Exposed:

Revealing Patterns of Community Violence Exposure and Psychological Well-Being Among Urban Youth

by

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DEDICATION

To Edward.

To Mom, Kelly, and Lisa.

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LIST OF ACRONYMS

ANOVA	Analysis of variance
CBCL	Child Behavior Checklist
CI	Confidence interval
CVE	Community violence exposure
ETV	Exposure to Violence
GEE	Generalized estimating equations
ICPSR	Inter-university Consortium for Political and Social Research
IQR	Inter-quartile range
ISR	Institute for Social Research
MCAR	Missing completely at random
NAJCD	National Archive of Criminal Justice Data
NIH	National Institutes of Health
OLS	Ordinary least squares
PC	Primary caregiver
PHDCN	Project on Human Development in Chicago Neighborhoods
PTSD	Post-traumatic stress disorder
PY	Past year
QIC	Quasi Likelihood under Independence Model Criterion
SES	Socioeconomic status

ABSTRACT

Community violence exposure (CVE) is a major environmental stressor that threatens the psychological well-being of many youth living in American cities. Although research to date has documented the many psychosocial correlates of CVE among youth of all ages, issues regarding the definition and measurement of CVE limit our complete understanding of precisely how exposure to various forms of community violence relates to youths' well-being. This study uses longitudinal data from the Project on Human Development in Chicago Neighborhoods (PHDCN) to investigate relations between CVE and both internalizing and externalizing symptoms among 4,149 youth ages 3 to 15 at baseline. In particular, this study examines patterns of emotional desensitization to CVE, the differential impact of chronic versus isolated CVE, the moderating roles of age and gender in these patterns, and the impact of CVE severity on youths' internalizing and externalizing symptoms. Overwhelmingly, results provided support for the hypothesis that youths become emotionally desensitized to violence, as evidenced by quadratic associations between CVE and internalizing symptoms both over youths' lifetimes and a one-year period. Quadratic associations between CVE and externalizing symptoms also emerged in some cases, but tended to be weaker than those for internalizing symptoms. Whereas linear associations were greater among older youth than younger youth, neither cohort nor gender moderated the quadratic associations between CVE and well-being. Isolated CVE was not distinctly associated with internalizing or externalizing symptoms compared with more chronic exposure, and *less* severe CVE was more strongly associated with well-being than more severe

CVE. These findings are integrated with evidence for desensitization. Further, both theoretical and practical implications of the findings are considered, and next steps for research are offered.

CHAPTER I

Introduction

Community violence exposure (CVE) poses an enormous threat to the lives and psychosocial well-being of children and adolescents throughout the United States. In particular, youth from low socioeconomic status (SES) families living in high-crime, urban neighborhoods so frequently experience community violence (Turner, Finkelhor, & Ormrod, 2006; see Foster & Brooks-Gunn, 2009, for review) that some scholars have labeled these environments "urban war zones" (Garbarino, 1999). Others have dubbed the high rate of community violence exposure (CVE) in U.S. cities a public health emergency (Koop & Lundberg, 1992). In fact, youth under the age of 18 are victimized by violent crime at a significantly higher rate than adults (Hashima & Finkelhor, 1999). Perhaps a more compelling account of the constant and life-threatening violence that pervades many urban neighborhoods, however, comes not from quantitative data, but rather from the youths who experience it every day. For instance, one adolescent resident of a Chicago housing project compared his experience in a dangerous neighborhood to that of a soldier in the Vietnam War:

> It's like Vietnam. I remember one time I was over at my auntie's house spending the night. We were playing Super Nintendo and I heard this lady….BOOM! BOOM! BOOM! BOOM! She let off about eight shots. Then I heard the other gun fire off. And we were just still there like nothing happened. In Vietnam, them people came back crazy. I live in Vietnam, so what you think I'm gonna be if I live in it and they just went and

visited? Living around here is depressing! It's depressing! Just look outside…! (Jones & Newman, 1997, pp. 35-36).

This description paints an uncomfortably clear picture of the chaotic violence that imbues the daily landscapes of millions of urban American youth.

The present study attempts to contribute to the overarching goal of better understanding the relation between CVE and youths' well-being from several different methodological approaches. Moreover, this study addresses several of the six initiatives for the study of youths' exposure to violence recently posed by the National Institutes of Health (NIH; Price & Maholmes, 2009) by investigating issues of the measurement of children's CVE, by providing information about youths' CVE drawn from a large, representative sample, and by examining both short- and long-term consequences of various forms of youth violence exposure. In addition to addressing these important NIH initiatives, the central aim of this study is to provide a more in-depth and detailed account of patterns of CVE as they relate to youths' well-being in a large, urban sample. In doing so, this study makes a significant contribution to the CVE literature and informs future directions for conceptualizing, measuring, and understanding CVE.

Prevalence of Community Violence Exposure Among Youth in the United States

A wealth of data indicate that virtually all adolescents living in urban neighborhoods have experienced at least some form of CVE in their lifetimes (e.g., Bell & Jenkins, 1993; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009; Fredland, Campbell, & Han, 2008; Gorman-Smith, Henry, & Tolan, 2004; Martinez & Richters, 1993; Miller, Wasserman, Neugebauer, Gorman-Smith, & Kamboukos, 1999; Overstreet & Braun, 2000; Salzinger, Rosario, Feldman, & Ng-Mak, 2008; Suglia, Ryan, & Wright, 2008; Weist, Acosta, & Youngstrom, 2001; see Stein, Jaycox, Kataoka, Rhodes, & Vestal, 2003, for review). Although

adolescents tend to experience more CVE than younger youth, children are by no means immune to the widespread community violence in urban neighborhoods and endure high rates of exposure as well (Briggs-Gowan, Carter, & Ford, 2012; Briggs-Gowan, Ford, Fraleigh, McCarthy, & Carter, 2010; Farver, Natera, & Frosch, 1999; Farver, Xu, Eppe, Fernandez, & Schwartz, 2005; Kennedy, Bybee, Sullivan, & Greeson, 2010; Miller et al., 1999; Richters & Martinez, 1993; Shahinfar, Fox, & Leavitt, 2000; see Stein et al., 2003, for review). Moreover, the majority of urban youth have been exposed to multiple types of community violence in their lives (e.g., Fredland et al., 2008). For instance, upwards of 90% of children and adolescents in urban samples have heard gunshots in their neighborhoods; more than half have witnessed a physical assault; up to 40 percent have seen a shooting; between 10 and 35 percent have witnessed a stabbing, with a significant portion of these having witnessed three or more; and up to a quarter or more of youth living in urban neighborhoods have been firsthand witnesses to murder (Bell & Jenkins; Fitzpatrick & Boldizar, 1993; Fredland et al.; Gorman-Smith et al., 2004; Kennedy & Ceballo, in press; Lambert, Nylund-Gibson, Copeland-Linder, & Ialongo, 2010; Miller et al.; Schwab-Stone et al., 1999). Even in national probability samples of adolescents, including those living in non-urban neighborhoods, nearly 40 percent had witnessed community violence (Turner et al., 2006; Zinzow et al., 2009).

In addition to witnessing violence in their communities, well over half of urban youth in many studies have been directly victimized in their neighborhoods (Aisenberg, Ayón, & Orozco-Figueroa, 2008; Kennedy & Ceballo, in press; Overstreet & Braun, 2000; Salzinger, Rosario, Feldman, & Ng-Mak, 2008; Weist et al., 2001), and 2 to 14 percent have suffered particularly severe victimization, such as being beaten, stabbed, or shot at (Gorman-Smith et al., 2004; Kennedy & Ceballo; Lambert et al., 2010). Although some findings suggest that boys experience

more CVE than do girls, others indicate that girls and boys are exposed to community violence at equal rates (e.g., Aisenberg et al., 2008; Cooley-Quille & Lorion, 1999; Kliewer, Lepore, Oskin, & Johnson, 1998; Lambert et al., 2010; Schwartz & Proctor, 2000; Selner-O'Hagan, Kindlon, Buka, Raudenbush, & Earls, 1998), especially when considering sexual assaults and threats, which females are significantly more likely to experience than their male counterparts (e.g., Schwab-Stone et al., 1999; Turner et al., 2006). Without question, these statistics indicate that children and adolescents in the U.S. are exposed to community violence at alarmingly high rates.

Impact of CVE on Youths' Psychological Well-Being

Aside from the immediate threats to youths' safety and physical well-being, CVE is associated with a range of negative mental health outcomes (see Cooley-Strickland et al., 2009, Fowler et al., 2009, Lynch, 2003, and Margolin & Gordis, 2004, for reviews), including symptoms of depression and anxiety (e.g., Horowitz, McKay, & Marshall, 2005; Jaycox et al., 2002; Kennedy & Ceballo, in press; Kennedy et al., 2010; Lambert et al., 2010; Scarpa, Hurley, Shumate, & Haden, 2006; Turner et al., 2006; Zinzow et al., 2009). For example, in a qualitative study, one youth expressed significant worries due to CVE: " 'I feel more scared, I feel less confident, I feel that I cannot walk from here to across the street without something happening because there is always something going on'" (Horowitz et al., 2005, p. 360). Perhaps the most frequently observed outcomes of CVE among youth are posttraumatic stress disorder (PTSD) and sub-clinical post-traumatic stress symptoms (Aisenberg et al., 2008; Allwood & Bell, 2008; Cooley-Quille, Boyd, Frantz, & Walsh, 2001; Denson, Marshall, Schell, & Jaycox, 2007; Jaycox et al., 2002; Kennedy & Ceballo, in press; Kliewer et al., 1998; Overstreet & Braun, 2000; Scarpa et al., 2006; Zinzow et al.). In fact, in a recent meta-analysis of 114 studies, the relation between CVE and PTSD yielded a stronger effect size than any other association (Fowler et al.,

2009). Thus, PTSD appears to be an especially pernicious consequence of CVE. While some data suggest that girls are more likely than boys to develop internalizing symptoms in response to CVE, such as depression and anxiety (Bacchini, Miranda, & Affuso, 2011; Fowler et al., 2009; Moses, 1999; Zinzow et al.), other evidence contradicts the existence of gender differences (Kliewer et al.; Salzinger et al., 2008; Schwab-Stone et al., 1999), suggesting that internalizing symptoms are a significant concern for youth of both genders exposed to high levels of CVE.

In addition to these internalizing symptoms, many youth exposed to community violence tend to develop externalizing behaviors, such as aggression and delinquency (Allwood & Bell, 2008; Bingenheimer, Brennan, & Earls, 2005; Briggs-Gowan et al., 2012; Gorman-Smith et al., 2004; Guerra, Huesmann, & Spindler, 2003; Moses, 1999; Salzinger et al., 2008; Scarpa et al., 2006; Turner et al., 2006). However, CVE was not related to externalizing behavior in a longitudinal study of primarily African American adolescents (Cooley-Quille et al., 2001). Although many studies, including the meta-analysis by Fowler and colleagues (2009), found that CVE is most strongly linked with PTSD, others – all with adolescent samples – have found stronger associations for externalizing problems than for internalizing symptoms (Fitzpatrick & Boldizar, 1993; Jenkins & Bell, 1994; Kliewer et al., 1998; Schwab-Stone et al., 1999). This has led some theorists to speculate that a desensitization process over time results in youths' adopting normative beliefs about violence as a legitimate response to conflict, so that by the time they reach adolescence, youth have developed aggressive behavioral patterns commensurate with the chronic community violence to which they have been exposed (e.g., Allwood & Bell, 2008; Ng-Mak, Salzinger, Feldman, & Stueve, 2004). Similarly, social learning theory predicts that youth who witness high levels of violence will increase their own use of violence simply by virtue of observing others behaving violently in their environments (Bandura, 1973; Margolin &

Gordis, 2004). While externalizing behaviors are more prevalent among boys than girls in the general population (Kazdin, 1995; Salzinger et al., 2008; Scarpa et al., 2005) and some findings suggest that CVE is more strongly associated with aggression among boys than among girls (Bacchini et al., 2011; Bingenheimer et al., 2005), many studies indicate that the association does not vary by gender (Fowler et al., 2009; Moses, 1999; Salzinger et al., 2008; Scwab-Stone et al., 1999; Schwartz & Proctor, 2000). Once youth aggression emerges, it typically escalates throughout one's life, making it particularly resistant to intervention (Kazdin, 1995; Rappaport & Thomas, 2004; Robins, 1981) and therefore another especially adverse outcome.

It is important to note that many of the statistical associations described above rely on cross-sectional, observational data, and even most of the longitudinal studies have not controlled for possible confounding variables or selection bias, limiting the extent to which causation may be presumed. One notable exception is a longitudinal study using data from the Project on Human Development in Chicago Neighborhoods (PHDCN), in which the authors utilized the method of propensity score stratification to determine that exposure to firearm violence predicted subsequent violent behavior among adolescents (Bingenheimer et al., 2005). The application of propensity scores simulates random assignment into experimental treatment and control groups (Rosenbaum & Rubin, 1983); thus, the findings from this study provide a more credible basis for the conclusion that CVE is indeed causally related to the development of adolescent aggression.

These findings illustrate that community violence exposure, as a very general construct, is associated with a wide range of outcomes among youth (see Foster & Brooks-Gunn, 2009, for review). Two interesting points stem from this observation. First, it is likely that many youth manifest comorbid psychopathology in response to CVE rather than a single constellation of symptoms, representing a range of outcomes *within* the individual. Such comorbidity may signal

particularly severe problems among youth who have been exposed to very high levels of CVE, or it may represent the normative pattern within the context of urban violence exposure (Cooley-Strickland et al., 2009). Second, it is also likely that the experience of CVE produces a range of outcomes *between* individuals, with each child experiencing certain symptoms as a result of his or her unique combination of relevant factors. This reasoning underlies Strain Theory, which posits that CVE is a social strain, much like any other social difficulty or stressor one may encounter, which yields different outcomes depending on how individuals experience and cope with the social strains in their lives (Horn & Trickett, 1998). As Trickett and colleagues (2003) note, many researchers implicitly test this unstated strain theory by examining the nonspecific effects of a general, combined measure of youths' frequency of CVE. However, strain theory may not serve as the optimal theoretical guide to investigating the impact of CVE on youth well-being. Instead, it may be the case that distinct causal pathways account for the association between CVE and each of these various outcomes (Fowler et al., 2009). Indeed, perhaps these differential causal pathways are at least partly driven by the unique contextual factors and characteristics of different forms of CVE, such as the nature and severity of the violence, one's relationship to the perpetrator and victim, the location in which the violence occurs, the persistence of CVE over time, and many others (Feerick & Prinz, 2003; Shahinfar et al., 2000). Very little research to date has considered this alternative approach to the study of CVE, though a more detailed examination of the ways in which the characteristics of CVE interact to yield psychological outcomes is needed to advance the field and more effectively inform interventions designed to ameliorate its impact on youths' well-being. By understanding what it is about CVE that reliably predicts how a child will respond to CVE, interventionists can tailor their efforts to more accurately target specific outcomes among youth.

Researchers in the closely related field of psychological trauma have increasingly adopted a theoretical framework that permits individual heterogeneity in responses to potentially traumatic events, rather than assuming that the same personal trajectories of PTSD arise from all encounters with traumatic events; indeed, such a perspective has illuminated nuanced and important diversity in the mental health outcomes of individuals who have witnessed traumatic events, beyond a simple dichotomy of PTSD versus healthy functioning (Bonanno & Mancini, 2012). While this literature has been treated as largely separate from the CVE literature to date, it is likely that incorporating a similar theoretical framework in analyzing the differential effects of the potentially traumatic experience of CVE would prove fruitful in the CVE literature. Therefore, this study's approach departs from that of strain theory and has as its overarching goal to investigate the differential impacts of several distinct characteristics of CVE.

Issues of Definition and Measurement in Conceptualizing CVE

Despite a proliferation of research on the prevalence and impact of CVE on youths' well-being over the past two decades, the literature remains limited by the pervasive problem of precisely conceptualizing, defining, and measuring CVE (Kindlon, Wright, Raudenbush, & Earls, 1996; Trickett, Duran, & Horn, 2003). Although the plethora of findings discussed above serves as a fundamental building block for CVE research, a shift beyond identifying relations between general levels of CVE and outcomes toward a more nuanced understanding of the various factors that moderate risk for youth who are exposed is needed to begin to move the field forward (Margolin, 2005). Many of these factors, such as characteristics of youths' experiences with community violence exposure, have not been investigated as contributors to the impact of CVE on youths' well-being simply because they have not been measured properly in previous research. Herein lies the primary motivation for the current study.

To understand how improved measurement of CVE and its various facets can enhance our understanding of its impact on youths' well-being, an appreciation for the existing limitations is warranted. Briefly, these limitations include: 1) Inconsistency in definitions of CVE; 2) Inconsistency in coding CVE frequency; 3) The implicit assumption that CVE is linear; and 4) The implicit assumption that CVE is a homogenous construct.

Limitation 1: Inconsistency in definitions. One of the primary measurement issues plaguing the CVE literature is that researchers use a wide range of definitions of CVE and methods of measuring it to study its effects (Brandt, Ward, Dawes, & Flisher, 2005). As a result, researchers lack a shared definition of CVE, impeding comparisons across studies and meaningful scientific progress (Feerick & Prinz, 2003; Guterman, Cameron, & Staller, 2000; Margolin, 2005). For example, although many measures of CVE tap respondents' frequency of exposure to various incidents of community violence, some ask about lifetime frequency (i.e., the number of times youth have experienced a range of events) while others ask about frequency of CVE within the past year. Further complicating the literature, other authors have measured the *variety* of youths' CVE by assessing the number of different events to which youth have been exposed at least once within a given time period (Brandt et al., 2005). Each of these types of instruments has its merits depending on the question a researcher is trying to answer. However, in most cases, authors have not explicitly stated their theoretical reasons for measuring past year versus lifetime CVE frequency versus CVE variety, and instead treat all of these measures as equivalent overall "CVE" constructs. In actuality, these distinct conceptualizations of CVE likely represent different aspects of CVE and therefore have very different meanings. This practice has scattered the literature with findings of various associations with CVE that are in fact based on incomparable CVE measures.

Even the types of incidents that are considered instances of community violence exposure are vastly inconsistent among CVE measures (Buka, Stichick, Birdthistle, & Earls, 2001; Guterman et al., 2000; Selner-O'Hagan et al., 1998; Trickett et al., 2003). Although CVE measures tend to have some overlap in their items (e.g., seeing someone shot or shot at), many types of CVE are only sporadically included in CVE scales (e.g., hearing gunshots; being threatened with violence; experiencing a sexual assault). Many studies measure both witnessing and victimization, whereas others focus on only one type (Trickett et al.). Interestingly, qualitative reports of CVE that individuals have experienced are rarely captured in measures of CVE frequency, perhaps because they are less commonly recognized as types of community violence per se. These have included experiences such as being chased by a car, witnessing the killing of a pet, and witnessing acts of arson (Guterman et al.). While some scholars may oppose the inclusion of these items into measures of CVE, they may prove important to investigate, since some urban residents identified them as examples of community violence. CVE researchers have also debated whether individuals' subjective reports of "perceived" overall violence or dangerousness of one's neighborhood should be considered legitimate measures of the construct of CVE (Guterman et al.). This brief sampling demonstrates that the term "community violence exposure" and the specific elements that comprise it must be more clearly defined across studies that claim to measure its impact on well-being.

Limitation 2: Inconsistency in coding CVE frequency. The way in which CVE frequency counts are coded and categorized differs among studies as well. Whereas some researchers use a truly continuous scale to measure frequency, with a numerical response for each item representing the number of occasions on which the respondent was exposed to the event, others somewhat arbitrarily categorize responses into an ordinal scale – for example, no

exposure to the given event (0), one exposure in the past year (1), two to three exposures (2), three to four exposures (3), five to seven exposures (4), and eight or more exposures (5). Such a scale is not a truly linear, continuous representation of CVE frequency, although it is often treated as one in analyses without theoretical justification (Brandt et al., 2005; Trickett et al., 2003). Still others recode qualitative response options (e.g., "none," "once in a while," and "almost everyday") into an ordinal scale (Brandt et al., 2005). Clearly, these various coding schemes make direct comparisons of CVE levels across studies nearly impossible. Even within a study using a single measure, the ordinal coding scheme may not necessarily reflect true variability among participants in their levels of exposure (Kindlon et al., 1996; Trickett et al.). For instance, using the second coding method above, someone who has experienced a given event twenty times in the past year would be assigned the same score on that item as someone who had experienced it eight times. When scores across many items are summed, this may result in participants with the same score who in fact have very distinct frequencies of CVE.

Limitation 3: Implicit assumption that CVE is linear. One of the most problematic limitations in the measurement of CVE frequency is the untested assumption that CVE, however it is measured, has a strictly linear association with outcomes. By this reasoning, CVE measured with an interval scale that ranges from "no exposure" (0) to "exposed every day" (8) implies that an increase from "no exposure" (0) to "exposed once" (1) is proportionally the same as an increase from "exposed once a week" (7) to "exposed everyday" (8) or similar one-point differences (Kindlon et al., 1996; Selner-O'Hagan et al., 1998; Trickett et al., 2003). However, aside from statistical convenience, there is no apparent justification for presupposing equally weighted intervals between ordinal scale points in this way. Even on continuous scales of CVE, the difference between never seeing a given instance of CVE and seeing it once may not be the

same as the difference between seeing the same instance nine times and seeing it ten times, but nonlinear associations between CVE and outcomes are rarely tested, limiting our understanding of how CVE may operate in the real world. In fact, it is nearly inconceivable that CVE truly behaves in a linear manner in all instances (Trickett et al.), particularly in light of the potential desensitization that may occur among youth when exposed to increasingly high levels of CVE (e.g., Mrug, Loosier, & Windle, 2008; Ng-Mak et al., 2004).

Limitation 4: Implicit assumption that CVE is a homogenous construct. A closely related issue is the fact that CVE is often conceptualized, and therefore measured, simply as a composite index of one's overall "level" of CVE in general without regard to the various types of CVE and without a theoretical basis to guide this conceptualization (Selner-'O'Hagan et al., 1998; Suglia et al., 2008; Trickett et al., 2003). Although many researchers have implicitly relied on the assumption of Item Response Theory that CVE scales comprised of many different items are governed by a single, underlying latent variable of "community violence exposure" (Earls & Buka, 1997), it is not necessarily clear that CVE is a construct that operates this cleanly. Nonetheless, most researchers simply sum respondents' scores on heterogeneous items of CVE, yielding one overall value ostensibly representing each participant's CVE level. Often unstated in these studies is an implicit, untested assumption that there is an unweighted, linear effect of one's varying experiences of different types of CVE, such that items are additively combined into one value. However, this implicit theory of the effects of violence exposure overlooks the likelihood that all events within the scale are not equally severe or influential. For example, being the victim of a stabbing may not have the same incremental impact on a person's well-being as hearing gunshots in the neighborhood; however, using an unweighted, linear scale assumes that it does. Additionally, as discussed above, even within a given type of CVE, there

may not be a linear, incremental impact of exposure. The appropriateness of making these assumptions is further called into question when another dimension of participants' exposure to violence – age or developmental level over time – enters into the picture. In most studies, it is "implicitly assumed that in one child, the stress of rape at age 8 adds to the stress of being beaten up at age 10 and witnessing a robbery at age 14, whereas in another child, the stress of being beaten up at age 9 adds to the stress of witnessing a drug deal at age 12 and being stabbed at age 16. Each child in this example would get a score of 3 in an unweighted linear composite measure" (Trickett et al., 2003, p. 231). Thus, in this example, both the potentially differential impact of identical events at distinct developmental levels as well as the diverse levels of severity of various events are ignored, leading to a potentially inaccurate conception of participants' CVE and therefore potentially invalid conclusions about its effects on well-being. Moreover, using unidimensional, linear scales of CVE precludes researchers from examining the potentially distinct impact of experiencing acute as opposed to chronic CVE (Selner-O'Hagan et al., 1998), the differential severity of each type of CVE, and the role of one's physical proximity to the violent event in its effects (Guterman et al., 2000), to name a few.

Proposed solutions. In light of these shortcomings among measures of CVE, scholars have called attention to the need for more thoughtful theory to guide the definition and measurement of CVE (Trickett et al., 2003). Researchers are beginning to recognize that CVE is almost certainly a complex, multidimensional construct rather than simply a summed frequency of diverse experiences, and therefore must be measured as such (Trickett et al.). Such an approach has been widely and successfully adopted in the maltreatment literature. The conceptualization of child maltreatment as a complex, multidimensional phenomenon has led to

a better understanding among researchers of the ways in which various characteristics of maltreatment singly and jointly impact children's development (Trickett et al.).

Several solutions to achieve this multidimensional measurement of CVE have recently been proposed. At a broad level, scholars have recommended that researchers conceptualize CVE as a latent construct, comprised of multiple different, yet related, subtypes (Fowler et al., 2009). One group of researchers took this approach by conducting a factor analysis on a scale of overall CVE frequency. They found that items on the scale that measured witnessing comprised a separate factor of CVE from those that measured direct victimization. Moreover, within victimization, two separate factors emerged based on the severity of the violent event (Miller et al., 1999).

Other researchers have proposed extending this approach by creating a CVE scale that involves multiples dimensions of CVE by assigning weights to each item response based on the respondent's frequency of exposure as well as the severity, location, and respondent's social relationships with the actors of the given violent event (Kindlon et al., 1996; Suglia et al., 2008). This type of Rasch model (Masters & Wright, 1984), based on Item Response Theory, assists researchers in constructing a continuous measure from a set of questions that are assumed to reflect various dimensions of a single underlying latent construct (Suglia et al.). Employing a weighted model in this way may be critical to more accurately express the assumption that some instances of CVE may impact a child's mental health differently or to a greater extent than others. However, the assignment of item weights can be somewhat subjective, based on one's a priori hypothesis that seeing a murder, for example, is more detrimental to youths' well-being than another event, regardless of potentially interacting factors such as child characteristics (Trickett et al., 2003). In other words, in creating a weighted scale to measure the consequences

of exposure to violence, one must specify item weights according to how one *predicts* factors like severity will impact the very consequences of exposure to violence that one hopes to measure. Therefore, even complex types of scaling such as Rasch models do not necessarily solve the problem of accurately measuring the various components of CVE (Trickett et al.). This technique may have the potential to become more standardized and therefore more useful in CVE research, however, if research were conducted with the purpose of determining precisely how item weights should be assigned – for example, which events should be considered most severe, how much weight should be given to an event that involves individuals known to the respondent rather than strangers, etc. In addition, much more research is needed to specifically *test* the often implicit assumption that CVE, however it is measured, operates in a linear fashion. Testing whether composite CVE scales are truly linear is an important initial step to potentially move beyond the implicit assumption that there is a constant, linear impact of CVE on youths' well-being. Most important, CVE researchers must think more carefully about what it is that they are trying to define in their measures of CVE and make this thought process explicit in presenting their findings. In doing so, they must be open to pursuing alternative theories about how CVE may be experienced by individuals and to evaluating such models, expanding our thinking about CVE (Trickett et al.).

Research Questions and Hypotheses

The present study aims to address these limitations in the conceptualization and measurement of CVE by explicitly testing the linearity assumption and by considering and carefully evaluating how several factors may interact in the impact of CVE on youths' well-being. In doing so, this study attempts to respond to recommendations in the literature to advance the field by building a more complete, nuanced understanding of precisely how and for whom

CVE contributes to patterns of psychological symptoms among youth (e.g., Fowler et al., 2009). This overarching goal prompts the four general research questions that follow and their corresponding specific hypotheses, each of which focuses on a particular dimension or characteristic of CVE and the youth who are exposed to it. This set of objectives reflects a departure from the commonly unstated strain theory underlying most prior investigations of the impact of CVE on youths' well-being. Instead, it is assumed that various characteristics of CVE and the youth who experience it may interact and have unique, differential impacts on different psychological outcomes, and that these relations may be nonlinear in form. In sum, I predict that CVE will be related to particular well-being outcomes in a curvilinear fashion, that CVE chronicity and severity will differentially affect outcomes among youth, and that these associations may vary depending on youths' age and gender. Table 1 outlines the general research questions that guide this study and the specific hypotheses associated with each question that were investigated.

Question 1: How is CVE chronicity associated with well-being? The question of how the long-term chronicity of CVE affects youths' well-being is a salient one, because most youth living in urban areas are in fact exposed to chronic and cumulative community violence over their lifetimes (Gorman-Smith et al., 2004; Kataoka et al., 2003; Kennedy et al., 2010; Menard & Huizinga, 2001; Moses, 1999; Weist et al., 2001). For example, in a sample of school-aged boys, nearly all children had witnessed at least one violent event, with 75 percent having experienced four or more different violent events. Several of these boys were exposed to particularly severe forms of cumulative violence: 15 percent had witnessed three or more shootings and 11 percent had seen at least three stabbings (Miller et al., 1999). Similarly, the mean number of violent events to which middle school students in a low-income neighborhood had been exposed was 4.8

(Aisenberg et al., 2008). In a related vein, urban youth also tend to be exposed to multiple *forms* of violence in addition to community violence, such as witnessing domestic violence and experiencing maltreatment (Crouch, Hanson, Saunders, Kilpatrick, & Resnick, 2000; Fredland et al., 2008; Kennedy et al., 2010; Lynch & Cicchetti, 1998; Mrug et al., 2008; Overstreet & Braun, 2000; Turner et al., 2006; see Foster & Brooks-Gunn, 2009, for review). Hence, urban youth not only experience high levels of exposure to community violence at any one time, but quite often continue to experience ongoing violence exposure over several years, and perhaps throughout their lifetimes. It is interesting to note, however, that one study that directly compared the relative impacts of CVE and exposure to family violence and conflict found that the former had more robust longitudinal associations with internalizing symptoms than did the latter (Briggs-Gowan et al., 2012).

Understanding the ways in which CVE impacts children and adolescents becomes particularly complex when considering the chronicity, or persistence, of violence exposure over time. For example, although personal victimization is more strongly related to well-being than witnessing (Fowler et al., 2009; Horowitz, McKay, & Marshall, 2005), victimization may not always be more distressing to individuals than witnessing; witnessing many events incessantly over time may have a greater (or different) impact than one isolated experience of victimization. This reasoning highlights the need for more systematic research to determine whether and how chronic experiences of CVE are associated with psychological outcomes, and how this pattern of exposure may be differentially related to outcomes from more acute or less cumulative exposure (Ferrick & Prinz, 2003; Foster & Brooks-Gunn, 2009). For instance, Horowitz and colleagues (2005) advance the theory that rather than any one exposure or group of exposures, the ongoing and cumulative nature of CVE itself may serve as a singular stressor for youth, which impacts

youths' well-being differently than any given single exposure. Such an approach is critical to improve the effectiveness of interventions for youth affected by community violence: although cognitive-behavioral therapies are known to be effective for youth suffering from PTSD triggered by discrete traumas, it is unknown whether these treatments can be applied with equal effectiveness to youth who develop PTSD as a result of chronic, ongoing CVE (Horowitz et al., 2005).

This phenomenon has only begun to be examined in the literature, because most measures of CVE simply calculate participants' total CVE frequency without inquiring about their *rates* of exposure over time, making analyses of the impact of chronicity on youths' well-being challenging at best (Selner-O'Hagan et al., 1998). When measures of CVE tap into both lifetime and past year violence exposure, however, or when these measures are taken repeatedly over time in a longitudinal study, researchers are able to statistically control for the effects of past year exposure when analyzing the effects of more chronic exposure extending further into a child's past; indeed, this is the approach some researchers have taken, allowing them to isolate the impact of earlier exposure in their analyses (Briggs-Gowan et al., 2012). Still, though, it is difficult, if not impossible, to determine the relative effects of more versus less chronic CVE even with these more descriptive measures, because more often than not, the same youth who have experienced chronic CVE in the past are those who continue to experience CVE in the present. Nonetheless, it would be informative to better understand how CVE experienced within the past year may be uniquely associated with youths' well-being as compared to cumulative or lifetime CVE, rather than resigning to the conclusion that more chronic CVE is categorically worse for youths' well-being.

