Psychologist

Appendix A-2: Information Letter to Families Unavailable by Phone

Dear (Parent's Name),

We are writing to ask for your help in a project about children who have been in car accidents. We learned that (child's name) was in an accident from the Roanoke (Christiansburg or Blacksburg) Police Department records, which as you may know, are available to the public. You and your child can help us learn more about how to help children who have been involved in accidents by talking with us and completing some surveys.

Our project will look at how children react to being in an accident. Over 5,000 children under 15 years of age are injured in accidents each year in Virginia alone. Almost all children see a doctor if they have physical injuries or other medical problems resulting from the accident. But most children do not see a doctor if they have other kinds of reactions. For example, some children may have increased fears, worries, sleep problems, nightmares and bad memories of the accident. Other children, however, may have little or no reaction. We want to find out more about how children react after an accident and what makes children react so differently. We will also want you to answer some questions about you and your child's reactions to the accident.

To be involved in the project, it will be necessary for you and your child to meet with us for about 3 hours at the Roanoke Valley Graduate Center (or the Psychological Services Center), at a time that is convenient for you. While this is a lot of time, it is very important that we learn all that we can about your child's experience. If transportation is a problem, we can help out. All interview information will be kept <u>strictly confidential</u>.

The session will allow you the opportunity to talk about the accident, something that many people find helpful. In addition, we can give you our impressions of how (child's name) is adjusting and what factors might lessen the impact of the event.

Since your phone number is unavailable, we have enclosed a self-addressed postcard to help in our correspondence. Please indicate on the card whether or not you agree to talk with us further about the project, either by giving us your number or by agreeing to call. Be assured that your phone number will not be disclosed to persons outside the project, nor will it be used for any other purposes. If you would like to contact us, please feel free to call us at the Psychological Services\Child Study Center at 231-6914. We will be happy to talk with you at anytime.

Sincerely,

Jane M. Keppel-Benson, M.S.   Thomas H. Ollendick, Ph.D.
Clinician, Child Study Center   Licensed Clinical Psychologist

Appendix A-3: Consent Form for Target Families

Protocol#:____

I consent to participating in the research project entitled:
Posttraumatic Stress Disorder in Children: Psychological Adjustment
Following Automobile Accidents

Jane M. Keppel-Benson, M.S, principal investigator, or her
authorized representative has explained the purpose of the study,
the procedures to be followed, and the expected duration of my (my
child's) participation. Possible benefits/risks of the study have
also been described.

More specifically, I understand that talking about the accident and
its effects may cause some discomfort for me and my child. If such
discomfort occurs, I will be provided the names of agencies to call
if I so desire. I also understand that if I want to be seen at the
Psychological Service Center itself, an appointment can be
arranged. However, I also understand that some people do not
experience such discomfort when talking about these matters and
that I may not experience severe distress or discomfort.

I acknowledge that I have had the opportunity to obtain additional
information regarding the study and that any questions I have
raised have been answered to my full satisfaction. Further, I
understand that I am (my child is) free to withdraw consent at any
time and to discontinue participation in the study without
prejudice to me (my child).

I understand that portions of this evaluation will be videotaped
for use in the project, and will be viewed only by the
investigator, her advisor, or her assistants. After project, the
tapes will be destroyed.

I understand that this project has been approved by the Human
Subjects Committee and the Institutional Review Board and any
questions that I may have about the project should be addressed
to Jane M. Keppel-Benson, M.S. (231-6914), principal investigator;
Thomas H. Ollendick, Ph.D. (231-6451), faculty advisor; Helen
Crawford (231-5874), Human Subjects Committee Chair; Ernest R.
Stout (231-5281), Institutional Review Board Chairperson.

Finally, I hereby agree to voluntarily participate in the research
project described above and under the conditions described above.

_____
parent's signature

_____
child's signature

Appendix A-4: Consent Form For Comparison Families

Protocol#:____

I consent to participating in the research project entitled:
Posttraumatic Stress Disorder in Children: Psychological Adjustment
Following Automobile Accidents

Jane M. Keppel-Benson, M.S, principal investigator, or her
authorized representative has explained the purpose of the study,
the procedures to be followed, and the expected duration of my (my
child's) participation. Possible benefits/risks of the study
have also been described.

More specifically, I understand that talking about anxiety and its
effects may cause some discomfort for me and my child. If such
discomfort occurs, I will be provided the names of agencies to call
if I so desire. I also understand that if I want to be seen at the
Psychological Service Center itself, an appointment can be
arranged. However, I also understand that some people do not
experience such discomfort when talking about these matters and
that I may not experience severe distress or discomfort.

I acknowledge that I have had the opportunity to obtain additional
information regarding the study and that any questions I have
raised have been answered to my full satisfaction. Further, I
understand that I am (my child is) free to withdraw consent at any
time and to discontinue participation in the study without
prejudice to me (my child).

I understand that portions of this evaluation will be audiotaped
for use in the project, and will be reviewed only by the
investigator, her advisor, or her assistants. After the project,
the tapes will be destroyed.

I understand that this project has been approved by the Human
Subjects Committee and the Institutional Review Board and any
questions that I may have about the project should be addressed
to Jane M. Keppel-Benson, M.S. (231-6914), principal investigator;
Thomas H. Ollendick, Ph.D. (231-6451), faculty advisor; Helen
Crawford (231-5874), Human Subjects Committee Chair; Ernest R.
Stout (231-5281), Institutional Review Board Chairperson.

Finally, I hereby agree to voluntarily participate in the research
project described above and under the conditions described above.

_____
parent's signature

_____
child's signature

Appendix B-1: Child Accident Interview

Subject #____
Interviewer jk 01   pw 02   mw 03   va 04   sb 05   other:

How old are you? 7 8 9 10 11 12 13 14 15
What grade are you in?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Who lives in your house with you?
    01   mother   02   step-mother
    03   father   04   step-father
    05   older brother(s) #___   06   younger brother(s) #___
    07   older sister(s) #___   08   younger sister(s) #___
    others:

Tell me about the accident that you were in:
Ask about the accident per se, and events prior to and following
the crash. (Probes: What happened then? Tell me more about that.)

Were you hurt during the accident? Indicate child's response:
then indicate Police Injury Code from accident report:
02 visible signs of injury, as bleeding wound or distorted member
      or had to be carried from scene
03 other visible injury, such as bruises, abrasions, swelling,
      limping, etc.
04 no visible injury but complaint of pain or momentary
      unconsciousness

Did you see other people that were hurt? no 01 yes 02 **Who?** 01
mother 02 father 03 sibling 04 other relative 05 friend 06
stranger other:
What did you see?

