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The Cycle of Violence in Context: Exploring the Moderating Roles of Neighborhood Disadvantage and Cultural Norms

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ABSTRACT

While the cycle of violence has received empirical support (Widom 1989), not all victims of child physical abuse become involved in violence. Yet, little is known regarding factors that may moderate the relationship between abuse and subsequent violence, particularly contextual circumstances. The current investigation utilized longitudinal data from 1,372 youth living in 79 neighborhoods who participated in the Project on Human Development in Chicago Neighborhoods (PHDCN), and employed a multivariate multilevel Rasch model to explore the degree to which neighborhood disadvantage and cultural norms attenuate or strengthen the abuse—violence relationship. The results indicate that the effect of child physical abuse on violence was weaker in more disadvantaged communities. Neighborhood cultural norms regarding tolerance for youth delinquency and fighting among family and friends did not moderate the child abuse/violence relationship, but each had a direct effect on violence, such that residence in neighborhoods more tolerant of delinquency and fighting increased the propensity for violence. These results suggest that the cycle of violence may be contextualized by neighborhood structural and cultural conditions.

Keywords: Neighborhoods; Child Abuse; Disadvantage; Culture; Family Violence

INTRODUCTION

The cycle of violence theory (Widom 1989) purports that violent victimization, particularly physical abuse perpetrated by parents or caregivers, increases the likelihood of subsequent violent behavior among youth. While some well-conducted, longitudinal studies have supported the cycle of violence (Mersky and Reynolds 2007; Smith, Ireland, and Thornberry 2005; Widom 1989), not all empirical research has conclusively established significant and/or substantial relationships between child physical abuse and subsequent violence (Derzon 2010; Zingraff et al. 1993), and some children appear to be resilient to the negative effects of abuse (DuMont, Widom, and Czaja 2007). These results suggest that other facets of youths' lives may moderate the impact of child abuse on later violence.

The current study investigates the possibility that the cycle of violence (Widom 1989) may be contextualized by neighborhood conditions, particularly disadvantage and cultural norms. The potential for neighborhood characteristics to moderate the relationship between child abuse and subsequent violence has been posited (Zielinski and Bradshaw 2006) but rarely examined, perhaps due to the notion that neighborhood characteristics are ill-equipped to influence "private" forms of violence and victimization, particularly those that occur "behind closed doors" (Gelles 1983; Raudenbush and Sampson 1999). Yet, there is evidence linking neighborhood conditions to the occurrence of both child abuse/neglect (Coulton et al. 2007; Coulton, Korbin, and Su 1999; Molnar et al. 2003), and delinquency and violence (e.g., Maimon and Browning 2010; Zimmerman and Messner 2010, 2011), as well as studies indicating that neighborhood conditions (especially disadvantage) moderate the impact of various risk factors on youth delinquency and violence (e.g., Bellair and McNulty 2010; Gibson 2012; Simons et al. 2005). We extend these lines of research to explore the degree to which neighborhood

disadvantage and cultural values, such as tolerance for forms of deviance, violence, or victimization (Sampson and Bartusch 1998; Sampson and Wilson 1995) affect the relationship between child physical abuse and violence.

VIOLENCE BEGETS VIOLENCE

Cathy Widom's seminal longitudinal research examining the short and long-term effects of child physical abuse found that victims were significantly more likely than those without officially substantiated records of abuse to be arrested for violent crimes during adolescence and young adulthood (Maxfield and Widom 1996; Widom 1989). Widom's work significantly advanced knowledge regarding the impact of child maltreatment and set new methodological standards for victimization research, which had previously tended to utilize cross-sectional and/or retrospective data, often gathered from children and families in child welfare or criminal justice systems who were likely not representative of the general population (Fergusson and Lynskey 1997; Widom 1989). Following Widom's lead, recent studies have relied more heavily on longitudinal data, which are better able to establish causal relationships between abuse and violence, and on larger, more representative samples. These studies have provided additional evidence for the link between child abuse and subsequent violent behavior, whether relying on official reports (e.g., Mersky and Reynolds 2007; Smith, Ireland, and Thornberry 2005) or when utilizing maternal (Herrenkohl, Egolf, and Herrenkohl 1997; Herrenkohl et al. 2003) or youth reports (Fagan 2005) of child physical abuse.