Research to date suggests that CVE is linked to youths' psychological well-being via a dose-response mechanism, such that as experiences of violence exposure accumulate over time, psychological well-being declines (e.g., Kennedy et al., 2010). Indeed, Lynch (2003) concluded based on a review of the literature that chronic CVE more strongly predicts youths' psychosocial outcomes than does more acute or discrete instances of exposure, supporting a "cumulative effects" model of CVE. The cumulative effect of CVE appears to apply to a range of psychological outcomes. For instance, in nationally representative samples, a greater number of multiple exposures over time was associated with higher risk for PTSD, depression, and aggression (Turner et al., 2006; Zinzow et al., 2009). Even when accounting for the interacting effects of violence severity and familiarity with victims and perpetrators by means of a weighted Rasch model, researchers have found more cumulative, chronic CVE to be an important factor in predicting youths' outcomes (Suglia et al., 2008). Moreover, in line with a "poly-victimization" model, youth who are exposed to many different *types* of violence over a given period of time tend to experience more severe trauma symptoms than youth who are exposed to many instances of a particular type of violence (Finkelhor, Shattuck, Turner, Ormrod, & Hamby, 2011). However, these studies have tested the relation between CVE and well-being using linear models, which by definition require that any association will be fitted to a dose-response, linear pattern. Thus, a better test of whether there is a truly dose-response association between CVE and well-being, both with regard to frequency and variety of CVE, would involve the examination of nonlinear models.

In addition to this general cumulative effects model, however, discrete instances of CVE situated at one point in time may have unique effects on well-being that are distinct from the effects of chronic CVE. For example, drawing from the theory postulated by Horowitz and

colleagues (2005), acute instances of CVE may mirror more classic examples of trauma, such as isolated natural disasters or victimizations that are most often cited in the trauma literature, whereas chronic CVE may reflect a unique type of trauma in one's life that may not solely prompt PTSD symptoms. In line with this hypothesis, the results of a meta-analysis indicated that more recent exposure to community violence, regardless of one's degree of lifetime exposure, has a stronger effect on youths' PTSD than did overall lifetime exposure, whereas the degree of chronic lifetime exposure was more strongly related to externalizing behaviors (Fowler et al., 2009). This finding raises the issue of the potential confounding effect of age or developmental level on the effect of CVE chronicity on youths' outcomes. Although more chronic, long-term exposure may appear to be related to more or different psychological outcomes than less chronic exposure, an alternative explanation may be that older children and adolescents have simply been exposed to more community violence than have younger children, and these older youth happen to be differentially impacted by their exposure due to their developmental level rather than the chronic nature of the violence exposure per se. Statistically controlling for age in tests of the effects of CVE chronicity is one approach to limit these confounding effects. However, it may be the case that *both* chronicity and age play separate yet equally important roles in the impact that CVE has on youths' well-being. Thus, more research is needed that attempts to parse out the effects of CVE chronicity and youths' age, which is the approach that this study takes. (See discussion of age as a moderator below.)

One theory that may account for differential outcomes for more versus less chronic CVE is that youth become desensitized to CVE over time, leading to emotional numbing (which would account for a weaker association between CVE and emotional symptoms over time). As a corollary to *emotional* desensitization, researchers have also proposed that youth develop a

greater acceptance of the use of violence as a normative problem solving strategy with increasing CVE (which would account for a stronger association between CVE and externalizing behaviors over time; Ng-Mak et al., 2004). Some scholars have termed this pattern "pathologic adaptation," implying that while some youth appear able to adapt to chronic CVE emotionally, such resilience comes at the expense of maladaptive behaviors as youth become more likely to use violence themselves (Schwab-Stone et al., 1995). Other theorists have framed this desensitization process as truly adaptive, arguing that within the dangerous context of CVE, replacing emotional coping with aggression may help urban youth more effectively respond to the threatening violence to which they are exposed (Swisher & Latzman, 2008). Yet another explanation that may account for this process is that youth who are chronically exposed to violence and suffer distress symptoms as a result eventually develop a pessimistic attitude about the future, upholding expectations about one's imminent mortality within a dangerous environment (see Fletcher, 2003, for review). This pessimistic future orientation may in turn lead youth to engage in risky behaviors characterized by aggression that yield short-term rewards, such as fighting and stealing from others, because they feel that long-term consequences of such actions may be irrelevant given daily threats to one's life.

Although research has provided support for a dose-response relation between CVE and children's well-being, it is important to note that most authors have not explicitly tested alternative models that might better reflect this association. However, several findings do provide some preliminary support for the desensitization model as an alternative to the dose-response model. For instance, despite the well-established strong association between CVE and internalizing symptoms (Fowler et al., 2009), some studies, particularly those with adolescent samples, have found stronger associations with aggression and externalizing behaviors

(Fitzpatrick & Boldizar, 1993; Jenkins & Bell, 1994; Kliewer et al., 1998). In a sample of African American adolescents, CVE was actually negatively associated with depression, with higher levels of CVE associated with less depression (Fitzpatrick, 1993). While these findings may simply reflect idiosyncratic samples, some have speculated that they represent a desensitization process resulting in emotional symptoms among younger children that evolve into externalizing symptoms among older youth who have experienced more persistent CVE (e.g., Ng-Mak et al., 2004).

More direct tests of the desensitization model provide even more compelling evidence. Several researchers have identified negative quadratic associations between CVE and internalizing symptoms over time, such that as exposure increases, internalizing symptoms increase to a point, then begin to decrease at very high levels of exposure. At the same time, they have found positive linear associations between CVE and externalizing problems (Mrug et al., 2008; Ng-Mak et al., 2004). Supplementing these findings, in a cross-sectional study of middle school youth living in low-income neighborhoods, while half of all participants reported having witnessed a violent death, only 14 percent of these youth expressed that it was the most bothersome event they had experienced. Although this finding may provide intriguing and perhaps unexpected insight into youths' subjective experiences of CVE, the authors interpret this response pattern to be indicative of a desensitization process, whereby participants downplayed the distress they experienced as a means to protect their emotional well-being (Aisenberg et al., 2008). Adolescents exposed to chronic community violence may also experience physiological desensitization, such as lower resting heart rates, which may be linked to the process of emotional numbing (Cooley-Quille & Lorion, 1999; Cooley-Quille et al., 2001).

Despite these preliminary data, more research testing the desensitization model of CVE is needed, particularly with longitudinal data, as most evidence comes from cross-sectional studies (Foster & Brooks-Gunn, 2009). Moreover, the results of one investigation failed to support the desensitization hypothesis (McCart et al., 2007). Notably, however, the authors of this study measured the frequency of youths' exposure to a range of violent events over the course of their lifetimes on a scale with 0 representing no exposure to the given item, 1 representing one lifetime exposure, and 2 representing *two or more* lifetime exposures to the given item. Although the authors did not explicitly discuss their reasons for coding CVE this way, such a coding scheme does not create a truly linear scale, but in fact is the very type of coding that underlies a desensitization model – that is, that the increase from one exposure to two exposures is not equally influential as the increase from two exposures to three or even more exposures. Therefore, the fact that these authors found a linear rather than a quadratic trend between their CVE variable and youth outcomes actually may provide evidence that there *is* a curvilinear association. These issues of measurement are not simply pedantic details, then, but have important implications about our understanding of how CVE is related to youths' well-being. Another potential reason for McCart and colleagues' (2007) findings may be that they explored the impact of CVE on PTSD symptoms, which are a particularly robust outcome of CVE (Fowler et al., 2009; Kennedy & Ceballo, in press). If desensitization occurs among youth, it may reflect desensitization of more general, subclinical levels of internalizing symptoms. Additionally, the only two studies that have provided support for the desensitization hypothesis have measured CVE as past year CVE variety – that is, the number of different events to which youth had been exposed within the past year (Mrug et al., 2008; Ng-Mak et al., 2004) – without addressing whether and how desensitization to CVE variety might be different from desensitization to CVE

frequency. For instance, quadratic effects of CVE variety may suggest that not all *types* of CVE impact youth in an equal fashion, providing evidence against the assumption that CVE is a homogenous underlying construct (Limitation 4 above), whereas quadratic effects of CVE frequency may suggest a weakening effect of CVE with increasing frequencies, providing evidence against the assumption that CVE is a linear construct (Limitation 3 above). Furthermore, if a desensitization process does occur among urban youth, it would be expected to be stronger for lifetime or cumulative CVE than past year CVE. Thus, the current study addresses these gaps in the literature by testing the desensitization hypothesis as it relates to both CVE frequency and variety, and both over the past year and cumulatively. Specifically, to determine whether youth become emotionally desensitized to CVE, this study tests three related hypotheses (see Table 1): Hypothesis 1a) Lifetime and past year CVE (frequency and variety) will be negatively quadratically related to internalizing symptoms, but positively linearly related to externalizing symptoms; Hypothesis 1b) Lifetime CVE (frequency and variety) will have stronger quadratic associations with internalizing symptoms than past year CVE; and Hypothesis 1c) The association between CVE item frequency (coded ordinally) and internalizing symptoms will weaken at higher levels of CVE frequency. With regard to specific Hypothesis 1a, a quadratic association between CVE *frequency* and internalizing symptoms would violate the assumption of linearity discussed above (Limitation 3). A quadratic association between CVE *variety* and internalizing symptoms may violate the assumption that CVE operates as a single, homogenous construct regardless of the different types of CVE that comprise it (Limitation 4).

One concern with investigating the distinct impacts of chronic versus more isolated CVE is that most youth living in urban neighborhoods have experienced unrelenting CVE throughout their lifetimes, potentially limiting the practical significance of any findings. Although persistent,

cumulative CVE is most common among urban youth, however, a minority does in fact experience more isolated, acute instances of CVE (Suglia et al., 2008). Selner-O'Hagan and colleagues (1998) identified a subset of youth comprising approximately five percent of the PHDCN dataset that fit an "acute" pattern of CVE – that is, a relatively low overall frequency of cumulative violence exposure and a relative absence of the least severe forms of CVE, but one or a few isolated exposures to severe instances of community violence. As an illustration of this general pattern, one participant in this study indicated having experienced a few sexual assaults, deemed quite severe instances of CVE by the authors, though virtually no other CVE. Thus, it may be important to examine how these youth are uniquely affected by more acute exposure. Perhaps unlike chronic exposure, isolated exposure in the absence of more pervasive violence functions more similarly to the isolated events and disasters that are commonly studied in the trauma literature as precursors to PTSD. Research on childhood trauma more generally suggests that the sudden, unpredictable occurrence of traumatic events increases children's risk for developing PTSD. Moreover, youth who experience acute, single traumas tend to develop somewhat distinct patterns of stress symptoms from youth who experience more chronic, abusive trauma, including a broader range of anxiety symptoms than solely those associated with PTSD as well as depressive symptoms (Fletcher, 2003). It may be the case that youth who experience acute traumas have a more difficult time putting out of their mind the distressing memories associated with these events than do youth with ongoing traumas (Fletcher). As a corollary to the desensitization theory, then, isolated CVE may be experienced as more emotionally jarring to youth who have not become desensitized to more chronic violence and therefore experience it as sudden, unpredictable, and more traumatizing. Hypothesis 1d proposes that isolated CVE will be more strongly associated with internalizing symptoms than will chronic CVE.

Question 2: How is CVE severity associated with well-being? While the chronicity of CVE likely plays a role in its impact on youths' well-being, this factor may tell us very little when considered separately from the relative severity of the violence to which they are exposed. In contrast to a solely cumulative perspective of CVE, many researchers argue that because some violent events in the community may be more severe or threatening than others, merely calculating youths' overall frequency or chronicity of exposure does not accurately reflect the differential impact that these various events may have on well-being (Horn & Trickett, 1998; Selner-O'Hagan et al., 1998; Suglia et al., 2008; Trickett et al., 2003). Instead, the extent and type of psychological symptoms that youth experience may depend on the severity and intensity of the events to which they are exposed (Margolin & Gordis, 2004; Trickett et al., 2003). This theoretical perspective moves beyond a general strain theory or cumulative effects model, thus calling for future research to test its validity by evaluating how the magnitude or severity of CVE impacts psychological outcomes; however, the fact that most youth are exposed to a wide range of violence rather than solely to events of equal severity makes this research aim difficult to pursue (Fredland et al., 2008; Gorman-Smith et al., 2004; Menard & Huizinga, 2001; Miller et al., 1999; Scarpa et al., 2006; see Foster & Brooks-Gunn, 2009, for review).

Despite the complexity involved in measuring the effect of violence severity on youths' well-being, several groups of researchers have attempted to do so. For instance, the results of a factor analysis yielded two distinct categories of community violence victimization, which the authors termed "severe" (items such as having been attacked, stabbed, and shot at), and "not-so-severe" (items such as having been chased, threatened, and beaten up; Vermeiren, Schwab-Stone, Deboutte, Leckman, & Ruckin, 2003). Thus, the relative severity of a violent event does appear to make a qualitative difference in how it operates as a construct, at least for direct

victimization. Other researchers have attempted to incorporate violence severity into their analyses of the impact of CVE by employing Rasch modeling techniques and weighting more heavily those events deemed to be more severe or extreme (Selner-O'Hagan et al., 1998; Suglia et al., 2008). Although this approach has clear advantages over employing non-weighted, linear scales that ignore violence severity, one potential problem is that the apparently objective severity of a violent event may not correspond to the event's perceived significance or subjective severity for a given individual (Schwartz & Proctor, 2000). For example, while witnessing a stabbing may be considered objectively more severe than witnessing a mugging, a mugging that occurs close to home and to a family member may have a greater impact on an individual than a stabbing of a stranger witnessed in a remote area of the neighborhood. By excluding other potentially interacting factors, such as event proximity, location, and familiarity of the victim, even combining severity and frequency into a scale of CVE presents a relatively shortsighted view of CVE (Trickett et al., 2003). Therefore, the severity of CVE may best be evaluated in concert with other potentially moderating variables.

Notwithstanding these limitations, some evidence suggests that exposure to more violent events places children and adolescents at greater risk for developing PTSD. First, the general trauma literature has established a clear link between the severity of a disaster, accident, or other trauma and an individual's risk for developing PTSD (e.g., Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002; see Peleg & Shalev, 2006, and Galea, Nandi, & Vlahov, 2005, for reviews). These findings in the related field of childhood trauma strengthen results from the limited work on violence severity in the CVE literature. For instance, in a cross-sectional study of low-income middle school students, the most severe event a child had experienced explained a larger portion of the variance in PTSD than frequency of exposure and one's relationship to the victim

(Aisenberg et al., 2008). While it may seem self evident that more severe violence exposure would yield more severe symptoms, more detailed data demonstrate that "severity" is a somewhat subjective measure, and the violent events that are considered most severe or extreme by one individual may be considered less so by another. In the study described above, for example, nearly three quarters of participants who met diagnostic criteria for PTSD had witnessed a homicide, an incident of CVE that the authors deemed most severe. Interestingly, however, the majority of participants did not report this event as the most bothersome one they had witnessed (Aisenberg et al., 2008). This discrepancy begs the question, should severity be defined by an event's effects on an individual's well-being, or rather by a more standardized set of criteria, such as the extent of the injuries sustained by the victim?

The present study aims to inform the development of more appropriately weighted CVE scales by building a theoretical basis for how CVE items should be differentially weighted. Therefore, in an exploratory fashion, the following hypotheses are tested: Hypothesis 2a) More severe witnessed community violence will be more strongly associated with youths' internalizing and externalizing symptoms than will less severe CVE; and Hypothesis 2b) More severe CVE will have a linear association with internalizing symptoms, whereas less severe CVE will have a quadratic association, reflecting greater desensitization for less severe CVE.

Question 3: How does a child's age or developmental level moderate the impact of CVE on psychological well-being? One individual characteristic that may interact with the various dimensions of CVE in moderating its impact is age, or developmental level. Typically, older children and adolescents are exposed to more community violence than are younger children (Jaycox et al., 2002; Kliewer et al., 1998; Selner-O'Hagan et al., 1998; see Horn & Trickett, 1998, for review). In one study, while older adolescents tended to witness more

community violence than younger adolescents and pre-adolescents, they were victimized at the same rate (Schwab-Stone et al., 1999). Nonetheless, young children are by no means immune to the widespread community violence in urban neighborhoods; in fact, many are exposed to high rates of quite severe violence (Briggs-Gowan et al., 2010; Flannery, Wester, & Singer, 2004; Miller et al., 1999). Over half of preschool children in low SES neighborhoods are estimated to have witnessed gang activity, arrests, and weapon-related assaults (Farver et al., 2005), and as many as 10% of preschoolers and young children in various research samples have witnessed a stabbing or shooting (Groves, Zuckerman, Marans, & Cohen, 1993; Taylor, Zuckerman, Harik, & Groves, 1994; see Stein et al., 2003, for review). Overall, nearly 80% of very young children have been exposed to at least one form of community violence by some estimates (Shahinfar et al., 2000), and, like adolescents, many urban preschoolers frequently hear gunshots from their homes (Farver et al. 2005; Taylor et al. 1994; see Stein et al., 2003, for review).

Drawing on developmental theory, there is good reason to suspect that children at different developmental stages will respond to and be affected by CVE differently, based on their cognitive, social, and emotional regulation abilities (Cicchetti, 1989; Margolin, 2005; Swisher & Latzman, 2008). For instance, the cognitive processes that are thought to mediate the effects of CVE, such as those involved in understanding social cues and coping with experienced violence, may not be fully developed early in life, leaving younger children more vulnerable than older youth to certain psychological outcomes of CVE (Margolin, 2005). Indeed, even a child's perceptions of the dangerousness of violence to which they are exposed may be impacted by his or her developmental stage (Guterman et al., 2000).

Some research indicates that age is, in fact, a modifier of CVE effects (see Foster & Brooks-Gunn, 2009, for review), though researchers diverge somewhat in their

conceptualizations and measurements of the exact nature of this moderating effect. The results of a meta-analysis suggest that adolescent samples exposed to violence had significantly stronger effects on psychosocial well-being, in general, than did child samples, and the magnitude of the effect of age on externalizing behaviors was particularly large (Fowler et al., 2009). While the results of this study did not reveal a significant difference in the effect of CVE on PTSD between child and adolescent samples, several studies have instead found that younger youth more often respond to CVE with internalizing symptoms than older youth, whereas older youth respond more often with externalizing behaviors (Flannery et al., 2004; Foster & Brooks-Gunn, 2009; Howard, Feigelman, Li, Cross, & Rachuba, 2002; Kennedy et al., 2010; Schwab-Stone et al., 1999; Schwartz & Proctor, 2000), echoing the pattern of the effects of chronicity that predominates in the findings. Findings from the trauma literature suggest that the reason for this pattern is that young children may be less able to cope emotionally with distressing events than older youth (Farver et al., 2005; Fowler et al.; Rossman, 1992, as cited in Fletcher, 2003).

Measuring a youth's level of CVE by linearly combining their frequency of exposure over time assumes that an experience of CVE for the same child at one point in time has the same magnitude of effect as even an identical experience when the child is older, which may not be the case if developmental level affects the way in which violence is experienced by youth (Trickett et al., 2003). However, as mentioned above, most research to date on the impact of CVE has relied on such a measurement strategy. Therefore, more studies are needed that employ methods to investigate how age or developmental stage moderates the effects of violence exposure on children's development (Foster & Brooks-Gunn, 2009; Horn & Trickett, 1998; Margolin & Gordis, 2004). The knowledge that this research yields will build more developmentally sensitive theories about the role of CVE in the development of youth

psychopathology (Horn & Trickett, 1998; Margolin, 2005). This dissertation aims to contribute to this research effort by testing age as a moderator of the impact of CVE on youths' psychological well-being. Specifically, given the research findings discussed above, it is hypothesized that CVE will have stronger associations with internalizing symptoms than with externalizing problems among younger youth, whereas CVE will be more strongly associated with externalizing problems than with internalizing symptoms among older youth. To further contribute to the literature, the present study also aims to parse the effects of age and CVE chronicity to the extent possible. In this vein, among youth with the highest levels of CVE, it is hypothesized that younger children are less likely to become desensitized than older children.

As discussed above, age is often embroiled in measurements of chronicity of CVE, as youth tend to experience more community violence as they grow older. Instead, it is essential to study changes in effects of exposure not only across ontogenetic time, but also across historical time. For instance, it has been concluded both that older youth and those youth who have experienced the most chronic CVE over time have higher rates of externalizing problems and lower rates of internalizing symptoms than younger youth and those who have experienced more acute CVE, respectively. Without separating these effects, one cannot be certain whether they both simply reflect a single underlying effect of age *or* chronicity. The moderating effects of age may also be confounded with those of severity: in a national sample, for example, older youth were exposed to more severe peer victimization than were younger children (Turner et al., in press). Therefore, the current study attempts to parse the effects of these distinct factors to determine whether developmental level per se, aside from its correlations with chronicity and severity, moderates the impact of CVE. Specifically, the following two hypotheses are proposed regarding the moderating role of age: Hypothesis 3a) CVE will have stronger linear associations

with internalizing symptoms for *younger* youth, but stronger linear associations with externalizing symptoms for *older* youth; and Hypothesis 3b) the quadratic association between CVE and internalizing symptoms will be stronger for older youth and adolescents than for younger children, reflecting greater desensitization among older youth.

Many questions may arise from a consideration of the moderating effects of age on the impact of CVE, aside from the moderating effect of age on the association between CVE and particular psychological outcomes. For example, does CVE experienced only early in one's life cause greater disruption in development than CVE experienced only later in life? Is it possible that CVE at one point in time has delayed effects on youths' psychological well-being? If so, do such effects occur even in the absence of ongoing CVE (Margolin & Gordis, 2004)? Given the many other factors of CVE and individual characteristics being examined, however, the current study focuses solely on the moderating effect of age per se on the link between CVE and psychological outcomes, while acknowledging that some of these more intricate questions may be conflated with such an investigation.

Question 4: How does a child's gender moderate the impact of CVE on psychological well-being? Another individual characteristic that may moderate the impact of CVE is gender. One of the most well-established findings in the CVE literature is that boys are exposed to more community violence than girls, particularly when excluding types of CVE that are more common among girls, such as sexual assaults (Jaycox et al., 2002; Menard & Huizinga, 2001; Moses, 1999; Selner-O'Hagan et al., 1998; Schwab-Stone et al., 1999; Weist et al., 2001). However, research on the moderating role of gender in the *impact* of CVE on psychological outcomes has been mixed. Although some findings suggest that CVE is more strongly associated with aggression among boys than among girls (Bacchini et al., 2011; Bingenheimer et al., 2005),

many studies indicate that the association does not vary by gender (Fowler et al., 2009; Moses, 1999; Salzinger et al., 2008; Scwab-Stone et al., 1999; Schwartz & Proctor, 2000). Similarly, while many findings indicate that girls are more likely than boys to develop internalizing symptoms in response to CVE (Bacchini, Miranda, & Affuso, 2011; Fowler et al., 2009; Moses, 1999; Zinzow et al., 2009), other evidence contradicts the existence of gender differences (Kliewer et al., 1998; Salzinger et al., 2008; Schwab-Stone et al., 1999). The authors of a meta-analysis investigating the moderating role of gender concluded that gender moderates the association between CVE and internalizing symptoms, with stronger associations among girls, but that gender does not moderate the association between CVE and externalizing symptoms (Fowler et al., 2009). However, the authors noted that moderating effects of gender that emerged may have been due to sampling differences among the studies rather than true gender effects.

In addition to investigating the differential impact of CVE between males and females, it is possible that gender may moderate youths' desensitization to CVE. Although this question has not previously been examined in studies of desensitization to my knowledge, it is possible that boys are more likely than girls to become desensitized to CVE in terms of their emotional responses, given their lower propensity for experiencing internalizing symptoms at baseline. Thus, the present study aims to further contribute to the literature on desensitization to CVE by examining the potential moderating role of gender. Specifically, Hypothesis 4 posits that girls will experience less desensitization to CVE for internalizing symptoms than boys.

The importance of exploring these questions simultaneously. Although some research has examined the moderating effects of proximity, chronicity, and severity of youth CVE on its psychological impact *individually*, very little research, if any, has assessed the relative roles of these characteristics *simultaneously* within the same analysis. However, this approach would

provide a more realistic view of youths' experiences with CVE, as these various dimensions constantly interact with each other to affect youths' well-being rather than operating in isolation. More severe violent events may tend to yield more serious psychological symptoms in youth, in general, but even the most severe event may differentially impact youth depending on their proximity to the event, how frequently they experience it, and their unique developmental and cultural backgrounds. For instance, it is conceivable that witnessing a stabbing is more distressing to youth than witnessing a robbery, while actually experiencing a stabbing is even more distressing, and being stabbed several times over one's lifetime is still more distressing. Moreover, a child who witnesses or experiences these events at age 8 may be affected quite differently from an adolescent, and the same violent event may impact youth differently depending on the cultural context from which they view and interpret these experiences.

The finding by Aisenberg and colleagues (2008), which indicated that most youth who had witnessed a homicide did not report it as the most bothersome event, saliently illustrates the importance of considering the interacting effects of the various dimensions of CVE, such as proximity and chronicity, as well as the characteristics of youth who experience it, such as developmental level and cultural background. In this particular case, one might imagine that youth who witnessed a homicide were more distressed by less "severe" events in which they were victimized, such as a beating or a robbery, due to their more direct proximity to the violence and resulting feeling of threat. As an alternative explanation, perhaps most participants did not know the victims of the murders they witnessed, and so were more bothered by less "severe" events that involved a friend or a family member. Yet another reason for the discrepancy may be that older youth were more likely to witness homicides than younger children, and they were able to draw on more sophisticated cognitive processes to understand

and cope with this rare event, whereas they were less able to make sense of more chronic, everyday instances of violence that they may view as more troubling. Clearly, a plethora of interacting processes may be at play for any given individual who experiences CVE, highlighting the relative and interacting importance of each aspect of CVE. Unfortunately, many aspects of CVE were not measured in the PHDCN data used for this study, making such interacting processes impossible to measure.

This nuanced theoretical approach has not been well tested in the CVE literature; instead, the little attention that has been devoted to investigating the differential effects of CVE has been done so piecemeal, investigating individual associations while ignoring the potential interacting influences of other important elements of CVE. Therefore, the present dissertation specifically aims to provide a more complete, cohesive picture of the multifaceted nature of CVE's psychological impact than currently exists in the literature.

Additional moderators of the impact of CVE. Certainly there may be additional factors aside from those explored in the present study that are related to the impact of CVE on youths' well-being in important ways. For instance, factors such as victimization versus witnessing, physical proximity to community violence, CVE recency, gang involvement, temperament, cultural values, and parental and other family influences may all interact with the impact of CVE on youths' well-being (e.g., Ceballo, Kennedy, Bregman, & Epstein-Ngo, 2012). However, an evaluation of all of these potential factors is beyond the scope of the present study. Additionally, an examination of whether and how the factors explored in the present study may differentially operate in youth from different racial/ethnic backgrounds and with differing levels of gang involvement would best be informed by first establishing whether and how factors such as chronicity and severity differentially affect youth more generally. Only then can appropriate

theories be developed to guide comparative research among distinct groups of children and adolescents. An additional concern in considering the moderating role of gang involvement in the impact of CVE on youths' well-being is that gang members are almost certainly exposed to more community violence than their peers (Decker & Curry, 2000; Katz, Webb, Fox, & Shaffer, 2011; Taylor, Peterson, Esbensen, & Freng, 2007). Therefore, an investigation of the moderating role of gang involvement may be irrevocably confounded by CVE frequency and variety. Moreover, perhaps the greatest attention in the literature with regard to differential characteristics of CVE has been paid to issues of proximity, such as how witnessing versus being victimized by CVE differentially affect youth (Pynoos, Frederick, Nader, & Arroyo, 1987). Hence, this study attempts to add to rather than duplicate previous findings to contribute to a more complete understanding of the various factors involved in the impact of CVE on youths' well-being. Further, a primary goal of the present study is to examine one particular aspect of CVE in great depth rather than conducting a cursory examination of a range of questions. In particular, as depicted in Table 1, this study comprehensively tests the desensitization hypothesis using several approaches and several ways of conceptualizing CVE, with additional attention to exploring the roles of CVE chronicity and severity, and of participants' age and gender.

CHAPTER II

Method

Sample

The data for this dissertation study were drawn from the Project on Human Development in Chicago Neighborhoods (PHDCN) Longitudinal Cohort Study (Earls, Brooks-Gunn, Raudenbush, & Sampson, 1994-2002). These data are currently managed by the Inter-University Consortium for Political and Social Research (ICPSR) within the National Archive of Criminal Justice Data (NAJCD) at the Institute for Social Research (ISR) at the University of Michigan. The Longitudinal Cohort Study of the PHDCN consists of three waves of data, each collected two to three years apart between 1994 and 2002. This large-scale, longitudinal study was conducted in order to investigate the influences of family, school, and individual factors on youths' social, emotional, and academic development (Earls & Buka, 1997).

Data were collected from a random sample of 6,228 children and adolescents in Chicago neighborhoods. The city of Chicago was selected as the site for the PHDCN because of its racial, ethnic, and socioeconomic diversity, thereby enhancing the potential generalizability of conclusions drawn from these data. Within Chicago, a stratified probability sample of 80 neighborhood clusters was chosen from among 343, which were selected from among 847 geographical census tracts on the basis of racial/ethnic and socioeconomic composition. The 80 neighborhood clusters each consisted of two or three census tracts that were alike in terms of their racial/ethnic composition, housing density, and residents' family structure and SES. These neighborhood clusters were selected to represent racial/ethnic and socioeconomic groups as

equitably as possible and to limit confounding between racial/ethnic composition and socioeconomic status. Within each neighborhood cluster, a random sample of dwelling units were selected for data collection, from which all household members within 6 months of one of the seven cohort ages were invited to participate in the study. Of the 8,347 eligible participants that were identified via this initial screening, a total of 6,228 were interviewed during the first wave of data collection, yielding an overall response rate of 75 percent for Wave 1 (Earls & Buka, 1997).

Children belonged to the following seven age cohorts at the first wave of data-collection: birth (0), 3, 6, 9, 12, 15, and 18. The present study uses data drawn from Cohorts 3, 6, 9, 12, and 15. These cohorts were selected to permit the investigation of the research questions across a broad range of development, particularly the ways in which age relates to CVE and its associations with well-being. In addition, the primary measures for this study were administered to participants and/or caregivers within these five cohorts. Of the 4,327 participants in these cohorts at Wave 1, those who identified as Asian (52; 1.2%), Pacific Islander (10; .2%), Native American 36; .8%), Other race/ethnicity (66; 1.5%), or for whom racial/ethnic background was not reported (14; .3%), were deleted from the sample. Thus, the final sample consisted of 4,149 Hispanic, Black, and White youth at Wave 1 (see Table 2). Tables 3 and 4 display demographic information for the total sample by cohort, reflecting a representative sample with regard to gender, socioeconomic status, and other demographic characteristics.

Attrition analyses. Response rates for each cohort at each wave of data collection are reported in Table 2. Compared to the full sample at Wave 1, 506 participants were not interviewed at Wave 2 (12.2%), leaving a sample of 3,643 at Wave 2. As shown in Table 5, participants lost to attrition at Wave 2 were comparable to Wave 2 participants with respect to

age, cohort, primary caregiver's age, family size, sex, language, relationship to primary caregiver, past year CVE frequency, lifetime CVE frequency, and outcome variables, including CBCL internalizing T-score and CBCL externalizing T-score, using a Bonferroni-corrected *p*-value of .003 for multiple comparisons. Participants lost to attrition at Wave 2 had significantly lower total household income and primary caregiver education level, were more likely to be Black, were more likely to have received public assistance in the tax year prior to being interviewed, and tended to have unmarried primary caregivers, on average.

Compared to the full sample at Wave 1, 817 participants were not interviewed at Wave 3 (19.7%), leaving a sample at Wave 3 of 3,332 participants. As shown in Table 6, participants lost to attrition at Wave 3 were comparable to Wave 3 participants with respect to age, cohort, primary caregiver's age, family size, sex, language, relationship to primary caregiver, receipt of public assistance, past year CVE frequency, lifetime CVE frequency, and outcome variables, including CBCL internalizing T-score and CBCL externalizing T-score, using a Bonferroni-corrected *p*-value of .003. Participants lost to attrition at Wave 3 had significantly lower total household income and primary caregiver education level, were more likely to be Hispanic, and tended to have unmarried primary caregivers, on average.

Of the participants who did *not* participate at Wave 3, 351 (43%) *also* did not participate at Wave 2, representing the participants who were permanently lost to attrition. Of the participants who did *not* participate at Wave 3, 155 (57%) *did* participate at Wave 2. Finally, of the Wave 3 participants, 155 (4.7%) did not participate at Wave 2, representing the subsample that was initially lost to attrition then resumed participation at the final wave of data collection.

