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Youth Exposure to Violence: Prevalence, Risks, and Consequences

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Recent empirical work on the distribution, determinants, and consequences of children and adolescents' witnessing of community violence are reviewed. Major findings across studies indicate that males, ethnic minorities, and urban residents are at increased risk for witnessing violence, and that higher rates of PTSD, depression, distress, aggression, and externalizing behavior disturbances are reported among those who witness violence. Degree of family conflict, domestic violence, and family support were demonstrated to modify the impact of exposure to violence. Research and policy recommendations are offered.

According to most reports, the "epidemic" of violence affecting young Americans peaked in 1993 and has since been on a promising, more or less linear decline *(Cole, 1999)*. Nonetheless, the impact on children and youth, especially those in inner-city areas who have been exposed to community violence, remains a complex issue. Violence in major American cities rose throughout the 1980s; by 1992, homicide had become the leading cause of death among black males and females 15–34 years of age and the second leading cause of death for all 10–19-year-olds *(Hammett, Powell, O'Carroll, & Clanton, 1992)*. Between 1985 and 1991, there was a 154% increase in the rate of homicide among young people aged 15–19, surpassing that for young adults in the 25–29 and 30–34-year-old age groups. Though rates of homicide for 15–19-year-olds peaked in the late 1980s, they still remain among the highest ever recorded for this age category. Even as the United States is experiencing a welcome decline in violence, the degree to which young people are affected by it remains "unacceptably high" *(Centers for Disease Control and Prevention [CDC], 2000)*.

Though startling, such homicide figures reflect only the most extreme forms of community violence in many neighborhoods throughout the United States *(Richters & Martinez, 1993a)*. It has been estimated that the ratio of nonfatal to fatal assaults may be as high as 100:1 *(Rosenberg & Mercy, 1986)*. The rate at which American youth, especially those in certain sociodemographic groups or geographic areas, are exposed to violence in their communities continues to be a source of great concern. Of particular interest to the medical and public health community are the nonfatal health consequences for those children and adolescents exposed to chronic violence and urban conflict.

When studying youth exposure to violence (ETV), many authors have considered both "direct" exposure, or victimization, and "indirect" exposure, i.e., witnessing *(Richters & Martinez, 1993a; Martin, Gordon, & Kupersmith, 1995; Osofsky, Wewers, Hann, & Fick, 1993)*. Victimization refers to intentional acts initiated by another person to cause one harm (e.g., being chased, threatened, beaten up, robbed, mugged, raped, shot, stabbed, or killed). There is less agreement regarding the definition of "witnessed" violence. Some authors have referred specifically to eye-witnessing an event that involves death, injury, or a threat to the physical integrity of another person *(Shakoor & Chalmers, 1991)*; others have included hearing violent events take place (e.g., gunshots, screams) *(Campbell &*

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Schwarz, 1996); and others still have included the witnessing of lesser crimes such as property damage *(Lai, 1999)*, the viewing of violence on television and in movies *(Cooley-Quille, Turner, & Beidel, 1995)*, having knowledge of another's victimization *(Bell & Jenkins, 1993)* or hearing about violent events *(Richters & Saltzman, 1990)*, and the amount of time children feel scared at school *(Sheley, McGee, & Wright, 1992)*.

In this paper, we consider ETV as a broad class of events, composed of victimization from, witnessing of, and hearing about "real life" (not fictional) violent events. We refrain, however, from labeling exposure as either "direct" or "indirect." Instead, we view ETV in terms of *levels* of exposure: primary, indicating victimization; secondary, referring to violence seen or heard; and tertiary, i.e., learning of violent death, serious harm, or threat of death or injury to another person. Most previous research has focused on primary ETV (personal victimization); less is known about the prevalence, antecedents, or consequences of secondary or tertiary exposure. This paper reviews recent empirical data on children and adolescents' "secondary" ETV—their *witnessing* of violence. It focuses specifically on violence occurring in the community, rather than domestic violence, which has been reviewed elsewhere *(Edleson, 1999)*.

FOCUS AND METHODS

This paper integrates available empirical evidence regarding: *1)* the prevalence of witnessing community violence in childhood and adolescence; *2)* individual and contextual risk factors for witnessing violence; *3)* the health consequences of this type of exposure, including psychiatric disorder, social-emotional adjustment, and behavioral and physiological consequences; and *4)* potential moderators of the impact of witnessing violence.

A literature search was conducted to identify all studies investigating exposure to community violence in the period between March 1984 and March 2000. Searches were conducted on Medline (National Library of Medicine), PubMed, and PsychLit for English-language literature containing the subject terms *exposure to violence*, *violence*, *community violence*, *adolescence*, *adolescent behavior*, *children*, and *environmental exposure*. In addition, bibliographies of relevant published books and articles were reviewed. Twenty-five original studies with quantitative data on the prevalence or consequences of witnessing community violence during childhood or adolescence (up to 18 years of age) were selected for detailed review. Studies that used well-defined and systematic methods for assessing ETV were given priority.*

PREVALENCE OF WITNESSING VIOLENCE

Overview

Prevalence estimates indicate that, by most reports, youth living in American cities are witnessing a great deal of violence in their communities. The proportion of children and adolescents who reported having witnessed murder ranged from a low of 1% in a "resort" group—middle- and upper-class, predominantly Caucasian youth *(Gladstein, Rusonis, & Heald, 1992)*—to 47% in a low-income, predominantly African-American sample *(Fitzpatrick, 1997)*. Variability was less in studies assessing predominantly low-income, urban youth, where witnessing murder was typically reported by one-quarter of the participants.