Who was with you in the accident? mother 01 father 02 sibling 03
 other relative 04 other 05 specify:
Anyone else?

Where were you when the accident happened? front 01 back seat 02
bicycle 03 pedestrian 04 other 05 specify:_____

If a passenger, **Were you wearing a safety (seat) belt?** no 01 yes
02 don't know 03   If passenger or bicyclist, **Where were you
going?**

Appendix B-1: Child Accident Interview (cont.)

Since the accident, have you ever blamed yourself for what happened or thought that it was your fault? no 01   yes 02

As you think about the accident right now, I want you to tell me how much you feel like it was your fault. Look at this scale (show Card A). You see the numbers 1 to 5. I want you to tell me how much you think that the accident was your fault by giving me one of these numbers. For example, if you don't think that it was your fault <u>at all</u>, then you would say #1. If you think the accident was a little bit your fault, you'd say #2, if you think that it was some your fault, you'd say #3; quite a bit, #4; and <u>a lot</u> your fault, #5. Do you understand? Okay, which one describes what you think?

1	2	3	4	5
not at all	a little	some	quite a bit	a lot

Who or what do you think caused the accident? (if they respond with more than one answer, If you had to choose just one thing..) chance 01 obstacle in road 02 weather or road conditions 03 bad luck 04 other driver 05 child's behavior 06   other 07 Specify:

Looking back on the accident, do you feel like there is anything you could have done to keep it from happening? No 01 Yes 02 Unsure 03   If yes or unsure say: Tell me more about that. Specify:

Have you ever been in an accident (car or bike) before? No 01 Yes 02 If yes, describe:

If yes, Who were your with? 01 mother 02 father 03 relative 04 friend 05 alone 06 other Specify and code:

When did it happen?   Describe the accident briefly. Note if serious injuries occurred.

Has anyone you know ever been in a serious (car or bike) accident before? No 01   Yes 02   Who?   What happened?.

Appendix B-1: Child Accident Interview

How often do you and your parent(s) talk about the accident that you were in?

daily	No. of times/day ____
weekly	No. of times/wk ____
monthly	No. of times/mth ____

once every few months
several times following accident only
not since it occurred

Do you talk to anyone else about it? no 01 yes 02 Who?
What do you say?

I'm going to read a number of words that describe different feelings and emotions. After I say the word, I want you to find the number on this scale (show Card B) that tells me how much you feel this way when you think about the accident. For example, the first one is "sad". When you think about the accident, how sad do you feel? If you do not feel sad at all, then you would put #1 on the blank line. If you feel a little sad, you would put #2. If you feel kind of in the middle or "somewhat" sad, you'd say #3. If you feel "a lot" sad, you'd say #4 and if you feel "very, very sad", then you'd say # 5. Do you understand? (Repeat all options for next entry, then you may use a shortened version to complete the rest).

1	2	3	4	5
not at all	a little	some	a lot	very much

sad   ____   upset   ____
angry   ____   worried ____
guilty   ____   (responsible, feeling bad because it was
your   fault)
scared   ____   (afraid)
relieved   ____   (glad that things were not worse)
optimistic   ____   (like things will be okay)
pessimistic   ____   (like things are not going to be okay)

What happened to you <u>right</u> after the accident? 01 walked away from scene   02 treated by rescue squad and released   03 taken to hospital Other 04 Specify:

If the child was in a car, (not a pedestrian or on a bike), What happened to the other people in your car right after the accident happened? 01 walked away from scene   02 treated by rescue squad and released 03 taken to hospital 04 other Specify:

What happened the people in the other car(s) right after the accident happened? 01 walked away from scene 02 treated by rescue squad and released 03 taken to hospital 04 don't know

Appendix B-1: Child Accident Interview (cont.)

Look at this scale (show Card C). I'd like for you to tell me how other people treated you after the accident. If a person was very helpful and nice to you, you'd say #1. If they were nice, you'd say #2; if they were so-so or in between, you'd say #3; if they were kind of mean or not so nice, you'd say #4, and if they were very mean or unhelpful then you would say #5. Do you understand? OK. What about the other people in your car. How did they treat you after the accident? write down response and continue .....

1	2	3	4	5
very positive or helpful	positive	neutral	negative	very negative or hurtful

other passengers in same car ____
passengers in other car ____
police ____
emergency room staff ____
doctors ____
parents ____
other people at the scene (bystanders) ____
Can you think of other people that I haven't mentioned?

If parent not in accident, ask:
  How long after the accident did you first see your parent(s)?
  01 within 30 minutes
  02 within an hour
  03 several hours later
  04 next day
  05 longer Specify:_____

What did your parent(s) do or say to you when they first saw you after the accident?

After something bad like an accident happens to people, they sometimes ask questions like, "Why did this have to happen to me?". Have you ever asked yourself this type of question?
No 01 Yes 02 Other 03

Exactly what do you ask?

Did you come up with an answer?
No 01 Yes 02 Other 03   What was it?

Appendix B-1: Child Accident Interview (cont.)

Have you noticed any changes in yourself since the accident?
No 01 Yes 02
Wait for response, then probe specifically with the following,

	NO	YES
Like— how you get along with your friends?	01	02
—how you get along with your parents?	01	02
—how you do in school?	01	02
—how much you eat?	01	02
—how well you sleep?	01	02

Have you noticed any of these kinds of changes in your parents?
No 01 Yes 02

How about changes in how your parents treat you?
No 01 Yes 02
If yes, What have you noticed?

Do you think that your parent(s) worry more about something bad
happening to you than they did before the accident? no 01 yes 02

Do they need to know where you are more than before? no 01 yes 02

How do you think that you have handled the accident compared to
other children? (Show Card D) If you think that you handled it a
lot better than other children, you would say #5. If you think
that you handled it somewhat better, you'd say #4; if you think you
handled it about the same as other children, you'd say #3. If you
think you handled it somewhat worse than other children, you'd say
#2; and, if you think that you handled it a lot worse, you'd say
#1. So, compared to other children, how do you think you handled
the accident? (Follow-up question on next page...)

1	2	3	4	5
a lot worse	somewhat worse	about the same	somewhat better	much better

If 1,2,4,or 5 is indicated, ask: In what ways do you think that you
   handled it (better or worse) ?

Are you comparing yourself to someone in particular? no 01 yes 02
If yes, Who? (indicate comparison child's age and relationship to
            target child)

Appendix B-1: Child Accident Interview (cont.)

How likely would you say it is that another accident will happen to you or someone in your family at some point in the future? (Card E) If you think it is very, very likely, you'd say #5; if you think that it is very likely, you'd say #4; likely, you'd say #3; somewhat likely, #2; and not at all likely, #1.