Procedure

Interviews were administered by trained interviewers face-to-face or over the phone when a face-to-face interview was not possible. Respondents were either the youth participants themselves or their identified primary caregivers, depending on the given cohort and measure. Interviews were conducted in Spanish, English, or Polish depending upon the respondent's language preference. An interpreter assisted with survey administration for all respondents who spoke a language besides one of these three. Participants were compensated in cash (between $5 and $20 per interview) and other incentives (e.g., passes to the museum, aquarium tickets, and monthly drawing prizes) for their participation, depending on the age and wave of data collection.

Procedure for obtaining and storing the PHDCN data. The proposed study has been reviewed by the University of Michigan's Institutional Review Board and has been deemed "exempt" from full review. A Data Use Agreement form and a Data Protection Plan were submitted to the National Archives of Criminal Justice through ICPSR, per the institute's protocol for obtaining the restricted data. The Data Protection Plan specifically outlined the measures that have been taken to ensure participants' privacy and the security of the data for the duration of the study, such as retaining only one copy of the data files per research team member, accessing the data files only from a non-networked device, and storing the data and all related data analysis output on a dedicated external hard drive kept in a locked, private desk.

Strengths of the Data

The PHDCN data possess a number of assets that not only strengthen the potential for statistical analysis, but also make them particularly well suited to address the questions proposed in the current study. First, the data are both longitudinal and cross-sectional, allowing the examination of changes in variables over time, both across and within individuals. Furthermore,

the data are prospective with respect to the outcome measures of interest, minimizing retrospective reporting biases. Given that much of the prior CVE research has relied on cross-sectional data, the need for longitudinal designs such as that employed by the PHDCN is a particularly pressing one (Cooley-Strickland et al., 2009; Feerick & Prinz, 2003; Foster & Brooks-Gunn, 2009; Fowler et al., 2009; Margolin, 2005; Swisher & Latzman, 2008). Moreover, the availability of well-being measures at multiple time points permits the statistical control for autoregressive effects of well-being. The cross-sectional data will further permit me to measure the moderating impact of both developmental level per se and within-individual chronicity of CVE, in an attempt to address research questions 1 and 3 (see Table 1). The broad timeframe through which the longitudinal data extend is an additional advantage of the PHDCN data, as it allows a rich examination both of the effects of CVE at numerous developmental stages (early childhood through young adulthood), as well as developmental change over a relatively substantial period of five years within each cohort. An assessment of both short- and long-term mental health outcomes of CVE via developmentally sensitive longitudinal designs, such as that employed in the PHDCN, has been duly emphasized by researchers seeking to expand our understanding of precisely how the effects of CVE unfold over the course of children's development (Margolin; Swisher & Latzman).

A second primary benefit of the PHDCN data is that they have been drawn from a large, urban sample, including a substantial number of racial/ethnic minority youth, which is important to advance the field, given that much of the CVE research to date has focused on smaller, less ethnically diverse samples (Cooley-Strickland et al., 2009). The large sample offers sufficient statistical power to uncover potentially subtle effects and patterns of CVE on youths' well-being that may otherwise go unnoticed in smaller samples. Third, participants were randomly selected

from ethnically, culturally, and socioeconomically diverse communities in Chicago, greatly reducing potentially confounding selection effects and increasing the generalizability of findings to youth living in U.S. cities Fourth, the data derive from both caregivers and participants themselves for most cohorts, providing more information on the variables of interest than would be available from single-respondent measures.

Finally, what makes the PHDCN dataset most distinctively apt for this investigation is its extremely detailed and nuanced measure of community violence exposure. One of the most significant limitations of past research in developing a richer understanding of the impact of CVE on youths' well-being is the use of measures of violence exposure that yield only a very general picture of children's overall exposure either in the past year or in their lifetimes. In contrast, the PHDCN measure solicits detailed information about many different types, severity, chronicity, and location of violence exposure, providing a multidimensional assessment of youths' exposure (Horn & Trickett, 1998; Selner-O'Hagan et al., 1998). Moreover, the instrument measures participants' community violence exposure both during the prior year as well as lifetime exposure, and measures both the frequency and variety of participants' CVE. Assessing CVE for multiple durations is helpful in examining its impact on youths' well-being, because for many youth, exposure is intermittent; thus, if only past-year exposure were measured (as is often the case in CVE studies), researchers may have overlooked significant experiences with CVE in participants' lives (Menard & Huizinga, 2001). Including this distinction between lifetime and past-year CVE also enables the analysis of potentially differential effects of chronic versus more recent, acute CVE. In sum, the specificity with which this measure documents community violence exposure for each participant exceeds standards that scholars have set for an optimally detailed and informative CVE measurement tool (Guterman, Cameron, & Staller,

2000). Thus, the PHDCN CVE measure is a valuable step toward addressing the measurement issues that CVE researchers have highlighted (Selner-O'Hagan et al., 1998; Trickett, Duran, & Horn, 2003).

Measures

Demographic variables. Demographic information was collected from primary caregivers of all participants at Wave 1. All time-variant demographic data were collected again from primary caregivers at Waves 2 and 3.

Community violence exposure.

For the purposes of the current study, five primary CVE scales were constructed from the CVE measure items, depending upon the particular measure that was administered at the given wave of data collection: 1) past year CVE frequency at Wave 1 (coded on a continuous scale); 2) lifetime CVE frequency at Wave 1 (coded on a continuous scale); 3) past year CVE frequency at Waves 2 and 3 (coded on an ordinal scale); 4) past year CVE variety at Waves 2 and 3; and 5) lifetime CVE variety at Waves 2 and 3. In addition, for each of the three scales at Waves 2 and 3 (3, 4, and 5 above), a corresponding "severe" and "non-severe" scale was created (e.g., severe past year CVE frequency, non-severe past year CVE frequency, severe past year CVE variety, etc.). These composite scales will be described in more detail in the sub-sections that follow.

The composite scales used in this study were created for two reasons. First, a primary goal of the present study was to test whether the typically unstated assumption underlying this very approach – that is, that youths' CVE represents a truly linear, homogenous construct – is valid. In order to explicitly test this assumption, the composite scales were constructed in order to *reflect* this assumption by combining equally weighted heterogeneous CVE items into an overall CVE construct. Then, nonlinear terms were tested to determine whether or not the scale

actually *does* behave in a truly linear way. In other words, the assumptions of linearity and homogeneity were treated as the null hypotheses that were explicitly tested in this study to determine whether the alternative hypothesis of nonlinearity better reflects the CVE constructs. Second, and related, overall scales were used to explore whether youth become desensitized to CVE as they are exposed to a greater frequency and greater variety; thus, a sum of all of the acts of community violence to which youth have been exposed was needed to test this model of desensitization.

Wave 1. In Wave 1, participants in Cohorts 9, 12, and 15 and the primary caregivers of participants in all cohorts (3, 6, 9 , 12, and 15) were administered the *Exposure to Violence* (ETV) instrument, which was adapted by PHDCN researchers from the *Survey of Children's Exposure to Community Violence* (Richters & Saltzman, 1990), one of the most widely used CVE measures. A plethora of research has revealed that low agreement between parent- and child-report measures of children's behavior and experiences is commonplace (Achenbach, McConaughy, & Howell, 1987; De Los Reyes, 2011; De Los Reyes & Kazdin, 2005; De Los Reyes et al., 2011; Kazdin, Esveldt-Dawson, Unis, & Rancurello, 1983; Rescorla et al., 2013). More specifically, parent and child observations of children's CVE tend to differ substantially (Brennan, Molnar, & Earls, 2007; Ceballo, Dahl, Aretakis, & Ramirez, 2001; Kuo, Mohler, Raudenbush, & Earls, 2000; Raviv et al., 2001; Stover, Hahn, Im, & Berkowitz, 2010; Thomson, Roberts, Curran, Ryan, & Wright, 2002), especially for older children and adolescents (Raviv et al.; Stover et al., 2010; Thomson et al., 2002). Researchers and theorists have begun to recognize that informant discrepancies – particularly discrepancies between parents and youth – likely reflect a great deal more than "unreliability," but also reflect differential knowledge and awareness of youths' experiences in different contexts (Achenbach, 2011; Achenbach et al.,

1987; De Los Reyes, 2011; De Los Reyes et al., 2011), especially when informants report on what children see or experience as opposed to children's behaviors (Hartley, Zakriski, & Wright, 2011); thus, averaging or combining responses across informants does not necessarily increase reliability when one informant may have greater access to the information that is being solicited (Achenbach, 2011; De Los Reyes, 2011; Hartley et al., 2011). In the case of children's and adolescents' CVE, youth tend to report *more* CVE than do their parents, which several researchers have proposed provides evidence for parents' underestimation of their children's CVE (Ceballo et al., 2001; Stover et al.; Thomson et al.). Indeed, it is conceivable that children and adolescents, most of whom spend at least a portion of their days away from home (e.g., at school), may experience CVE about which their parents are unaware, which would render their parents potentially less reliable reporters of their levels of CVE (Reynolds, MacPherson, Matusiewicz, Schreiber, & Lejuez, 2011). For instance, agreement between parent- and child-reports of children's CVE tends to be higher for younger children, perhaps because they spend more time with their parents than older youth and therefore share many of their experiences of CVE (Kuo et al., 2000; Raviv et al., 2001). Additionally, inter-rater agreement is higher between parents and children for instances of CVE that occur near children's homes than those that occur near children's schools (Kuo et al.; Raviv et al.; Thomson et al.).

In light of these findings, and because primary caregiver-reports and participant-reports were not both available for every participant at every wave of data collection, self-report measures were used for all cohorts for which self-report data were available (older youth and adolescents), and primary caregiver-report measures were used for the remaining cohorts (younger children), as described below. This procedure follows the recommendation of Kuo and

colleagues (2000) for incorporating multiple-informant responses on the ETV within the PHDCN dataset.

In Wave 1, the ETV measure prompted for the number of times participants had been exposed to four different types of community violence, both the past year and in their lifetimes, including: 1) seeing someone shoved, kicked, or punched; 2) seeing someone attacked with a knife; 3) hearing gunshots; and 4) seeing someone shot. Participants' responses to each item were coded on a continuous scale. This measure further assessed the location and frequency of the violent acts experienced by the participant, as well as the participant's relationship to both victim and perpetrator. The measure was administered to primary caregivers of participants in Cohorts 3, 6, 9, 12, and 15 and to participants in Cohorts 9, 12, and 15. Items were identical across informants aside from wording. In a study based on a subsample of 80 participants in the first wave of data collection, researchers documented excellent psychometric properties of the ETV, including test-retest reliability, internal consistency, and validity (Selner-O'Hagan et al., 1998).

An overall past year CVE frequency scale, coded on a continuous scale, was created by summing participants' or their primary caregivers' reported frequencies for each of the four items within the past year, yielding an overall continuous score for each participant. Similarly, an overall lifetime CVE frequency scale was created by summing participants' or their primary caregivers' reported frequencies for each of the four items within their lifetimes, yielding an overall continuous score for each participant. For participants in Cohorts 3 and 6, primary caregiver responses comprised the scales, whereas participants' self reports were used for Cohorts 9, 12, and 15. Although the accuracy of parents' reporting on very young children's experiences of CVE may be questionable, children as young as 3 were included in this study to

permit the examination of relations between CVE and well-being across a wide range of development. Moreover, prior work suggests that children as young as 3 living in urban contexts are indeed exposed to community violence, sometimes at quite high rates (e.g., Briggs-Gowan et al., 2012; Briggs-Gowan et al., 2010; Shahinfar et al., 2000). Internal consistency for CVE scales is better understood as a measure of cumulative CVE for a given individual, as youth who have been exposed to a broader range of violent events in the community will have higher internal consistencies. Therefore, internal consistencies for the composite CVE scales are not reported.

Waves 2 and 3. The CVE measure was revised and expanded for Waves 2 and 3 to gather more detailed information about participants' exposure to a broader variety of community violence than was obtained in Wave 1 (Buka, Selner-O'Hagan, Kindlon, & Earls, 1996). The *My Exposure to Violence (Subject*) instrument was administered to participants in Cohorts 9, 12, and 15 at Wave 2 and to participants in Cohorts 6, 9, 12, and 15 at Wave 3. The primary caregiver version, *My Child's Exposure to Violence*, was administered to primary caregivers of participants in all cohorts (3, 6, 9, 12, and 15) at Wave 2 and in Cohorts 3, 6, and 9 at Wave 3. For the present study, at Wave 2, primary caregiver reports were used for Cohorts 3 and 6, and self-reports were used for Cohorts 9, 12, and 15. At Wave 3, primary caregiver reports were used for Cohort 3, and self-reports were used for Cohorts 6, 9, 12, and 15. Both versions obtained detailed information regarding participants' CVE both in the past year and over their lifetimes, and items were identical apart from wording across informant measures. Respondents indicated whether they (or their children, in the case of primary caregivers) had witnessed or experienced a number of violent events in the community, both within the past year and within their lifetimes. For each event, respondents were asked whether they *ever* experienced/witnessed the event, whether they had experienced/witnessed the event within the past year, and, if they had past year exposure,

how many times they experienced/witnessed the event in the past year. For each item, past year frequency was originally coded on an scale from 1 to 4, such that 1 represented one exposure to the given event, 2 represented two to three exposures, 3 represented four to ten exposures, and 4 represented more than ten exposures. A 0 category was added for the present study, representing participants who reported no exposures to the given event in the past year. This ordinal coding scheme differed from the continuous past year frequency coding scheme in Wave 1. The appendix includes the CVE measures for participants and primary caregivers.

Brennan and colleagues (2007) found an empirical distinction between items in the PHDCN ETV measure representing community interpersonal violence (e.g., seeing someone chased; seeing someone shot) and those reflecting other potentially traumatic events (e.g., being in a serious accident; being in a natural disaster). Based on these findings, the same items that they deemed to reflect interpersonal community violence exposure were used in the current study, in addition to four items that measured hearing about specific acts of community violence involving acquaintances. Thus, the following twenty items were selected for inclusion in the composite CVE scales for Waves 2 and 3: being chased; seeing someone else chased; being hit; seeing someone hit; being attacked with a weapon; seeing someone attacked with a weapon; being shot; seeing someone shot; being shot at; seeing someone shot at; hearing gunfire; seeing someone get killed; being sexually assaulted; being threatened with violence; seeing someone threatened with violence; finding a dead body; learning that an acquaintance had been shot; learning that an acquaintance had been killed; learning that an acquaintance had committed suicide; and learning that an acquaintance had been raped. Items that were excluded from the original measure were: being in a serious accident; seeing someone involved in a serious accident; being in a natural disaster; and learning that an acquaintance had died.

Past year CVE frequency. Several composite scales were created from the individual ETV measure items at Waves 2 and 3 in order to assess the impact of CVE on youths' well-being in a variety of ways. First, an overall past year CVE frequency scale was created by summing participants' ordinal responses to the question asking the number of times they experienced or witnessed each of the twenty CVE items within the past year. Unfortunately, a companion lifetime CVE frequency was unable to be created as in Wave 1, because participants were not asked about their frequency of lifetime CVE in Waves 2 and 3 . The composite past year CVE frequency scale had a possible total score ranging from 0 to 80. Because participants' responses to each of the 20 items comprising this scale were coded ordinally, participants' values on this scale do not reflect actual frequencies of past year CVE, but rather contain the assumption underlying this coding scheme that seeing or experiencing a given instance of CVE two to three times is somehow different from seeing the same event once, and that this difference is the same as the difference between two to three events and four to ten events. Therefore, the Waves 2 and 3 CVE measure in the PHDCN limits to some extent the analyses that can be undertaken to investigate this exact assumption. Nonetheless, as described below, the structure of this scale was exploited to address several of the hypotheses set forth in the present study.

Past year CVE variety. A second scale was created to measure past year CVE *variety* – that is, the number of *different* instances of CVE that youth have experienced in the past year at least once, without regard to the frequency of exposure to each. The past year CVE variety scale was computed by summing the number of CVE items that participants endorsed experiencing at least once during the prior year, yielding an overall score with potential range from 0 to 20.

Lifetime CVE variety. A third and final scale was created to measure cumulative lifetime CVE variety, representing the total number of different instances of CVE that youth have

experienced during their lifetimes. The past year CVE variety scale was computed by summing the number of CVE items that participants endorsed experiencing at least once during their lifetimes, yielding an overall score with potential values ranging from 0 to 20.

CVE severity. In addition to these composite measures of CVE, each of these three overall scales was recoded into two component scales that were constructed to investigate the differential impact of CVE severity on youths' well-being as an initial step toward developing multi-dimensional measures of CVE. Selected items comprising these scales were limited to events that participants had witnessed and excluded personal victimization to eliminate the potentially confounding influence of victimization on the impact of CVE severity. A "severe" past year CVE frequency scale was created by summing youths' past year frequency (coded on the ordinal scale) of four events identified in previous studies to represent severe forms of violence exposure, yielding an overall score ranging from 0 to 16. Items included having seen someone attacked with a weapon, having seen someone shot, having seen someone shot at, and having seen someone killed. A parallel "non-severe" scale was computed by summing youths' past year frequency of four separate events, yielding an overall score ranging from 0 to 16. Items included having heard gunfire, having seen someone chased, having seen someone hit, and having seen someone threatened.

In addition, a "severe" and "non-severe" past year CVE variety scale was created by summing the number of severe and non-severe events (using the same items as above) to which participants were exposed in the past year. Finally, a parallel pair of "severe" and "non-severe" lifetime CVE variety scales was also created. Each of these scales yielded a composite score with a potential range between 0 and 4.

Internalizing symptoms. The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000; 2001) was administered to primary caregivers at all three waves, but was not administered for participants in Cohort 15 at Wave 3. Primary caregivers rated statements about their children's behavior on a 3-point Likert scale, with possible responses of 0 (Not True), 1 (Somewhat or Sometimes True), and 2 (Very True or Often True). The preschool version of the CBCL was administered to primary caregivers of participants in Cohort 3 in Wave 1; the school-aged version was used for all other cohorts (6, 9, 12, and 15) in Wave 1 and in all cohorts at Waves 2 and 3. T-scores from the Internalizing scale of this well-validated and reliable measure were used as a measure of participants' overall levels of internalizing symptoms. The Internalizing scale on both the preschool and school-aged versions consists of the Anxious/Depressed, Withdrawn, and Somatization subscales. The preschool version of the CBCL additionally includes the Emotionally Reactive subscale within the Internalizing scale. Example items include: "would rather be alone than with others;" "aches/pains without medical cause;" and "unhappy, sad, or depressed." In Waves 2 and 3, a subset of the items used in the Wave 1 Internalizing scale was administered to participants. In line with previous reports of the scale's reliability, internal consistency was acceptable in this sample. In Wave 1, Cronbach's alpha for Cohort 3 (pre-school version) was .84, and Cronbach's alpha for participants in Cohorts 6, 9, 12, and 15 (school-aged version) was .95. Cronbach's alpha for this scale was .87 in Wave 2 and .88 in Wave 3.

Externalizing symptoms. The Externalizing scale of the CBCL was used to assess participants' overall levels of externalizing symptoms. T-scores were used for Wave 1 analyses, whereas total Externalizing scale scores were used for Waves 2 and 3 analyses, as T-scores of this scale were not available at Waves 2 and 3. The Externalizing scale consists of the

Delinquent Behavior and the Aggressive Behavior subscales. Example items include: “argues a lot;” “destroys things belonging to others;” and “gets in many fights.” In Waves 2 and 3, a subset of the items used in the Wave 1 Externalizing scale was administered to participants. In Wave 1, Cronbach’s alpha for Cohort 3 (pre-school version) was .89, and Cronbach’s alpha for participants in Cohorts 6, 9, 12, and 15 (school-aged version) was .95. Cronbach’s alpha for this scale was .89 in Wave 2 and .90 in Wave 3.

CHAPTER III

Results

Preliminary Analyses

Descriptive statistics. Although many participants were exposed to a high degree of community violence, in line with previous findings, rates were wide-ranging. To obtain a detailed understanding of the types of community violence to which youth were exposed, Table 7 displays past year frequencies for CVE scale items by wave and cohort, and Table 8 displays lifetime frequencies. These frequencies represent the number of youth within the sample who experienced each type of CVE listed at least once. Even children in the youngest cohort experienced alarmingly high rates of exposure. A preliminary examination of frequencies and histograms for each of the CVE scales by wave and cohort reflected highly right-skewed distributions of CVE, particularly for the lifetime CVE frequency scale in Wave 1. Table 9 outlines summary statistics for each of the CVE scales by wave and cohort. These descriptive statistics suggest that all types of CVE, including past year frequency, lifetime frequency, past year variety, and lifetime variety, tended to increase with age, on average. Figures 1a though 5b further illustrate the increasing trends in mean and median level CVE by cohort.

Univariate correlation analyses.

Wave 1. Bivariate correlations among Wave 1 continuous demographic characteristics, CVE variables, and well-being variables are displayed in Table 10. Of note, both past year and lifetime CVE frequency were significantly and positively correlated with cohort and primary caregiver age, as well as with one another ($p < .001$). Internalizing and externalizing symptoms

were both significantly and negatively correlated with several demographic variables, including primary caregiver age ($p < .001$), total household income ($p < .001$), and primary caregiver education level ($p < .001$ for internalizing and $p < .01$ for externalizing). Family size was significantly and positively correlated with both internalizing and externalizing symptoms ($p < .05$), but correlations were quite small. Among all variables, internalizing and externalizing symptoms were most highly correlated at .61 ($p < .001$), suggesting overlap in the constructs, high rates of comorbidity between internalizing and externalizing symptoms within the sample, or both. Finally, both past year and lifetime CVE frequency were significantly and positively correlated with externalizing symptoms ($p < .001$), but not internalizing symptoms, providing very preliminary support for Hypothesis 1a, that youth become emotionally desensitized to CVE as their exposure increases while behavior problems worsen.

Supplementing these correlational analyses of relations among continuous variables at Wave 1, key categorical demographic variables – sex, race/ethnicity, and primary caregivers' marital status – were investigated in relation to continuous demographic, CVE, and well-being variables at Wave 1. Table 11 displays means and standard deviations for each group, along with the results of independent samples t-tests and one-way ANOVAs comparing the demographic groups on the continuous variables. In interpreting the multiple group comparison results, a Bonferroni correction was used within each family of demographic comparisons (i.e., sex, race/ethnicity, and primary caregiver marital status) to reduce the likelihood of type I errors, yielding a *p*-value of .006. Using this criterion, results revealed that mean values of all variables explored differed significantly by race/ethnicity. CVE and well-being variables appeared higher, on average, among Black participants than among White and Hispanic youth. White participants tended to report higher primary caregiver age, income, and primary caregiver education level,

and smaller family size. However, post-hoc comparisons were not performed to determine whether these specific groups differed significantly. Males and females differed only with respect to their mean levels of internalizing symptoms, with males reporting higher internalizing symptoms than females. Finally, participants whose primary caregivers were unmarried had significantly lower income and family size, and significantly higher primary caregiver education level, past year and lifetime CVE, and internalizing and externalizing symptoms, than participants whose primary caregivers were married or living with a partner.

As an additional preliminary investigation of Hypotheses 1a, 3a, and 3b, scatterplots of the relations between lifetime CVE frequency and well-being outcomes at Wave 1 were examined, separated by cohort. These plots indicated that there was a stronger positive correlation between lifetime CVE frequency and internalizing symptoms among the youngest participants (those in Cohort 3) than among participants in older cohorts, providing preliminary support for Hypothesis 3a. Moreover, the lines for Cohorts 6, 9, 12, and 15 appeared nearly flat, in contrast to the line for Cohort 3, which was much steeper. This pattern provides preliminary evidence for Hypothesis 3b. To explore preliminary patterns of desensitization (Hypothesis 1a), separate loess curves were fitted for each cohort on the same scatterplot predicting internalizing symptoms from lifetime CVE frequency. The scatterplot illustrated that while CVE had a linear and positive relation with internalizing symptoms at the very lowest levels of CVE (where the greatest number of cases lay), the direction of this relation changed as CVE increases and flattened for all cohorts. This pattern suggests a nonlinear relation between lifetime CVE frequency and internalizing, perhaps approximating a quadratic association instead, as proposed in Hypothesis 1a. In contrast to the scatterplot predicting internalizing symptoms, scatterplots predicting externalizing symptoms showed more consistently positive associations between

lifetime CVE frequency and externalizing symptoms across cohorts, further providing preliminary evidence for Hypothesis 1a. Although these patterns are only crude depictions of the associations between CVE and well-being, they provide some preliminary support for the hypothesis that youth become emotionally desensitized to CVE as they are increasingly exposed to community violence, and justify the application of more sophisticated statistical methods to formally test this hypothesis.

Wave 2. Bivariate correlations among Wave 2 continuous demographic characteristics, CVE variables, and well-being variables are displayed in Table 12. In addition to significant correlations among several demographic variables, cohort was significantly and positively correlated with all three CVE scales ($p < .001$), indicating that older youth were exposed to more community violence than younger youth. Income was significantly and negatively correlated with all three CVE scales ($p < .001$). Past year CVE frequency was highly positively correlated with both past year CVE variety ($r = .95$, $p < .001$) and lifetime CVE variety ($r = .83$, $p < .001$), and past year CVE variety and lifetime CVE variety were highly positively correlated with one another ($r = .87$, $p < .001$). As in Wave 1, Wave 2 internalizing and externalizing symptoms were significantly positively correlated with one another ($p < .001$). Finally, all three CVE scales were significantly positively correlated with both internalizing and externalizing symptoms ($p < .001$).

Table 13 displays means and standard deviations for demographic, CVE, and well-being variables by sex, race/ethnicity, and primary caregivers' marital status, along with the results of independent samples t-tests and one-way ANOVAs comparing the demographic groups on the continuous variables. In interpreting the multiple group comparison results, a Bonferroni correction was used within each family of demographic comparisons (i.e., sex, race/ethnicity,

and primary caregiver marital status) to reduce the likelihood of type I errors, yielding a *p*-value of .008. Using this criterion, results revealed that mean values of all variables differed significantly by race/ethnicity. Similar to Wave 1, White participants appeared to have higher mean income than participants of other racial/ethnic backgrounds, and Black participants appeared to have the highest levels of CVE on all three scales. Males reported significantly more CVE than females, on average, on all three CVE scales, and males had significantly higher levels of both internalizing and externalizing symptoms. Finally, participants whose primary caregivers were unmarried had significantly lower income and significantly higher CVE and externalizing symptoms than participants whose primary caregivers were married or living with a partner.

Wave 3. Bivariate correlations among Wave 3 variables were similar to Wave 2 correlations (Table 14). Specifically, in addition to significant correlations among several demographic variables, cohort was significantly positively correlated with all three CVE scales ($p < .001$), indicating that older youth were exposed to more community violence than younger youth. Income was significantly negatively correlated with all three CVE scales ($p < .001$). Past year CVE frequency was highly positively correlated with both past year CVE variety ($r = .95$, $p < .001$) and lifetime CVE variety ($r = .77$, $p < .001$), and past year CVE variety and lifetime CVE variety were highly positively correlated with one another ($r = .81$, $p < .001$). As in Waves 1 and 2, Wave 3 internalizing and externalizing symptoms were significantly positively correlated with one another ($p < .001$). Finally, all three CVE scales were significantly positively correlated with both internalizing and externalizing symptoms ($p < .001$).

Table 15 displays means and standard deviations for demographic, CVE, and well-being variables by sex, race/ethnicity, and primary caregivers' marital status, along with the results of independent samples t-tests and one-way ANOVAs comparing the demographic groups on the

continuous variables. As in Wave 2, a Bonferroni correction was used, reducing the *p*-value within each family of comparisons to .008. Using this criterion, results were similar to those in Wave 2. Mean values of all variables differed significantly by race/ethnicity. White participants appeared to have higher mean income than participants of other racial/ethnic backgrounds, and Black participants appeared to have higher mean levels of CVE than participants of other racial/ethnic backgrounds. Males reported significantly more CVE than females, on average, on all three CVE scales. Males also had significantly higher levels of both internalizing and externalizing symptoms than females. Finally, participants whose primary caregivers were unmarried had significantly lower income and significantly higher CVE, internalizing symptoms, and externalizing symptoms than participants whose primary caregivers were married or living with a partner.

Preliminary scatterplots of the associations between past year CVE frequency and well-being outcomes in Waves 2 and 3 were examined. In keeping with Wave 1 results, the strength of the linear association between past year CVE frequency and internalizing symptoms appeared to weaken as age increased, providing preliminary support for Hypothesis 3a. Moreover, the association between past year CVE frequency and internalizing symptoms appeared nonlinear, behaving linearly at low levels of CVE then flattening at higher levels of CVE as proposed in Hypothesis 1a, particularly among older cohorts (Hypothesis 3b). In contrast, the association between past year CVE frequency and externalizing symptoms appeared more consistently linear across cohorts. Taken together, these plots offer preliminary support for Hypothesis 1a that youth become emotionally desensitized to CVE (in this case, measured within the past year). Additionally, the association between CVE and internalizing symptoms appeared stronger and

perhaps more linear for children in Cohort 3 than for youth in older cohorts, providing preliminary support for Hypotheses 3a and 3b.

Primary Analyses

Desensitization, age, and gender. To investigate Hypotheses 1a, 1b, and 1c regarding desensitization to CVE, as well as 3a, 3b, and 4 regarding the moderating roles of age and gender, a series of analyses was conducted, each using the CVE measures that were available within each wave of data.

Wave 1: Lifetime and past year CVE frequency. A central hypothesis related to the desensitization model was that lifetime CVE frequency would be significantly quadratically associated with internalizing symptoms, but that it would be significantly linearly associated with externalizing symptoms (Hypothesis 1a). To test this hypothesis, two hierarchical ordinary least squares (OLS) regression analyses were conducted at Wave 1, the only wave at which data on lifetime CVE frequency were collected, predicting internalizing and externalizing symptoms, respectively. Table 16 displays the results of each successive step of these analyses. At the first step of each model, demographic control variables were entered. At the second step, the linear lifetime CVE frequency term was added, followed by the quadratic lifetime CVE frequency term at the third step. At this point in the analysis, sex and cohort interactions with linear and quadratic lifetime CVE frequency were added in the fourth step to test Hypotheses 3a, 3b, and 4; however, because these terms were not significantly predictive of either internalizing or externalizing symptoms and did not significantly add to the variance in outcomes, they were removed from the models. In order to test Hypothesis 1b, that lifetime CVE would have stronger quadratic associations with internalizing symptoms than past year CVE, a linear past year CVE frequency term was added in the fourth step, followed by a quadratic past year CVE frequency

term. An examination of diagnostic plots and statistics indicated that neither of the OLS regression models violated the assumptions of multicollinearity, normality of the distribution of residuals, linearity between residuals and predicted values, or homoscedasticity. Further, the sample size was large enough to generalize results to other samples given the number of independent variables included in the models (Tabachnick & Fidell, 2001). Finally, observations of all variables were assumed to be independent across cases, as all observations were drawn from Wave 1, and participants were randomly selected. However, scatterplots indicated the presence of a single high outlier on the lifetime CVE scale with a value of more than five standard deviations greater than the case preceding it; given the particular sensitivity of OLS regression to extreme outliers, this single observation was removed for these analyses (Kutner, Nachtsheim, Neter, & Li, 2005). Both CVE variables were standardized before being included in the models both to eschew multicollinearity with interaction terms (Aiken & West, 1991) and to facilitate the interpretability of linear and quadratic regression coefficients for these variables, which were otherwise quite extreme due to their right-skewed distributions.

Table 16 shows that for the model predicting internalizing symptoms, demographic control variables entered at step 1 accounted for a significant portion of the variance in internalizing symptoms, $R^2 = .045$, $p < .001$, though the effect size was relatively small. Specifically, participants who were male, $B = .97$, $SE = .36$, $p = .006$, identified as Hispanic, $B = 2.14$, $SE = .54$, $p < .001$, had lower household income, $B = -.83$, $SE = .11$, $p < .001$, and whose primary caregivers were unmarried, $B = -1.03$, $SE = .44$, $p = .018$, tended to have higher levels of internalizing symptoms. At the second step, the addition of the linear lifetime CVE frequency scale did not account for significantly more variance in internalizing symptoms over and above the control variables, and linear lifetime CVE frequency was not significantly associated with

internalizing symptoms, B = .18, SE = .36, p = .619. In contrast, the addition of the quadratic lifetime CVE term in the third step did account for significantly more variance in internalizing symptoms over and above the effects of both the control variables and linear lifetime CVE frequency, ΔR^2 = .004, p < .001, and the quadratic term was significantly negatively associated with internalizing symptoms, B = -.45, SE = .12, p < .001, though again these effect sizes were small. These results provide support for Hypothesis 1a, that youth become emotionally desensitized to CVE (measured here as lifetime CVE frequency) at increasing levels. To test Hypotheses 3a, 3b, and 4 regarding the moderating roles of age and gender, interaction terms between the CVE variables and cohort and between the CVE variables and sex were entered in the next step of the model; however, none of the interaction terms were significantly associated with internalizing symptoms, so they were removed from the model to achieve greater parsimony. Hypotheses 3a, 3b, and 4 were therefore not supported with respect to lifetime CVE frequency. Figure 6 illustrates the significant quadratic association between lifetime CVE frequency and CBCL internalizing symptoms controlling for demographic variables. The plot shows that at low levels of CVE (where most of the data lie), the association is approximately linear and positive. However, at increasingly higher levels of CVE, the association begins to flatten and actually changes direction at quite extreme levels of CVE.