The proportion of study participants who reported witnessing stabbings in their lifetime ranged from 9% in an affluent sample attending a private resort *(Gladstein et al., 1992)* to 56% among the central-city summer camp population studied by Fitzpatrick *(1997)*. Finally, the percentage of those witnessing a shooting sometime during their life ranged from 4% to 70%; among urban youth surveyed, the lowest prevalence was 20%. Parent reports of their offspring's witnessing of community violence were routinely lower than child or adolescent self-reports: i.e., murder, 3%–6%; stabbings, 4%–19%; shootings, 7%–26%. The consistent pattern of parent underreporting of children's ETV has been confirmed by Kuo and colleagues *(2000)*.

While it has often been suspected that ETV is more prevalent in inner-city communities, this review reveals the paucity of data from other settings. A survey of children of farm workers *(Martin et al., 1995)* and a study of students in a small Ohio city *(Singer, Anglin, Song, & Lunghofer, 1995)* revealed exposure comparable to the urban samples, suggesting that the problem may be overlooked in some rural and small-city settings. The suburban *(Campbell & Schwarz, 1996; Singer et al., 1995)* and resort *(Gladstein et al., 1992)* samples reported rates lower than those in the urban populations.

*A detailed summary of these studies is available from the corresponding author or by accessing: http//phdcn.harvard.edu/res_pubs.

Variation Among Studies

The varying prevalence estimates for ETV may result in part from differences in sample characteristics, data collection instruments, and reporting methods. These methodological differences and limitations affect the resulting prevalence estimates and make interpretation of results and comparisons across studies difficult. Study samples differed considerably with respect to settings—from youth living in housing projects to those seen for pediatric care and attending specialized schools—as well as socioeconomic status and age.

A variety of instruments have been developed and used to assess youth ETV. In the studies reviewed here, authors generally developed their own questionnaire or used an adaptation of the NIMH Survey of Exposure to Community Violence, Self-Report Version *(Richters & Martinez, 1993a)*. The different instruments lack uniformity in their methods of administration, definitions of events considered violent, and descriptions of where events occurred. Although many studies have explored violence in different settings (e.g., community vs. home), most instruments fail to separate the nature or impact of exposure by setting, despite the acknowledged importance of such distinctions *(Selner-O'Hagan, Kindlon, Buka, Raudenbush, & Earls, 1998)*. Methods for combining information into some aggregate index of ETV also differed radically across studies. Most measures weight violent events equally despite considerable differences in item content (e.g., seeing someone hit vs. seeing someone shot). With a few exceptions *(Cooley et al., 1995; Selner-O'Hagan et al., 1998)*, psychometric characteristics of these inventories are largely unknown.

Nature of Violence Witnessed

The types of violent events that pose the greatest threat to children, in terms of social and emotional functioning, are not yet fully understood. Putnam and Trickett *(1993)* warned ETV researchers that heterogeneity in the nature and severity of traumatic exposure presents a potential methodological problem, and they urged investigators to clarify the types of traumatic stressors examined by developing standard definitions and operational criteria. Richters and Martinez *(1993a)* asserted that a "taxonomy of violence exposure will be indispensable" to identify populations at greatest risk for maladjustment and psychopathology following exposure. We know most about the three types of events that are the focus of this review—witnessing of a stabbing, shooting, or killing—which have been reported in multiple studies.

It may prove difficult to determine the relative effects of different types of violence exposure, since subjects rarely report having witnessed severe violence without also having experienced lesser types. Bell and Jenkins *(1993)* noted that students' experiences with violence have been shown to be cumulative: those witnessing a killing had also witnessed other events involving severe violence (robbery, shooting, stabbing), reflecting a generally "violent milieu." Subsequent studies have typically confirmed the cumulative nature of children's ETV *(Kindlon, Wright, Raudenbush, & Earls, 1996; Selner-O'Hagan et al., 1998)*.

The relationship between victims and perpetrators of witnessed violence also warrants further scrutiny. Richters and Martinez *(1993a)* attempted to assess the nature of the violence children witness by probing for details surrounding violent events, such as location, frequency, and persons involved. They found that 62% of witnessed violence was committed by people familiar to their fifth- and sixth-grade respondents. Similarly, 67% of the victims of violence witnessed by older children were known to the children. Future studies should ideally examine contextual variables such as location of the exposure and identity of the victim and perpetrator.

Setting of Events

The fifth- and sixth-graders surveyed by Richters and Martinez *(1993a)*—when asked whether the violent events they had witnessed took place in the home, near home, in school, or near school—reported that most of the violence (68%) occurred near their homes; only 7% took place in their homes and 9% in school. It is likely that the type of violence witnessed varies by setting. For example, events like shootings, stabbings, muggings, drug trade, arrests, etc. may be more likely to occur outdoors than indoors. Therefore, information on where violence is witnessed should vary considerably depending on the specific measure and items assessed.