1	2	3	4	5
not at all likely	somewhat likely	likely	very likely	very, very likely

Since the accident, have you ever found yourself thinking, "It could have been worse"?   no 01   yes 02
If yes, Tell me more about that.

Sometimes even the worst events have their positive side.   Have you benefitted in any way or had good things happen to you because of the accident?   no 01   yes 02
If yes, Tell me more about that.

Thank you for sharing your thoughts and feelings with us.

Appendix B-2: Reaction Index

ID#:_____

Below are some statements about how children and adolescents might react to the stress of car accidents. For each one, circle the number to show how much of the time it is true for you.

	None of the Time	Little of the Time	Some of the Time	Much of the Time	Most of the Time
1. I feel the accident was so bad it would upset most youngsters.	1	2	3	4	5
2. I feel afraid or upset with thoughts about the accident.	1	2	3	4	5
3. I go over in my mind what happened, keep seeing pictures or hearing the sounds.	1	2	3	4	5
4. Bad thoughts about the accident come back even though I don't want them to.	1	2	3	4	5
5. I have bad dreams since the accident.	1	2	3	4	5
6. Things sometimes make me think it might happen again.	1	2	3	4	5
7. I feel as good about things I like to do as I did before the accident.	1	2	3	4	5
8. I feel more alone inside; other people do not really understand how I'm feeling.	1	2	3	4	5
9. I feel so scared or sad sometimes that I don't really understand how I'm feeling.	1	2	3	4	5

Appendix B-2: Reaction Index (cont.)

	None of the Time	Little of the Time	Some of the Time	Much of the Time	Most of the Time
10. I feel so scared or sad I can't even talk or cry about it.	1	2	3	4	5
11. I'm more jumpy or nervous than before (startled at loud noises).	1	2	3	4	5
12. I sleep well.	1	2	3	4	5
13. I feel bad that I couldn't do something to stop it from happening or to help.	1	2	3	4	5
14. I remember things well; thoughts or feelings about the accident do not make me forget things I learn in school.	1	2	3	4	5
15. It's as easy now to pay attention as before.	1	2	3	4	5
16. I want to stay away from things that make me think about what happened.	1	2	3	4	5
17. When something makes me think about the accident, I get tense or upset.	1	2	3	4	5
18. I remember something else happening that seemed to warn that the accident was going to happen.	1	2	3	4	5

Appendix B-2: Reaction Index (cont.)

	None of the Time	Little of the Time	Some of the Time	Much of the Time	Most of the Time
19. I have stomachaches, headaches, or other signs of illness since the accident.	1	2	3	4	5
20. I do not behave recklessly or take chances.	1	2	3	4	5

Appendix B-3: Impact of Events Scale

ID#_____

On _____ you experienced _____ . Below is a list of comments made by people after stressful life events. Please check each item, indicating how frequently these comments were true for you during the PAST SEVEN DAYS. If they did not occur during that time, please mark the "not at all" column.

Comment	FREQUENCY			
	Not at all	Rarely	Sometimes	Often
1. I thought about it when I didn't mean to.	_____	_____	_____	_____
2. I avoided letting myself get upset when I thought about it or was reminded of it.	_____	_____	_____	_____
3. I tried to remove it from memory.	_____	_____	_____	_____
4. I had trouble falling asleep or staying asleep because of pictures or thoughts about it that came into my mind.	_____	_____	_____	_____
5. I had waves of strong feeling about it.	_____	_____	_____	_____
6. I had dreams about it.	_____	_____	_____	_____
7. I stayed away from reminders of it.	_____	_____	_____	_____
8. I felt as if it hadn't happened or it wasn't real.	_____	_____	_____	_____
9. I tried not to talk about it.	_____	_____	_____	_____
10. Pictures about it popped into my mind.	_____	_____	_____	_____
11. Other things kept making me think about it.	_____	_____	_____	_____

Appendix B-3: Impact of Events Scale (cont.)

FREQUENCY

Comment	Not at all	Rarely	Sometimes	Often
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.	_____	_____	_____	_____
13. I tried not to think about it.	_____	_____	_____	_____
14. Any reminder brought back feelings about it.	_____	_____	_____	_____
15. My feelings about it were kind of numb.	_____	_____	_____	_____

Appendix B-4: Self-Rating Questionnaire (FSSC-R)

Thomas H. Ollendick

ID#: _____

DIRECTIONS: A number of statements which boys and girls use to describe the fears they have are given below. Read each fear carefully and put an X in the blank in front of the word that describes your fear. There are no right or wrong answers. Remember, find the word which best describes how much fear you have.

1. Giving an oral report .... __ None __ Some __ A lot

2. Riding in the car or bus .... __ None __ Some __ A lot

3. Getting punished by mother .... __ None __ Some __ A lot

4. Lizards .... __ None __ Some __ A lot

5. Looking foolish .... __ None __ Some __ A lot

6. Ghost or spooky things .... __ None __ Some __ A lot

7. Sharp objects .... __ None __ Some __ A lot

8. Having to go to the hospital ...... __ None __ Some __ A lot

9. Death or dead people .... __ None __ Some __ A lot

10. Getting lost in a strange place ... __ None __ Some __ A lot

11. Snakes .... __ None __ Some __ A lot

12. Talking on the telephone .... __ None __ Some __ A lot

13. Roller coaster or carnival rides .. __ None __ Some __ A lot

14. Getting sick at school .... __ None __ Some __ A lot

15. Being sent to the principal .... __ None __ Some __ A lot

16. Riding on the train .... __ None __ Some __ A lot

17. Being left at home with a sitter .. __ None __ Some __ A lot

18. Bears or wolves .... __ None __ Some __ A lot

19. Meeting someone for the first time. __ None __ Some __ A lot

20. Bombing attacks -- being invaded .. __ None __ Some __ A lot

Appendix B-4: Self-Rating Questionnaire (FSSC-R) (cont.)