In the fourth step of the model, a linear past year CVE frequency term was added to determine whether more time-limited, less chronic CVE was related to internalizing symptoms, controlling for lifetime exposure (Hypothesis 1b). The linear past year CVE frequency term was not significantly associated with internalizing symptoms, and the model did not significantly add to the variance in internalizing symptoms. In the fifth and final step of the model, a quadratic past year CVE frequency term was added. The quadratic term was significantly negatively

associated with internalizing symptoms, B = -.09, SE = .04, p = .024, and the model as a whole accounted for a significantly greater portion of the variance in internalizing symptoms over an above the effect of the linear term, ΔR^2 = .001, p = .024, though again, effect sizes were small. These results provide support for Hypothesis 1a, that youth become emotionally desensitized to CVE (measured here as past year CVE frequency) at increasing levels. Initially, interactions of the two past year CVE frequency terms with cohort and sex were added in a sixth step to address Hypotheses 3a, 3b, and 4; however, because these terms were not significantly associated with internalizing symptoms and did not account for a significantly greater portion of the variance in internalizing symptoms as a group, they were removed to preserve parsimony. Figure 7 illustrates the quadratic association between lifetime CVE frequency and internalizing symptoms, controlling for demographic variables and past year CVE frequency, and Figure 8 illustrates the quadratic association for past year CVE frequency.

As shown in Table 16, sex, Hispanic ethnicity, income, and primary caregiver's marital status all emerged as significant demographic predictors of internalizing symptoms in the final model. The quadratic lifetime CVE frequency term remained significant even when controlling for past year CVE frequency, and vice versa. However, the lifetime CVE frequency results must be interpreted with caution, as controlling for events that occur *after* the construct of interest (i.e., controlling for *past year* CVE frequency when estimating the effects of *lifetime* CVE frequency prior to the past year) may artificially remove a portion of the observed effect of the prior events (Almirall, Ten Have, & Murphy, 2010; Robins & Hernan, 2009). Nonetheless, the remaining quadratic association between lifetime CVE frequency and internalizing symptoms was significant, and is illustrated in Figure 7. Follow-up analyses revealed that the regression coefficients for quadratic lifetime CVE frequency and quadratic past year CVE frequency were

not significantly different from one another, $t = 1.57$, $p = .117$, thus failing to support Hypothesis 1b that the quadratic association between lifetime CVE and internalizing symptoms would be stronger than the quadratic association between past year CVE and internalizing symptoms. Again, however, this comparison must be interpreted with caution, given the limitations of controlling for the effects of later events when estimating the effects of prior ones. However, a comparison of Figures 6 and 8 suggest that when estimating the effect of lifetime frequency alone, the quadratic association with internalizing symptoms may be noticeably stronger than the quadratic association between past year CVE and internalizing symptoms, controlling for lifetime CVE frequency. The final model accounted for 5% of the variance in internalizing symptoms, representing a particularly small effect size.

For the second series of regression analyses predicting externalizing symptoms, the procedure outlined above was repeated. In the first step of the model in which demographic control variables were entered, results indicated that total household income, $B = -.67$, $SE = .11$, $p < .001$, and primary caregiver's marital status, $B = -2.50$, $SE = .45$, $p < .001$, were significantly negatively related to externalizing symptoms. As a whole, the demographic control model accounted for a significant portion of the variance in externalizing symptoms, $R^2 = .041$, $p < .001$, though like the model predicting internalizing symptoms, the effect size was relatively small. At the second step, the addition of the linear lifetime CVE frequency accounted for a significantly greater portion of the variance in externalizing symptoms over and above the control variables, $\Delta R^2 = .002$, $p = .004$, and linear lifetime CVE frequency was significantly associated with externalizing symptoms, $B = 1.07$, $SE = .37$, $p = .004$, unlike the results for internalizing symptoms. Thus, these results provided additional partial support for Hypothesis 1a in conjunction with the results for internalizing symptoms. Next, the addition of the quadratic

lifetime CVE term in the third step accounted for significantly more variance in externalizing symptoms over and above the linear model, $\Delta R^2 = .003$, $p < .001$, and the quadratic term was significantly negatively associated with externalizing symptoms, $B = -.44$, $SE = .13$, $p < .001$, though again these effect sizes were small. These results are contrary to the portion of Hypothesis 1a postulating a linear rather than a quadratic relation between CVE and externalizing symptoms. To test Hypotheses 3a, 3b, and 4, interaction terms between the CVE variables and cohort and between the CVE variables and sex were entered in the next step of the model; however, none of the interaction terms were significantly associated with externalizing symptoms, so they were removed from the model to achieve greater parsimony, thus failing to provide support for Hypotheses 3a, 3b, and 4. Figure 21 illustrates the significant quadratic association between lifetime CVE frequency and externalizing symptoms, holding demographic variables constant. The plot shows that at low levels of lifetime CVE (where most of the data lie), the association is approximately linear and positive. However, at increasingly extreme levels of CVE, the association begins to flatten. In comparison with the quadratic association between lifetime CVE frequency and internalizing symptoms illustrated in Figure 6, the quadratic association between lifetime CVE frequency and externalizing symptoms shown in Figure 9 appears somewhat weaker, such that the relation behaves in a linear fashion over a wider range of CVE frequency, again providing partial support for Hypothesis 1a.

In the fourth step of the model, a linear past year CVE frequency term was added to determine whether more time-limited, less chronic CVE was related to externalizing symptoms, controlling for lifetime exposure (Hypothesis 1b). The linear past year CVE frequency term was significantly associated with externalizing symptoms, $B = .82$, $SE = .27$, $p = .003$, and the model accounted for a significantly greater portion of the variance in externalizing symptoms than the

previous model, $\Delta R^2 = .002$, $p = .003$, again providing partial support for Hypothesis 1a. In the fifth and final step, a quadratic past year CVE frequency term was added. The quadratic term was significantly negatively associated with externalizing symptoms, $B = -.17$, $SE = .04$, $p < .001$, and the addition of the quadratic term accounted for a significantly greater portion of the variance in externalizing symptoms than the linear model, $\Delta R^2 = .004$, $p < .001$, though again, effect sizes were small. These results are contrary to the portion of Hypothesis 1a postulating a linear rather than a quadratic relation between CVE and externalizing symptoms. Interactions of the past year CVE frequency terms with cohort and sex were added in a sixth step; however, because these terms were not significantly associated with externalizing symptoms and did not account for a significantly greater portion of the variance in externalizing symptoms as a group, they were removed from the final model to preserve parsimony, thus failing to support Hypotheses 3a, 3b, and 4. Figure 10 illustrates the quadratic association between lifetime CVE frequency and externalizing symptoms, controlling for demographic variables and past year CVE frequency, and Figure 11 illustrates the quadratic association for past year CVE frequency.

As shown in Table 16, sex, income, and primary caregiver's marital status emerged as significant demographic predictors of externalizing symptoms in the final model. The linear and quadratic lifetime CVE frequency terms reduced to nonsignificance when controlling for past year CVE frequency, though both the linear and quadratic past year CVE frequency terms were significant controlling for lifetime CVE frequency. In keeping with the results for internalizing symptoms, these results failed to support Hypothesis 1b. However, as discussed above, the lifetime CVE frequency results must be interpreted with caution, as estimating the effect of past year CVE frequency may mask part of the observed effect of lifetime CVE frequency. Nonetheless, the association between lifetime CVE frequency and externalizing symptoms is

illustrated in Figure 22. The final model as a whole accounted for 5.4% of the variance in externalizing symptoms, representing a particularly small effect size.

Waves 2 and 3: Past year CVE frequency. Separate analyses testing the desensitization hypothesis were performed within Waves 2 and 3 from those used in Wave 1, because the measure of CVE used in Waves 2 and 3 was substantially different from the measure used in Wave 1. Analyzing data from both Waves 2 and 3 simultaneously (repeated measures) provides some advantages over analyzing data within a single wave, as each participant contributes two data points to the analyses. Thus, the longitudinal nature of the data is exploited so that conclusions about the association between levels of CVE and well-being can more reliably map onto observed patterns for individual participants than can conclusions drawn from purely cross-sectional data. In other words, if higher levels of CVE are found to be associated with higher levels of internalizing and externalizing symptoms, the conclusion can more reliably be made that increases in an *individual's* level of CVE over time will correlate with increases in his or her internalizing and externalizing symptoms as well, on average. However, repeated measures within individuals requires the use of appropriate statistical techniques that account for the non-independence among data – that is, the fact that within-person observations between the two time points will tend to be more highly correlated than between-person observations. Thus, generalized estimating equations (GEE) were used, which is a technique within the class of generalized linear models that extends the multiple regression framework to the analysis of correlated data by controlling for the dependence of within-person observations (Liang & Zeger, 1986; Zeger & Liang, 1986). GEE requires very few assumptions for the accurate interpretation of results. Principally, the method assumes that the regression model under investigation is correctly specified in terms of its structure (Liang & Zeger; Zeger & Liang). Given that the

regression models tested in this study move beyond linear estimations of the primary variables of interest and allow greater flexibility in the shape of the regression model by including nonlinear terms, this assumption is likely satisfied. Second, and related, the coefficients for GEE models are most efficient when data are missing completely at random (MCAR; Rubin, 1976); as shown in Tables 5 and 6, participants who were lost to attrition at Waves 2 and 3 did not differ from other participants on the basis of any of the primary variables of interest, thus providing some evidence that the data for the present study were MCAR (Enders, 2013). As a semi-parametric method, GEE makes no distributional assumptions with reasonably large sample sizes (Liang & Zeger; Zeger & Liang). This characteristic is especially advantageous in the current study, as histograms and normal probability plots indicate some deviation from normality for the externalizing variable in Waves 2 and 3. Thus, even with non-normal distributions, GEE yields unbiased coefficient estimates and valid inference.

Two separate GEE analyses were run to investigate whether, like lifetime and past year CVE frequency in Wave 1, there were quadratic associations between past year CVE frequency and internalizing and externalizing symptoms in Waves 2 and 3. In both models, control variables included sex, cohort, race/ethnicity indicator variables, income, primary caregiver's marital status, autoregressive effects of the given outcome variable from the previous wave, and an interaction between the autoregressive effect and cohort, allowing the effects of previous outcomes on current outcomes to vary as a function of age. Table 17 shows that cohort was significantly negatively associated with internalizing symptoms, such that younger children tended to have higher levels of internalizing symptoms than older children. In addition, Black participants tended to have fewer internalizing symptoms, on average than White participants. Income was significantly negatively associated with internalizing symptoms. As expected,

participants' levels of internalizing symptoms from the prior wave significantly positively predicted current levels of internalizing, and this association differed significantly by cohort. Unlike in Wave 1, linear past year CVE frequency *was* significantly positively associated with internalizing symptoms. However, as predicted by Hypothesis 1a, the quadratic past year CVE frequency term significantly predicted variance in internalizing symptoms, above and beyond the effect of the linear term, although the effect size was rather small. Finally, the interaction between cohort and the linear past year CVE frequency term was significantly associated with internalizing symptoms, indicating that the linear association between CVE and internalizing symptoms differed significantly by cohort as predicted by Hypothesis 3a. However, the interaction between cohort and the quadratic term was not significant, contrary to Hypothesis 3b. Interactions between CVE and sex were also tested; however, because they were not significant, they were eliminated from the model, thus failing to support Hypothesis 4. Figure 12 illustrates the *linear* association between past year CVE frequency and internalizing symptoms, with distinct slopes for separate cohorts. Figure 13 illustrates the predicted model including both the linear and quadratic CVE terms, with distinct curves for separate cohorts. This plot demonstrates that as participants' levels of past year CVE frequency increase, their internalizing symptoms increase to a point at which the association levels off and begins to decrease, as predicted by Hypothesis 1a. Of note, most of the data lie within the 0 to 10 range on the past year CVE frequency scale; thus, it appears that only when youth experience the most extreme levels of CVE within the past year does desensitization begin to occur. Moreover, in comparing Figures 12 and 13, it becomes clear that had the regression model included only linear CVE terms, the curvilinear shape of the relation between CVE and internalizing symptoms, while small in magnitude, would be overlooked.

A parallel GEE analysis was conducted to predict externalizing symptoms. Table 17 displays the results of this analysis alongside those for the model predicting internalizing symptoms. Among the demographic control variables, cohort was not significantly associated with externalizing symptoms. However, Hispanic ethnicity was significantly negatively associated with externalizing symptoms, indicating that Hispanic participants tended to have lower levels of externalizing symptoms, on average, than White participants. Income was also significantly negatively related to externalizing symptoms. As expected, participants' levels of externalizing symptoms from prior time points significantly positively predicted current externalizing, and this association differed significantly by cohort. Like the model for internalizing symptoms, the linear past year CVE frequency term significantly positively predicted externalizing symptoms; however, unlike the model for internalizing symptoms, the quadratic term did not significantly predict externalizing symptoms, as predicted by Hypothesis 1a. Finally, the associations between CVE and externalizing symptoms did not significantly differ by cohort, thus failing to provide support for Hypotheses 3a and 3b. Similarly, interactions between sex and each of the CVE terms were not significantly associated with externalizing symptoms, contrary to Hypothesis 4, so they were excluded from the final model. Figure 14 displays the linear association between past year CVE frequency and externalizing symptoms, controlling for the accompanying covariates in the model. Although the regression lines are plotted separately by cohort, the differences in the slopes among cohorts did not reach significance. Figure 15 depicts the predicted values of the regression model with both the linear CVE term and the nonsignificant quadratic CVE term included. Unlike the visibly curvilinear pattern for internalizing symptoms in Figure 13, the relatively flat lines in Figure 15 highlight the

absence of a quadratic association between past year CVE frequency and externalizing symptoms, providing support for Hypothesis 1a.

A second set of GEE analyses using data from Waves 2 and 3 was conducted to determine whether these patterns would hold when controlling for the effects of a measure of more chronic, lifetime CVE, in order to address Hypothesis 1b. Because a measure of lifetime CVE frequency was not available at Waves 2 and 3, however, analyses were limited to lifetime CVE *variety*. Thus, the relations that this model tests must be made clear – that is, the associations between past year CVE frequency and well-being outcomes, controlling for the number of different types of violent events to which participants have been exposed in their lifetimes. Additionally, the regression coefficients for lifetime CVE variety are not interpreted here, as they include values from both Waves 2 and 3; thus, there is significant overlap in the effects of lifetime CVE variety on externalizing symptoms. While interpretations of the past year CVE frequency coefficients are provided, it is assumed that these represent conservative estimates of the true effects of past year CVE frequency on outcomes, as the effect of lifetime CVE variety is multiply accounted for within the model.

Table 18 displays the results of the GEE analyses for both internalizing and externalizing symptoms. In the model predicting internalizing symptoms, cohort, Black racial background, and income were significantly negatively associated with internalizing symptoms. The autoregressive effect of prior internalizing symptoms, as well as its interaction with cohort, significantly positively predicted current internalizing symptoms. After controlling for both the linear and quadratic effects of lifetime CVE variety, there was a significant negative quadratic effect of past year CVE frequency on internalizing symptoms over and above the significant positive linear effect, as predicted by Hypothesis 1a. Finally, both the linear and quadratic effects of past year

CVE frequency significantly differed by cohort, providing support for both Hypotheses 3a and 3b. Interactions between sex and each of the CVE terms were originally included in the model, but they were not significantly associated with internalizing symptoms, so they were excluded from the final model, thus failing to provide support for Hypothesis 4.

In the model predicting externalizing symptoms, income was again significantly negatively associated with externalizing symptoms, and cohort was not. Hispanic participants had lower levels of externalizing symptoms, on average, than White participants. The autoregressive effect of prior externalizing symptoms, as well as its interaction with cohort, significantly positively predicted current externalizing symptoms. After controlling for both the linear and quadratic effects of lifetime CVE variety, there was a significant positive linear association between past year CVE frequency and externalizing symptoms, but the quadratic association was nonsignificant, as predicted by Hypothesis 1a. The interactions of both linear and quadratic past year CVE frequency terms with cohort were nonsignificant as well. Interactions between sex and each of the CVE terms were originally included in the model, but they were not significantly associated with externalizing symptoms, so they were excluded from the final model. Thus, Hypotheses 3a, 3b, and 4 were not supported by this model.

Waves 2 and 3: Past year CVE variety. In order to explicitly test whether there is also a curvilinear effect of CVE variety, or the number of different types of CVE to which youth are exposed, as postulated by Hypothesis 1a, parallel GEE analyses were conducted with past year and lifetime CVE variety variables using data from Waves 2 and 3. Table 19 displays the results of two separate GEE analyses predicting internalizing and externalizing symptoms, respectively. The results indicate that cohort was significantly negatively related to internalizing symptoms, such that younger children had higher levels of internalizing symptoms, on average, than older

youth. In addition, income was significantly negatively associated with internalizing symptoms. Further, as expected, prior levels of internalizing symptoms were significantly positively associated with current levels of internalizing symptoms, and this association was significantly moderated by cohort. Unlike the results for past year CVE frequency, there was *not* a significant negative quadratic effect of past year CVE variety on participants' internalizing symptoms over and above the significant linear effect, thus failing to provide support for Hypothesis 1a with respect to past year CVE *variety*. Finally, mirroring results for past year CVE frequency, the association between linear past year CVE variety and internalizing symptoms was significantly moderated by cohort, as predicted by Hypothesis 3a, but the quadratic association was not, in contrast with Hypothesis 3b. Interactions between sex and each of the CVE terms were originally included in the model, but they were not significantly associated with internalizing symptoms, so they were excluded from the final model, thus failing to support Hypothesis 4. Figure 16 illustrates the predicted values of internalizing symptoms from past year CVE variety, as well as the moderating effect of cohort on the linear association. The plot shows that there is a roughly linear effect of past year CVE variety on internalizing symptoms that weakens with increasing age, though it approaches a quadratic form.

For the corresponding model predicting externalizing symptoms, cohort was not significantly related to externalizing symptoms when controlling for all other covariates. Similar to the results for past year CVE frequency, Hispanic ethnicity was significantly negatively associated with externalizing symptoms, relative to White participants, and income was significantly negatively related to externalizing symptoms as well. As expected, prior levels of externalizing symptoms were significantly positively associated with current levels, and this association was significantly moderated by cohort. Mirroring the results for past year CVE

frequency, there was a significant positive linear association between past year CVE variety and externalizing symptoms, but the quadratic association was not significant, thus providing support for Hypothesis 1a. Contrary to Hypotheses 3a and 3b, the interactions between the CVE terms and cohort did not significantly predict externalizing symptoms. Interactions between sex and each of the CVE terms were originally included in the model, but they were not significantly associated with externalizing symptoms, so they were excluded from the final model, thus failing to support Hypothesis 4. Figure 18 illustrates the predicted values of externalizing symptoms from past year CVE variety, which indicates that the association is linear rather than quadratic, even when the model is afforded the flexibility to assume a nonlinear form.

Supplementing these analyses, an additional set of GEE analyses was conducted to determine whether these patterns would hold while controlling for lifetime CVE variety, providing a more stringent test of Hypothesis 1a by isolating the effects of past year CVE variety apart from more chronic, lifetime CVE. As with previous analyses statistically controlling for lifetime CVE variety, the results of these analyses likely provide an imperfect, conservative estimate of the effect of past year CVE variety on outcomes, given that the effect of lifetime CVE variety was included for both Waves 2 and 3, although there is significant overlap between the values at the two time points. For this reason, the regression coefficients for the lifetime CVE variety terms in the following results are not interpreted.

Table 20 displays the results of the GEE analyses predicting internalizing and externalizing symptoms from past year CVE variety and other covariates, controlling for lifetime CVE variety. For the model predicting internalizing symptoms, results were similar to those in the absence of lifetime CVE variety. Cohort was significantly negatively associated with internalizing symptoms, as was income. Black participants tended to have lower levels of

internalizing symptoms, on average, than White participants. Additionally, as expected, the autoregressive effect of internalizing symptoms was significant and positive, as was its interaction with cohort. After controlling for lifetime CVE variety, there was a linear association between past year CVE variety and internalizing symptoms, but the quadratic association was not significant, consistent with the previous, more parsimonious model and contrary to Hypothesis 1a with respect to past year CVE variety. Finally, there was a significant interaction effect between linear past year CVE variety and cohort, as predicted by Hypothesis 3a, but the interaction between cohort and quadratic past year CVE variety was not significant, again failing to support Hypothesis 3b. As in previous analyses, sex did not significantly moderate the associations between CVE terms and internalizing symptoms, again failing to support Hypothesis 4. Figure 17 illustrates the association between past year CVE variety and internalizing symptoms, including the interaction between this association and cohort.

For the model predicting externalizing symptoms, associations between demographic control variables and externalizing symptoms were roughly equivalent to the associations in the model that excluded lifetime CVE variety, depicted in Table 19. In addition, mirroring the previous results, even after controlling for lifetime CVE variety, there was a significant positive linear association between past year CVE variety and externalizing symptoms, but the quadratic association was not significant, as predicted by Hypothesis 1a. Also in line with previous results, the interactions between each of the CVE terms and neither cohort nor sex significantly predicted externalizing symptoms, thus failing to support Hypothesis 3a. Figure 19 depicts the linear association between past year CVE variety and externalizing symptoms, controlling for lifetime CVE variety and other covariates, which closely mimics the plot for past year CVE variety in the absence of lifetime CVE variety shown in Figure 18.

Wave 3: Lifetime CVE variety. Finally, in order to accurately estimate the associations between lifetime CVE variety and well-being, these associations were tested at Wave 3 only using OLS hierarchical regressions. An examination of diagnostic plots and statistics suggested that all assumptions were satisfied for both outcome variables, with the exception of a slight deviation from normality in the distribution of the residuals predicting externalizing symptoms. Although the normality assumption is relatively robust to slight violations with large sample sizes (Kutner et al., 2005), the results for the model predicting externalizing symptoms should be interpreted with caution.

Table 21 displays the results of these OLS regressions for both internalizing and externalizing symptoms. The results for the model predicting internalizing symptoms indicate that income was significantly negatively associated with internalizing symptoms. Unlike previous models, there was not a significant association between cohort and internalizing symptoms. Additionally, prior levels of internalizing were significantly positively associated with current levels, but the association did not differ significantly by cohort. Finally, lifetime CVE variety had a significant negative quadratic association with internalizing symptoms over and above the significant positive linear association, as shown in step 3 of the model in Table 21 and as predicted by Hypothesis 1a. Figure 20 illustrates this significant quadratic association. The final model accounted for 34.8% of the variance in internalizing symptoms. Cohort and sex interactions with the CVE terms were also examined, but their coefficients were not significant predictors of internalizing symptoms, so these terms were excluded from the final model. Thus, Hypotheses 3a, 3b, and 4 were not supported in this model.

The results for externalizing symptoms were very similar to those for internalizing symptoms. Indeed, income was significantly negatively related to externalizing symptoms. As

expected, prior levels of externalizing symptoms were significantly positively associated with current levels, and this association differed significantly by cohort. Finally, lifetime CVE variety had both a significant positive linear association and a significant negative quadratic association with externalizing symptoms, which provides partial support for Hypothesis 1a. Figure 21 illustrates these significant associations. The final model accounted for 44.9% of the variance in internalizing symptoms. Cohort and sex interactions with the CVE terms were also examined, but their coefficients were not significant predictors of externalizing symptoms, so these terms were excluded from the final model, thus failing to support Hypotheses 3a, 3b, and 4 .

Hypothesis 1c: Using ordinal coding of past year CVE frequency. Supplementary tests of the desensitization hypothesis were conducted by capitalizing on the ordinal coding scheme used for participants' past year frequency of individual CVE items at Waves 2 and 3. To test Hypothesis 1c that there is a nonlinear relation between CVE frequency and internalizing symptoms, but a linear, incremental association between CVE frequency and externalizing symptoms, a series of GEE analyses was conducted in which the linear association between a given past year CVE frequency item and well-being was first estimated. The results of this analysis would indicate the extent to which each CVE item, coded on a 5-point frequency scale, predicts the outcome in a linear manner. Then, separate indicator variables representing the four separate frequency groups (one exposure; two to three exposures; four to ten exposures; and more than ten exposures) compared to participants with zero exposures in the past year (the reference group) replaced the single linear item to determine whether each increasing category incrementally predicted the outcome. If the regression coefficients for the indicator variables were not significantly different from one another, it would provide evidence that the CVE variable is *not* linear. Further, model fit statistics for the linear model and the model including

separate indicator variables were compared to determine whether or not the linear model was better fitting. Three past year CVE frequency items were selected for these analyses to represent a range of CVE type and severity: seeing someone chased, hearing gunfire, and seeing someone shot. Clearly, this technique begins to bridge the investigations of CVE frequency and severity.

The first GEE analysis predicted internalizing symptoms from demographic and control variables (sex, race/ethnicity, cohort, income, primary caregiver's marital status, autoregressive effects of internalizing symptoms, and the interaction between the autoregressive effect and cohort), a linear term of the first past year CVE frequency item examined, "saw someone chased" (coded on the 5-point ordinal scale), and interactions between the CVE variable and both sex and cohort. In the first model, results indicated that cohort, $B = -.54$, $SE = .19$, $p = .006$, and income, $B = -.33$, $SE = .08$, $p < .001$, were significantly negatively associated with internalizing symptoms, and the autoregressive effect of internalizing symptoms, $B = .48$, $SE = .03$, $p < .001$, and its interaction with cohort, $B = .01$, $SE = .004$, $p < .001$, were both significantly positively related to internalizing symptoms. The interaction between sex and the CVE variable was not a significant predictor of internalizing symptoms. Finally, the linear association between the number of times participants saw someone chased over the past year and internalizing symptoms was significant and positive, $B = 1.42$, $SE = .42$, $p = .001$, and the association was moderated by cohort, $B = -.08$, $SE = .04$, $p = .038$.

Next, to determine whether this apparently linear association was comprised of truly incremental increases in the effects of increasing CVE frequency, a second GEE model was tested including the same demographic and control variables, along with four indicator variables representing each of the frequency response categories relative to participants who reported never having seen someone chased within the past year. The interactions of each of these four

indicator terms with cohort were also included in the model, given the significant moderating effect of cohort on the linear term. In examining the main effects of each of the four indicator variables, having seen someone chased once within the past year, $B = 3.02$, $SE = 1.29$, $p = .020$, and two to three times, $B = 5.12$, $SE = 1.46$, $p < .001$, were each significantly positively associated with internalizing symptoms; however, seeing someone chased four to ten times and more than ten times were not significantly predictive of internalizing symptoms. The interaction between cohort and seeing someone chased once within the past year, $B = -.30$, $SE = .14$, $p = .033$, and between cohort and seeing someone chased two to three times, $B = -.32$, $SE = .14$, $p = .021$, were both significantly negatively associated with internalizing symptoms. Post-hoc analyses revealed that the coefficients for indicator variables were not significantly different from one another (Cohen & Cohen, 1984; Paternoster, Brame, Mazerolle, & Piquero, 1998), suggesting that there is *not* a significantly incremental association between number of exposures to seeing someone chased in the past year and internalizing symptoms.

Figure 22 illustrates that among younger children, there is an incremental increase in internalizing symptoms at low levels of exposure; however, beyond seeing someone chased two to three times in the past year, additional exposures no longer predict higher levels of internalizing symptoms. Among older youth, the association between seeing someone chased and internalizing symptoms is essentially flat, without a clear incremental increase in internalizing symptoms. Further, a comparison of the Quasi Likelihood under Independence Model Criterion (QIC; a goodness of fit index for GEE models) for the linear model versus the model that allows the coefficient for each CVE frequency category to vary in magnitude suggests that the more flexible model, QIC = 405,957.614, is a better fitting model than the strictly linear model, QIC = 407,119.530, based on a lower QIC value (Pan, 2001; a test statistic does not exist

to test whether the QIC for two models are significantly different from one another; rather, the relative magnitude of the QIC is used to guide model comparisons). Overall, these results provide support for Hypothesis 1c.

The procedure described above was repeated for a pair of GEE models predicting externalizing symptoms. In the first model, which included demographic covariates and the linear term for past year frequency of seeing someone chased, interactions between the CVE term and both sex and cohort were not significant. Results indicated that Hispanic ethnicity, B = -.42, SE = .20, p = .035, and income, B = -.12, SE = .05, p = .010, were significantly negatively associated with externalizing symptoms, as in previous models predicting externalizing symptoms. Prior levels of externalizing symptoms were significantly positively related to current symptoms, B = 3.85, SE = .23, p < .001, as was its interaction with cohort, B = .08, SE = .03, p = .008. Finally, the linear association between the frequency of seeing someone chased over the past year and externalizing symptoms was significant and positive, B = .43, SE = .09, p < .001.

Next, to further probe this apparently linear association, a second GEE analysis was conducted including the same demographic and control variables, along with four indicator variables representing each of the frequency response categories. Having seen someone chased two to three times within the past year, B = 1.16, SE = .28, p < .001, and ten or more times, B = 2.13, SE = .74, p = .004, were each significantly positively associated with externalizing symptoms; however, seeing someone chased once and seeing someone chased four to ten times were not significantly predictive of externalizing symptoms. Post-hoc analyses revealed that the coefficients for the two groups that were significantly different from zero (two to three exposures versus more than ten exposures) did not differ significantly from one another, nor did the coefficients for groups 4 and 3. However, the coefficients for groups 1 and 2, Z = 2.34, p = .019,

were significantly different from one another, suggesting an incremental increase in externalizing symptoms between these groups. Further, the second model, QIC = 117,035.471, was slightly better fitting than the first model that included only a linear term, QIC = 117,177.911. Overall, these results suggest that the frequency of seeing someone chased in the past year operates in a more linear fashion with respect to externalizing symptoms as compared to internalizing symptoms, providing further evidence for Hypothesis 1c. Figure 23 illustrates externalizing symptoms predicted from each of these frequency groups and covariates, reflecting a more linear trend than the predicted values of *internalizing* symptoms plotted in Figure 22. However, the increase in externalizing symptoms is not *perfectly* constant across all levels of CVE, suggesting that a purely linear form does not precisely reflect the relation.

This set of procedures was again employed to predict internalizing and externalizing symptoms from another past year CVE frequency item – "heard gunfire nearby" – controlling for the same covariates. In the first GEE model predicting internalizing symptoms from demographic control variables and a linear term for the single CVE variable, cohort, B = -.58, SE = .20, p = .004, income, B = -.27, SE = .09, p = .003, prior internalizing symptoms, B = .48, SE = .03, $p < .001$, and their interaction with cohort, B = .01, SE = .004, $p < .001$, all emerged as significant predictors, consistent with previous models. The interactions between the CVE variable and both sex and cohort were not significant. Past year frequency of hearing gunfire was significantly positively associated with internalizing symptoms, B = .57, SE = .12, $p < .001$.

In the next model, which tested the effects of the four frequency groups separately, all four groups were significantly positively related to internalizing symptoms. Post-hoc analyses revealed, however, that while all four regression coefficients were significantly different from 0, indicating that *any* exposure to gunfire was associated with significantly more internalizing

symptoms than no exposure, none of them were significantly different from one another. These results suggest the absence of an incremental association between frequency of hearing gunfire in the past year and youths' internalizing symptoms and provide further support for Hypothesis 1c with respect to frequency of hearing gunfire. Figure 24 emphasizes this finding: despite a significant increase in internalizing symptoms between no exposure and one exposure, hearing gunfire once in the past year appears equally related to internalizing symptoms as hearing gunfire more than 10 times. The second model, which included indicator variables of the four separate frequency groups, QIC = 388,503.244, was better fitting than the first model, which included only a linear term for the CVE variable, QIC = 388,777.857, further supporting Hypothesis 1c.