Using the parent-report version of the NIMH Survey, Osofsky et al. *(1993)* found a strong and significant relationship between exposure to community violence and the incidence of family violence. This is an area deserving of more intensive study. Further, domestic violence may be an im-

portant variable to be considered when investigating the psychosocial impact of exposure to community violence, due to the apparent vulnerability it poses for children doubly exposed.

WHO WITNESSES VIOLENCE?

Individual Risk Factors

Gender. Several studies have found that males are more likely than females to be victims and witnesses of violent acts *(Fitzpatrick & Boldizar, 1993; Gladstein, Rusonis, & Heald, 1992; Schwab-Stone et al., 1995; Selner-O'Hagan et al., 1998; Singer et al., 1995).* Gladstein and colleagues found this to be true in both the inner-city and the upper-middle-class groups they studied. However, there is some evidence of gender differences in ETV by age. Whereas, in a recent study of preschool children, Shahinfar, Fox, and Leavitt, *(2000)* observed no gender differences for children's ETV, Attar, Guerra, and Tolan *(1994)* earlier found that girls of elementary school age actually reported more ETV than boys, although these gender differences were no longer present two years later.

Age. Although studies generally report increasing prevalence of ETV with age, there are inconsistencies in the findings. Richters and Martinez's *(1993a)* survey of parents indicated that fifth- and sixth-grade children were significantly more likely than first- and second-graders to have witnessed both muggings (43% vs. 25%) and arrests (70% vs. 37%). Similarly, Selner-O'Hagan et al. *(1998)* found that younger subjects generally reported less exposure than did older subjects. In contrast, Schwab-Stone et al. *(1995)* reported that eighth-grade students' level of exposure was significantly greater than that of both sixth- and tenth-graders. Fitzpatrick and Boldizar *(1993)* found no association between age and levels of ETV.

The degree to which young children can reliably report ETV remains an important question. Several measures have been developed to assess ETV in young children *(Richters, Martinez, & Valla, 1990)*, and significant agreement has been reported between parent and child summary ratings of ETV, indicating that children as young as age six may be able to provide "useful information" *(Richters & Martinez, 1993a).* Overall, the research demonstrates that even the youngest participants may be witnesses to community violence *(Richters & Martinez, 1993a; Shahanifar et al., 2000; Taylor, Zuckerman, Harik, & Groves, 1994).* The self-reports of younger children—significantly more than those of their parents—suggest that many had already witnessed high levels of violence by the time they entered first grade *(Richters & Martinez, 1993a).* Parental reports noted by Taylor et al. *(1994)* indicate that one of every ten 1–5-year-olds attending Boston City Hospital witnessed a shooting or stabbing, divided evenly between incidents in the home and those on the streets.

Race/Ethnicity and SES

In prevalence studies comparing adolescents who differed in ethnicity or social class, ETV has been found to be greater among ethnic minorities. Several studies have reported higher rates of exposure among African Americans *(Fitzpatrick & Boldizar, 1993; Gladstein et al., 1992; Selner-O'Hagan et al., 1998)* or African-American and Latino/Latina students combined *(Singer et al., 1995)* than among Caucasian youth. In research on children of migrant and seasonal farm workers, ETV was found to be significantly higher among African-American than Hispanic children, and more common among English speakers compared with Spanish speakers *(Martin et al., 1995).*

Across most studies, respondents reporting the highest rates of ETV tended to live in poorer neighborhoods *(Fitzpatrick, 1997; Fitzpatrick & Boldizar, 1993; Moses, 1999; Overstreet, Dempsey, Graham, & Moely, 1999; Schubiner, Scott, & Tzelepis, 1993).* Singer and colleagues *(1995)* also found that students of lower SES reported higher rates of ETV. Campbell and Schwarz *(1996)*, comparing ETV in preadolescent children living in urban and suburban areas of Philadelphia, found combined exposure of witnessing a beating, robbery, stabbing, shooting, or murder to be 57% in the suburban sample and 88% in the urban sample. Gladstein et al. *(1992)* reported that significantly more inner-city youth in Maryland had been exposed to severe violence and knew someone who had been victimized personally than was the case in upper- and middle-class samples. In both the Philadelphia and Maryland studies, it was noted that high rates of ETV are not endemic to low-income neighborhoods, but that the intensity and severity of events witnessed appear to affect low-income youth disproportionately.

Familial Risk Factors

Living arrangement/family composition. Researchers have examined many demographic and family characteristics as possible risk factors for

ETV. After comparing parents' education, income level, family structure, and living arrangements, Richters and Martinez *(1993a)* identified family living arrangement as the only characteristic significantly associated with total violence exposure in both younger and older children's reports. More specifically, younger children who reported higher levels of witnessing community violence were more likely to live in houses rather than apartments. Families living in houses were also more likely to have lived longer at their current residence and to have moved less in the past five years than those residing in apartments. Martin and colleagues *(1995)*, comparing children of seasonal farm workers who were and were not living with both biological parents, found the latter significantly more likely to be exposed to violence. Schubiner and colleagues *(1993)* found that youth in families headed by fathers or grandmothers were significantly more likely to have seen a physical fight in the three months prior to the interview. Fitzpatrick and Boldizar *(1993)*, while finding no significant differences in ETV based on the presence of first-degree male or first-degree female relatives in the household, noted nonsignificant trends indicating that living in households with no first-degree females and two first-degree males put children at greater risk for witnessing violence.