21. Getting a shot from a doctor or nurse__ None __ Some __ A lot

22. Going to the dentist .... __ None __ Some __ A lot

23. High places like on mountains ...... __ None __ Some __ A lot

24. Being teased .... __ None __ Some __ A lot

25. Spiders .... __ None __ Some __ A lot

26. A burglar breaking into our house... __ None __ Some __ A lot

27. Flying in a plane .... __ None __ Some __ A lot

28. Being called on by the teacher...... __ None __ Some __ A lot

29. Getting poor grades................. __ None __ Some __ A lot

30. Bats or birds....................... __ None __ Some __ A lot

31. My parents criticizing me .... __ None __ Some __ A lot

32. Guns .... __ None __ Some __ A lot

33. Being in a fight .... __ None __ Some __ A lot

34. Fire -- getting burned.............. __ None __ Some __ A lot

35. Getting a cut or injury .... __ None __ Some __ A lot

36. Being in a big crowd .... __ None __ Some __ A lot

37. Thunderstorms....................... __ None __ Some __ A lot

38. Having to eat some food I don't like.__ None __ Some __ A lot

39. Cats................................ __ None __ Some __ A lot

40. Failing a test..................... __ None __ Some __ A lot

41. Being hit by a car or truck .... __ None __ Some __ A lot

42. Having to go to school ....__ None __ Some __ A lot

43. Playing rough games during recess... __ None __ Some __ A lot

44. Having my parents argue .... __ None __ Some __ A lot

45. Dark rooms or closets .... __ None __ Some __ A lot

Appendix B-4: Self-Rating Questionnaire (FSSC-R) (cont.)

46. Having to put on a recital.......... __ None __ Some __ A lot

47. Ants or beetles..................... __ None __ Some __ A lot

48. Being criticized by others .... __ None __ Some __ A lot

49. Strange looking people .... __ None __ Some __ A lot

50. The sight of blood.................. __ None __ Some __ A lot

51. Going to the doctor................. __ None __ Some __ A lot

52. Strange or mean looking dogs .... __ None __ Some __ A lot

53. Cemeteries.......................... __ None __ Some __ A lot

54. Getting a report card .... __ None __ Some __ A lot

55. Getting a haircut .... __ None __ Some __ A lot

56. Deep water or the ocean .... __ None __ Some __ A lot

57. Nightmares .... __ None __ Some __ A lot

58. Falling from high places .... __ None __ Some __ A lot

59. Getting a shock from electricity ... __ None __ Some __ A lot

60. Going to bed in the dark .... __ None __ Some __ A lot

61. Getting car sick .... __ None __ Some __ A lot

62. Being alone .... __ None __ Some __ A lot

63. Having to wear clothes different
       from others .... __ None __ Some __ A lot

64. Getting punished by her father...... __ None __ Some __ A lot

65. Having to stay after school .... __ None __ Some __ A lot

66. Making mistakes .... __ None __ Some __ A lot

67. Mystery movie .... __ None __ Some __ A lot

68. Loud sirens .... __ None __ Some __ A lot

69. Doing something new .... __ None __ Some __ A lot

70. Germs or getting a serious illness . __ None __ Some __ A lot

Appendix B-4: Self-Rating Questionnaire (FSSC-R) (cont.)

71. Closed places .... __ None __ Some __ A lot

72. Earthquakes .... __ None __ Some __ A lot

73. Russia .... __ None __ Some __ A lot

74. Elevators .... __ None __ Some __ A lot

75. Dark places .... __ None __ Some __ A lot

76. Not being able to breathe .... __ None __ Some __ A lot

77. Getting a bee sting .... __ None __ Some __ A lot

78. Worms or snails .... __ None __ Some __ A lot

79. Rats or mice .... __ None __ Some __ A lot

80. Taking a test .... __ None __ Some __ A lot

*81. Seeing or hearing automobiles ...... __ None __ Some __ A lot

*82. Thinking about riding in a car...... __ None __ Some __ A lot

*83. Seeing a car in a magazine or on tv. __ None __ Some __ A lot

*84. Thinking about parents riding in a car
                                        __ None __ Some __ A lot

*85. Thinking about going someplace ..... __ None __ Some __ A lot

*86. Leaving mom or dad................. __ None __ Some __ A lot

*87. Police/ Ambulances................. __ None __ Some __ A lot

*88. Being trapped in a car .... __ None __ Some __ A lot

*89. Motorcycles/ Bicycles .... __ None __ Some __ A lot

* These nine items were added to FSSC-R. They are the items of the Child Accident Fears Scale.

Appendix B-5: Parent Accident Interview

Subject #____
Interviewer jk 01 pw 02 mw 03 va 04 sb 05 other:

**Now I'd like to ask you some specifics about the accident. I
understand that the accident occurred on** _____ . **Is that
right? If no, when did it happen?** _____.

O.K. In your own words, briefly tell me about the accident:
Ask about the accident per se, <u>and</u> events prior to and following
the crash. (Probes: What happened then? Tell me more about that.)

Who was with (child's name) during the accident? mother 01 father
02 sibling 03 other relative 04 other 05 Specify:
Anyone else?

Where was (child's name) during the accident? front 01 back seat
02 bicycle 03   pedestrian 04 other 05 specify:

What was the purpose of the drive? purposeful 01   leisure 02

If child was a passenger in a car ask,
    **Was the driver of (child's name)'s car travelling over the speed
    limit?** no 01 yes 02 don't know 03
    Were safety belts used by your child(ren)? no 01   yes 02

If parent was in car, assess severity of parent's injury by asking:
    Were you injured? Tell me about your injuries.
then indicate Police Injury Code from accident report:
02 visible signs of injury, as bleeding wound or distorted member
      or had to be carried from scene
03 other visible injury, such as bruises, abrasions, swelling,
      limping, etc.
04 no visible injury but complaint of pain or momentary
      unconsciousness

Who else was injured in the accident? no one 01 specify others:
Code <u>most</u> seriously injured other: 02 03   04

Appendix B-5: Parent Accident Interview (cont.)

If parent or others were injured, show (card A) and ask:
How much do you feel that (child's name) was affected by his/her injury?

1	2	3	4	5
not at all	a little	some	quite a bit	a lot

According this same scale (Card A)...
    To what extent do you feel that (child's name) was negatively
    affected by the accident in general? 1 2 3 4 5
    To what extent would you say that you were negatively affected
      by the accident? 1 2 3 4 5
      If greater than 1,
      How are you trying to deal with the accident? What do
you do to cope with the situation? Probe: Anything else?

      What has worked best for you in trying to deal with the
      situation?

      What have you tried that hasn't worked?

(Show card A again) To what extent do you feel responsible for your
child's accident? 1 2 3 4 5

**Who or what was the cause of the accident? (If you had to choose
one thing, what would it be?)** chance 01 obstacle in road 02
weather or road conditions 03 bad luck 04 other driver 05
child's behavior 06

**Looking back on the accident, do you feel as if there is anything
you could have done to prevent it?**
01 No   02 Unsure   03 Yes
If yes or unsure, Please tell me more about that.