While many studies have supported Widom's (e.g., Maxfield and Widom 1996; Widom 1989) findings regarding the cycle of violence, the strength of the relationship between physical abuse and violence has varied across studies (Derzon 2010; Maas, Herrenkohl, and Sousa 2007) and a few investigations have failed to show a significant relationship between these constructs

(Smith and Thornberry 1995; Zingraff et al. 1993). Widom's own research has indicated that a substantial proportion of victims appear to be resilient to the negative effects of abuse (DuMont, Widom, and Czaja 2007). These examples suggest that there may be differences across individuals and/or settings in terms of how individuals respond to child victimization.

Our work builds on this foundation and seeks to extend the cycle of violence literature by examining potential moderators of the child abuse/violence relationship in the neighborhood context, while also ensuring that our analyses are methodologically rigorous. In particular, a goal of the current study is to better distinguish the effects of physical abuse from other potential risk factors for violence. Dodge and colleagues (1990, p. 250) caution that studies using official data to identify victims of abuse may "confound the experience of abuse with subsequent actions by these agencies." That is, such investigations cannot easily differentiate whether it is the experience of abuse that heightens the risk for violence, or if this is due to the process of and consequences that stem from being officially labeled a victim (e.g., potential separation from care-givers, placement in foster homes, etc.). Studies that rely on child (Fagan 2005) or caregiver (Herrenkohl, Egolf, and Herrenkohl 1997; Herrenkohl et al. 2003) reports of child physical abuse avoid this potential "contamination." Although official records may be considered more valid, self-reports have also been shown to produce valid and reliable information on child maltreatment (Smith et al. 2008), assuming that respondents are not asked to recall events in the distant past (Henry et al. 1994; Widom 1989). Our study relies on caregivers to report their use of physical discipline in the year prior to data collection, thus minimizing problems associated with retrospective recall. This information is used to predict violent behavior self-reported by youth; using independent sources to assess abuse and violence further helps to establish the validity of our findings.

Secondly, empirical research demonstrates that child abuse does not operate in a vacuum, and that abused children are likely to experience many other factors that can increase their potential for delinquency and violence, including low socio-economic status (SES), criminal parents, poor parenting practices, exposure to delinquent peers, and/or individual risk factors such as impulsivity or low self-control (Dodge, Bates, and Pettit 1990; Fergusson and Lynskey 1997). Most tests of the cycle of violence theory have controlled for demographic characteristics of children and/or families (e.g., age, gender, race/ethnicity, and family SES), but fewer have controlled for other psycho-social risk factors known to influence violence (though for exceptions, see Fagan 2005; Herrenkohl et al. 2003). Failure to do so risks mis-specifying and perhaps over-stating the relationship between child physical abuse and subsequent violence. Our data are drawn from a large-scale and comprehensive study of children's development, thereby allowing the inclusion of a diverse set of control variables and a stringent examination of the relationship between abuse and violence.

Finally, our analyses explore the possibility that the effect of abuse on violence will differ across children and their environments. While some investigations have examined demographic characteristics such as gender, race/ethnicity, and family socio-economic status as potential moderators of the cycle of violence (e.g., Fagan 2005; Mersky and Reynolds 2007), there has been little examination of the potential for neighborhood conditions to impact the relationship between child physical abuse and subsequent violence. We examine this possibility in this study.