Parenting characteristics. Family-child relations appear to play a more important role in moderating children's response to ETV than in predicting which children will be exposed to community violence. Gorman and Tolan *(1998)* found that family and parenting characteristics did not predict a child's level of ETV, and Miller, Wasserman, Neugebauer, Gorman-Smith, and Kamboukos *(1999)* similarly reported that the degree of parent and child conflict, monitoring, and involvement did not predict ETV in a sample of younger male siblings of adjudicated juvenile offenders.

Community Risk Factors

The literature suggests that community risk and protective influences on ETV are more poorly understood than are family and individual-level factors. Population indicators such as poverty rates, proportion of female-headed households, and racial/ethnic composition have been most frequently investigated *(Campbell & Schwarz, 1996; Fitzpatrick & Boldizar, 1993; Selner-O'Hagan et al., 1998)*.

Neighborhood economic/demographic variables. Fitzpatrick and Boldizar's *(1993)* comparison of ETV among low-income African-American and upper-middle-class resort youth found that either sociodemographic or environmental characteristics, or both, contributed to higher levels of ETV in the urban sample. Singer and colleagues *(1995)* reported differences among large-city, small-city, and suburban youth, particularly in the type of violence witnessed. Adolescent males from large-city schools had the highest rates of witnessing severe violence such as stabbings and shootings (38%–62%). However, males from a small-city school also reported substantial exposure to severe violence (35%), whereas suburban youth had relatively low exposure (5%–14%). Boys from the suburban site, however, had high exposure to lesser forms of violence in school, such as witnessing someone being threatened (70%), slapped/hit/punched (81%), and beaten or mugged (32%). Such findings illuminate the issue of threatening and psychological abuse from peers that characterizes the experiences of many American school children.

CONSEQUENCES OF WITNESSING VIOLENCE

While the complexities of primary child victimization have been well studied *(Breslau, Chilcoat, Kessler, Peterson, & Lucia, 1999; Cicchetti & Lynch, 1995; Putnam & Trickett, 1993)*, less attention has been paid to the effects on children and adolescents of witnessing community violence. Existing research suggests that high levels of witnessing violence place youth at risk for psychological, social, academic, and physical difficulties, as well as for engaging in violent acts themselves. Richters *(1993)* noted that studies of children in war-torn areas and children growing up in violent families

> ...point to numerous domains of cognitive, social, emotional, and psychophysiological functioning that can be severely affected by ETV, including depression, withdrawal, fear, anxiety, affect disregulation, aggression, dissociative reactions, and intrusive thoughts. *(p. 5)*

Mental Health Effects

PTSD. Jaffe and colleagues *(1990)* noted that, while specific traumatic events may have unique effects on children, there are common patterns among the child victims' symptoms:

> At the extreme, post-traumatic stress disorder (PTSD) appears to offer a unifying description of the anxiety disorder most often associated with overwhelming life experiences. *(p. 72)*

PTSD and related symptoms have been the focus of most studies investigating the effects of ETV, and the available evidence suggests that both chronic and acute exposure to violence are associ-

ated with the symptomatology of PTSD, particularly among younger persons *(Dyson, 1990; Pynoos et al., 1987)*.

In a review of early clinical studies addressing the effects of acute trauma, Lyons *(1987)* found that children who witnessed single violent events reported the following PTSD symptomatology: diminished concentration in school, sleep disturbances, flashbacks, disordered attachment behavior, sudden startling, and hypervigilance. Pynoos and colleagues *(1987)*, in a study of the reactions of 159 elementary school children to a sniper attack on their school playground, found significant relationships between proximity to the violence and the type and number of PTSD symptoms.

The use of clinical-descriptive methodology and anecdotal evidence in these studies limits the generalizability of their findings. Furthermore, as they are focused on single violent incidents or more acute forms of violence, the results may not apply to children who are exposed to chronic urban violence. Fitzpatrick and Boldizar *(1993)*, studying the relationship between chronic exposure to community violence and PTSD symptoms in a nonrandom sample of 221 low-income, 7–18-year-old African-American youth, found moderately high symptomatology, with 27.1% meeting all three *DSM-III-R* diagnostic criteria for PTSD *(American Psychiatric Association, 1987)*. Greater exposure, either as a victim or witness, was positively related to increased reporting of PTSD symptoms.

In a longitudinal study of a community sample of adolescents, Gianconia et al. *(1995)* found that, by age 18, over two-fifths of the sample had experienced a "qualifying trauma," a category that included, but did not separately examine, exposure to extreme community violence. The researchers found no differences between males and females with regard to risk of exposure to specific and total traumatic events. However, females in the sample exposed to such trauma demonstrated a six-fold higher likelihood of developing PTSD than did males.