**Is there anything that you feel that you could have done to reduce
the severity of the accident?** 01 no   02 unsure   03 yes

Are the courts involved in the case? No 01 Yes 02
If yes,
    Civil 01 **or criminal** 02 **case?**
    If civil, **Who filed suit?** parent 01 driver of child's car 02
 other driver 03

Appendix B-5: Parent Accident Interview (cont.)

(Show Card B). Before your child's accident, how often did you
consider the possibility of an accident occurring to you or to a
member of your family? How about now?

1	2	3	4	5
never	rarely	sometimes	often	most of the time

Has your child ever been in an accident before? 01 No 02 Yes
If yes,
  With whom was s/he riding? 01 parent 02 relative 03 other
  When?   Describe the accident briefly.

Has anyone else in your family ever been in an accident before? 01
No   02 Yes
If yes,
  Who? 01 parent (of target child) 02 relative 03 other
Specify:
  When?   Describe the accident briefly.

How often do you and your child talk about his/her accident?
daily   No. of times/day ____
weekly   No. of times/wk   ____
monthly   No. of times/mth ____
once every few months
several times following accident only
not since it occurred

Do you ever discuss your reactions to the accident with anyone
else? (or help or advice about problems related to the accident)
no 01 yes 02 Who? minister/priest 01 marriage or family
counselor/therapist 02 medical doctor 03 self-help group 04
friends 05 your employer 06 other 07 Specify:

I'm going to read a number of words that describe different
feelings and emotions. Indicate to me, on the 1 to 5 scale (show
Card B) the extent to which you feel each of these when you think
about the accident.

1	2	3	4	5
very slightly	a little	moderately	quite a bit	extremely

angry   ____   ashamed   ____
distressed ____   relieved   ____
concerned ____   optimistic ____
upset   ____   pessimistic ____
numb   ____   guilty   ____
indifferent ____   scared   ____
helpless   ____   hostile   ____

Appendix B-5: Parent Accident Interview (cont.)

***If parent present during accident, ask:
   What happened to you immediately after the accident? 01 walked
   away from scene 02 treated by rescue squad and released 03
   taken to hospital other:

   **What did you do or say to your child immediately after the
accident?**

   **How would you rate the response of the following other persons
   involved?** (Card C)

1	2	3	4	5
very	positive	neutral	negative	very
positive				negative
or helpful				or hurtful

   other passengers in same car   ____
passengers in other car   ____
police   ____
emergency room staff   ____
doctors   ____
other bystanders at the scene   ____

   Can you think of others that I haven't mentioned?

***If parent not in car, ask:
   How did you find out about your child's accident? 01 family
 member 02 friend/neighbor 03 police 04 neighbor/friend 05
other Specify:

   **What did you do or say to your child when you first saw
   him/her after the accident?**

If child or parent taken to the hospital,
How long did you/your child stay in the hospital?

How long were you separated from your child? or **How long after the
accident did you see your child?**
   01 within 30 minutes
   02 within an hour
   03 several hours later
   04 next day
   05 longer Specify:_____

What happened to your child immediately following the accident?
01 walked away from scene 02 treated by rescue squad and released
03 taken to hospital other:

Appendix B-5: Parent Accident Interview (cont.)

Do you feel that other people avoid you or your child or are uncomfortable around you because of the accident? no 01 yes 02 If yes, Who? and Why? Specify:

Anyone else?

Many people ask "why me" or "why my child" when something like this happens. Have you ever asked yourself this type of question? No 01   Yes 02   Other 03

Exactly what do you ask?

Did you come up with an answer? No 01   Yes 02   Other 03 If yes, What was it?

Sometimes stressful events can affect marital relationships. Have you noticed differences in the quality of your relationship with your spouse?   No 01   Yes 02   Other 03

How did your relationship change after accident? Check if the following are mentioned:
____ became closer   ____ became more distant
____ increased communication   ____ decreased communication
____ less conflict/arguments   ____ more conflict/arguments

Have there been any changes in your employment since the accident? No 01 Yes 02   If yes ask: Was this a result of the accident? No 01 Yes 02 Has the accident affected your ability to do your job?   No 01 Yes 02   Describe:

Have financial difficulties resulted from the accident? No 01 Yes 02 If yes, describe:

Now I'd like to ask you some questions about your child. Have you noticed any changes in his/her behavior since the accident? No 01   Yes 02   If yes, please describe these:

Appendix B-5: Parent Accident Interview (cont.)

Have you noticed differences in the types of games that your child plays? No 01   Yes 02   If yes, tell me about the differences.

Compared to other children in general, rate your child's current level of functioning? (show Card D)

1	2	3	4	5
much worse than most		similar		much better than most

Now, compared to other children involved in a car accident, how do you perceive your child's adjustment so far? (show Card D again)

1	2	3	4	5
much worse than most		similar		much better than most

Are you comparing your child with anyone in particular? no 01 yes 02 If yes, Who? (indicate child's age)

How likely would you say is it that another accident will happen to you or someone in your family at some point in the future? (Card E)

1	2	3	4	5
not at all likely				extremely likely

Since the accident, do you worry more about the possibility of harm coming to your child(ren)? no 01   yes 02   Please describe your worries.

Since the accident, do you need to know where your children are more than before? no 01 yes 02

Since the accident, have you ever found yourself thinking, "It could have been worse"? no 01   yes 02   If yes, Tell me more about that.

Sometimes even the worst events have their positive side. Have you benefitted in any way or had good things happen to you as a result of the accident? no 01   yes 02   If yes, Tell me more about that.

Thank you for sharing your thoughts and feelings with us.

Appendix B-6: Fear Survey Schedule (FSS-III)

ID#: _____

The items in this questionnaire refer to things and experiences that may cause fear or other unpleasant feelings. Check the column that describes how much you are disturbed by each item nowadays.

	Not at All	A Little	A Fair Amount	Much	Very Much
1. Noise of vacuum cleaners	____	____	____	____	____
2. Open wounds	____	____	____	____	____
3. Being alone	____	____	____	____	____
4. Being in a strange place	____	____	____	____	____
5. Loud voices	____	____	____	____	____
6. Dead people	____	____	____	____	____
7. Speaking in public	____	____	____	____	____
8. Crossing streets	____	____	____	____	____
9. People who seem insane	____	____	____	____	____
10. Falling	____	____	____	____	____
11. Automobiles	____	____	____	____	____
12. Being teased	____	____	____	____	____
13. Dentists	____	____	____	____	____
14. Thunder	____	____	____	____	____
15. Sirens	____	____	____	____	____
16. Failure	____	____	____	____	____
17. Entering a room where other people are already seated	____	____	____	____	____
18. High places on land	____	____	____	____	____

Appendix B-6: Fear Survey Schedule (FSS-III) (cont.)