In the GEE model predicting externalizing symptoms from demographic control variables and a linear term for the single CVE variable, Hispanic ethnicity, B = -.48, SE = .20, p = .019, cohort, B = .09, SE = .03, p = .001, income, B = -.10, SE = .05, p = .035, prior levels of externalizing symptoms, B = 3.65, SE = .24, p < .001, and their interaction with cohort, B = .10, SE = .03, p = .001, all emerged as significant predictors. Past year frequency of hearing gunfire nearby was significantly positively associated with externalizing symptoms, B = .64, SE = .15, p < .001. Additionally, the interaction between cohort and hearing gunfire was significantly negatively associated with externalizing symptoms, B = -.04, SE = .02, p = .024. The interaction with sex was not significant.

In the next model, which tested the effects of the four frequency groups separately, four to ten exposures in the past year, B = 1.92, SE = .70, p = .006, and more than ten exposures, B = 3.22, SE = .86, p < .001, were significantly positively related to externalizing symptoms. This suggests that while low levels of exposure to gunfire are not significantly associated with externalizing symptoms compared to no exposure, risk for externalizing symptoms increases at

much higher levels of exposure. However, the differences between frequency groups were not significant. Given the significant interaction between cohort and the linear CVE term in the previous model, interaction terms between cohort and each of the indicator variables were also included. Of the four interaction terms, only the interaction between cohort and hearing gunfire more than ten times in the past year was significantly related to externalizing symptoms, B = -.19, SE = .08, p = .024. Figure 25 displays the associations between each level of CVE, plotted separately by cohort. The second model, which accounted for the effects of each exposure group separately, QIC = 116,904.312, was better fitting than the first model, which estimated the effect of hearing gunfire nearby via a single linear term, QIC = 117,102.853, suggesting that Hypothesis 1c did not hold for externalizing symptoms with respect to hearing gunfire nearby, although the plot for younger children appeared more linear.

Finally, the above set of procedures was again repeated, replacing the CVE variable with a lower frequency item: the number of times participants saw someone shot in the past year. In Waves 2 and 3 combined, 338 participants (4.1%) had witnessed this event in the past year. In the first GEE model predicting internalizing symptoms from demographic control variables and a linear term for the single CVE variable, cohort, B = -.51, SE = .20, p = .009, income, B = -.33, SE = .08, $p < .001$, prior levels of internalizing symptoms, B = .49, SE = .03, $p < .001$, and their interaction with cohort, B = .013, SE = .004, $p < .001$, all emerged as significant predictors. Past year frequency of seeing someone shot was significantly positively associated with internalizing symptoms, B = 3.96, SE = 1.63, p = .015, and the interaction between cohort and seeing someone shot was significantly negatively associated with internalizing symptoms, B = -.31, SE = .14, p = .025. However, the interaction between sex and CVE was not a significant predictor.

In the next model, which tested the associations between each of the four frequency groups and internalizing symptoms separately, the associations between the demographic control variables discussed above were significantly associated with internalizing symptoms. In addition, the only CVE frequency group that was significantly related to internalizing symptoms was having seen someone shot more than ten times, $B = 7.47$, $SE = 3.02$, $p = .013$. Although there was a significant interaction between cohort and the linear CVE term in the previous model, cohort interaction terms were not included for each of the four frequency group indicator variables in the second model, because so few participants comprised the higher frequency groups, especially in younger cohorts. Figure 26 shows that there is no difference in participants' average level of internalizing symptoms from zero to ten exposures, but the increase from ten exposures to more than ten is associated with a sharp increase in internalizing symptoms, contrary to Hypothesis 1c. Post-hoc analyses revealed that the association between the highest level of exposure and internalizing symptoms is significantly greater than the association between lower frequency groups and internalizing symptoms, $Z = 2.20$, $p = .028$. Finally, in contrast to the models for the other CVE items, the linear model, QIC = 411,355.219, was better fitting than the second model, which accounted for the effects of each exposure group separately, QIC = 411,609.396. Thus, Hypothesis 1c was not supported with respect to past year frequency of seeing someone shot.

In the GEE model predicting externalizing symptoms from demographic control variables and a linear term for the single CVE variable, sex, $B = .28$, $SE = .14$, $p = .047$, cohort, $B = .08$, $SE = .02$, $p < .001$, income, $B = -.13$, $SE = .05$, $p = .005$, prior levels of externalizing symptoms, $B = 3.82$, $SE = .23$, $p < .001$, and their interaction with cohort, $B = .09$, $SE = .03$, $p = .002$, all emerged as significant predictors. The interactions between seeing someone shot and both sex

and cohort were not significantly associated with externalizing symptoms,. Finally, the linear term representing the number of times participants saw someone shot in the past year was not significantly related to externalizing symptoms.

In the next model, which tested the associations between each of the four frequency groups and externalizing symptoms separately, the associations between the demographic control variables discussed above were significantly associated with internalizing symptoms. Beyond these relations, none of the four frequency groups was significantly associated with internalizing symptoms. Figure 27 displays predicted levels of externalizing symptoms from past year frequency of seeing someone shot, controlling for demographic covariates. Although the overall pattern appears similar to that in Figure 26 for internalizing symptoms, the wide error bars indicate that large variance within the higher frequency groups likely contributed to the nonsignificant findings. Finally, the second model, which estimated the effects of the four frequency groups separately, QIC = 118,893.051, was a better fit to the data than the linear model, QIC = 118,921.847, contrary to Hypothesis 1c.

Hypothesis 1d: Isolated CVE vs. chronic CVE. In order to determine whether isolated, single-occurrence CVE is more strongly associated with internalizing symptoms than more chronic CVE, each of the three total CVE scales available in Waves 2 and 3 were recoded into two indicator variables, the first representing youth who had experienced only one instance or one type of event within the given time frame (past year or lifetime, depending on the given scale), and the second representing youth who had experienced two or more instances or types. The reference group was comprised of youth who had experienced no instances or types of CVE within the given timeframe. For instance, on the past year CVE frequency scale, those who had experienced only one instance of an event in the past year comprised the “isolated” group,

whereas those who had experienced two or more instances of CVE in the past year comprised the "chronic" group. On the past year CVE variety scale, those who had experienced only one *type* of CVE in the past year, regardless of the number of times they experienced it, comprised the "isolated" group, whereas those who had experienced two or more *types* of CVE in the past year comprised the "chronic" group.

Using GEE analyses and data from Waves 2 and 3, a model was tested predicting internalizing symptoms from demographic control variables, prior levels of internalizing symptoms, the interaction between cohort and prior levels of internalizing symptoms, and the past year CVE variety "isolated" and "chronic" groups – that is, youth who had experienced one *type* of exposure ("isolated") versus two or more *types* of exposures ("chronic") within the *past year*. After examining sex and cohort interactions with each of the two CVE indicator variables, only the interaction between cohort and the "chronic" group was significant, so it was retained in the final model. The same demographic and control variables emerged as significant predictors as in previous models (cohort, income, prior levels of internalizing symptoms, and the interaction between prior levels of internalizing symptoms and cohort). In addition, both exposure to one type of CVE in the past year ("isolated"), $B = .99$, $SE = .40$, $p = .014$, and exposure to two or more types ("chronic"), $B = 1.03$, $SE = .70$, $p < .001$, were significantly positively associated with internalizing symptoms relative to participants with no exposure. Cohort also significantly moderated the association between exposure to two or more types of CVE and externalizing symptoms, $B = -.23$, $SE = .08$, $p = .004$. While both chronic and isolated past year CVE variety were significantly associated with internalizing symptoms, the regression coefficient for the chronic group was significantly larger, $Z = 3.78$, $p = .0002$. Thus, while chronic and isolated

past year CVE variety were both significantly related to internalizing symptoms, chronic exposure was a stronger predictor, contrary to Hypothesis 1d.

A parallel model was tested to predict externalizing symptoms in order to compare the results for internalizing symptoms, although no specific hypotheses were proposed with respect to externalizing symptoms. In addition to the demographic and control variables that emerged as significant predictors in line with previous models (Hispanic ethnicity, income, prior levels of externalizing symptoms, and the interaction between cohort and prior levels of externalizing symptoms), both exposure to one type of CVE in the past year, $B = .71$, $SE = .20$, $p < .001$, and exposure to two or more types, $B = 1.45$, $SE = .19$, $p < .001$, were significantly positively associated with externalizing symptoms relative to participants with no exposure, and the coefficient for the chronic group was significantly greater than the coefficient for the isolated group, $Z = 2.65$, $p = .008$. There were no significant interactions between the CVE groups and sex or cohort, so they were excluded from the final model.

This procedure was repeated, replacing the CVE variables with indicators representing exposure to one type of CVE within participants' *lifetimes* and exposure to two or more types ("isolated" versus "chronic" lifetime CVE variety). For the model predicting internalizing symptoms, in addition to the demographic and control variables that emerged as significant predictors consistent with previous models, exposure to two or more types of CVE within one's lifetime (chronic lifetime CVE variety) was significantly positively associated with internalizing symptoms, $B = 2.23$, $SE = .41$, $p < .001$, but exposure to one type of CVE within one's lifetime (isolated lifetime CVE variety), relative to participants with no lifetime exposure, was not significantly associated with internalizing symptoms, contrary to Hypothesis 1d. In the model predicting externalizing symptoms, exposure to two or more types of events in one's lifetime

was significantly positively related to externalizing symptoms, $B = 1.09$, $SE = .21$, $p < .001$, but exposure to one type was not. Neither cohort nor sex was a significant moderator of the association between chronic CVE and either internalizing or externalizing symptoms.

Finally, parallel analyses were conducted to test whether a *single exposure* to a single type of CVE within the past year was differentially associated with internalizing symptoms compared to two or more exposures. For the model predicting internalizing symptoms, in addition to the same significant associations between demographic and control variables and internalizing symptoms that emerged in previous models, exposure to two or more instances of CVE over the past year (chronic past year CVE frequency) was significantly positively associated with internalizing symptoms, $B = 2.05$, $SE = .33$, $p < .001$, whereas exposure to a single incident (isolated past year CVE frequency), relative to individuals with no exposure, was not, thus again failing to support Hypothesis 1d. Though no hypotheses regarding externalizing symptoms were proposed, this pattern was replicated in the model predicting externalizing symptoms: in addition to significant associations between demographic and control variables and externalizing symptoms, exposure to two or more instances of CVE over the past year was significantly positively associated with externalizing symptoms, $B = 1.32$, $SE = .18$, $p < .001$, but exposure to a single instance of CVE, relative to those with no exposure, was not. Taken together, this set of results failed to support Hypothesis 1d, and instead suggested that more chronic CVE variety and frequency is associated with more internalizing symptoms than isolated CVE.

Hypotheses 2a and 2b: Severity. As an extension of the results reported above regarding desensitization and chronic versus isolated CVE, Hypotheses 2a and b predicted not only that exposure to more subjectively severe violent incidents would be more strongly associated with

well-being than less severe incidents, but also that patterns of desensitization would be stronger for *less* severe events than for more severe events. To test this hypothesis, a set of GEE analyses were conducted predicting internalizing and externalizing symptoms separately from the three pairs of "severe" and "non-severe" CVE scales: past year frequency, past year variety, and lifetime variety. All CVE variables were standardized.

For the first pair of GEE analyses, internalizing and externalizing symptoms were each predicted separately from the same set of covariates included in previous models, a linear term for the non-severe past year CVE frequency scale, a linear term for the severe past year CVE frequency scale, and quadratic terms for the non-severe and severe past year CVE frequency scales. In addition to the same demographic and control variables that emerged as significant in previous models, non-severe past year CVE frequency was significantly positively associated with internalizing symptoms, $B = 2.05$, $SE = .41$, $p < .001$, but severe past year CVE frequency was not, $B = .04$, $SE = .35$, $p = .919$. Moreover, the regression coefficient for the linear non-severe CVE scale was significantly greater than the regression coefficient for the severe CVE scale, Wald $X^2 = 14.39$, $p < .001$. Not only do these results fail to support Hypothesis 2a, but they actually provide support for the opposite phenomenon: *less* severe past year CVE frequency was *more* strongly related to internalizing symptoms than was more severe past year CVE frequency. The quadratic terms for severe and non-severe past year CVE frequency were not significantly associated with internalizing symptoms, unlike previous models testing quadratic effects of overall CVE scales and contrary to Hypothesis 2b. Because most of the interactions between each of the four CVE variables and both sex and cohort were not significant predictors of internalizing symptoms, they were excluded from the model; however, the interaction between cohort and the linear non-severe CVE term was significant and negative, $B = -.11$, $SE = .04$, $p =$

.009, so it was retained in the final model. Figure 28 illustrates this significant interaction, in which the linear association between non-severe past year CVE frequency and internalizing symptoms appears stronger for younger children than for older youth, consistent with previous models.

Results were similar for the parallel model predicting externalizing symptoms: there was a significant positive association between non-severe past year CVE frequency and externalizing symptoms, $B = .78$, $SE = .13$, $p < .001$, but a nonsignificant relation between severe past year CVE frequency and externalizing symptoms, $B = .12$, $SE = .20$, $p = .533$, and the coefficient for the non-severe scale was significantly larger than the coefficient for the severe scale, Wald $X^2 = 5.83$, $p = .016$. As for the model predicting internalizing symptoms, the quadratic terms for severe and non-severe past year CVE frequency were not significantly associated with externalizing symptoms, and interactions with sex and cohort were not included in the final model due to nonsignificance. Taken together, and consistent with the results for internalizing symptoms, these results failed to support Hypotheses 2a and 2b with respect to severe versus non-severe past year CVE frequency.

Next, the same pair of models was tested, replacing the past year CVE frequency variables with the severe and non-severe past year CVE *variety* scales. In the model predicting internalizing symptoms, in addition to the significant effects of the same demographic and control variables that emerged in previous models, the linear non-severe past year CVE variety term was significantly positively associated with internalizing symptoms, $B = 1.00$, $SE = .20$, $p < .001$, but the linear severe past year CVE variety term was not, $B = .39$, $SE = .35$, $p = .266$, though these coefficients were not significantly different from one another, Wald $X^2 = 1.82$, $p = .177$. Additionally, the quadratic severe and non-severe CVE terms were both nonsignificant

predictors of internalizing symptoms, as were the interactions of the CVE terms with sex and cohort. Taken together, these results failed to support Hypotheses 2a and 2b.

The results for the model predicting externalizing symptoms differed somewhat. Beyond the effects of the same demographic and control variables that emerged in previous models, both the linear non-severe past year CVE variety term, $B = .56$, $SE = .11$, $p < .001$, and the linear severe term, $B = .50$, $SE = .20$, $p = .012$, were significantly positively associated with externalizing symptoms, and these two coefficients did not significantly differ from one another, Wald $X^2 = .05$, $p = .818$, contrary to Hypothesis 2a. Further, the quadratic severe past year CVE variety term was significantly negatively related to externalizing symptoms, $B = -.16$, $SE = .06$, $p = .004$, but the quadratic non-severe term was not, contrary to Hypothesis 2b. Finally, interactions with age and cohort were not significant, so they were excluded from the final model.

Lastly, the analyses were repeated for the severe and non-severe *lifetime* CVE variety scales. In the model predicting internalizing symptoms, in addition to demographic and control variables, the linear term for non-severe lifetime CVE variety was significantly positively associated with internalizing symptoms, $B = 2.03$, $SE = .39$, $p < .001$, but the linear term for the severe variable was not, $B = .32$, $SE = .34$, $p = .349$. In keeping with the results for past year CVE variety and past year CVE frequency, these results are opposite those predicted by Hypothesis 2a. Neither of the quadratic terms was significant, thus failing to support Hypothesis 2b; however, the interaction between cohort and the linear non-severe lifetime CVE variety scale was significantly negatively associated with internalizing symptoms, $B = -.14$, $SE = .05$, $p = .003$. Figure 29 illustrates this interaction effect, reflecting a stronger association between non-severe lifetime CVE variety and internalizing for younger cohorts than for older cohorts. Other

cohort and sex interactions were not significant, so they were excluded from the final model. Finally, in the model predicting externalizing symptoms, in addition to demographic and control variables, the linear term for non-severe lifetime CVE variety was significantly positively associated with externalizing symptoms, $B = .53$, $SE = .10$, $p < .001$, as was the linear term for the severe variable, $B = .38$, $SE = .19$, $p = .046$. However, the regression coefficient for the severe linear CVE term was quite small, though it did not significantly differ from the coefficient for the non-severe linear CVE term, Wald $X^2 = .35$, $p = .554$. Neither of the quadratic CVE terms was significant, and nor were the two-way interactions with sex and cohort that were initially tested. Taken together, these results failed to support Hypotheses 2a and 2b. Overall, the results addressing CVE severity not only failed to support Hypotheses 2a and 2b with respect to past year CVE frequency and both past year and lifetime CVE variety, but they actually provided evidence to the *contrary* – that is, that *non*-severe CVE was more strongly related to internalizing and externalizing symptoms than severe CVE, and that patterns of desensitization were not present.

CHAPTER IV

Discussion

This dissertation used data from three waves of the Longitudinal Cohort Study of the PHDCN to investigate detailed patterns in the relation between community violence exposure and youths' well-being. With a representative sample of more than 4,000 Hispanic, Black, and White youth living in urban Chicago neighborhoods, this study examined patterns of desensitization to CVE, the moderating roles of age and gender in these patterns, and the impact of CVE severity on children's and adolescents' internalizing and externalizing symptoms. Given the size and the representativeness of the sample, the present findings are expected to generalize to urban American youth from a range of socioeconomic and cultural backgrounds. Moreover, by including youth ranging in age from 3 to 21 over the course of the study period, this investigation provides a valuable developmental perspective on how CVE is related to well-being across children's development.

In addition to these methodological strengths, the current study took a unique approach to the study of CVE by departing from a general "strain theory" framework and instead specifically tested the often implicit assumptions underlying the ways in which CVE is measured and conceptualized. For example, the virtually ubiquitous assumption that the relation between CVE and youths' well-being is incrementally linear was explicitly tested and challenged, as well as the idea that CVE is a single, homogenous construct. This study also differs from many previous studies in that it makes clear the ways in which CVE was measured, employs several different methods of coding and conceptualizing CVE variables to tap different aspects of CVE (e.g.,

frequency and variety), provides clear rationales for why each CVE variable was selected, and carefully considers the distinct implications of each CVE measure in interpreting results. As such, the findings from this study help to advance the CVE literature toward a more comprehensive, accurate understanding of the relations between CVE and youths' well-being and offer a starting point for progress in improving issues of measurement and definition of CVE. Moreover, several aspects of CVE are included in an examination of its impact, including chronicity and severity, as well as several individual characteristics, including age and gender, which add to the contribution this study makes to the literature. The statistical power to detect even nuanced effects afforded by the large sample, as well as the variety of age cohorts comprising youth with wide-ranging experiences of CVE, enabled the examination of the moderating role of age in the relations between CVE and well-being, controlling for the often confounding effects of cumulative violence exposure.

Desensitization

The primary set of hypotheses for this study centered on testing whether youth become desensitized to community violence exposure and whether such a pattern differs among youth of different ages and genders. This set of hypotheses includes three related concepts. First, as several theorists have proposed and a handful of empirical findings have suggested, although higher levels of CVE is generally associated with more internalizing symptoms, this association may level off as youth become accustomed and therefore "numb" to the CVE they experience. At the same time, CVE may prompt the development of externalizing behaviors in a more linear fashion, reflecting an emotional desensitization alongside an increase in the use of violence. Second, researchers often assume a linear relation between CVE and outcomes, and therefore measure and test its effects in a linear manner without any explicit justification for this approach.

Therefore, a test of linearity between CVE and well-being outcomes in this study addresses not only whether youth actually become desensitized to CVE at increasing *frequency* of exposure, but also whether CVE as a construct is best measured and conceptualized as a linear construct based on the ways in which the construct behaves in relation to youth outcomes. Third, a nonlinear relation between CVE *variety* and well-being may indicate that like the assumption of linearity, CVE may not operate as a single, homogenous construct comprised of many different types of CVE that contribute to the construct equally.

In general, using several methodological approaches and examining a range of CVE constructs, the present findings provide support for the desensitization hypothesis (Hypothesis 1a). More specifically, they suggest that the association between CVE and youths' internalizing symptoms is more quadratic than linear, and that the association between CVE and externalizing symptoms, though quadratic in some cases, tends to be more linear. First, preliminary correlations and scatterplots suggested the presence of nonlinear patterns in the association between CVE and well-being, particularly internalizing symptoms. When linear curves were fitted on these scatterplots, the slopes of the lines were practically zero. Thus, one might conclude that lifetime CVE frequency is not systematically related to internalizing symptoms. Indeed, the bivariate correlation between CVE and internalizing symptoms at Wave 1 was small and nonsignificant – a notably rare finding in a well-powered study. However, when the scatterplot curves were afforded greater flexibility to fit more closely to the data by plotting a loess curve, the data within the lowest range of lifetime CVE frequency reflected a clear positive linear pattern between CVE and internalizing symptoms across cohorts, but the lines then decreased and leveled off to some extent. These preliminary patterns suggested a pattern more closely fitting a quadratic curve than a linear curve. On the other hand, the association between

lifetime CVE frequency and externalizing symptoms at Wave 1 appeared more consistently linear for most cohorts. Taken together, these preliminary results suggested the presence of a desensitization phenomenon and justified more formal tests of Hypotheses 1a, 1b, and 1c.

The results of Wave 1 analyses using the lifetime and past year CVE frequency scales indicated that there was a significant quadratic association between lifetime CVE frequency and internalizing symptoms, whereas the linear term in isolation was not a significant predictor of internalizing symptoms. In line with previous findings, these patterns emerged controlling for a range of demographic control variables (Ng-Mak et al., 2004). Thus, had analyses for the present study been limited to examination of linear relations, these results would have led to the conclusion that lifetime CVE frequency was not associated with internalizing symptoms at all. In contrast, the linear association between lifetime CVE frequency and externalizing symptoms *was* significant, providing support for Hypothesis 1a. Figures 6 and 7 illustrate these quadratic trends, and demonstrate that at lower levels of CVE, the relation between CVE and well-being behaves in a roughly linear fashion whereas the association levels off and even becomes negative at the highest levels of CVE. An examination of both figures underscores the importance of including quadratic terms when investigating the relation between CVE and well-being outcomes: if one were to observe patterns between CVE and well-being only in youth with the lowest levels of CVE (which includes the greatest number of cases), one would conclude that there is a linear relation between CVE and symptoms; on the other hand, if one were to examine only the youth with the highest levels of CVE, one may conclude that the relation between CVE and symptoms is either nonsignificant or even negatively linear. Only upon a complete examination of the quadratic trend across the full range of CVE does this pattern of desensitization to CVE emerge.

Further analyses examined whether these results held for *past year* CVE frequency controlling for lifetime CVE frequency to shed light on whether more temporally proximal violence exposure would operate differently on youths' well-being than the lifetime CVE to which they appear to become desensitized. These results indicated the presence of quadratic associations between past year CVE frequency and both internalizing and externalizing symptoms, over and above the effects of lifetime CVE frequency. Thus, youth appeared to become desensitized to CVE within the past year both emotionally and behaviorally, and the influence of past year CVE seems particularly salient for youth, even in the context of more cumulative, lifetime CVE. Figures 10 and 11 highlight this pattern for past year CVE frequency. However, the association between lifetime CVE frequency and internalizing symptoms was not significantly larger than that for past year CVE frequency, thus failing to support Hypothesis 1b that desensitization would be more likely to occur over one's lifetime than over one year. At the same time, whereas the linear association between past year CVE frequency and internalizing symptoms was statistically significant, the linear association for lifetime CVE frequency was not, suggesting that more recent CVE may impact youth in a *more* linear fashion than cumulative lifetime CVE. It is also important to note that the quadratic association between lifetime CVE frequency and internalizing symptoms remained significant, even when controlling for past year CVE frequency, suggesting that youth become desensitized to the violence to which they have been exposed over the course of their lifetimes, regardless of the level of CVE they experienced in the immediate past.

Some of these results must be interpreted with caution. Specifically, controlling for past year CVE when estimating the effects of lifetime CVE introduces two methodological challenges to making valid inferences. First, lifetime CVE frequency *includes* the frequency of CVE within

the past year, thus introducing some overlap between the two constructs. For this reason, when estimating the effect of lifetime CVE frequency and past year CVE frequency simultaneously, the interpretation of the former is better conceptualized as the frequency of CVE experienced *up until* the past year. Second, however, it is likely unwise to interpret the regression coefficients for lifetime CVE frequency when controlling for past year CVE frequency, because estimating the effect of a *later* event on a given outcome may bias or inappropriately reduce the estimated effect of the event preceding it. Theoretically, exposure to community violence that occurred earlier in time may impact youths' exposure to violence at a later point in time. Therefore, by adjusting for effects of more recent CVE on youths' well-being, a portion of the effect of previous CVE may be unintentionally "adjusted away." Thus, while preliminary interpretations of the results regarding lifetime CVE are offered here, it is acknowledged that these interpretations may provide an incomplete picture of the differential impact of lifetime and past year CVE frequency on youths' internalizing and externalizing symptoms. Instead, the application of innovative statistical techniques to this problem in future research is recommended and discussed below.

Using data from Waves 2 and 3 and the measures of CVE that were available at those time points, similar patterns emerged, providing additional support for Hypothesis 1a and evidence that youth become emotionally desensitized to CVE exposure. Specifically, preliminary scatterplots showed that, as in Wave 1 for lifetime CVE frequency, the relation between past year CVE frequency and internalizing symptoms appeared linear at low levels of CVE but appeared to level off as CVE increased. In contrast, the relation for externalizing symptoms appeared more consistently linear across the range of CVE frequency. Further, as hypothesized, results of primary analyses revealed a significant quadratic association between past year CVE frequency and internalizing symptoms, but not externalizing symptoms, controlling for

demographic covariates and autoregressive effects of the well-being outcomes. This pattern persisted even when controlling for the variety, or number of different types, of CVE that youth had experienced in their lifetimes, which suggests that the process of desensitization that occurs over the course of one year is distinct from any effects of cumulative CVE variety. In other words, past year frequency appears to make a meaningful difference in youths' well-being aside from other aspects of their CVE. A comparison between Figures 12 and 13 provides an even more compelling illustration of the nonlinear association between past year CVE frequency and internalizing symptoms: Figure 12 shows that if the statistical model were constrained to estimating the linear effect of past year CVE frequency, one would conclude that youth with the highest levels of CVE tend to exhibit the highest levels of internalizing symptoms, whereas Figure 13 displays the quadratic association that more closely fits the data. As seen in Figure 13, youth with the highest levels of CVE actually do *not* tend to exhibit the highest levels of internalizing symptoms, but rather show declines, on average, in internalizing symptoms. Such a pattern provides evidence for emotional numbing that may occur at the highest levels of CVE, whereby at lower levels of CVE, increases in exposure are related to increases in internalizing symptoms as one might expect, but after accumulating many experiences of CVE, the same increase in exposure is no longer associated with increases in internalizing symptoms. In contrast, the comparison between Figures 14 and 15 indicate that even when the model predicting externalizing symptoms is afforded greater flexibility to fit to any quadratic trends in the data between past year CVE frequency and externalizing symptoms, the association barely strays from linearity. Therefore, a linear scale seems to best capture the relation between past year CVE frequency and externalizing symptoms, such that externalizing symptoms tend to increase more or less incrementally with increases in exposure to community violence. In

conjunction with the findings for internalizing symptoms, then, these results further support Hypothesis 1a and appear to reflect a desensitization phenomenon, which stands in stark contrast to the commonly, implicitly assumed linear, incremental relation between CVE and well-being.

In order to address measurement and definitional issues in the study of CVE, a key objective of the present study was to very carefully and explicitly consider how each CVE variable was measured, the underlying assumptions that its measurement reflects, and the most accurate interpretations of the results given the ways in which each variable was measured and coded. In that vein, these results exemplify a critical issue regarding CVE measurement – that is, the assumptions underlying CVE item scaling. Unlike the CVE frequency measures at Wave 1, the past year CVE frequency measure used in Waves 2 and 3 was coded on an ordinal rather than a true count or continuous scale. Briefly, each item on the past year CVE frequency scale for Waves 2 and 3 was coded as 0 (0 exposures to the event), 1 (1 exposure), 2 (2 to 3 exposures), 3 (4 to 10 exposures), or 4 (more than 10 exposures). Unfortunately, the PHDCN research team has not documented, to my knowledge, their rationale for choosing to use this coding scheme. Nonetheless, this ordinal scaling has several important implications, and several fruitful lessons may be learned from this choice of coding scheme. By collapsing frequencies into ordinal categories, the original frequency count scales were unable to be reproduced and a great deal of potentially valuable information in the data was lost. Therefore, a true test of linearity could not be conducted, because no truly linear CVE scale was available. Instead, the way in which the ordinal scale was coded actually approximates more closely a *logarithmic* scale rather than a linear one, in that each single unit increment in the scale was associated with an increasingly greater increment in the actual quantity being measured. In essence, the true CVE frequencies underlying this scale would be "stretched out" at increasingly higher levels. Therefore, the linear

associations that were found when using this scale may actually represent *nonlinear* associations, in that at higher levels of CVE, linear associations with the outcomes would be even weaker than the results suggest. Additionally, quadratic associations that emerged may, in reality, be even more extreme, given that the CVE variable already approximated a nonlinear scale. In sum, the ordinal coding scheme for the Waves 2 and 3 CVE frequency variable does not diminish the evidence for quadratic associations between CVE and internalizing symptoms, which is a key premise of the desensitization hypothesis; rather, it renders the estimates of the quadratic associations *conservative* and, if anything, further bolsters these findings. However, the ordinal coding does call into question whether some of the linear associations that emerged were truly linear, or whether they were artifacts of the coding scheme. This may account for the fact that when the continuous scale for past year CVE frequency was used in Wave 1, there was a quadratic association between CVE and externalizing symptoms, but when the ordinal scale was used in Waves 2 and 3, there was only a linear association. In actuality, the apparent linear association using the ordinal scale, which condenses the frequency range into a shorter distance, might reflect the same quadratic associations that emerged using the continuous scale, albeit weaker than the quadratic associations found for internalizing symptoms.

Perhaps the original PHDCN researchers specifically intended to capture the assumption that CVE behaves in a nonlinear fashion by choosing to code the data in this way; however, when such an assumption is not made explicit, it leaves substantial room for uncertainty in interpretation. Further, because so little work has been done investigating whether CVE does indeed relate to youths' well-being in a nonlinear manner, the choice to code CVE in this way precludes the possibility of examining potential linear effects in comparison with quadratic effects, and therefore seems shortsighted. Finally, even if the PHDCN researchers did

presuppose an assumption of nonlinearity, it would have been advantageous to fellow researchers to have *coded* the scale continuously, but then tested their assumption using quadratic terms in a statistical model as was undertaken in the present study. In this way, researchers would have had the opportunity to explicitly make their own choices and assumptions about how to best represent the CVE construct, given the particular foci of their investigations, so as to base these choices more appropriately on theory rather than mere convenience of what measures were available in the data. On the other hand, perhaps the developers of the PHDCN CVE scale actually intended to artificially force a nonlinear CVE construct to behave in a more linear manner by condensing item frequencies into an ordinal scale (Earls & Buka, 1997); however, this study takes the approach that the true form of the CVE construct itself in relation to youths' well-being is of primary importance and worthy of study in its own right. Indeed, as the present findings suggest, nonlinear associations between CVE and well-being may reflect an important underlying *process* of desensitization rather than simply causing a nuisance for statistical analyses that must be rectified through artificial coding schemes. Nonetheless, although this scaling issue unfortunately limits the conclusions that may be drawn from the current findings, it is a particularly instructive example of the need to carefully consider how CVE measures are defined, measured, and coded, and the significant impact these decisions can have on the interpretability of findings. Ideally, future CVE researchers will incorporate the lessons learned from measurement issues such as this one in order to yield more reliable and meaningful findings.