Depression. Fitzpatrick's *(1993)* comparison of levels of depressive symptoms among witnesses and victims of violence in a sample of low-income African-American youth yielded unexpected results. While victims of violence reported higher levels of depressive symptoms than did nonvictims, witnessing violence was not significantly related to depression. Upon further analysis, witnessing violence was found to have a significant, but *negative* association with depressive symptoms. Thus, while there appears to be a strong link between witnessing violence and posttraumatic stress symptomatology, the link with depression is less well established. Fitzpatrick suggested that perhaps youth chronically exposed to violence experienced a desensitization process whereby these types of daily stressors had little impact on reported well-being.

Dissociation. Others have also suggested that the dissociative coping mechanisms employed by children exposed to chronic stressors such as childhood sexual abuse may have parallels with the strategies employed by children chronically exposed to community violence *(Putnam & Trickett, 1993)*. Dissociation can have important protective functions for children by providing escape from reality and isolating difficult experiences in the face of fear. As Ludwig *(1983)* put it, a dissociated state of consciousness, or psychological distance from such frightening situations, may serve as an "analgesic for pain." In her study of 337 inner-city adolescents, Moses *(1999)* found that exposure to all types of violence was correlated with levels of hostility, with the exception of violence directed at strangers. Moses posited that this lack of a response among youth witnessing victimization of strangers supported the concern that many urban youth are becoming desensitized to the high degree of violence witnessed in their neighborhoods. While acknowledging that such a reaction may serve an adaptive function, Moses emphasized that prolonged desensitization and lack of empathy for others may have adverse and long-term social and emotional consequences.

Aggression. Although the impact of witnessing community violence on subsequent levels of aggression may not be as clear-cut as that of witnessing domestic violence, some evidence of an independent impact exists. In a study of 225 African-American adolescents, DuRant, Pendergrast, and Cadenhead *(1994)* found that, among social and psychological factors associated with the use of violence, previous ETV and victimization comprised the strongest predictor. ETV explained 26.6% of the variation in the adolescents' use of violent behavior, as compared to 3.8% for depression, leading the authors to conclude that experiencing or being a victim of violence increases the risk of an adolescent using violence against others. Bell and Jenkins *(1993)* reported that exposure to high levels of community violence led to defensive and of-

fensive fighting, as well as other serious high-risk behavior (e.g., alcohol and drug use, carrying knives and guns, trouble in school). Martin et al. *(1995)* found that children exposed to violence were four times more likely to carry weapons.

In a longitudinal study of elementary school students, exposure to chronic community violence was found to predict peer-rated aggression *(Attar et al., 1994)*. Similarly, Miller et al. *(1999)*, in a 15-month follow-up that controlled for key aspects of the parent-child relationship, found that witnessing community violence was significantly and positively related to changes in antisocial behavior in 6–10-year-old urban boys. In a study controlling for other types of life stressors and previous aggression, Gorman and Tolan *(1998)* found exposure to community violence to be significantly related to changes in aggression a year later. However, when ETV was investigated along with other life stressors, it was associated with changes in anxiety and depression but not with changes in aggression, leading the authors to conclude that the relationship between exposure to community violence and aggression was "qualitatively different" than that for other life stressors.

Substance abuse. Studying a large community sample of adolescents (N=4,023), Kilpatrick et al. *(2000)* observed that witnessed violence was one of the strongest risk factors for disorders related to substance use. Controlling for demographics, family substance abuse, and individual victimization, this study found that ETV tripled the risk of abuse or dependency for all substances. Overall, given current attention to increasing rates of substance use and abuse by young people *(Gilvarry, 2000; Kilpatrick et al., 2000)*, the relationship between ETV and substance abuse merits a great deal more attention in the research literature. This research need is made even more compelling by demonstrated associations between early aggressive and antisocial behavior and substance abuse/dependency *(Loeber, 1988; White, Brick, & Hansell, 1993)*.

Psychosocial Effects of Acute vs. Chronic ETV

Cooley-Quille et al. *(1995)* contended that childhood exposure to acute violence is related to a range of internalizing problems (e.g., psychological disorders, fear, anxiety, depression, somatic symptoms), but that research on exposure to chronic (high-frequency) community violence indicates a stronger relationship to externalizing behavior disturbances (e.g., conduct problems). Their pilot study of 37 school children (7–12 years old) found that exposure to high levels of community violence was not related to internalizing behavior and disorders, but rather was associated with externalizing behavior, i.e., impaired social and behavioral functioning. These conclusions were not supported, however, by Martin et al.'s *(1995)* finding that children exposed to violence were eight times more likely to manifest internalizing behavior and six times more likely to evidence externalizing behavior than nonexposed children. In a longitudinal analysis of ETV, Lynch and Cicchetti *(1998)* observed that witnessing community violence was negatively correlated with ratings of internalizing behavior one year later. At the same time, children's externalizing behavior at baseline predicted increased victimization and further witnessing of community violence at follow-up. This finding indicated some support for a "transactional" or bidirectional causal relationship between externalizing behavior and exposure to community violence, which requires further longitudinal inquiry.