NEIGHBORHOOD DISADVANTAGE, CHILD ABUSE, AND YOUTH VIOLENCE

Contextual research suggests that neighborhoods impact children's development in direct, indirect, and moderating ways (Aber et al. 1997). We speculate that the relationship between child abuse and violence will be moderated by neighborhood characteristics – that is, that the

impact of child abuse on violence will vary according to the neighborhood in which children reside. Although there are very few studies that have examined the degree to which neighborhood context moderates the effect of child abuse (Coulton et al. 2007), our hypothesis is based on emerging evidence that neighborhoods condition the relationships between other family violence-related variables, such as family violence and the perpetration of child maltreatment (Coulton, Korbin, and Su 1999), maltreatment and aggression (Schuck and Widom 2005; Yonas et al. 2010), and race and child abuse (Molnar et al. 2003). Only one study that we are aware of has explored the moderating impact of neighborhood disadvantage on the relationship between child abuse and violence (Schuck and Widom 2005). Schuck and Widom (2005) examined the long-term impact of officially substantiated child abuse and neglect on adult criminal offending. This study found that not only were abused and neglected children more likely to be arrested later in life than non-maltreated children (consistent with the expectations of the cycle of violence), but the relationship between child abuse/neglect and adult criminal arrests was slightly ($p < .10$) *stronger* in areas of higher concentrated disadvantage, controlling for victims' gender, race, and age.[1] Additional analyses that examined relationships according to the type of maltreatment experienced indicated that neglect was a stronger risk factor for later criminal offending among children who grew up in disadvantaged neighborhoods. The effect of child physical abuse, however, was not moderated by neighborhood disadvantage. This study provided some evidence that neighborhood disadvantage may moderate the relationship between child maltreatment and offending, though it did not examine violent behavior in particular, focused on adult offenders (who were on average 32 years old), and measured maltreatment and offending using official statistics, which likely reflect individuals

[1]Schuck and Widom's (2005) results indicated that residential stability, ethnic heterogeneity, and concentrated advantage did not have direct or moderating effects in fully specified models.

experiencing more extreme forms of maltreatment or who are involved in more frequent and/or serious criminal behavior. The degree to which neighborhood context moderates the effects of physical abuse on violence among adolescents has not, to our knowledge, yet been examined.

Although Schuck and Widom (2005) found that the effect of maltreatment (primarily neglect) on adult offending was *amplified* in more disadvantaged neighborhoods, in the broader literature examining neighborhood moderation on a variety of individual-level relationships, some studies have also indicated that disadvantage makes bad situations worse (e.g., Beaver et al. 2012; Schuck and Widom 2005), while others have suggested that disadvantage *mitigates* the effects of certain risk factors (Coulton, Korbin, and Su 1999; Gibson 2012; Zimmerman and Messner 2011). Similar to Schuck and Widom's (2005) results, Brody and colleagues (2003) found that poor parenting practices had stronger effects on delinquency in high poverty neighborhoods, and Simons et al. (2005) reported that the effect of positive parenting practices on delinquency were *weaker* in disadvantaged neighborhoods. Neighborhood disadvantage has even been found to moderate the effect of genes on behavior: Beaver and colleagues (2012) reported that the effect of certain genetic risk factors on aggression were stronger in disadvantaged areas.

Alternatively, some scholars report contradictory findings regarding the negative impact of disadvantage. Coulton and colleagues (1999) examined parents' potential for child maltreatment in Cleveland, and found that the relationship between parents who reported experiencing violence as children and their own potential for child maltreatment was *weaker* in poorer neighborhoods, while the relationship was strongest in the most affluent neighborhoods. Gibson (2012) reported that low self-control increased victimization among adolescents in a Chicago sample, and this relationship was attenuated in disadvantaged areas and exacerbated in

more affluent areas. Finally, Zimmerman and Messner (2011) found similar moderating effects between disadvantage and delinquent peers on adolescent violence: as neighborhood disadvantage increased, the negative impact of delinquent peers on violence decreased.