	Not at All	A Little	A Fair Amount	Much	Very Much
19. People with deformities	_____	_____	_____	_____	_____
20. Worms	_____	_____	_____	_____	_____
21. Imaginary creatures	_____	_____	_____	_____	_____
22. Receiving injections	_____	_____	_____	_____	_____
23. Strangers	_____	_____	_____	_____	_____
24. Bats	_____	_____	_____	_____	_____
25. Journeys: a) train b) bus c) car	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____
26. Feeling angry	_____	_____	_____	_____	_____
27. People in authority	_____	_____	_____	_____	_____
28. Flying insects	_____	_____	_____	_____	_____
29. Seeing other people injected	_____	_____	_____	_____	_____
30. Sudden noises	_____	_____	_____	_____	_____
31. Dull weather	_____	_____	_____	_____	_____
32. Crowds	_____	_____	_____	_____	_____
33. Large open spaces	_____	_____	_____	_____	_____
34. Cats	_____	_____	_____	_____	_____
35. One person bullying another	_____	_____	_____	_____	_____
36. Tough looking people	_____	_____	_____	_____	_____
37. Birds	_____	_____	_____	_____	_____

Appendix B-6: Fear Survey Schedule (FSS-III) (cont.)

	Not at All	A Little	A Fair Amount	Much	Very Much
38. Sight of deep water	____	____	____	____	____
39. Being watched working	____	____	____	____	____
40. Dead animals	____	____	____	____	____
41. Weapons	____	____	____	____	____
42. Dirt	____	____	____	____	____
43. Crawling insects	____	____	____	____	____
44. Sight of fighting	____	____	____	____	____
45. Ugly people	____	____	____	____	____
46. Fire	____	____	____	____	____
47. Sick people	____	____	____	____	____
48. Dogs	____	____	____	____	____
49. Being criticized	____	____	____	____	____
50. Strange shapes	____	____	____	____	____
51. Being in an elevator	____	____	____	____	____
52. Witnessing surgical operations	____	____	____	____	____
53. Angry people	____	____	____	____	____
54. Mice	____	____	____	____	____
55. Blood: a) human	____	____	____	____	____
b) animal	____	____	____	____	____
56. Parting from friends	____	____	____	____	____
57. Enclosed places	____	____	____	____	____

Appendix B-6: Fear Survey Schedule (FSS-III) (cont.)

	Not at All	A Little	A Fair Amount	Much	Very Much
58. Prospect of a surgical operation	___	___	___	___	___
59. Feeling rejected by others	___	___	___	___	___
60. Airplanes	___	___	___	___	___
61. Medical odors	___	___	___	___	___
62. Feeling disapproved of	___	___	___	___	___
63. Harmless snakes	___	___	___	___	___
64. Cemeteries	___	___	___	___	___
65. Being ignored	___	___	___	___	___
66. Darkness	___	___	___	___	___
67. Premature heart beats (missing a beat)	___	___	___	___	___
68. (a) Nude Men	___	___	___	___	___
(b) Nude Women	___	___	___	___	___
69. Lightning	___	___	___	___	___
70. Doctors	___	___	___	___	___
71. Making mistakes	___	___	___	___	___
72. Looking foolish	___	___	___	___	___
*73. Seeing or hearing automobiles	___	___	___	___	___
*74. Thinking about riding in a car	___	___	___	___	___
*75. Seeing automobile ads	___	___	___	___	___

Appendix B-6: Fear Survey Schedule (FSS-III) (cont.)

	Not at All	A Little	A Fair Amount	Much	Very Much
*76. Thinking about children riding in a car	____	____	____	____	____
*77. Thinking about going someplace	____	____	____	____	____
*78. Traveling	____	____	____	____	____
*79. Police /Ambulances	____	____	____	____	____
*80. Motorcycles /Bicycles	____	____	____	____	____
*81. Being trapped in a car	____	____	____	____	____

* These nine items were added to FSS-III. They are the items of the Parent Accident Fears Scale.

Appendix B-7: Injury Severity Rating Scale

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Type of Injury	Rating
A. Contusion &/or abrasion &/or laceration &/or burn	1 - 7
If permanent disfiguration	8
B. Muscular strain &/or joint sprain	1 - 4
If permanent or chronic disability	5
C. Intraabdominal or intrathorasic injury	3 - 7
If permanent disability is secondary	8
D. Fractures &/or dislocations	2 - 6
If permanent mobility problems ensue	8
E. Concussion without brain damage	3 - 6
F. Damage to eyes/ears	3 - 8
Blindness: one eye	6
both eyes	8
Deafness: one ear	4
both ears	7
G. Nasal sensory perception	2 - 3
H. Spinal cord or other nerve injury	1 - 8
Cutaneous nerve	1 - 2
Facial paralysis	3 - 4
One arm	6
Two arms	7
One leg	6
Two legs	7
Paraplegia	8

Appendix B-7: Injury Severity Rating Scale (cont.)

I. Alteration of speech   2 - 4

J. Loss of speech   6

K. Damage/loss of function to sexual organs   3 - 7

L. Any injury leading to limitation of motion or

   diminished life style, loss of job, etc.   3 - 6

M. Disruption or inability to pursue education

   or chosen vocation   2 - 3

N. Dental injury   1 - 4

Appendix C

Table 1

Multiple Regression Equations Predicting Children's Reaction Index Scores by Pre-trauma Variables

Pre-trauma Variable	Increment			R^2
	F-value	R^2	$\underline{p}$	
Demographic				
Socioeconomic Status	8.599	.152	.005	.152
Age at time of Accident	9.491	.142	.003	.294
Sex	1.668	.025	.203	.319
Child				
Trait Anxiety	6.343	.143	.016	.143
Accident History	.915	.021	.345	.164
Child Psychiatric History	.319	.007	.575	.171
Child Depression Inventory	.254	.006	.617	.177
Life Events Before	.032	.000	.858	.178
Coping Resources	.023	.000	.879	.422
Parent				
Trait Anxiety	.983	.021	.327	.021
Mental Health Inventory	2.989	.061	.091	.082
Family Psychiatric History	.523	.010	.473	.093
Beck Depression Inventory	.268	.006	.607	.098

Appendix C

Table 2

Multiple Regression Equations for Predicting Children's Reaction
Index Scores by Trauma Variables