Physiological Effects of Witnessing Violence

The impact of witnessing violence on the physiological functioning and physical development of youth, particularly at critical stages such as infancy and puberty, is less well understood but may have profound implications. Research on PTSD indicates that there can be long-term biological alterations produced by exposure to trauma, such as increased heart rate, elevated or lower cortisol levels, and chronic sleep disturbance *(Hefez, Metz, & Lavie, 1987; Orr et al., 1990; Pitman & Orr, 1990; van der Kolk, 1987)*. Putnam and Trickett *(1993)* maintained that hormonal or biological responses to trauma during the pubertal period would co-occur with newly maturing hormonal systems, such as the hypothalamic-pituitary-gonadal axis, and that biological responses to such stressors may be similar to those reported in depression, eating disorders, and physically stressed adolescent populations (e.g. athletes, ballet dancers). Such responses include: elevated cortisol levels, elevated androstenedione, decreased levels of leutinizing hormone, decreased levels of testosterone and dihydroepiandrosterone.

Goenjian and colleagues *(1996)* conducted the first study to assess neuroendocrine responses to trauma (specifically, a catastrophic disaster) in adolescents. They evaluated cortisol and 3-meth-

oxy-4-hydroxyphenylglycol (MHPG) levels in a sample of 37 Armenian adolescents, five years following the 1988 earthquake in that country. Adolescents from the city closest to the epicenter were found to have experienced more severe posttraumatic stress reactions and to have significantly lower morning baseline cortisol levels and greater cortisol suppression by dexamethasone than those living further from the city center. The authors concluded that "chronic posttraumatic stress reactions among adolescents exposed to catastrophic disaster are associated with HPA axis alterations" *(p. 929)*, which is consistent with findings described in adults with chronic PTSD. There were no significant salivary MHPG differences between the two groups of adolescents.

A possible physiological alteration caused by stressors, including ETV, may be the timing or rate of physical development in traumatized children. Stress-related effects on the MHPG axis include alterations in the timing and progression of physical growth; timing of puberty; and cognitive, social, and emotional development. Studies disagree, however, on whether stress activation of the HPA system, and subsequently the HPG axis, is associated with delayed or earlier menarche in girls. As these biological mechanisms remain speculative at this point, there is need for further research on the physiological responses of children and adolescents to witnessing violence *(Obeidallah, Brennan, Brooks-Gunn, Kindlon, & Earls, in press)*.

PROTECTIVE FACTORS IN CHILDREN'S ETV

In assessing children's reactions to ETV, a number of individual, family, and community factors have been identified as potential moderators. These include age of the child *(Hughes, 1988; Shakoor & Chalmers, 1991; Wolfe, Jaffe, Wilson, & Zak, 1985)*, gender *(Fitzpatrick & Boldizar, 1993; Gladstein et al., 1992; Richters & Martinez, 1993b; Schubiner et al., 1993; Singer et al. 1995)*, caregiver demographics (e.g., education, income, gender) *(Fitzpatrick & Boldizar, 1993; Osofsky et al., 1993; Richters & Martinez, 1993a)*, family/household structure *(Richters & Martinez, 1993a)*, school characteristics *(Schwab-Stone et al., 1995)*, and peer relationships *(Parker & Asher, 1987; Shakoor & Chalmers, 1991)*.

Individual Moderators

Gender. Although boys tend to experience ETV at higher rates than girls, the literature suggests that the effects, especially over the long term, may be more deleterious for girls. Singer et al. *(1995)* found that female gender was the strongest demographic predictor of total trauma symptoms. Moses *(1999)* observed that, although males had higher levels of ETV, cumulative ETV was predictive of depression for females, but not males. ETV was correlated with hostility for both males and females in this sample. Using a series of three time intervals, Farrell and Bruce *(1997)* demonstrated that ETV was significantly related to the frequency of violent behavior for girls, but not for boys.

Characteristics of the violent event. Event characteristics (e.g., setting, severity, relationship to victim or perpetrator, whether witnessed alone or with others) may also influence the impact of ETV. In early studies of exposure to traumatic events, Pynoos et al. *(1987)* indicated that a child's reaction to trauma is related to the proximity to the violent event, the victim's relationship with the child, and the presence of a parent or caretaker to moderate the intensity. In their large community sample of six public high schools, Song, Singer, and Anglin *(1998)* reported that certain types of ETV were highly associated with specific categories of trauma symptoms. For males, the combined measure of exposure to shooting or knife attack was the strongest predictor of violent behavior, as well as a significant predictor of anger. For females, exposure to a knife attack or shooting, being the victim of school violence, and witnessing domestic violence were equally associated with violent behavior.