In addition to examining the patterns of relations between the *frequency* of CVE and youth well-being at Waves 2 and 3, this study capitalized on the range of information available on CVE in the PHDCN and also conceptualized CVE as the *variety* of violent events to which

youth had been exposed at least once. Because this type of scale is often used in the CVE literature as an alternative to CVE frequency without explicit justification, this study aimed to explore whether the CVE variety construct behaved similarly to the CVE frequency construct in its relation with youth well-being, and specifically, whether youth become desensitized to CVE as they are exposed to more *types* of CVE, irrespective of their frequency of exposure. Results indicated that, unlike past year CVE frequency, past year CVE variety was *not* quadratically associated with either internalizing or externalizing symptoms, particularly when controlling for lifetime CVE variety. However, like the results for lifetime CVE frequency, the quadratic association between *lifetime* CVE variety and internalizing symptoms *was* significant. These findings suggest that youths' desensitization in response to increasing *types* or variety of exposures is better captured by measuring one's diversity of CVE over the *lifetime* rather than the past year, whereas desensitization as measured by CVE frequency does occur both over one's lifetime and the past year. Figures 16 and 18 illustrate this pattern clearly. For internalizing symptoms, Figure 16 shows that the relation between past year CVE variety and internalizing symptoms is approximately linear. Figure 18 shows even more clearly that every exposure to a new type of CVE is associated with a linear increase in externalizing symptoms, on average.

Whereas the quadratic association between CVE *frequency* and well-being may reflect desensitization or emotional numbing to CVE with increasing exposure, the quadratic association between lifetime CVE *variety* and well-being may instead indicate that not all *types* of community violence exposure contribute equally to an overall, homogenous CVE construct as is often assumed. Thus, the present findings suggest that various aspects of the CVE items within the scale, such as severity, should also be considered in combining items into a composite scale when measuring CVE over the course of one's lifetime. Additionally, the differential results for

lifetime and past year CVE variety underscore the importance of measuring CVE over both timeframes in examining its impact on youths' well-being. Alternatively, it is important that researchers make very explicit the timeframe under study and provide a rationale for selecting it, given that past year and lifetime CVE variety appear to operate as slightly different constructs with respect to their relations with youths' well-being.

As described above, mirroring findings on lifetime CVE *frequency* in Wave 1, there were significant quadratic associations between lifetime CVE *variety* and both internalizing and externalizing symptoms. In contrast with the findings on past year CVE, then, lifetime CVE, operationalized as both lifetime frequency and lifetime variety, does appear to have a curvilinear, quadratic association with externalizing symptoms. Departing somewhat from Hypothesis 1a, then, these results suggest that youth become emotionally numb with increasing cumulative violence exposure, but that they may become behaviorally desensitized as well, in that at high levels of exposure, externalizing symptoms cease increasing with continued increases in CVE. However, this process for externalizing symptoms appears to occur more gradually than the desensitization process for internalizing symptoms, which may be why these patterns emerge for externalizing symptoms only over the course of one's lifetime rather than over the course of a single year, perhaps providing support for Hypothesis 1b, albeit unexpectedly for externalizing rather than internalizing symptoms. Alternatively, perhaps this curvilinear pattern does not necessarily represent "desensitization" to CVE in youths' behavioral responses, but rather a ceiling effect, whereby those youth who are engaged in the highest levels of externalizing behaviors and are exposed to a very high level of CVE were not captured by this study, because their externalizing symptoms were so significant as to lead to incarceration or even fatalities due to risky or violent behavior. The results of attrition analyses do not provide strong support for

this explanation, however, as there was no association between participants' externalizing symptoms at Wave 1 and their likelihood of dropping out at later waves (Tables 5 and 6).

The fact that lifetime and past year CVE frequency as well as lifetime CVE variety were all found to have quadratic associations with well-being in this study significantly adds to the handful of previous findings on desensitization to CVE, which have focused solely on CVE variety (Mrug et al., 2008; Ng-Mak et al., 2004). The emergence of nonlinear patterns for both of these constructs over the lifetime and for frequency over the past year provides a much richer understanding of the form of the associations between CVE constructs and well-being. Moreover, by examining the curvilinear effects of lifetime and past year CVE variety separately, this study was able to uncover differential patterns that have not been addressed in previous studies, in that CVE variety had quadratic associations with well-being only over the course of one's lifetime rather than within the past year. It is important to note that past year CVE frequency and variety, though tested and interpreted as separate constructs in this study, were very highly correlated. In part, this correlation is due to the fact that the CVE frequency scale combined the same variety of CVE types that were included in the CVE variety scale, so it actually captures both frequency *and* variety. Beyond this overlap, the high correlation may suggest that the same youth who are exposed to the greatest *frequency* of violent events are also exposed to the greatest *variety* of events, as suggested by the cumulative effects model (Lynch, 2003). In this case, it may nonetheless be beneficial to consider the differential implications of curvilinear trends between each of these CVE constructs and youths' well-being to more completely understand the multifaceted ways in which urban violence impacts their well-being. In any case, the strong positive correlation between past year CVE frequency and variety may

mean that they essentially represent the same construct, in which case a separate consideration of their relations with well-being in the present study may be redundant.

One additional approach was taken to further test the desensitization hypothesis by exploiting the ordinal scaling of the CVE frequency variables in Waves 2 and 3 (Hypothesis 1c). Specifically, the linear association between each of several CVE frequency items and well-being outcomes was examined. Subsequently, alternate models were run in which the CVE item was divided into its component frequency groups to test whether the linear effect truly represented consistent, incremental increases in the association between CVE frequency and symptoms. Further, this method permitted the exploration of whether *individual* CVE items related to well-being outcomes on a linear or nonlinear scale, and also provided a more detailed view of the precise structure and magnitude of the associations between CVE and well-being. On the whole, these findings suggest that although the linear association between each CVE item and well-being outcomes was statistically significant, closer examination of the associations between each frequency group and outcomes revealed that the patterns are much less straightforward, as illustrated in Figures 22 through 27.

First, although the trends appeared positive and linear overall, well-being outcomes did not consistently increase with each increase to a higher frequency group; in fact, the trends actually changed direction for some variables and manifested a negative association at some points along the ordinal scale. Therefore, there was not a consistent, incremental increase in outcomes with increases in CVE frequency as researchers so often implicitly assume by using linear scales. Second, for the two CVE items that were considered less severe – saw someone chased and heard gunfire nearby – the patterns underscored the desensitization effects uncovered in previous analyses that supported Hypothesis 1a. For internalizing symptoms, each increase in

frequency group was associated with an increase in symptoms at lower levels, but these increases then leveled off at higher levels. However, for externalizing symptoms, there was a more consistently incremental increase in symptoms with increases in CVE frequency groups. Thus, these findings provided additional support for the desensitization theory and Hypothesis 1c. Third, the models that estimated the effects of being in a given frequency group separately from one another fit the data better than the models that pooled these effects into a single linear term. Therefore, even the impact of exposure to individual types of community violence is better characterized by nonlinear, more flexible associations than a strictly linear structure, particularly for internalizing symptoms.

Paradoxically, the relation between the most subjectively severe event examined (seeing someone shot) and internalizing symptoms was only statistically significant within the most extreme frequency group. In other words, the results indicate that only after having seen someone shot at least ten times within the past year does this experience begin to impact one's well-being. None of the frequency groups were significantly associated with externalizing symptoms. This is unexpected, given that this type of exposure had a low frequency within the sample and would be expected to affect youths' well-being even at very low levels, given its severity. Two possible explanations might account for these findings. First, unlike the less severe events, there were very few participants who had seen someone shot in the past year at each of the frequency groups. Thus, the variance is clearly quite large for these groups, as illustrated by the particularly wide error bars in Figures 26 and 27, which reduces the likelihood of smaller differences between groups reaching statistical significance. Second, it may be the case that, as the cumulative effects model suggests, those youth who were exposed to the most severe events at even low rates may be the same youth who are exposed to the highest frequency of all types of

violence more generally; thus, the nonsignificiant associations between seeing someone shot and internalizing and externalizing symptoms within the lower frequency groups might represent the desensitization effect discussed above, in that the youth within these frequency groups have been exposed to a very high frequency of CVE more generally and have therefore become desensitized. Future research that can disentangle the distinct effects of CVE frequency versus severity is needed to test this hypothesis.

As with the examination of relations between the overall ordinal CVE frequency scale and well-being outcomes, it must be emphasized that each frequency group on these scales did not represent a one-unit increase in CVE; in fact, each group contained a different range of frequencies, effectively condensing a much larger continuous scale into five distinct categories. Therefore, exploring interval increases in the CVE items in this study was not a true test of linearity. However, as described above, the fact that there were unequal changes in the outcome with each "unit" increase on the ordinal scale, even with a scale that already approximated nonlinearity, provides even stronger evidence for the conclusion that CVE frequency does not relate to outcomes (especially internalizing symptoms) in a consistently linear fashion.

In sum, the current findings provide support for curvilinear effects of CVE in favor of the commonly accepted dose-response, cumulative effects model (Suglia et al., 2008; Turner et al., 2006; Zinzow et al., 2009), with some nuanced qualifications, such as the quadratic effects of lifetime CVE variety versus the linear effects of past year CVE variety. These results suggest that the poly-victimization model must be adapted to reflect youths' desensitization at very high levels of CVE variety (Finkelhor et al., 2011). Interestingly, the plots of the quadratic associations between CVE and internalizing symptoms appear nonsignificant when examining only linear effects, masking the presence of the more nuanced quadratic structure. However, at

low levels of CVE, which characterizes the majority of youth, the slope between CVE and internalizing symptoms is actually stronger than the association between CVE and externalizing symptoms at the same levels of CVE. By examining only linear associations, these important patterns would be overlooked, and one might conclude that CVE is not related to internalizing symptoms whatsoever. In contrast, most children, who are *not* exposed to the very highest levels of community violence, have a greater tendency to respond to CVE with internalizing symptoms rather than externalizing symptoms. However, for children who are exposed to higher levels of CVE relative to their peers, externalizing symptoms are more likely to emerge, given that the average level of externalizing symptoms consistently increases with rises in CVE, but the average level of internalizing symptoms begins to decline. The linear increase in externalizing symptoms occurs quite gradually over a wide range of CVE, which may reflect the gradual development and emergence of aggressive and delinquent behavioral patterns over time as youth become more accustomed to the violence they see in their neighborhoods. In contrast, the sharper increase in internalizing symptoms with increases in CVE at lower levels perhaps suggests that emotional symptoms may represent more immediate, instinctual responses to community violence that then wane as CVE persists. Thus, not only does this pattern of findings support the desensitization hypothesis, but it indicates that the processes underlying the emergence of internalizing versus externalizing symptoms in response to CVE may be distinct from one another. Such a conclusion is consistent with the logic underlying the desensitization hypothesis that internalizing symptoms arise in response to CVE as an emotional reaction to events that are immediately distressing, whereas externalizing symptoms develop as a form of gradual adaptation to one's environment as one becomes accustomed to the use of violence and aggression as common forms of interpersonal interaction.

The present findings regarding desensitization are consistent with those of two previous studies that have similarly revealed significant quadratic associations between CVE and internalizing symptoms, but linear associations between CVE and externalizing symptoms (Mrug et al., 2008; Ng-Mak et al., 2004). The present findings also extend these previous findings by providing support for the desensitization hypothesis using longitudinal data, uncovering patterns of desensitization for both lifetime and past year CVE frequency as well as lifetime CVE variety, and predicting general, subclinical levels of internalizing symptoms rather than solely clinical symptoms of PTSD or depression. In addition, the present findings provide more substantive support for the desensitization theory than previous findings, as measures of both past year and lifetime CVE *frequency* were examined, in contrast with other studies that focused exclusively on variety. In conjunction with these previous findings and other supporting evidence (e.g., Aisenberg et al., 2008; Cooley-Quille et al., 2001), the present findings bolster the desensitization theory and suggest that "pathologic adaptation," characterized by emotional numbing and increased acceptance of the use of violence and aggression, may account for this pattern. However, the current findings suggest a more nuanced qualification to this theory: *behavioral* desensitization appears to occur over the course of youths' entire lifetimes, as opposed to the emotional desensitization that appears to develop over the course of one year.

In considering what might be driving the desensitization to CVE that youth demonstrated in this study, it may be the case that this pattern indicates true "desensitization" among youth in that they become emotionally numb, no longer become distressed by neighborhood violence because they are so accustomed to it, and gradually develop more aggressive tendencies as a means of adapting to their violent environments. On the other hand, youth may continue to *experience* subjective feelings of distress in response to CVE, but become more adept over time

at hiding or suppressing visible signs of emotional symptoms as means of coping. Conversely, on a more optimistic note, as they become more aware of the distress that such exposure provokes, youth who have experienced a great deal of CVE may turn to more active coping strategies that actually help to buffer the impact of further CVE on their well-being (Epstein-Ngo, Maurizi, Bregman, & Ceballo, 2013). Among youth with less CVE who have not been compelled to develop such adaptive strategies, involuntary stress responses may be more common, which tend to be positively linked to internalizing symptoms (Epstein-Ngo et al., 2013). This explanation may account for the differential findings regarding desensitization to past year CVE *frequency* versus past year CVE *variety*, as youth may be better able to increasingly cope with the same *type* of CVE at increasing levels of frequency, but have greater difficulty generalizing these coping strategies to *new* types of community violence to which they are exposed. Thus, the apparent "desensitization" effect may actually reflect a genuine increase in youths' use of adaptive strategies to cope with high levels of CVE leading to reductions in internalizing symptoms.

It is also important to consider the direction of causality that might account for the present findings. For instance, although one might infer that increased CVE over time leads to increased internalizing symptoms to a point, but that it causes a more gradual, consistent increase in externalizing behaviors, it could be the case that aggressive youth tend to self-select into situations characterized by violence in their communities, perhaps because they themselves are involved in the perpetration of such violence. However, given that these findings emerged even when controlling for prior levels of externalizing symptoms, this process is very unlikely to be the sole contributor to these findings. Finally, whether or not a given individual becomes desensitized to violence exposure almost certainly depends upon a range of additional factors

beyond the demographic and control variables included in the models in this study. For instance, whether a child witnessed or was directly victimized by violence, his or her physical proximity to the event, and how well the child knew the victim and perpetrator likely impact the degree to which each additional exposure adds linearly to the impact of CVE on well-being. Individual-level factors beyond those explored here, such as temperament, cultural norms, and family relations also likely play important roles. As an initial step toward building this more comprehensive understanding of the differential impact of CVE on children's well-being and of the circumstances under which desensitization occurs, one such factor, severity, is explored below. As the analyses testing Hypothesis 1c imply, not only the strength but also the structure of the relation between exposure to a given type of violence and well-being may differ depending on the severity of the event, as youth may not become desensitized to all types of CVE, particularly those that are much less common and therefore perhaps more emotionally jarring when they occur. Two individual-level factors, age and gender, were explored as well.

Age and gender. The present findings extend those from previous studies that have uncovered patterns of desensitization and further enhance our understanding of these patterns by examining the moderating roles of age and gender. With respect to age, Hypothesis 3a was partially supported. As predicted, the linear associations between *past year* measures of CVE (both frequency and variety) and internalizing symptoms were stronger among younger children than among older children as measured in Waves 2 and 3. For instance, Figure 12 illustrates the significant interaction between cohort and past year CVE frequency in predicting internalizing symptoms. However, contrary to the second component of Hypothesis 3a, cohort did not moderate the relation between CVE and externalizing symptoms, as illustrated by the negligible discrepancy in the slopes of the regression lines in Figure 14. One interpretation of these results

is that young children become more emotionally distressed in response to exposure to community violence than do older youth, perhaps because of more limited coping skills and other resources (Cicchetti, 1989; Margolin, 2005; Swisher, & Latzman, 2008). Interestingly, however, cohort did not significantly moderate the associations between *lifetime* measures of CVE (both frequency and variety) and well-being outcomes. Given the strong correlation between age and lifetime CVE, the apparent moderating effects of age on the impact of past year CVE almost certainly reflects the confounding influence of youths' differential levels of lifetime CVE at different ages, even though there was some variability in CVE levels within each cohort. The fact that the moderating effect of cohort disappeared when accounting for lifetime CVE lends support to this supposition. Thus, the stronger linear associations between past year CVE and internalizing symptoms among younger children may provide additional support for the desensitization hypothesis overall, in that the youth with the lowest levels of cumulative CVE (young youth) are most strongly affected by increases in CVE, whereas the youth with longer histories of cumulative CVE (older youth) do not experience increases in internalizing symptoms as CVE within the past year increases. Given that the moderating effect of age does not hold for externalizing symptoms, the overall pattern suggests that age indeed serves as a proxy for lifetime CVE and points once again to desensitization with higher levels of lifetime CVE.

In contrast to the findings regarding Hypothesis 3a, results failed to support Hypothesis 3b, that age would moderate the quadratic association between CVE and well-being outcomes across all measures of CVE. Thus, even young children appear to become desensitized to CVE when exposed to extreme levels, suggesting that it is the extent of CVE rather than the amount of time that one has experienced it that contributes to the pattern of desensitization observed in this study.

Two important caveats with respect to the moderating role of age must be highlighted. First, although there were children in the youngest cohorts who did reportedly experience quite extreme levels of CVE, the *most* extreme levels of both CVE frequency and variety tended to occur among the oldest youth in the sample. Thus, despite the large size of the sample overall, moderating effects of cohort may have failed to emerge due to limited power among the smallest subgroups. Second, although some research has investigated CVE among children as young as age 3, it is unclear to what extent children as young as three years old in this study may have been aware of the CVE (particularly lifetime exposure) that their primary caregivers reported, as well as how accurate primary caregivers were as reporters for the youngest children. Although it is conceivable that CVE may affect children's well-being without their full awareness of the violence to which they are exposed, more work by developmental researchers is needed in this area to verify the validity of measuring CVE among young children and to improve our understanding of how it may impact their well-being. In light of these provisions, the present findings should be cautiously generalized to very young children.

Finally, Hypothesis 4b predicted that girls would experience less desensitization to CVE than boys. However, across all analyses, gender did not emerge as a significant moderator of the relations between CVE and well-being. This finding suggests that while girls may have a greater propensity toward internalizing symptoms than boys in general, in the context of CVE, the relation between exposure over time and internalizing symptoms does not differentiate boys and girls. Instead, the desensitization phenomenon appears to be relatively robust across genders. Though not related to any specific hypotheses, it was surprising that boys had higher levels of internalizing symptoms in general than did girls in this study. While the difference was

significant, however, it was quite small (approximately one T-score point on the CBCL Internalizing scale); thus, this difference within the PHDCN sample may be negligible.

Isolated vs. Chronic CVE

In addition to the primary findings regarding desensitization, a closely related question was explored: Is isolated (single occurrence) CVE uniquely related to well-being relative to more ongoing, chronic CVE? Contrary to Hypothesis 1d, one-time exposure to community violence was not more strongly related to internalizing symptoms than more chronic exposure, either over the past year or within one's lifetime. In fact, when conceptualized as either exposure to a single *type* of violence over the course of one's lifetime or exposure to a single instance of violence within the past year, participants with isolated CVE did not exhibit significantly higher levels of internalizing or externalizing symptoms relative to youth who had no exposure. Alternatively, youth who had been exposed to one type of violence over the past year (without regard to frequency) did have higher levels of internalizing symptoms, but the association was significantly weaker than for participants in the more chronic exposure group.

In line with previous research, the results of this study found that while a small minority of youth were exposed to either one form or one instance of community violence, this pattern represented the rare exception to the large majority of participants who either experienced no CVE or more recurring patterns (Gorman-Smith et al., 2004; Kataoka et al., 2003; Kennedy et al., 2010; Menard & Huizinga, 2001; Moses, 1999; Weist et al., 2001). Although a group of participants was identified that exhibited a pattern of isolated exposure as previous research has found (Selner-O'Hagan et al., 1998; Suglia et al., 2008), this pattern does not appear to reflect a distinct form of trauma that uniquely predicts well-being above and beyond the more chronic exposure that is known to predict such outcomes. Instead, this pattern indicates that isolated

exposure is perhaps *less* detrimental, in line with the cumulative effects model (Kennedy et al., 2010; Lynch, 2003; Turner et al., 2006; Zinzow et al., 2009). However, these results must be understood within the context of the primary findings regarding desensitization, which suggest that within the more "chronic" exposure group, the youth with the highest levels of CVE may not necessarily have worse internalizing symptoms than youth with even one exposure. Future research is needed to further differentiate the "chronic" exposure group and compare the most extreme cases of chronic exposure to youth with one-time, isolated CVE to determine if these patterns of CVE differentially predict well-being. Moreover, such information is necessary to determine whether the method of coding exposure to violence into ordinal groups of zero exposures, one exposure, and two or more exposures that some researchers have employed accurately captures the differential ways in which CVE is related to well-being (Buka et al., 2001; McCart et al., 2007). Finally, it is possible that isolated exposure may have been more highly associated with PTSD symptoms, specifically, given that researchers have proposed it may represent a distinct type of trauma in the absence of more widespread CVE (Fletcher, 2003). The examination of a more general construct of internalizing symptoms in this study may not have captured the uniquely traumatic impact that isolated exposure may have on youth.

Severity

As an initial step toward investigating how different aspects of CVE might interact to moderate its impact on youths' well-being (as suggested by curvilinear associations between CVE variety and well-being), the differential impact of CVE severity for witnessed community violence was examined in relation to internalizing and externalizing symptoms. As suggested by the results addressing Hypothesis 1c regarding desensitization, patterns of desensitization over the range of CVE frequency may differ depending on the event under consideration. Although

this question is complex and the exact impact of severity itself is difficult to isolate using overall estimates of CVE, since youth tend to be exposed to varying levels of both severe and less severe CVE, the present study undertook a preliminary exploration of this question. Certainly the way in which CVE items were classified as "severe" and "non-severe" in this study was somewhat subjective, though based in part on approaches taken by other researchers who have examined the question of severity (Selner-O'Hagan et al., 1998; Suglia et al., 2008; Vermeiren et al., 2003). Thus, this aspect of the findings is best interpreted as a preliminary step toward better understanding the potential role of severity in CVE's impact on youth well-being to inform future approaches to examining this question more closely.

Contrary to Hypothesis 2a, exposure to more severe community violence was not associated with more internalizing or externalizing symptoms than non-severe CVE. In fact, paradoxically, the exact opposite pattern was found: non-severe CVE was actually associated with *more* internalizing and externalizing symptoms than more severe CVE, which was not significantly associated with symptoms at all. Results were similar across several different CVE constructs, including past year CVE frequency, past year CVE variety, and lifetime CVE variety. While initially surprising, these results actually make good sense in light of the robust theme of desensitization that emerged from the findings. For instance, it is likely the case that those youth who were exposed to the most severe events were also those who are exposed to the highest *frequency* of community violence in general (Earls & Buka, 1997). Therefore, these results may reflect the desensitization of the more highly exposed youth to community violence. For youth exposed only to non-severe events, on the other hand, in the context of less frequent exposure overall, increases in CVE (even relatively "non-severe" events) may be more impactful, as these youth have not become emotionally desensitized to CVE. However, follow-up analyses revealed

that the non-severe CVE scales for all three CVE constructs (past year frequency, past year variety, and lifetime variety) were actually more highly correlated with the associated total CVE scales than were the severe CVE scales, shedding doubt on this hypothesis. Nonetheless, a closer investigation of the impact of CVE severity on youths' well-being controlling for the potentially confounding effects of frequency is warranted to further explore this question.

Of note, even in this particularly large sample, the number of youth with the highest levels of overall CVE severity was much smaller than the number of youth comprising the non-severe scale and lower levels of the severe scale. Thus, the regression analyses may have lacked sufficient power to make meaningful inferences about the associations between CVE and well-being at the very highest levels of severity. However, the fact that few youth comprised the very highest severity group in this study, which draws from a large, representative sample of youth living in urban Chicago neighborhoods, may suggest that any lack of association between severe CVE and well-being does reflect patterns that exist in the general population, which likely contains similar proportions of youth within each severity group.

In contrast to these surprising findings, however, which may lend further support to the desensitization hypothesis, results failed to support Hypothesis 2b, that non-severe CVE would be quadratically associated with internalizing symptoms. In fact, neither severe nor non-severe CVE were quadratically related to well-being, unlike the findings for overall levels of CVE more generally. This suggests that perhaps youth do not become desensitized to either severe or non-severe CVE when examined separately. Several explanations might account for this finding. First, the severe and non-severe scales included only four items each; therefore, the range in total scores may have been too small to capture desensitization effects, particularly for the variety scales, which range from zero to only four. Second, perhaps it is something about the items that

were excluded from the severe and non-severe scales and included in the overall CVE scales that contributed to patterns of desensitization observed for the latter, such as hearing about CVE or being directly victimized. Therefore, further research on the exact aspects of CVE to which youth become desensitized would help clarify these apparent discrepancies in the results. Finally as discussed above, perhaps the differential impact of severe versus non-severe events found for the linear terms itself accounts for the desensitization effect; therefore, quadratic associations with internalizing symptoms would not emerge within either the severe or non-severe CVE variables. Instead, the nonsignificant association between severe CVE and internalizing symptoms may reflect the pattern for those youth who comprise the highest levels of the quadratic associations between *overall* CVE and internalizing, where the association levels off.

Implications

Theoretical implications. A primary motivation for the current study was the set of definitional and measurement issues that have limited our understanding of the relations between CVE and youths' well-being. Thus, the present findings, as well as several lessons gleaned from this study, have major, direct implications for the refinement of CVE theoretical foundations and continued advancement of the field. First, potentially one of the most significant CVE measurement issues that theorists and researchers have begun to call into question is the often implicit assumption that CVE impacts youths' well-being on a linear, incremental scale (e.g., Trickett et al., 2003; Guterman et al., 2000). This issue is closely related to the various methods of coding and scaling CVE variables that researchers use to quantify the construct of CVE that they purport to measure, likewise without identifying specific rationales or theoretical bases for their choices (Brandt et al., 2005; Kindlon et al., 1996; Trickett et al.). Researchers may incorrectly interpret relations between CVE frequency coded on an ordinal scale and outcomes

as linear, even though the choice of scaling already instilled an assumption of an underlying nonlinear form (Brandt et al). In reality, although the cumulative effects model reasonably postulates that increases in CVE (however it is measured) will be associated with *more* psychological and behavioral symptoms, there is no theoretical reason to suspect that this positive association would follow a strictly linear pattern. This seems especially pertinent when attempting to estimate the impact of CVE on youths' well-being by combining measures of youths' exposure to a variety of different types of violence, which may each make an unequal contribution to one's overall "level" of CVE and therefore to associated outcomes (Guterman et al.; Kindlon et al.; Selner-O'Hagan et al., 1998; Trickett et al.).

One of the most evident and important implications of the present findings is that CVE does, in fact, relate to youths' well-being in a nonlinear fashion in some cases, and it is therefore critical that researchers more readily estimate nonlinear effects of CVE in models predicting youths' well-being. Even when using an ordinal scale of past year frequency in the current study that reflected an assumption that the underlying structure of CVE was nonlinear – that is, that an increase in frequency of CVE from never to once is more impactful than the increase in frequency from nine to ten exposures – quadratic associations between CVE and internalizing symptoms emerged, providing even more conservative evidence for nonlinearity. Nonetheless, an important lesson was learned in the current study about the restrictions that arbitrary coding of CVE scales place on hypothesis testing and dictate the conclusions that can be drawn from the original data. Thus, in addition to explicitly including curvilinear effects of CVE in models estimating its relations with well-being, the CVE literature would benefit from efforts to extend findings to develop the most appropriate scaling and coding schemes that either accurately reflect the underlying curvilinear structure in relation to certain outcomes, or permit the

identification of this structure. As emphasized by the current results, a truly continuous scale of youths' CVE frequency may be the most optimal characterization of the CVE construct. This approach would permit the estimation of curvilinear effects by specifying them in statistical models and would further prevent the loss of information from the original data that may occur by recoding scale items based on assumptions about their underlying structure. Certain coding schemes that have been employed in prior research, such as CVE item or composite scales with values of 0 (zero exposures), 1 (one exposure), and 2 (two or more exposures), are likely to mask any effects of desensitization manifested by curvilinear associations, and may even result in significant misconceptions about the relation between CVE and well-being (Buka et al., 2001). Thus, more careful, theoretically sound measurement and coding based on our growing knowledge of nonlinear associations between CVE and well-being is encouraged in future studies. Additionally, the current findings point to the importance of measuring multiple well-being outcomes in studies of the impact of CVE, as its patterns of influence may be best understood across several outcomes (e.g., negative curvilinear associations with internalizing symptoms alongside positive linear associations with externalizing symptoms) rather than in isolation with any given outcome. Indeed, had only a single well-being outcome been examined in the current study, the complete picture of desensitization may not have emerged.

Perhaps more important, the present findings suggest that the way in which CVE is measured and coded is not simply a minor detail in the process of investigating the relations between CVE and youths' well-being. In actuality, the measurement of CVE reflects important assumptions about what the construct actually means, and therefore significantly impacts the conclusions that may be drawn from the results. For instance, in this study, had a quadratic term been excluded from the models predicting well-being, one would mistakenly draw the

conclusion that CVE was not related to youths' internalizing symptoms. Meanwhile, the pattern of desensitization that emerged for several of the CVE constructs would have been overlooked. Therefore, the way in which CVE is conceptualized and measured is not merely a means to an end, but is rather an integral component in the process of investigating how the construct operates in relation to youths' well-being. A shift must be made in the CVE field from defining the construct of community violence exposure by default, based on how researchers choose to measure it, to crafting and refining our measures of CVE based on how the construct actually operates in the real world. And the only way to achieve this growth is by explicitly testing theories about how the construct of CVE might operate, in order to inform refinements in its measurement. In doing so, the current study has produced findings that suggest the existence of a quadratic pattern of desensitization, which must be accurately captured in future measures and models estimating the effects of CVE.

Some of the more surprising findings further emphasize the potentially serious consequences of implicit and perhaps even arbitrary choices about how to measure CVE without formally testing their validity. For example, contrary to the proposed hypotheses, not only was exposure to more severe instances of community violence not significantly associated with well-being, but the opposite pattern actually emerged, indicating stronger associations between non-severe CVE and well-being. This finding, though perplexing, calls into question the subjective weighting of more "severe" CVE items in Rasch models and other methods of attempting to account for the assumed moderating effects of severity in estimating the overall impact of CVE (Kindlon et al., 1996; Masters & Wright, 1984; Suglia et al., 2008), when in fact the events that are considered to be more "severe" by many may not be more impactful for those youth who experience them. Indeed, the present findings echo those from Aisenberg and colleagues (2008),

indicating that most adolescents interviewed who had witnessed a violent death did *not* consider it the most bothersome event, contrary to what researchers might expect based on the apparent severity of the event. While further research is certainly needed to better understand how CVE severity interacts with other aspects of CVE, such as frequency and variety, as well as the processes that might underlie the paradoxical patterns uncovered in this study, these findings provide a critical reality check for CVE measurement. Indeed, researchers ought to make much more explicit, theory-driven assumptions in their measurement of CVE and attempts to capture the differential impact of the various aspects of CVE.

The present findings also shed light on the potential problems with creating single, overall composite CVE scales comprised of many different types of CVE (Selner-O'Hagan et al., 1998; Suglia et al., 2008; Trickett et al., 2003). Instead, this study explicitly tested this assumption by including both linear and quadratic effects of overall scales of violence exposure. In doing so, it was found that the relations between frequency of different *types* of CVE individually are each somewhat unique and lead to nonlinear associations of CVE variety with well-being. Therefore, although combining a range of items into composite scales may increase the reliability of CVE when it is conceptualized as an overall, homogenous construct (Brennan et al., 2007), a consideration of individual items is important not only to best understand how these heterogeneous items should most appropriately be combined, but also to understand how they may each be uniquely related to well-being in their own right. In addition, findings from this study indicate that age emerges as a moderator of the associations between certain types of CVE and well-being. Therefore, as theorists have proposed, even a single given event may not have the same meaning for or impact on a young child as an adolescent, so it may effectively represent a different construct for youth of different ages. Although incorporation of one's developmental

level is perhaps not possible in building a more nuanced measure of CVE, these findings underscore the importance of including moderating effects of age, or perhaps other key constructs it is thought to approximate, such as lifetime exposure, in models of CVE. As research continues to build a more refined understanding of the relations between CVE and youths' well-being, additional moderating factors should be explored and incorporated into measures and models of CVE as it relates to well-being, such as youths' physical proximity to each instance of CVE, knowledge of the victim and perpetrator, one's own involvement in violent lifestyles such as gangs that might alter perceived meanings of the violence that youth experience, and more.