Trauma Variable	Increment			R^2
	F-value	R^2	p	
Car vs Bike and Pedestrian	12.681	.228	.000	.228
Emergency Room Injury Rating	1.890	.033	.176	.261
Parent & Child Separated	1.413	.025	.241	.286
Lag	.568	.010	.456	.296
Social Support (child)	.197	.003	.659	.299
Social Support (parent)	.094	.002	.760	.301

Appendix C

Table 3

Multiple Regression Equation for Predicting Children's Reaction
Index Scores by Post-Trauma Variables

Post-trauma Variable	Increment			R^2
	F-value	R^2	$\underline{p}$	
Child				
State Anxiety	15.199	.280	.000	.280
Fear Survey Schedule	7.343	.116	.010	.397
CBCL Externalizing T-score	7.098	.097	.011	.494
Parenting Style	2.916	.038	.096	.729
Likelihood of Another Accident	1.791	.023	.189	.555
Time Talking about Accident	2.422	.029	.129	.584
CBCL Internalizing T-Score	.254	.003	.618	.587
Parent				
Fear Survey Schedule	2.753	.060	.104	.060
Accident-related Fears	3.769	.077	.059	.137
Parenting Style	.521	.011	.469	.148
Self-blame	.551	.011	.462	.160
State Anxiety	.055	.001	.815	.161
Time Talking about Accident	.026	.000	.871	.162

Appendix C

Table 4

Multiple Regression Equation for Predicting Children's Impact of Events Scores by Pre-trauma Variables

Pre-trauma Variable	Increment			R^2
	F-value	R^2	$\underline{p}$	
Demographic				
Age at time of Accident	15.022	.238	.000	.238
Socioeconomic Status	1.765	.028	.190	.266
Sex	.789	.012	.379	.278
Child				
Accident History	3.349	.081	.074	.081
Coping Resources	3.409	.077	.073	.159
Trait Anxiety	4.630	.096	.038	.255
Child Depression Inventory	1.479	.030	.232	.285
Child Psychiatric History	.856	.017	.361	.302
Life Events Before	1.716	.034	.199	.337
Parent				
Family Psychiatric History	.398	.008	.531	.008
Mental Health Inventory	.074	.002	.787	.010
Beck Depression Inventory	.091	.002	.764	.012

Appendix C

Table 5

<u>Multiple Regression Equations for Predicting Children's Impact of</u>
<u>Events Scores by Trauma Variables</u>

Trauma Variable	Increment			R^2
	F-value	R^2	$\underline{p}$	
Social Support (Child)	6.927	.138	.012	.139
Car vs Bike and Pedestrian	2.561	.049	.117	.188
Lag	1.137	.022	.293	.210
Parent and Child Separated	.519	.010	.475	.220
Social Support (Parent)	.484	.009	.491	.230

Appendix C

Table 6

Multiple Regression Equation for Predicting Children's Impact of
Events Scores by Post-Trauma Variables

Post-trauma	Increment			
Variable	F-value	R^2	p	R^2
Child				
Accident-related Fears	16.000	.291	.000	.291
State Anxiety	4.462	.074	.041	.365
Fear Survey Schedule	.361	.006	.551	.371
CBCL Externalizing T-Score	.187	.003	.668	.375
Time Talking about Accident	.110	.002	.742	.377
Self-Blame	.073	.001	.789	.378
Likelihood of another Accident	.024	.000	.879	.247
Parent				
Fear Survey	1.489	.033	.223	.033
Parenting Style	1.489	.033	.229	.066
Accident-related Fears	.465	.010	.499	.077
State Anxiety	.156	.003	.695	.081
Self-blame	.052	.001	.821	.082
Time Talking about Accident	.032	.000	.858	.082

Appendix C

Table 7

Multiple Regression Equation for Predicting the Total Number of
DICA-R-C PTSD Symptoms by Pre-trauma Variables

Pre-trauma	Increment			
Variable	F-value	R^2	$\underline{p}$	R^2
Demographic				
Socioeconomic Status	1.008	.024	.321	.024
Age at time of Accident	.797	.019	.377	.043
Sex	.045	.001	.833	.044
Child				
Accident History	5.252	.134	.028	.134
Child Psychiatric History	1.422	.036	.241	.170
Child Depression Inventory	1.161	.029	.289	.199
Coping Resources	.544	.014	.466	.212
Life Events Before	.146	.004	.705	.216
Parent				
Family Psychiatric History	.536	.013	.468	.013
Trait Anxiety	.717	.018	.402	.031
Mental Health Inventory	.435	.011	.513	.042
Beck Depression Inventory	.043	.001	.837	.043

Appendix C

Table 8

Multiple Regression Equations for Predicting the Total Number of
DICA-R-C PTSD Symptoms by Trauma Variables

Trauma Variable	Increment			R^2
	F-value	R^2	$\underline{p}$	
Emergency Room Injury Code	4.919	.115	.033	.115
Car vs Bike and Pedestrian	1.403	.032	.244	.147
Parent and Child Separated	.563	.013	.456	.160
Social Support (Child)	.032	.001	.858	.161

Appendix C

Table 9

Multiple Regression Equation for Predicting the Total Number of

DICA-R-C PTSD Symptoms by Post-Trauma Variables

Post-trauma Variable	Increment			R^2
	F-value	R^2	p	
Child				
State Anxiety	22.771	.477	.000	.477
Parenting Style	4.589	.061	.039	.537
Likelihood of Another Accident	2.598	.033	.116	.570
Self-blame	1.407	.017	.244	.588
Accident-related Fears	1.651	.020	.208	.608
CBCL Internalizing T-Score	.696	.008	.411	.616
CBCL Externalizing T-Score	2.347	.027	.136	.644
Time Talking About Accident	.505	.006	.483	.650
Fear Survey Schedule	.346	.004	.561	.655
Parent				
Fear Survey	2.172	.053	.149	.053
Accident-related Fears	1.024	.025	.318	.077
State Anxiety	.676	.016	.416	.094

Vita

JANE M. KEPPEL-BENSON

PERSONAL INFORMATION

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Date of Birth: January 7, 1963

EDUCATION

Doctorate in Clinical Psychology, April 1992
Virginia Polytechnic Institute and State University
Blacksburg, VA. (APA Approved)

Master of Science in Clinical Psychology, November 1988
Virginia Polytechnic Institute and State University
Blacksburg, VA. (APA Approved)

Bachelor of Arts with Honors in Psychology, May 1984
University of North Carolina
Chapel Hill, NC.

ACADEMIC HONORS AND AWARDS

Dissertation Research Award (1991)
American Psychological Association

Clinical Child Fellowship (1989-90)
National Institute of Mental Health

PUBLICATIONS

Keppel-Benson, J. M. & Ollendick, T. H. (in press). Posttraumatic
    stress disorder in children and adolescents. In C. F. Saylor
    (Ed.) Children and disasters. New York: Plenum.