PTSD as a mediator of other psychiatric/behavioral sequelae. Development of PTSD symptoms may act as one mechanism by which the relationship between exposure to community violence and other co-morbid psychiatric sequelae develop *(Kliewer, Lepore, Oskin, & Johnson, 1998)*. Gianconia et al. *(1995)* observed that more than 40% of adolescents with (compared to 8% without) PTSD also met criteria for major depression. Furthermore, this study's longitudinal design demonstrated that PTSD either preceded or co-occurred with major depression in 70% of cases with both disorders. Mazza & Reynolds *(1999)* noted that PTSD symptoms moderate the relationship between ETV and suicidal ideation and depression. Specifically, they demonstrated that, upon controlling for PTSD, the relationships between ETV and depression and suicidal ideation were weak, thus suggesting that PTSD resulting from ETV is the

pathway that may subsequently lead to depression and suicidal ideation. These findings are from a small, cross-sectional sample, however, and future longitudinal studies are needed to refine the issue.

PTSD has also been considered as a potential pathway linking ETV with substance abuse and dependency. In their large community sample, Kilpatrick et al. *(2000),* having controlled for demographic and family variables, victimization, and witnessed violence, found that PTSD independently predicted increased risk of abuse/dependency of marijuana and hard drugs such as LSD, but not alcohol. Gianconia et al. *(1995)* also observed an association between PTSD and serious substance dependence, finding that, for a majority of adolescents with both PTSD and drug dependence (66.7%) and nearly half of adolescents with alcohol dependence (45.5%), development of PTSD either preceded the substance abuse disorder or occurred at the same age.

Familial influences. In several studies, features of family and parent-child relationships were demonstrated to moderate the impact of ETV. Richters and Martinez *(1993b)* investigated the relationship between ETV and "adaptational success" (i.e., socioemotional and academic functioning), while also considering teacher and child reports of family safety and stability. Although level of ETV was not a significant predictor, in situations where both family stability and safety were compromised, the odds of adaptational failure were dramatically increased. Overstreet et al. *(1999)* observed that the presence of a mother in the home significantly moderated the relationship between ETV and depressive symptoms, but not PTSD. Children living in mother-absent homes were at risk of depressive symptoms as the level of ETV increased. Family size was also identified as a potential moderator of depressive symptoms, but not PTSD.

In contrast, however, a longitudinal study of urban boys at "familial risk" for antisocial behavior (younger siblings of adjudicated juvenile delinquents), demonstrated that the degree of parent-child conflict in the home had a moderating effect, in the opposite direction, on the degree to which ETV predicted later antisocial behavior *(Miller et al., 1999).* In families with a low degree of parent-child conflict, ETV was significantly related to increases in antisocial behavior over time. However, in families with a high degree of parent-child conflict, the additional impact of ETV added little to the ability to predict later antisocial behavior. In another longitudinal study, Gorman-Smith and Tolan *(1998)* also observed differences in the ways in which two attributes of family functioning (structure and support) moderated the relationship between ETV and mental health problems. ETV was significantly related to changes in aggression in families with a high degree of structure. This finding suggests that even highly organized families may not be able to buffer the impact of ETV on aggression. Taken as a whole, research indicates a complicated interaction between family functioning and the impact of ETV; in various studies, different outcomes associated with ETV are both dampened and exacerbated in more stable and cohesive families.

CONCLUSIONS

Implications for Research

As demonstrated by this review, several studies since the late 1980s indicate that reported rates of children's exposure to community violence in the United States are disturbingly high, particularly among inner-city youth. The evidence that such exposure leads to adverse, potentially long-term, mental and physical disturbance is accumulating. The literature to date indicates that the distribution of ETV is not random in most cases, and that a number of risk and protective factors can be identified. Furthermore, there are important variables that may serve to reduce the impact of ETV on children and youth. Nonetheless, several areas of debate persist in children's ETV research, and further inquiry is merited.

These issues include: *1)* whether there are effects of exposure to community violence beyond those associated with often co-occurring domestic violence; *2)* whether exposure to extreme and acute forms of violence (e.g., kidnapping, mass shooting) affects children and youth differently (e.g., internalizing problems) than chronic exposure to community violence (e.g., externalizing problems); *3)* the assertion that youth become numbed by the ubiquity and prevalence of violence, and often come to accept it as inevitable, and the related issue of the complicated role of PTSD as both a consequence of ETV and a potential mechanism for subsequent adverse outcomes; *4)* conflicting evidence on whether the unique effects attributable to ETV are greater or lesser in intact or higher functioning families; and *5)* whether a "substantial proportion" of reported

ETV (and externalizing problems) in youth may be attributable to the respondents' and their peers' prior and ongoing perpetration of violence *(Kilpatrick, 2000)*. In all these areas, there is a need for longitudinal research, as well as a need to distinguish between and rigorously define key contextual elements of ETV, including the actors and settings involved.

As is made clear by the research reviewed here, the problem of children's ETV is a complex one necessitating a much more elaborate and multifaceted research response than has been the case to date. Four key aspects of study and practice merit particular attention in future ETV research.

High-Quality Measures

First, there is a need to develop measures of ETV with proven validity and reliability, promote replication of findings, and build a larger body of knowledge on the topics reviewed above. Ideally, such measures should assess the type, frequency, and duration of violent events witnessed, relationship to the perpetrator and victim, others present during the events, setting, and proximity. Addressing these measurement and study design challenges will result in taxonomies of ETV that may shed light on the types of violent events that lead to specific mental and behavioral difficulties. Additional work is required to determine how best to measure ETV in young children, including comparisons of child versus parent reports and assessment of levels of violence witnessed by primary caregivers.