Finally, this study highlights the advantages of both including multiple CVE variables that tap slightly different constructs as well interpreting results uniquely and explicitly based on each of these slightly different variables. Because CVE is variously measured and conceptualized in studies as frequency or variety, and either over one's lifetime or within a shorter period of time (e.g., one year), this study included each of these types of CVE, where possible, in response to the need for a more integrated knowledge base regarding how these slightly different definitions of CVE are differentially related to youths' well-being (Brandt et al., 2005; Feerick & Prinz, 2003; Guterman et al., 2000; Margolin, 2005). Most important, though, this study sought to provide utmost clarity about what conclusions could be drawn from the results based on the specific CVE variable that was used in each analysis. For instance, the process of desensitization was explored in terms of CVE frequency over the past year and one's lifetime, as well as the variety or number of different instances of CVE youth have experienced. This attention to the details differentiating the various CVE scales afforded important, nuanced discoveries that otherwise would have been missed had a single variable been used to represent CVE, such as the quadratic associations between past year CVE frequency and internalizing

symptoms over and above the effects of lifetime exposure, as well as the discrepancy between lifetime versus past year CVE variety. These results indicated that desensitization appears to occur for CVE frequency over a relatively short timeframe, but over a longer one for CVE variety, and enriched the overall picture of desensitization that emerged from this study. As such, the inclusion and careful interpretation of different conceptualizations of CVE within the same study in future research will prove especially valuable.

Practical implications. The findings from this study also have several important implications for urban youth who are exposed to community violence and the individuals and organizations that seek to support them in these high-risk environments. For instance, the potential role of intervention in the context of these findings is of particular import. Rather than suggesting that youth with the highest levels of CVE do not need or would not benefit from individual or systems-level intervention, patterns of desensitization underscore the critical necessity of intervention for youth exposed to community violence, especially *before* a process of desensitization sets in. In addition, because aggression and externalizing symptoms tend to be particularly stable over time, it is important to halt the steady increase in externalizing symptoms associated with this pattern of desensitization (Kazdin, 1995). Moreover, the premise underlying the term "pathologic adaptation" that has been assigned to this process of desensitization is that, while perhaps adaptive in the short-term, emotional numbing and the associated behavioral symptoms may lead to engagement in a more violent lifestyle and induce greater maladjustment among youth in the long-term (Ng-Mak et al., 2004). Indeed, it is this very emotional numbing that is considered a key characteristic of PTSD and related psychiatric disorders, and therefore may represent an even greater need for intervention at the highest levels of CVE (American Psychiatric Association, 2000). Moreover, this pattern of desensitization appears to fit even more

closely with a psychiatric diagnosis that was under consideration for inclusion in the *DSM-5*, Developmental Trauma Disorder. This diagnosis would be characterized by more heterogeneous symptom profiles in response to traumatic experiences, including both emotional numbing and dissociation, along with behavioral opposition, reactive aggression, substance use, and other externalizing symptoms (Schmid, Petermann, & Fegert, 2013). Therefore, while superficially indicative of decreases in internalizing symptoms, the "pathologic adaptation" to increasingly high levels of CVE may signal a particularly pernicious symptom profile that would likely benefit most from proactive intervention.

The moderating effects of age further emphasize the need for early intervention to attenuate the impact of CVE on well-being. Because the linear associations between past year CVE frequency and well-being are strongest for youngest children, the allocation of intervention resources to young children who are at risk for high levels of CVE seems warranted. Although older youth and adolescents are exposed to more violence, on average, than younger children, there were certainly young children within the PHDCN sample who had been exposed to quite high levels of community violence. Although primary caregivers may commonly believe that young children are not aware of the violence to which they are exposed in their neighborhoods, the results of this study perhaps suggest that CVE is particularly influential on young children's well-being, assuming that their CVE was indeed measured accurately. Furthermore, by initiating interventions at early ages for youth who are at risk for further exposure, such efforts may not only ameliorate current symptoms, but also prevent desensitization as children continue to develop. The lack of differential effects of CVE on well-being for girls and boys suggests that youth of both genders who have been exposed to community violence could potentially benefit from interventions targeted toward both internalizing and externalizing symptoms. Thus,

clinicians, educators, and other adults caring for urban youth are well-advised to avoid constraining their views of children's responses to CVE based on gender stereotypes.

Of important note, although the sample size of this study is a particular strength, in that it affords the statistical power to identify quite nuanced effects, it enables even very small effects that may not be clinically significant to reach statistical significance. While effect sizes must always be considered to determine clinical significance in any study regardless of the sample size, the examination of effect sizes alongside statistical significance is even more critical in studies with a high degree of statistical power. Therefore, it is perhaps especially important to consider effect sizes in interpreting the current results rather than focusing exclusively on statistical significance. In that vein, the regression coefficients for the quadratic CVE terms in this study tended to be relatively small, even when significant. Therefore, it may be the case that while a general pattern of desensitization occurs as youth are exposed to higher levels of community violence, the strength of the pattern in the "real world" is not so strong as to differentiate youth with slightly different levels of CVE in terms of their overall symptom profile.

For instance, although the plot in Figure 13 shows a clear and somewhat dramatic quadratic relation between past year CVE frequency and youths' internalizing symptoms, the difference between the average level of internalizing symptoms at the peak of the curve and the average predicted internalizing score at the very highest levels of CVE is no more than five T-score points, which is less than one standard deviation. Moreover, the majority of youth comprise the lower end of the CVE scales, such that only a small minority (approximately 10% to 20%) of youth with the highest levels of exposure actually becomes desensitized to CVE over time. Although the phenomenon applies to only a small group, however, these findings are

arguably nonetheless important. For instance, a comparison of Figures 12 and 13 reveals that predicted values of internalizing T-scores may differ by as much as an entire standard deviation when using a quadratic CVE term instead of solely a linear term. In addition, increases in both internalizing and externalizing symptoms *do* occur for most youth who are exposed to urban violence, and these symptoms may never level off in the absence of intervention. Furthermore, the group of youth with the very highest levels of CVE who tend to become desensitized may be in need of distinct, more targeted interventions and supports that address their unique histories of CVE and symptom profiles. Fortunately, this study's ample statistical power uncovered these nuanced, intriguing findings that may go overlooked in smaller studies.

Limitations

Despite the strengths of the PHDCN data, the comprehensive CVE measure, and the unique approach undertaken in this study, several potential methodological limitations nonetheless exist. Particularly disappointing are several drawbacks to the CVE measure that was administered as part of the PHDCN study. First, the CVE measure changed quite significantly between Wave 1 and Wave 2. For instance, the Wave 1 measure was comprised of only 4 items, whereas the Waves 2 and 3 measure included more than 20 items (though not including all of the 4 original items). This discrepancy precluded full analyses of all three waves of data and a more explicit examination of within-person change over time. Such data may have shed additional light on the average level patterns of desensitization that emerged in the current study. Furthermore, the fact that lifetime CVE frequency was assessed only at Wave 1 prevented the examination of this construct at later waves. Further, past year CVE frequency as measured in Waves 2 and 3 was coded on a predetermined ordinal scale. Therefore, a true test of linearity

could not be conducted, limiting the conclusions that may be drawn from the primary findings on desensitization.

Another disadvantage of the CVE measure across waves is that children's and primary caregivers' estimates of CVE were obtained via retrospective report. If accurate, this technique is helpful in establishing the temporal ordering of CVE prior to levels of internalizing and externalizing symptoms assessed at the time of the interview, lending some credence to causal inference based upon results. However, research suggests that retrospective reporting on one's experiences and behaviors are subject to substantial recall bias that likely reduced the reliability of the CVE measure items; this may be especially true for measures of lifetime CVE, which require one to recall events from long ago, and particularly for younger children, who have difficulty estimating and remembering their past experiences (Belli, 1998; Schwarz, 2007). Although rarely feasible, real-time measures of youths' CVE, such as the methods employed in daily diary studies, would be particularly fruitful. These methods have not been utilized in studies of CVE to my knowledge, despite their potentially invaluable contribution to increasing accuracy in the measurement of youth CVE. Alternatively, the use of a life history calendar may have served as a more feasible technique to facilitate participants' responses to PHDCN interview questions and minimize recall biases (Belli, 1998; Caspi et al., 1996). The use of such methods in future studies of CVE is important to enhance the reliability of CVE measurement and therefore improve our understanding of its relations with youths' well-being.

Another potential measurement limitation in the current study was the fact that for demographic covariates, CVE, and well-being, measures were not consistently available at all waves, for all cohorts, and from both participants and primary caregivers as informants. Indeed, this was one primary reason analyses were limited to internalizing and externalizing symptoms,

rather than examining measures of clinical symptoms that were available for some youth. Because only primary caregivers reported on CVE within some cohorts and only participants reported on their own CVE at other cohorts, the current study employed a mix of self- and primary caregiver-report, thereby potentially introducing additional measurement error into the assessment of youths' CVE. However, where possible, reports from older youth and adolescents were used to measure CVE, whereas primary caregiver reports were used for younger children, in keeping with evidence that older youth are more accurate reporters of their own CVE than are their primary caregivers (Raviv et al., 2001; Reynolds et al., 2011; Thomson et al., 2002) and recommendations by researchers who have analyzed the PHDCN data previously (Kuo et al., 2000). Although it was unfortunate that both primary caregiver- and self-report measures of CVE and well-being variables were not available for many cohorts, research suggests that reports from multiple informants represent distinct facets of the construct under investigation or a measure of the construct within a particular context, depending on the informant; therefore, the use of single-informant measures in this study is not necessarily viewed as providing "less reliable" or incorrect information as compared to data from multiple informants (De Los Reyes, 2011; De Los Reyes & Kazdin, 2005).

Missingness invariably poses challenges for the analysis of longitudinal data, and the current study is no exception. Fortunately, rates of attrition were reasonably low over the two follow-up time points in the PHDCN study. Moreover, attrition analyses indicated that participants lost to attrition did not tend to differ from follow-up participants on the basis of any primary variables of interest. However, there was also missing data for some variables among follow-up participants for unknown reasons. Therefore, cases were conservatively deleted listwise in all analyses, reducing the sample size and potentially biasing the remaining sample.

Although the scope of the present study limited opportunities to employ more sophisticated methods for addressing issues of missing data, techniques such as multiple imputation are highly recommended in the conduct of longitudinal developmental research and should be used in future studies using the PHDCN to maximize the available data (Enders, 2013).

Finally, a particularly complex limitation to the interpretation of the present findings centers on the control of potential confounders in the relation between CVE and youth outcomes. Specifically, one might infer from the associations between CVE and externalizing symptoms a causal relation, such that exposure to higher levels of CVE causes children to develop aggression and other externalizing behaviors. Indeed, this is a premise of the desensitization theory. However, it may be the case that youth who display aggression and related behaviors are those who tend to later become involved in community violence, for instance, through gang involvement. Youth who are involved in gangs are not only more likely than their peers to commit violence, but are also more likely to witness and become victimized by violence as well (e.g., Taylor et al., 2007). By controlling for autoregressive effects of externalizing behaviors in regression models predicting externalizing symptoms, however, it is expected that causal effects of prior levels of aggression and delinquency were adequately statistically controlled, thereby permitting a more straightforward estimation of the effect of past CVE on current externalizing symptoms. Nonetheless, unique effects of gang involvement that supersedes patterns captured in the CBCL externalizing measure may nonetheless confound the current results, and should therefore be addressed in future studies.

In a related vein, although all analyses controlled for prior levels of the well-being outcome (where available), theoretical work in the fields of statistics and biostatistics has shown that doing so may reduce the estimated effect of the independent variable on the dependent

variable and therefore yield overly conservative results (Almirall et al., 2010; Robins & Hernan, 2009). More specifically, because prior levels of externalizing behaviors (and possibly internalizing symptoms, as well) do likely impact one's later involvement in community violence, which in turn may predict later externalizing symptoms, controlling for prior levels of externalizing symptoms may "control away" some of the effects of CVE on the outcome variable. This dilemma would likewise emerge if researchers were to control for gang involvement. Several researchers have proposed the use of marginal structural models and structural nested models to more accurately capture the effects of a time-varying predictor in longitudinal data on an outcome while simultaneously adjusting for the potential confounding effects of time-varying covariates (Almirall, et al., 2010; Robins & Hernan, 2009). Thus, these methods are well suited to address several of the questions proposed in this study and should be pursued in future work.

Future Directions

The findings of the present study point toward many exciting future directions for research on relations between CVE and youths' well-being, and particularly for efforts to improve CVE definition and measurement. In addition to the methodological advances recommended above to overcome several of the limitations discussed, such as the application of structural nested models and multiple imputation, several other innovative statistical techniques and methodological approaches offer important next steps. For instance, one of the most robust findings in this study was the emergence of quadratic associations between CVE and internalizing symptoms, suggesting a pattern of desensitization to CVE. However, preliminary findings from scatterplots revealed that the nonlinear associations likely assumed more complex structures than the smooth quadratic curves that were fit in this study. Therefore, the use of

spline functions – that is, fitting a smooth curve to observations with high variability using mathematical algorithms – could more precisely expose the underlying structure of the relations between CVE and well-being, thereby providing a more informative test of the desensitization hypothesis (Katz, 2011). For instance, it is unlikely that the relations between CVE and well-being perfectly form a smooth quadratic shape, despite the fact that a quadratic form more accurately fit the data in this study than a linear form. Splines would highlight any cut points that might exist in relations between CVE and well-being, where linear associations begin to level off, which might emerge as a quadratic pattern when using only exponential terms. Preliminary investigations of scatterplots in this study suggest that such cut points may exist, emphasizing the need to employ the use of splines in future studies of the desensitization model.

Another statistical approach that would be helpful to more comprehensively examine patterns of associations between CVE and well-being is group-based trajectory modeling (Nagin, 2005; Nagin & Tremblay, 2005). This method is a person-based approach that would identify unique trajectories of youths' CVE over time and how these trajectories may differentially relate to well-being outcomes. For instance, researchers using this technique could distinguish different groups of youth on the basis of their violence exposure. Then, these distinct trajectories can be predicted from variables of interest, such as internalizing and externalizing symptoms. Not only would group-based trajectory modeling provide further insight into whether some youth show a pattern of high and increasing levels of CVE over time associated with desensitization in internalizing symptoms, but it would also allow researchers to further test whether some youth experience one-time, isolated exposure that might be uniquely associated with well-being.

One particularly enigmatic set of results was that for all types of CVE at Waves 2 and 3 (past year frequency, past year variety, and lifetime variety), *less* severe CVE was associated

with *more* internalizing and externalizing symptoms than more severe instances of CVE. While this finding may fit with the results on desensitization, they leave much to be explored, including whether or not the severity scale is a proxy for more generally high levels of CVE, and therefore taps the desensitization to CVE that emerged in other analyses within this study. In order to disentangle this and other potential confounders of the moderating role of severity in the impact of CVE on youths' well-being, more sophisticated statistical analyses must be applied, as obtaining a sample of youth in which the effects of severity can be clearly disengaged from other aspects of CVE using observational methods is almost certainly impossible. Instead, one promising approach is propensity score matching, which would enable youth exposed to one or more severe events to be matched with counterparts within the sample that have similar values for all other potential confounders. Thus, this method allows researchers to mimic random assignment in observational studies where random assignment is not feasible or possible, thereby removing the effects of confounding influences and eliciting any genuine effects of CVE severity (Haviland, Nagin, Rosenbaum, & Tremblay, 2008; Rosenbaum & Rubin, 1983).

It would be of particular interest to investigate whether the current findings on desensitization and related phenomena would extend beyond general well-being measures of internalizing and externalizing symptoms. More specifically, the CVE literature suggests that PTSD is a particularly salient outcome of CVE, but that youth may be less likely to show PTSD symptoms at the very highest levels of exposure (Ng-Mak et al., 2004). Additionally, although isolated exposure was examined in relation to general well-being outcomes in this study, theories have proposed that it might actually be uniquely related to PTSD, serving as a unique form of isolated trauma (Fletcher, 2003). Therefore, to better address these and other questions, it is critical that future research include additional measures of youths' well-being. Researchers

would do well to incorporate measures of resilience and positive outcomes into studies of CVE as well, providing a more balanced understanding of children's development in the context of high-risk urban neighborhoods.

Although the data employed in the current study were longitudinal, in that they were collected over three separate time points, long-term effects of CVE on later well-being could not be examined except through the measures of CVE obtained via retrospective recall. Had the study consisted of more time points at more frequent intervals, the questions addressed in the present study could have been extended to an examination of the long-term effects of CVE on well-being from year to year. Of course, the time and cost involved likely prohibited such an endeavor for the purposes of the PHDCN study. However, more frequent data collection points should be a goal for future developmental, longitudinal studies.

In order to contribute to a richer understanding of youth CVE as it relates to their well-being, qualitative research will continue to be an essential component to building and refining appropriate theories. Extremely valuable insights have emerged from qualitative investigations of youths' experiences with CVE that have then guided the further development of theories about how CVE affects youth. For instance, Aisenberg and colleagues (2008) prudently sought the observations and insights of youth themselves in identifying which types of CVE they experienced as most subjectively severe, in turn informing future considerations of the most appropriate approach to conceptualizing "severity" in measuring CVE. Qualitative interview, ethnographic, or focus group data could also provide key information about how youth perceive violence and its relation to their own well-being that survey data might not adequately capture. One important future goal stemming from the present findings, for instance, is to probe the apparent desensitization phenomenon that emerged from the data and better understand the

processes underlying this pattern. Obtaining observations and qualitative information from urban youth themselves may prove indispensable in uncovering what might be driving this desensitization effect. If youth are aware of these patterns, they are in the ideal position to explain from their perspectives and in their own words whether desensitization reflects true emotional numbing, a more volitional suppression of emotional symptoms, the engagement of adaptive coping strategies, or any number of possibilities. Beyond youths' subjective accounts of desensitization to CVE, their qualitative perspectives on how they are differentially affected by the type, proximity, and location of CVE is an important step in building theories about how to most appropriately measure and incorporate these aspects into studies of the effects of CVE.

In addition to refinements and advancements in the statistical and design methods recommended for future studies, it is the hope that these findings will provide a foundation for the future examination of additional factors related to CVE that might moderate its impact on youths' well-being, such as youths' proximity to witnessed violence, familiarity with the victim and perpetrator, the location in which CVE occurred, and others, along with individual-level variables such as age, which was shown here to interact with CVE in the relation with well-being. Future work should also investigate the impact of external factors aside from aspects of CVE itself that might moderate its impact, such as youths' levels of family support and engagement in extracurricular activities. Because no single study can adequately address all of these factors, ongoing research in this area should be considered developmental, with each study building upon previous work to continually refine our understanding of CVE. In this way, researchers can most effectively collaborate in their efforts to achieve an increasingly comprehensive, accurate, and detailed picture of the interplay between CVE and youths' well-being.

TABLES

Table 1

Research Questions and Hypotheses

	Topic	Questions	Hypotheses
1	Chronicity	Do youth become emotionally desensitized to CVE?	*a.) Lifetime and past year CVE (frequency and variety) will be negatively quadratically related to internalizing symptoms, but positively linearly related to externalizing symptoms.* *b.) Lifetime CVE (frequency and variety) will have stronger quadratic associations with internalizing symptoms and stronger linear associations with externalizing symptoms than past year CVE.* *c.) The association between past year CVE item frequency (coded ordinally) and internalizing symptoms will weaken at higher levels of CVE.*
		Do chronic and isolated CVE differentially influence youths' well-being?	*d.) Isolated CVE will be more strongly associated with internalizing symptoms than will chronic CVE.*
2	Severity	Does violence severity impact youths' well-being?	*a.) More severe CVE will be more strongly associated with internalizing and externalizing symptoms than will less severe CVE.* *b.) More severe CVE will have a linear association with internalizing symptoms, whereas less severe CVE will have a quadratic association, reflecting greater desensitization for less severe CVE.*
3	Age	How does a child's age or developmental level moderate the impact of CVE on psychological well-being?	*a.) CVE will have stronger linear associations with internalizing symptoms than with externalizing symptoms among younger youth, but stronger linear associations with externalizing symptoms among older youth.* *b.) The quadratic association between CVE and internalizing symptoms will be stronger for older youth and adolescents than for younger children, reflecting greater desensitization among older youth.*
4	Gender	How does a child's gender moderate the impact of CVE on psychological well-being?	*Girls will experience less desensitization to CVE for internalizing symptoms than boys.*

Table 2

PHDCN Response Rates by Wave and Cohort

	Participant Response Rate		Primary Caregiver Response Rate	
	Frequency	N	Frequency	N
Wave 1 Total	**75.0%**	**4,149**	**74.6%**	**4,129**
Cohort 3	76.6%	962	76.0%	954
Cohort 6	75.0%	940	74.8%	937
Cohort 9	75.9%	793	75.5%	789
Cohort 12	74.3%	785	74.0%	782
Cohort 15	71.6%	669	71.4%	667
Wave 2 Total	**87.8%**[a]	**3,643**	**88.0%**[a]	**3,635**
Cohort 3	88.7%	853	89.2%	851
Cohort 6	88.9%	836	89.0%	834
Cohort 9	86.8%	688	87.1%	687
Cohort 12	88.0%	691	88.1%	689
Cohort 15	85.9%	575	86.1%	574
Wave 3 Total	**80.3%**[a]	**3,332**	**80.0%**[a]	**3,303**
Cohort 3	81.3%	782	82.0%	782
Cohort 6	80.9%	760	81.1%	760
Cohort 9	78.8%	625	79.0%	623
Cohort 12	79.6%	625	79.8%	624
Cohort 15	80.7%	540	77.1%	514

[a]Percentage of original Wave 1 sample that participated at the given wave.

Table 3

Sample Demographic Characteristics for Continuous Variables by Wave and Cohort

Wave	Cohort	Characteristics *M* (*SD*)				
		Participant Age	PC Age[a]	Family Size	Per Capita Income[b]	Household Income[c]
1	3	3.16 (.32)	30.63 (7.62)	5.16 (1.92)	5,712 (5,101)	3.88 (1.89)
	6	6.16 (.33)	33.50 (7.60)	5.35 (1.95)	5,832 (4,937)	4.00 (1.88)
	9	9.16 (.33)	35.91 (7.17)	5.52 (2.07)	5,887 (4,932)	4.07 (1.88)
	12	12.15 (.32)	39.21 (7.60)	5.36 (2.00)	6,182 (5,081)	4.14 (1.83)
	15	15.16 (.32)	41.65 (7.54)	5.21 (1.97)	6,612 (5,328)	4.15 (1.89)
	Total	8.62 (4.21)	35.68 (8.46)	5.32 (1.98)	6,009 (5,074)	4.04 (1.88)
2	3	5.28 (.55)				4.25 (1.99)
	6	8.29 (.57)				4.39 (1.89)
	9	11.22 (.59)				4.37 (1.89)
	12	14.19 (.60)				4.36 (1.89)
	15	17.23 (.64)				4.40 (1.90)
	Total	10.67 (4.20)				4.35 (1.91)
3	3	7.75 (.49)				4.66 (1.91)
	6	10.78 (.52)				4.71 (1.89)
	9	13.75 (.56)				4.80 (1.84)
	12	16.71 (.53)				4.59 (1.88)
	15	19.80 (.57)				---
	Total	13.20 (4.25)				4.69 (1.88)
Sample Total		10.66 (1.61)	35.68 (8.46)	5.32 (1.98)	6,009 (5,074)	4.32 (1.91)

[a]Primary caregiver's age.

[b]Per capita income in past tax year, dollar amount.

[c]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000

Table 4

Sample Demographic Characteristics for Categorical Variables at Wave 1 by Cohort

	Cohorts					
	3	6	9	12	15	Total
Characteristics	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Sex						
Female	481 (50%)	485 (51.6%)	380 (47.9%)	394 (50.2%)	344 (51.4%)	2,084 (50.2%)
Male	481 (50%)	455 (48.4%)	413 (52.1%)	391 (49.8%)	325 (48.6%)	2,065 (19.8%)
Race/Ethnicity[a]						
Hispanic	481 (50%)	473 (50.3%)	394 (49.7%)	369 (47%)	311 (46.5%)	2,028 (48.9%)
Black	338 (35.1%)	325 (34.6%)	283 (35.7%)	304 (38.7%)	253 (37.8%)	1,503 (36.2%)
White	143 (14.9%)	142 (15.1%)	116 (14.6%)	112 (14.3%)	105 (15.7%)	618 (14.9%)
Language[b]						
English	718 (74.6%)	689 (73.3%)	639 (80.6%)	657 (83.7%)	565 (84.5%)	3,268 (78.8%)
Spanish	234 (24.3%)	243 (25.9%)	150 (18.9%)	124 (15.8%)	102 (15.2%)	853 (20.6%)
Polish	10 (1%)	8 (.9%)	4 (.5%)	4 (.5%)	2 (.3%)	28 (.7%)
PC Relationship[c]						
Biological mother	868 (90.2%)	812 (86.4%)	674 (85%)	634 (80.8%)	554 (82.8%)	3,542 (85.4%)
Biological father	51 (5.3%)	61 (6.5%)	58 (7.3%)	77 (9.8%)	57 (8.5%)	304 (7.3%)
Grandparent	24 (2.5%)	30 (3.2%)	32 (4%)	36 (4.6%)	24 (3.6%)	146 (3.5%)
Step-parent	3 (.3%)	5 (.5%)	6 (.7%)	6 (.7%)	6 (.9%)	26 (.6%)
Foster mother	1 (.1%)	2 (.2%)	2 (.3%)	6 (.7%)	2 (.3%)	13 (.3%)
Adoptive mother	1 (.1%)	9 (1%)	6 (.8%)	7 (.9%)	4 (.6%)	27 (.7%)
Other relative	6 (.6%)	8 (.8%)	4 (.5%)	9 (1%)	8 (1.1%)	35 (.9%)
Other	5 (.5%)	8 (.8%)	5 (.6%)	8 (1%)	6 (.9%)	32 (.8%)
PC Marital Status						
Married	516 (53.6%)	515 (54.8%)	473 (59.6%)	438 (55.8%)	349 (52.2%)	2,291 (55.2%)
Single	281 (29.2%)	236 (25.1%)	160 (20.2%)	139 (17.7%)	129 (19.3%)	945 (22.8%)
Living with partner	64 (6.7%)	59 (6.3%)	40 (5%)	33 (4.2%)	30 (4.5%)	226 (5.4%)
Divorced	41 (4.3%)	57 (6.1%)	58 (7.3%)	81 (10.3%)	86 (12.9%)	323 (7.8%)
Separated	33 (3.4%)	45 (4.8%)	37 (4.7%)	56 (7.1%)	40 (6%)	211 (5.1%)
Widowed	8 (.8%)	20 (2.1%)	10 (1.3%)	29 (3.7%)	25 (3.7%)	92 (2.2%)
PC Education Level[d]						
Less than high school	146 (15.5%)	190 (20.2%)	167 (21.1%)	185 (23.6%)	163 (24.4%)	851 (20.5%)
Some high school	255 (27.0%)	226 (24%)	162 (20.4%)	173 (22%)	132 (19.7%)	948 (22.8%)
High school diploma	137 (14.5%)	99 (10.5%)	107 (13.5%)	102 (13%)	78 (11.7%)	523 (12.6%)
Some college	310 (32.9%)	335 (35.6%)	262 (33%)	240 (30.6%)	196 (29.3%)	1,343 (32.4%)
Bachelor's degree or More	95 (10.1%)	72 (7.7%)	66 (8.3%)	64 (8.2%)	68 (10.2%)	365 (8.8%)
Total Household Income[e]						
< $5,000	91 (9.5%)	81 (8.6%)	71 (9%)	62 (7.9%)	65 (9.7%)	370 (8.9%)
$5,000 - $9,999	116 (12.1%)	113 (12%)	75 (9.5%)	67 (8.5%)	43 (6.4%)	414 (10%)
$10,000 - $19,999	197 (20.5%)	156 (16.6%)	147 (18.5%)	138 (17.6%)	117 (17.5%)	755 (18.2%)
$20,000 - $29,999	141 (14.7%)	149 (15.9%)	124 (15.6%)	141 (18%)	119 (17.8%)	674 (16.2%)

$30,000 - $39,999	90 (9.4%)	110 (11.7%)	94 (11.9%)	106 (13.5%)	73 (10.9%)	473 (11.4%)
$40,000 - $49,999	71 (7.4%)	74 (7.9%)	67 (8.4%)	57 (7.3%)	60 (9%)	329 (7.9%)
> $50,000	123 (12.8%)	123 (13.1%)	110 (13.9%)	111 (14.1%)	98 (14.6%)	565 (13.6%)
Public Assistance						
Yes	385 (40%)	353 (37.6%)	261 (32.9%)	221 (28.2%)	178 (26.6%)	1,398 (33.7%)
No	565 (58.7%)	574 (61.1%)	520 (65.6%)	558 (71.1%)	479 (71.6%)	2,696 (65%)
Home Ownership						
Rent	537 (55.8%)	511 (54.4%)	410 (51.7%)	394 (50.2%)	325 (48.6%)	2,177 (52.5%)
Own	254 (26.4%)	290 (30.9%)	270 (34%)	310 (19.5%)	279 (41.7%)	1,403 (33.8%)
Live with renter	19 (2%)	17 (1.8%)	11 (1.4%)	10 (1.3%)	8 (1.2%)	65 (1.6%)
Live with owner	53 (5.5%)	31 (3.3%)	25 (3.2%)	18 (2.3%)	11 (1.6%)	138 (3.3%)
Live with other	63 (6.5%)	60 (6.4%)	34 (4.3%)	29 (3.7%)	29 (4.3%)	215 (5.2%)
TOTAL	962(23.2%)	940 (22.7%)	793 (19.1%)	785 (18.9%)	669 (16.1%)	4,149

Note: PC = Primary caregiver.
[a]Participant's race/ethnicity.
[b]Language in which participant's interview was conducted.
[c]Primary caregiver's relationship to participant.
[d]Highest level of education attained by primary caregiver.
[e]Total household income in past tax year.

Table 5

Means, Standard Deviations, and Mean Comparisons of Wave 1 Demographic, CVE, and Well-Being Variables Between Wave 2 Participants and Non-Participants

Wave 1 Variables	Wave 2 Participants *M* (*SD*)	Wave 2 Non-Participants *M* (*SD*)	*t* (df)	*p*
Age	8.57 (4.20)	8.96 (4.26)	-1.90 (4147)	.057
PC Age	35.82 (8.46)	34.67 (8.38)	2.85 (4033)	.004
Household Income[a]	4.10 (1.88)	3.56 (1.77)	5.89 (556)	.000
PC Education Level[b]	2.88 (1.33)	2.68 (1.26)	3.18 (4028)	.002
Family Size	5.32 (1.98)	5.30 (1.99)	.28 (4022)	.777
PY CVE Frequency[c]	16.25 (63.81)	21.19 (67.41)	-1.53 (611)	.128
Lifetime CVE Frequency[d]	64.35(331.71)	87.79 (422.45)	-1.17 (612)	.240
Internalizing[e]	52.67 (10.70)	52.53 (10.97)	.29 (4083)	.775
Externalizing[f]	53.53 (10.96)	54.05 (11.16)	-.99 (4086)	.320
	N (%)[k]	N (%)[l]	Pearson Chi-Square (df)	*p*
Sex				
Female	1821 (50%)	263 (52%)	.70 (1)	.402
Male	1822 (50%)	243 (48%)		
Cohort				
3	853 (23.4%)	109 (21.5%)	4.79 (4)	.309
6	836 (22.9%)	104 (20.6%)		
9	688 (18.9%)	105 (20.8%)		
12	691 (19%	94 (18.6%)		
15	575 (15.8%)	94 (14.1%)		
Race/Ethnicity[g]				
Hispanic	1782 (48.9%)	246 (48.6%)	22.90 (2)	.000
Black	1286 (35.3%)	217 (42.9%)		
White	575 (15.8%)	43 (8.5%)		
Language[h]				
English	2877 (79%)	391 (77.3%)	1.71 (2)	.425
Spanish	740 (20.3%)	113 (22.3%)		
Polish	26 (.7%)	2 (.4%)		
PC Relationship[i]				
Biological Mother	3119 (86.2%)	423 (83.8%)	2.710 (1)	.147
Other	501 (13.8%)	82 (16.2%)		
PC Marital Status				
Married[j]	2080 (58%)	211 (42.2%)	44.31 (1)	.000
Not Married	1508 (42%)	289 (57.8%)		
Public Assistance				
Yes	1185 (33%)	213 (42.3%)	17.14 (1)	.000
No	2406 (67%)	290 (57.7%)		

Note: PC = Primary caregiver.