Keppel, J. M. (1989). Monitoring psychopharmacology in programs for
    the retarded. In T. B. Karasu (Ed.), Treatments of psychiatric
    disorders, 68-71.

Gualtieri, C. T. & Keppel, J. M. (1985). Psychopharmacology in the
    mentally retarded and a few related issues. Psychopharmacology
    Bulletin, 21, 304-309.

Gualtieri, C. T., Keppel, J. M. & Schroeder, S. R. (1986). Tardive dyskinesia: Facts, issues and new recommendations. Psychiatric Aspects of Mental Retardation Reviews, 5, 1-6.

SUPERVISED CLINICAL EXPERIENCE

Pre-Doctoral Internship
(APA Approved)   September 1990 - September 1991
Medical University of South Carolina, Charleston, SC.

Charleston Area Mental Health Center
Provided individual and family therapy for range of problems
Worked on task force for victims of sexual assault
Served as consultant for youth offender program in group home
Supervisors: Al Finch, Ph.D. and Mary Mueller, M.S.

Crime Victims Research and Treatment Center
Conducted psychotherapy for child and adult victims of crime
Provided crisis counseling for adult victims of sexual assault
Consulted with area professionals on disaster relief project
Supervisors: Julie Lipovsky, Ph.D. and Al Finch, Ph.D.

Adult Inpatient Unit of the Institute of Psychiatry
Conducted personality, projective, and neuropsych testing
Served as consultant to multidisciplinary treatment team
Provided individual psychotherapy and led psychotherapy groups
Supervisor: Randall Wade, Ph.D.

Child Inpatient Unit of the Institute of Psychiatry
Administered personality, projective, and intellectual tests
Provided consultation to multidisciplinary treatment team
Assessed and triage families at Navy Hospital
Supervisors: Al Finch, Ph.D. and Ronald Belter, Ph.D

Consultation/Liaison Service - Children's Hospital
Provided psychiatric consultation on medical units
Served as primary consultant for Hematology/Oncology units
Consulted on programs for multiply handicapped children
Led support group for mothers of children with AIDS
Supervisors: Conway Saylor, Ph.D. and Stan Shoemaker, Ph.D.

Graduate Clinician
August 1989 - September 1990
Psychological Services Center, VPI & SU, Blacksburg, VA.

Attention Deficit and Hyperactivity Disorders Clinic
Assessed children referred for attentional problems
Supervised assessments of first year clinical students
Conducted family therapy and parent-training groups
Supervisor: Thomas H. Ollendick, Ph.D and Jack Finney, Ph.D.

<u>Externship in Clinical Psychology</u>
August 1988 - August 1989
New River Valley Community Services Board, Radford, VA.

<u>Pulaski Mental Health Center</u>
Provided psychotherapy for adults, children, and families
Led psychotherapy group for suicidal adolescents
Supervisor: Dennis Cropper, Ph.D.

<u>Clinical Assistant</u>
September 1987 - May 1988
NIMH Contract: "Bridging the Gap", Blacksburg, VA.

<u>Developmental Disorders Intervention Program</u>
Led training workshops for families and professionals
Provided case consultation for MH and MR professionals
Conducted evaluations in group homes and state hospitals
Supervisor: Thomas H. Ollendick, Ph.D.

<u>Practicum Clinician</u>
September 1986 - September 1988
VPI & SU, Blacksburg, VA.

<u>Psychological Services Center</u>
Provided individual and family therapy in outpatient clinic
Led young adult relationship group
Conducted intellectual and personality assessments Supervisors:
Thomas H. Ollendick, Ph.D., George Clum, Ph.D., Caryn Carlson,
Ph.D, and Jack Finney, Ph.D.

PROFESSIONAL PRESENTATIONS

Keppel, J. M., & Ollendick, T. H. (1991, August). Children injured
in automobile accidents: A focus on psychological adjustment.
In R. W. Belter (Chair), <u>Short- and long-term effects of trauma
in children and adolescents</u>. Symposium conducted at the meeting
of the American Psychological Association, San Francisco, CA.

Keppel, J. M., Lipovsky, J. A., & Saunders, B. E. (1990, March).
Characteristics of mothers in father-daughter incest families.
Poster presented at the meeting of the Southeastern
Psychological Association, New Orleans, LA.

Keppel, J. M., Lipovsky, J. A., & Saunders, B. D. (1990, December).
Family of origin characteristics of mothers in father-daughter
incest families. Paper presented at the meeting of the San
Diego Conference on responding to Child Maltreatment, San
Diego, CA.

Keppel, J. M., Ollendick, T. H., & Carlson, C. C. (1989, November). Correlates of learning disabled students' social acceptance in mainstream classrooms. Poster presented at the Association of Behavior Therapist Convention, Washington, D.C.

Ollendick, T. H., & Keppel, J. M. (1987, November). Assessment and treatment of anxiety and depression. In Ollendick (Chair), Focus on behavior management; A workshop on autism, mental retardation, and behavior disorders. Workshop conducted at the meeting of the Virginia Autism Resource Center, Richmond, VA.

TEACHING EXPERIENCE

Graduate Teaching Assistant
August 1989 - December 1989
Assessment of Human Intelligence
(Graduate Level Course, PSYC 5224)
VPI & SU
   Supervised administration of intellectual assessment
   Guided and evaluated interpretation of test results
   Supervisor: Thomas H. Ollendick, Ph.D.

Graduate Teaching Assistant
August 1989 - December 1989
Psychology of Personality
(Undergraduate Level Course, PSYC 2054)
VPI & SU
   Lectured on personality disorders to undergraduate students
   Assisted class instructor with grading class projects
   Supervisor: Joseph Germana, Ph.D.

Graduate Teaching Assistant
August 1986 - May 1987
Introduction to Psychology
(Undergraduate Level Course, PSYC 2000)
VPI & SU
   Instructor for three discussion sections of introductory
   psychology class (approximately 30 students per class)
   Supervisor: Neil Bohannon, Ph.D.

EMPLOYMENT

Clinical Research Assistant
August 1984 - May 1986
Biological Sciences Research Center and Child Development Center
University of North Carolina School of Medicine
Chapel Hill, NC.

Respite Care Provider and Case Manager
August 1985 - September 1986
Annie Sullivan House
Chapel Hill, NC.

PROFESSIONAL AFFILIATIONS

American Psychological Association
Association for the Advancement of Behavior Therapy

REFERENCES

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Jack Finney, Ph.D.
Director of Child Study Center
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