Protective Factors

There is still a great deal to be learned about individual, family, peer, and ecological factors that protect children and youth from adverse effects of ETV. At the individual level, more intricate knowledge of the impact of ETV on a child's self-perception and ability to manage other developmental tasks is needed. The research community should consider possible cycles wherein ETV may lead to disorders such as PTSD, which may in turn alter coping strategies or otherwise increase the likelihood of involvement in behavior or situations that perpetuate exposure to violence and adverse sequelae.

Further work needs to be conducted to understand family conditions that reduce the likelihood and consequences of ETV. At least two competing hypotheses exist, both with partial research support. The first maintains that families experiencing domestic conflict and violence may exacerbate the adverse impact of child ETV, and thus warrant special attention for clinical and preventive efforts. The second holds that children from intact, cohesive, and low-conflict families may be at greatest risk for adverse consequences of ETV, as it is unfamiliar to and not readily managed by child and family. Similarly, a great deal of work needs to be done to illuminate peer, treatment, and community responses that may help children and youth cope with violence that they witness in their communities, schools, and homes.

A finding of particular relevance to the clinical community, as reflected in the research reviewed here, is the key role of PTSD and related dissociative conditions as both an outcome of ETV and a potential mediator of secondary consequences. Available evidence suggests that resulting behavioral and emotional difficulties for children exposed to community violence are most common for those who develop PTSD. More information is needed to determine the degree to which various types of trauma result in PTSD, which individuals are most likely to develop symptoms if exposed, and clinical and ecological conditions protecting against progression to PTSD. While adult PTSD rates have been estimated at approximately 1% in the general population, the rates among community samples, the general pediatric population, and special populations like inner-city youth have not been well-established. Some recent community studies have reported lifetime prevalence of PTSD as high as 6.3% in a sample of adolescents *(Gianconia et al., 1995)* and 9.2% for young adults aged 21–30 years *(Breslau, Davis, Andreski, & Peterson, 1991)*. As Gianconia et al. pointed out, there is a need to investigate the prevalence of PTSD in the general pediatric population, in addition to community samples that may underrepresent trauma and subsequent PTSD experienced by high-risk youth.

Routine Population Surveys

A great deal remains unknown about the prevalence, risks, and sequelae of ETV. While we have routine sources of information on youth perpetration of violence, none exist to monitor youth ETV. Such routine population surveys are needed to identify regional and temporal trends in this area of public health concern. These data collection efforts can provide a backbone for attempts to col-

lect data on ETV and design appropriate support programs.

Longitudinal Studies

The dearth of longitudinal studies on children's community ETV is a serious limitation on our understanding of causal pathways among ETV, resulting psychiatric and behavioral sequelae, and intervening factors. Longitudinal and multilevel approaches to investigating these issues, such as the Project on Human Development in Chicago Neighborhoods (PHDCN) *(Earls & Buka, 1997)*, are a promising approach to exploring the greater complexities of the impact of ETV across many levels of influence in child development. In all such investigations, interactions with other types of vulnerability and protective factors must be given thorough consideration.

This review has led to several refinements in the conceptualization and measurement of children's ETV in the present authors' ongoing longitudinal research in the PHDCN. First, we have developed, tested, and implemented an improved measure of ETV, termed "My ETV," that has been designed to overcome many of the flaws of earlier measures *(Buka, Selner-O'Hagan, Kindlon, & Earls, 1996; Selner-O'Hagan et al., 1998)*. Most notably, it allows for the assignment of greater weights to exposures that are commonly viewed as having the most clinical and research significance, as well as distinguishing community ETV from other forms. Different versions assess child/youth ETV, primary caregiver reports of children's ETV, and primary caregiver self-reports.

Secondly, the importance of contrasting acute and chronic ETV has been sharpened in formulating research hypotheses, refining our research design, and selecting outcome measures.

Thirdly, the study design has been strengthened to reflect a greater range of ages and developmental diversity in the sample, in part by measuring primary caregivers' exposures and reactions to violence as risk factors for infants and toddlers. Parallel forms of the ETV measure for parents and for children over the age of six have been tested, with results that strongly support the superior validity of child reports *(Kuo et al., 2000)*.

A fourth refinement has been to recognize the importance of working with detailed measures of psychopathology to capture the specific disorders and impairments that may be associated with ETV. Such efforts are critical to developing a taxonomy of exposures and sequelae that are responsive to developmental and contextual influences.

Finally, the salience of adaptive aspects of children's ecological settings and their individual psychological and physiological responses to ETV have been underscored. This has led us to examine factors within the child's immediate environment that can serve either vulnerability or protective functions.

In all these respects, the multilevel, longitudinal design of the PHDCN has benefited. Just as these improvements have been a necessary part of growth within the design of this research project, advances in conceptualization and methods for investigating ETV across many settings by other researchers will prove critical in exploring the complexity of children's exposure to community violence; promoting a meaningful research agenda; developing reasoned policy; and improving clinical and public health prevention and intervention efforts.

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