[a]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000

[b]Highest level of education attained by primary caregiver; values are coded as follows: 1 = less than high school; 2 = some high school; 3 = high school diploma; 4 = some college; 5 = bachelor's degree or more
[c]Past year CVE frequency, coded on continuous scale.
[d]Lifetime CVE frequency, coded on continuous scale.
[e]CBCL Internalizing T-score.
[f]CBCL Externalizing T-score
[g]Participant's race/ethnicity.
[h]Language in which participant's interview was conducted.
[i]Primary caregiver's relationship to participant.
[j]Primary caregiver married or living with partner.
[k]Percentage of Wave 2 participants in the given demographic category; frequencies within *columns* comprise 100%.
[l]Percentage of Wave 2 non-participants in the given demographic category; frequencies within *columns* comprise 100%.

Table 6

Means, Standard Deviations, and Mean Comparisons of Wave 1 Demographic, CVE, and Well-Being Variables Between Wave 3 Participants and Non-Participants

Wave 1 Variables	Wave 3 Participants *M* (*SD*)	Wave 3 Non-Participants *M* (*SD*)	*t* (df)	*p*
Age	8.59 (4.22)	8.74 (4.17)	-.90 (4147)	.367
PC Age	35.83 (8.46)	35.05 (8.34)	2.32 (4033)	.020
Household Income[a]	4.11 (1.88)	3.72 (1.85)	4.87 (3578)	.000
PC Education Level[b]	2.91 (1.33)	2.65 (1.28)	4.95 (4028)	.000
Family Size	5.36 (2.01)	5.16 (1.84)	2.71 (1292)	.007
PY CVE Frequency[c]	16.64 (63.66)	17.71 (66.72)	-.42 (611)	.674
Lifetime CVE Frequency[d]	62.93 (317.61)	84.54 (435.29)	-1.32 (1008)	.188
Internalizing[e]	53.53 (11.31)	52.91 (12.31)	.38 (501)	.703
Externalizing[f]	53.53 (10.83)	53.86 (11.60)	-.74 (1165)	.460
	N (%)[k]	N (%)[l]	Pearson Chi-Square (df)	*p*
Sex				
Female	1667 (50%)	417 (51%)	.27 (1)	.605
Male	1665 (50%)	400 (49%)		
Cohort				
3	782 (23.5%)	180 (22%)	2.19 (4)	.702
6	760 (22.8%)	180 (22%)		
9	625 (18.8%)	168 (20.6%)		
12	625 (18.8%	160 (19.6%)		
15	540 (16.2%)	129 (15.8%)		
Race/Ethnicity[g]				
Hispanic	1594 (47.8%)	434 (53.1%)	16.06 (2)	.000
Black	1207 (36.2%)	296 (36.2%)		
White	531 (15.9%)	87 (10.6%)		
Language[h]				
English	2644 (79.4%)	624 (76.4%)	4.53 (2)	.104
Spanish	664 (19.9%)	189 (23.1%)		
Polish	24 (.7%)	4 (.5%)		
PC Relationship[i]				
Biological Mother	2860 (86.4%)	682 (83.8%)	3.63 (1)	.057
Other	451 (13.6%)	132 (16.2%)		
PC Marital Status				
Married[j]	1890 (57.5%)	401 (49.9%)	15.12 (1)	.000
Not Married	1395 (42.5%)	402 (50.1%)		
Public Assistance				
Yes	1086 (33%)	312 (38.6%)	8.93 (1)	.003
No	2200 (67%)	496 (61.4%)		

Note: PC = Primary caregiver.

[a]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000

[b]Highest level of education attained by primary caregiver; values are coded as follows: 1 = less than high school; 2 = some high school; 3 = high school diploma; 4 = some college; 5 = bachelor's degree or more
[c]Past year CVE frequency, coded on continuous scale.
[d]Lifetime CVE frequency, coded on continuous scale.
[e]CBCL Internalizing T-score.
[f]CBCL Externalizing T-score
[g]Participant's race/ethnicity.
[h]Language in which participant's interview was conducted.
[i]Primary caregiver's relationship to participant.
[j]Primary caregiver married or living with partner.
[k]Percentage of Wave 3 participants in the given demographic category; frequencies within *columns* comprise 100%.
[l]Percentage of Wave 3 non-participants in the given demographic category; frequencies within *columns* comprise 100%.

Table 7

Past Year CVE Variety Item Frequencies by Wave and Cohort

Item	Wave	3 N (%)	6 N (%)	9 N (%)	12 N (%)	15 N (%)	Total N (%)
Saw someone shoved/kicked/punched	1	206 (21.4%)	247 (26.3%)	433 (54.6%)	573 (73%)	555 (83%)	2,014 (48.5%)
Saw someone attacked with knife	1	7 (.7%)	7 (.7%)	37 (4.7%)	78 (9.9%)	124 (18.5%)	253 (6.1%)
Heard gunfire	1	205 (21.3%)	343 (36.5%)	439 (55.4%)	517 (65.9%)	532 (79.5%)	2,036 (49.1%)
	2	237 (24.6%)	291 (31%)	288 (36.3%)	389 (49.6%)	354 (52.9%)	1,559 (37.6%)
	3	233 (24.2%)	261 (27.8%)	278 (35.1%)	339 (43.2%)	288 (43%)	1,399 (33.7%)
Saw someone shot	1	4 (.4%)	18 (1.9%)	44 (5.5%)	54 (6.9%)	90 (13.5%)	210 (5.1%)
	2	9 (.9%)	10 (1.1%)	28 (3.5%)	65 (8.3%)	70 (10.5%)	182 (4.4%)
	3	5 (.5%)	25 (2.7%)	26 (3.3%)	49 (6.2%)	51 (7.6%)	156 (3.8%)
Saw someone chased to hurt	2	73 (7.6%)	85 (9%)	165 (20.8%)	264 (33.6%)	279 (41.7%)	866 (20.9%)
	3	83 (8.6%)	200 (21.3%)	204 (25.7%)	260 (33.1%)	189 (28.3%)	936 (22.6%)
Chased to hurt	2	18 (1.9%)	41 (4.4%)	53 (6.7%)	73 (9.3%)	84 (12.6%)	269 (6.5%)
	3	32 (3.3%)	90 (9.6%)	40 (5%)	59 (7.5%)	37 (5.5%)	258 (6.2%)
Saw someone hit	2	125 (13%)	128 (13.6%)	258 (32.5%)	386 (49.2%)	370 (55.3%)	1,267 (30.5%)
	3	135 (14%)	272 (28.9%)	303 (38.2%)	380 (48.4%)	257 (38.4%)	1,347 (32.5%)
Hit	2	64 (6.7%)	92 (9.8%)	90 (11.3%)	115 (14.6%)	114 (17%)	475 (11.4%)
	3	107 (11.1%)	108 (11.5%)	87 (11%)	90 (11.5%)	64 (9.6%)	456 (11%)
Saw someone attacked with weapon	2	14 (1.5%)	16 (1.7%)	67 (8.4%)	131 (16.7%)	164 (24.5%)	392 (9.4%)
	3	15 (1.6%)	71 (7.6%)	66 (8.3%)	116 (14.8%)	92 (13.8%)	360 (8.7%)
Attacked with weapon	2	1 (.1%)	1 (.1%)	9 (1.1%)	25 (3.2%)	37 (5.5%)	73 (1.8%)
	3	4 (.4%)	10 (1.1%)	9 (1.1%)	25 (3.2%)	24 (3.6%)	72 (1.7%)
Shot	2	0	0	0	1 (.1%)	3 (.4%)	4 (.1%)
	3	0	0	1 (.1%)	1 (.1%)	4 (.6%)	6 (.1%)
Saw someone shot at	2	10 (1%)	9 (1%)	23 (2.9%)	84 (10.7%)	128 (19.1%)	254 (6.1%)

	3	8 (.8%)	27 (2.9%)	42 (5.3%)	85 (10.8%)	93 (13.9%)	255 (6.1%)
Shot at	2	2 (.2%)	0	2 (.3%)	17 (2.2%)	43 (6.4%)	64 (1.5%)
	3	2 (.2%)	5 (.5%)	5 (.6%)	25 (3.2%)	25 (3.7%)	62 (1.5%)
Saw someone killed	2	2 (.2%)	7 (.7%)	17 (2.1%)	27 (3.4%)	41 (6.1%)	94 (2.3%)
	3	3 (.3%)	15 (1.6%)	8 (1%)	14 (1.8%)	33 (4.9%)	73 (1.8%)
Sexually assaulted	2	1 (.1%)	2 (.2%)	2 (.3%)	6 (.8%)	9 (1.3%)	20 (.5%)
	3	3 (.3%)	6 (.6%)	7 (.9%)	8 (1%)	5 (.7%)	29 (.7%)
Saw someone threatened	2	26 (2.7%)	35 (3.7%)	86 (10.8%)	161 (20.5%)	173 (25.9%)	481 (11.6%)
	3	32 (3.3%)	115 (12.2%)	100 (12.6%)	146 (18.6%)	117 (17.5%)	510 (12.3%)
Threatened	2	2 (.2%)	6 (.6%)	25 (3.2%)	59 (7.5%)	90 (13.5%)	182 (4.4%)
	3	8 (.8%)	33 (3.5%)	30 (3.8%)	64 (8.2%)	55 (8.2%)	190 (4.6%)
Found dead body	2	3 (.3%)	6 (.6%)	3 (.4%)	6 (.8%)	9 (1.3%)	27 (.7%)
	3	3 (.3%)	2 (.2%)	0	6 (.8%)	11 (1.6%)	22 (.5%)
Learned acquaintance shot	2	33 (3.4%)	57 (6.1%)	69 (8.7%)	162 (20.6%)	193 (28.8%)	514 (12.4%)
	3	38 (4%)	56 (6%)	98 (12.4%)	169 (21.5%)	145 (21.7%)	506 (12.2%)
Learned acquaintance killed	2	47 (4.9%)	61 (6.5%)	74 (9.3%)	149 (19%)	197 (29.4%)	528 (12.7%)
	3	45 (4.7%)	83 (8.8%)	83 (10.5%)	161 (20.5%)	145 (21.7%)	517 (12.5%)
Learned acquaintance suicide	2	6 (.6%)	14 (1.5%)	11 (1.4%)	24 (3.1%)	46 (6.9%)	101 (2.4%)
	3	8 (.8%)	14 (1.5%)	17 (2.1%)	44 (5.6%)	25 (3.7%)	108 (2.6%)
Learned acquaintance raped	2	3 (.3%)	7 (.7%)	22 (2.8%)	86 (11%)	71 (10.6%)	189 (4.6%)
	3	6 (.6%)	17 (1.8%)	38 (4.8%)	69 (8.8%)	47 (7%)	177 (4.3%)

Table 8

Lifetime CVE Variety Item Frequencies by Wave and Cohort

Item	Wave	3 N (%)	6 N (%)	9 N (%)	12 N (%)	15 N (%)	Total N (%)
Saw someone shoved/kicked/punched	1	243 (25.3%)	314 (33.4%)	468 (59%)	600 (76.4%)	581 (86.8%)	2,206 (53.2%)
Saw someone attacked with knife	1	8 (.8%)	20 (2.1%)	59 (7.4%)	114 (14.5%)	163 (24.4%)	364 (8.8%)
Heard gunfire	1	208 (21.6%)	368 (39.1%)	503 (63.4%)	588 (74.9%)	569 (85.1%)	2,120 (51.1%)
	2	346 (36%)	453 (48.2%)	480 (60.5%)	552 (70.3%)	469 (70.1%)	2,300 (55.4%)
	3	351 (36.4%)	467 (49.6%)	439 (55.4%)	466 (59.4%)	411 (61.4%)	2,134 (51.4%)
Saw someone shot	1	7 (.7%)	26 (2.8%)	59 (7.4%)	84 (10.7%)	142 (21.2%)	318 (7.7%)
	2	17 (1.8%)	21 (2.2%)	59 (7.4%)	134 (17.1%)	149 (22.3%)	380 (9.2%)
	3	19 (2%)	61 (6.5%)	59 (7.4%)	109 (13.9%)	141 (21.1%)	389 (9.4%)
Saw someone chased to hurt	2	117 (12.2%)	151 (16.1%)	323 (40.7%)	429 (54.6%)	423 (63.2%)	1,443 (34.8%)
	3	133 (13.8%)	360 (38.3%)	327 (41.2%)	376 (47.9%)	339 (50.7%)	1,535 (37%)
Chased to hurt	2	28 (2.9%)	58 (6.2%)	98 (12.4%)	166 (21.1%)	213 (31.8%)	563 (13.6%)
	3	43 (4.5%)	159 (16.9%)	89 (11.2%)	156 (19.9%)	177 (26.5%)	624 (15%)
Saw someone hit	2	217 (22.6%)	248 (26.4%)	400 (50.4%)	536 (68.3%)	493 (73.7%)	1,894 (45.6%)
	3	211 (21.9%)	404 (43%)	429 (54.1%)	466 (59.4%)	412 (61.6%)	1,922 (46.3%)
Hit	2	80 (8.3%)	133 (14.1%)	180 (22.7%)	266 (33.9%)	286 (42.8%)	945 (22.8%)
	3	134 (13.9%)	168 (17.9%)	183 (23.1%)	249 (31.7%)	245 (36.6%)	979 (23.6%)
Saw someone attacked with weapon	2	33 (3.4%)	41 (4.4%)	123 (15.5%)	219 (27.9%)	265 (39.6%)	681 (16.4%)
	3	35 (3.6%)	117 (12.4%)	148 (18.7)	227 (28.9%)	247 (36.9%)	774 (18.7%)
Attacked with weapon	2	1 (.1%)	1 (.1%)	25 (3.2%)	55 (7%)	82 (12.3%)	164 (4%)
	3	7 (.7%)	18 (1.9%)	30 (3.8%)	60 (7.6%)	89 (13.3%)	204 (4.9%)
Shot	2	0	0	3 (.4%)	2 (.3%)	14 (2.1%)	19 (.5%)
	3	0	1 (.1%)	3 (.4%)	6 (.8%)	14 (2.1%)	24 (.6%)
Saw someone shot at	2	18 (1.9%)	29 (3.1%)	74 (9.3%)	166 (21.1%)	227 (33.9%)	514 (12.4%)

	3	24 (2.5%)	62 (6.6%)	99 (12.5%)	191 (24.3%)	209 (31.2%)	585 (14.1%)
Shot at	2	2 (.2%)	0	5 (.6%)	41 (5.2%)	95 (14.2%)	143 (3.4%)
	3	4 (.4%)	11 (1.2%)	11 (1.4%)	45 (5.7%)	101 (15.1%)	172 (4.1%)
Saw someone killed	2	7 (.7%)	16 (1.7%)	40 (5%)	64 (8.2%)	97 (14.5%)	224 (5.4%)
	3	8 (.8%)	38 (4%)	23 (2.9%)	49 (6.2%)	91 (13.6%)	209 (5%)
Sexually assaulted	2	6 (.6%)	12 (1.3%)	8 (1%)	26 (3.3%)	40 (6%)	92 (2.2%)
	3	11 (1.1%)	14 (1.5%)	11 (1.4%)	39 (5%)	55 (8.2%)	130 (3.1%)
Saw someone threatened	2	42 (4.4%)	63 (6.7%)	140 (17.7%)	254 (32.4%)	272 (40.7%)	771 (18.6%)
	3	56 (5.8%)	183 (19.5%)	167 (211%)	225 (28.7%)	213 (31.8%)	844 (20.3%)
Threatened	2	3 (.3%)	12 (1.3%)	47 (5.9%)	101 (12.9%)	149 (22.3%)	312 (7.5%)
	3	11 (1.1%)	52 (5.5%)	52 (6.6%)	101 (12.9%)	134 (20%)	350 (8.4%)
Found dead body	2	5 (.5%)	6 (.6%)	11 (1.4%)	18 (2.3%)	32 (4.8%)	72 (1.7%)
	3	5 (.5%)	9 (1%)	9 (1.1%)	20 (2.5%)	34 (5.1%)	77 (1.9%)
Learned acquaintance shot	2	60 (6.2%)	118 (12.6%)	178 (22.4%)	317 (40.4%)	344 (51.4%)	1,017 (24.5%)
	3	94 (9.8%)	168 (17.9%)	237 (29.9%)	324 (41.3%)	317 (47.4%)	1,140 (27.5%)
Learned acquaintance killed	2	78 (8.1%)	123 (13.1%)	195 (24.6%)	283 (36.1%)	334 (49.9%)	1,013 (24.4%)
	3	96 (10%)	197 (21%)	208 (26.2%)	288 (36.7%)	297 (44.4%)	1,086 (26.2%)
Learned acquaintance suicide	2	11 (1.1%)	29 (3.1%)	31 (3.9%)	66 (8.4%)	107 (16%)	244 (5.9%)
	3	17 (1.8%)	38 (4%)	46 (5.8%)	99 (12.6%)	98 (14.6%)	298 (7.2%)
Learned acquaintance raped	2	4 (.4%)	19 (2%)	57 (7.2%)	157 (20%)	170 (25.4%)	407 (9.8%)
	3	8 (.8%)	44 (4.7%)	89 (11.2%)	165 (21%)	160 (23.9%)	466 (11.2%)

Table 9

CVE Scale Summary Statistics by Wave and Cohort

		CVE				
		1) Past Year CVE Frequency (Continuous)	2) Lifetime CVE Frequency (Continuous)	3) Past Year CVE Frequency (Ordinal)	4) Past Year CVE Variety	5) Lifetime CVE Variety
Wave	Cohort	*M* (*SD*) Median (IQR[a])	*M* (*SD*) Median (IQR)	*M* (*SD*) Median (IQR)	*M* (*SD*) Median (IQR)	*M* (*SD*) Median (IQR)
1	3	4.49 (23.52) 0 (0-1)	8.27 (47.93) 0 (0-2)		.44 (.67) 0 (0-1)	.52 (.71) 0 (0-1)
	6	7.93 (35.90) 0 (0-4)	25.86 (150.92) 1 (0-6)		.66 (.77) 0 (0-1)	.86 (.86) 1 (0-1)
	9	12.83 (65.83) 2 (0-7)	36.77 (225.55) 3 (1-13)		1.17 (.92) 1 (0-2)	1.43 (.94) 1 (1-2)
	12	25.46 (86.41) 7 (2-16)	149.90 (1356.23) 15 (3-55)		1.58 (.91) 2 (1-2)	1.85 (.92) 2 (1-2)
	15	45.34 (106.53) 10 (4-35)	211.19 (676.06) 28 (10-110)		1.99 (.94) 2 (1-2)	2.28 (.90) 2 (2-3)
	Total	17.26 (68.12) 2 (0-10)	76.36 (661.18) 3 (0-21)		1.09 (1.00) 1 (0-2)	1.30 (1.07) 1 (0-2)
2	3			1.46 (2.52) 0 (0-2)	.80 (1.21) 0 (0-1)	1.34 (1.66) 1 (0-2)
	6			1.86 (2.87) 1 (0-3)	1.06 (1.45) 1 (0-2)	1.94 (2.02) 1 (0-3)
	9			3.87 (4.80) 2 (0-6)	2.00 (2.19) 1 (0-3)	3.89 (2.95) 3 (2-6)
	12			6.36 (5.92) 5 (2-9)	3.37 (2.81) 3 (1-5)	5.87 (3.61) 5 (3-8)
	15			9.32 (8.01) 7 (3-14)	4.63 (3.31) 4 (2-7)	7.98 (3.93) 8 (5-11)
	Total			4.12 (5.66) 2 (0-6)	2.15 (2.61) 1 (0-3)	3.82 (3.71) 3 (1-6)
3	3			1.80 (2.89) 0 (0-3)	1.00 (1.42) 0 (0-2)	1.69 (1.93) 1 (0-3)
	6			3.73 (4.70) 2 (0-6)	1.97 (2.18) 1 (0-3)	3.63 (2.89) 3 (1-5)
	9			4.57 (4.39) 3 (1-7)	2.54 (2.23) 2 (1-4)	4.71 (3.02) 4 (2-6.75)
	12			7.43 (6.75) 6 (2-11)	3.83 (2.95) 3 (2-6)	6.68 (3.78) 6 (4-9)
	15			7.33 (7.80) 5 (2-10)	3.65 (3.26) 3 (1-5)	8.11 (4.43) 8 (5-11)
	Total			4.35 (5.70) 2 (0-6)	2.42 (2.62) 2 (0-4)	4.57 (3.88) 4 (2-7)
Wave 2/3 Total				4.35 (5.70) 2 (0-6)	2.28 (2.62) 1 (0-3)	4.17 (3.81) 3 (1-6)

[a]IQR = inter-quartile range (25^{th} – 75^{th} percentile)

Table 10

Intercorrelations Among Wave 1 Demographics, CVE, and Well-Being.

	Demographic Variables					CVE		Well-being	
	1	2	3	4	5	6	7	8	9
1. Cohort	-								
2. PC Age[a]	.46***	-							
3. Income[b]	.05**	.16***	-						
4. PC Education[c]	-.04*	.04*	.38***	-					
5. Family Size	.01	-.01	-.08***	-.24***	-				
6. PY CVE Frequency[d]	.20***	.10***	-.03	.02	.01	-			
7. Lifetime CVE Frequency[e]	.19***	.08***	-.04*	.03	-.03	.56***	-		
8. Internalizing[f]	-.02	-.09***	-.17***	-.14***	.04*	.02	.003	-	
9. Externalizing[g]	.02	-.08***	-.16***	-.04*	.04*	.10***	.06***	.61***	-

*$p < .05$; **$p < .01$; ***$p < .001$

Notes: Ns range from 2,944 to 4,149; PC = primary caregiver; one outlier on Lifetime CVE Frequency scale more than 5 standard deviations above preceding case is removed.

[a]Primary caregiver's age

[b]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000.

[c]Highest level of education attained by primary caregiver; values are coded as follows: 1 = less than high school; 2 = some high school; 3 = high school diploma; 4 = some college; 5 = bachelor's degree or more

[d]Past year CVE frequency; continuous scale

[e]Lifetime CVE frequency; continuous scale

[f]CBCL Internalizing T-score

[g]CBCL Externalizing T-score

Table 11

Means, Standard Deviations, and Mean Comparison Results Among Selected Wave 1 Demographics, CVE, and Well-Being

	Sex				Race/Ethnicity[h]					PC Marital Status			
	Female	Male			Hispanic	Black	White			Married[i]	Unmarried		
Variable	*M* (*SD*)	*M* (*SD*)	*t* (df)	*p*	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F* (df)	*p*	*M* (*SD*)	*M* (*SD*)	*t* (df)	*p*
PC Age[a]	35.56	35.61	-.20	.839	34.87	35.91	37.16	18.84	.000	35.79	35.30	-1.68	.092
	(8.45)	(8.35)	(3948)		(7.72)	(9.69)	(6.86)	(2, 3927)		(7.59)	(9.58)	(2653)	
Income[b]	3.99	4.09	-1.57	.116	3.78	3.74	5.52	229.62	.000	4.55	3.14	-23.02	.000
	(1.87)	(1.89)	(3502)		(1.62)	(1.99)	(1.73)	(2, 3778)		(1.75)	(1.74)	(2620)	
PC Education[c]	2.86	2.86	.032	.974	2.25	3.33	3.64	494.51	.000	2.78	2.99	4.95	.000
	(1.31)	(1.34)	(3937)		(1.29)	(1.05)	(1.14)	(2, 3943)		(1.42)	(1.15)	(3691)	
Family Size	5.37	5.26	1.77	.076	5.52	5.34	4.59	52.03	.000	5.48	5.05	-6.38	.000
	(2.01)	(1.94)	(3944)		(1.85)	(2.25)	(1.47)	(2, 3944)		(1.83)	(2.17)	(2778)	
PY CVE Frequency[d]	16.29	18.11	-.85	.393	9.42	30.20	11.30	42.88	.000	11.76	26.20	5.79	.000
	(69.52)	(66.40)	(4051)		(38.07)	(98.79)	(44.80)	(2, 4050)		(50.73)	(89.14)	(2148)	
Lifetime CVE Frequency[e]	57.34	77.79	-1.89	.059	35.84	122.64	38.32	29.69	.000	40.42	112.29	5.39	.000
	(348.9)	(347.0)	(4048)		(229.59)	(492.91)	(155.43)	(2, 4050)		(198.77)	(497.33)	(1833)	
Internalizing[f]	52.18	53.14	-2.84	.004	53.80	52.00	50.46	26.99	.000	52.09	53.57	4.24	.000
	(10.45)	(10.94)	(3997)		(10.76)	(10.64)	(10.23)	(2, 4011)		(10.64)	(10.76)	(3981)	
Externalizing[g]	53.90	53.28	1.82	.069	53.08	55.08	51.72	24.36	.000	52.11	55.99	11.00	.000
	(11.03)	(10.87)	(4012)		(11.11)	(10.64)	(10.77)	(2, 4011)		(10.69)	(11.00)	(3981)	

Notes: PC = primary caregiver; one outlier on Lifetime CVE Frequency scale more than 5 standard deviations above preceding case is removed.

[a]Primary caregiver's age

[b]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000.

[c]Highest level of education attained by primary caregiver; values are coded as follows: 1 = less than high school; 2 = some high school; 3 = high school diploma; 4 = some college; 5 = bachelor's degree or more

[d]Past year CVE frequency; continuous scale

[e]Lifetime CVE frequency; continuous scale

[f]CBCL Internalizing T-score

[g]CBCL Externalizing T-score

[h]Participant's race/ethnicity

[i]Married or living with partner

Table 12

Intercorrelations Among Wave 2 Demographics, CVE, and Well-Being.

	Demographic Variables		CVE			Well-Being	
	1	2	3	4	5	6	7
1. Cohort	-						
2. Income[a]	.02	-					
3. PY CVE Frequency[b]	.48***	-.11***	-				
4. PY CVE Variety[c]	.52***	-.11***	.95***	-			
5. Lifetime CVE Variety	.64***	-.10***	.83***	.87***	-		
6. Internalizing[d]	.07***	-.15***	.14***	.14***	.15***	-	
7. Externalizing[e]	-.03	-.14***	.19***	.20***	.18***	.62***	-

*$p < .05$; **$p < .01$; ***$p < .001$

Note: Ns range from 2,867 to 4,149

[a]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000.

[b]Past year CVE frequency; ordinal scale

[c]Past year CVE variety

[d]CBCL Internalizing T-score

[e]CBCL Externalizing score

Table 13

Means, Standard Deviations, and Mean Comparison Results Among Selected Wave 2 Demographics, CVE, and Well-Being

	Sex				Race/Ethnicity[f]					PC Marital Status			
	Female	Male			Hispanic	Black	White			Married[g]	Unmarried		
Variable	*M* (*SD*)	*M* (*SD*)	*t* (df)	*p*	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F* (df)	*p*	*M* (*SD*)	*M* (*SD*)	*t* (df)	*p*
Income[a]	4.32	4.38	-.87	.385	4.13	3.98	5.80	215.16	.000	4.94	3.63	-20.70	.000
	(1.93)	(1.89)	(3322)		(1.67)	(2.04)	(1.60)	(2, 4032)		(1.76)	(1.83)	(3240)	
PY CVE Frequency[b]	3.68	4.57	-4.66	.000	3.45	5.65	2.77	75.92	.000	3.46	4.97	7.66	.000
	(5.15)	(6.10)	(3399)		(5.13)	(6.32)	(4.87)	(2, 3502)		(5.21)	(6.13)	(3000)	
PY CVE Variety[c]	1.98	2.33	-3.99	.000	1.85	2.86	1.47	77.79	.000	1.84	2.54	7.84	.000
	(2.46)	(2.74)	(3458)		(2.49)	(2.76)	(2.26)	(2, 3502)		(2.47)	(2.73)	(3111)	
Lifetime CVE Variety	3.56	4.07	-4.09	.000	3.36	4.89	2.78	90.64	.000	3.29	4.46	9.21	.000
	(3.55)	(3.85)	(3476)		(3.57)	(3.80)	(3.34)	(2, 3502)		(3.52)	(3.84)	(3132)	
Internalizing[d]	52.34	53.92	-3.88	.000	54.38	52.20	50.82	22.79	.000	52.78	53.70	2.21	.027
	(11.17)	(11.66)	(3114)		(11.30)	(11.49)	(11.26)	(2, 3122)		(11.27)	(11.70)	(3046)	
Externalizing[e]	7.59	8.63	-4.40	.000	7.52	9.28	7.49	24.85	.000	7.28	9.24	8.13	.000
	(6.42)	(6.88)	(3112)		(6.67)	(6.70)	(6.27)	(2, 3131)		(6.31)	(6.98)	(3053)	

Notes: PC = primary caregiver

[a]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000.

[b]Past year CVE frequency; ordinal scale

[c]Past year CVE variety

[d]CBCL Internalizing T-score

[e]CBCL Externalizing score

[f]Participant's race/ethnicity

[g]Married or living with partner

Table 14

Intercorrelations Among Wave 3 Demographics, CVE, and Well-Being.

	Demographic Variables		CVE			Well-Being	
	1	2	3	4	5	6	7
1. Cohort	-						
2. Income[a]	-.01	-					
3. Past Year CVE Frequency[b]	.37***	-.15***	-				
4. Past Year CVE Variety[c]	.39***	-.14***	.95***	-			
5. Lifetime CVE Variety	.57***	-.12***	.77***	.81***	-		
6. Internalizing[d]	.06**	-.14***	.13***	.13***	.12***	-	
7. Externalizing[e]	.04	-.16***	.23***	.22***	.22***	.61***	-

*$p < .05$; **$p < .01$; ***$p < .001$

Note: Ns range from 2,309 to 4,149

[a]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000.

[b]Past year CVE frequency; ordinal scale

[c]Past year CVE variety

[d]CBCL Internalizing T-score

[e]CBCL Externalizing score

Table 15

Means, Standard Deviations, and Mean Comparison Results Among Selected Wave 3 Demographics, CVE, and Well-Being

	Sex				Race/Ethnicity[f]					PC Marital Status			
	Female	Male			Hispanic	Black	White			Married[g]	Unmarried		
Variable	*M* (*SD*)	*M* (*SD*)	*t* (df)	*p*	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F* (df)	*p*	*M* (*SD*)	*M* (*SD*)	*t* (df)	*p*
Income[a]	4.68	4.70	-.87	.385	4.61	4.20	6.03	154.51	.000	5.38	4.16	-16.80	.000
	(1.89)	(1.88)	(3322)		(1.67)	(2.02)	(1.45)	(2, 2502)		(1.63)	(1.89)	(2318)	
PY CVE Frequency[b]	4.09	5.15	-4.66	.000	4.11	6.14	2.68	75.79	.000	3.40	4.77	6.70	.000
	(5.34)	(6.07)	(3503)		(5.32)	(6.37)	(4.44)	(2, 3060)		(4.73)	(5.36)	(2423)	
PY CVE Variety[c]	2.20	2.65	-3.99	.000	2.21	3.10	1.52	74.36	.000	1.82	2.55	7.60	.000
	(2.47)	(2.74)	(3458)		(2.53)	(2.76)	(2.10)	(2, 3068)		(2.18)	(2.57)	(2431)	
Lifetime CVE Variety	4.24	4.92	-4.09	.000	4.15	5.68	3.33	82.60	.000	3.37	4.42	7.69	.000
	(3.68)	(4.06)	(3476)		(3.81)	(3.88)	(3.48)	(2, 3060)		(3.18)	(3.53)	(2416)	
Internalizing[d]	52.59	53.69	-3.88	.000	53.84	53.09	50.84	9.92	.000	52.14	53.98	3.94	.000
	(11.06)	(11.66)	(3114)		(11.30)	(11.64)	(10.64)	(2, 2545)		(11.07)	(11.58)	(2396)	
Externalizing[e]	7.24	7.98	-4.40	.000	6.83	9.11	6.48	40.30	.000	6.69	8.44	6.71	.000
	(6.20)	(6.79)	(3112)		(6.03)	(7.19)	(5.55)	(2, 2545)		(5.80)	(7.02)	(2395)	

Notes: PC = primary caregiver

[a]Total household income in past tax year; values are coded as follows: 1 = less than $5,000; 2 = $5,000 - $9,999; 3 = $10,000 - $19,999; 4 = $20,000 - $29,999; 5 = $30,000 - $39,999; 6 = $40,000 - $49,999; 7 = more than $50,000.

[b]Past year CVE frequency; ordinal scale

[c]Past year CVE variety

[d]CBCL Internalizing T-score

[e]CBCL Externalizing score

[f]Participant's race/ethnicity

[g]Married or living with partner