Because the findings to date regarding the moderating effects of neighborhood disadvantage on various individual-level relationships are mixed, many scholars maintain that the precise mechanism(s) by which neighborhood disadvantage may influence outcomes are still unknown (e.g., Schuck and Widom 2005; Zielinski and Bradshaw 2006). Many suggestions have been put forth, however. Zimmerman and Messner (2011) refer to "saturation effects" associated with highly disadvantaged areas, and hypothesize that the impact of violent peers (or, by extension, any other risk factor) on youth violence is weaker in these communities because exposure to the risk factor is much more likely to occur; in areas with lower levels of risk, the impact would be felt more strongly because such influences are not as plentiful or redundant with their own experiences. In a somewhat similar vein, Gibson (2012) discussed the "social push" hypothesis (Raine 2002), as a potential explanation of his findings. The social push hypothesis suggests that within neighborhoods experiencing multiple risk factors (such as disadvantage and abuse), the effect of any *one* risk factor is diluted (Raine 2002).

Others (e.g., Coulton et al. 2007; Stewart, Simons, and Conger 2002) have suggested that the norms in the neighborhood, especially highly disadvantaged and violent neighborhoods, play an important role in linking neighborhood characteristics to child and youth outcomes. For instance, Stewart et al. (2002, p. 820) suggested that children in violent disadvantaged neighborhoods may "become desensitized to the pervasive neighborhood violence they witness," and that by being exposed to high rates of violence, they "may be more likely to normalize it or become desensitized to it." We believe this perspective indicates a potential for neighborhood

cultural norms to moderate the effect of child abuse on violence, yet, no study that we are aware of has explored this possibility, and it is therefore unknown whether (or how) neighborhood norms are related to the child abuse—violence relationship. We examine this relationship in the current study.

THE MODERATING ROLES OF DISADVANTAGE, CULTURAL NORMS, AND TOLERANCE FOR DEVIANCE

It is possible that neighborhood disadvantage may moderate the relationship between child abuse and later violence in part because of neighborhood cultural norms or cognitive landscapes (Sampson and Wilson 1995). We suspect that these norms, if tolerant of child abuse, fighting between family members or with friends, or deviance/delinquency in general, may *exacerbate* the effect of child abuse on subsequent violence, particularly if they send a message to youth that: a) neighbors are unwilling to intervene to stop the abuse or to provide support to victims of child abuse, or b) certain acts and behaviors, such as child abuse (see, e.g., Korbin et al. 2000) or violence are not wholly unacceptable, at least under certain situations or contexts (e.g., as adaptations for instance, see Anderson 1999; Kirk and Papachristos 2011). Alternatively, neighborhood cultural norms regarding violence and fighting with others, including family members, might *mitigate* the effect of child abuse on youth violence by conveying less condemnation of such behavior and/or desensitizing (e.g., Stewart, Simons, and Conger 2002) or "saturating" (e.g., Zimmerman and Messner 2011) youth to abuse. We expand upon these possibilities below.

First, neighborhood disadvantage may foster a culture that tolerates violence which occurs within familial relationships and may make it less likely that neighbors will step in to stop such violence. In this manner, disadvantaged neighborhoods with attenuated mainstream values

(Kornhauser 1978; Warner 2003) may foster cognitive landscapes (Sampson and Wilson 1995) whereby residents view violence within families as somewhat acceptable under some conditions, normative, and/or a private matter (e.g., Sampson and Bartusch 1998; Sampson and Bean 2006; Sampson and Wilson 1995). For instance, some parents in these neighborhoods may believe that overly restrictive and punitive discipline strategies are necessary to keep children safe and may even help "toughen them up" so they are better prepared for the violent interactions they are likely to face on the streets (Furstenberg et al. 1999; Ness 2004). At the same time, some residents may be ambivalent about violence within the family (e.g., Berg et al. 2012; Harding 2007), and others may fiercely condemn such behavior. The multitude of different value systems that exist in disadvantaged communities may expose residents to a variety of different viewpoints on familial violence, and potentially increase the likelihood that they become more tolerant of a variety of acts (Berg et al. 2012; Harding 2007). The overall effect may be that neighborhood residents who are available to intervene may be less willing to get involved (e.g., "none of my business," see also Kirk and Papachristos 2011). If residents are more tolerant of violence in general and within families, and less apt to take action to stop violence, the social mores that work to control such behavior may be weakened, essentially "freeing" people to behave more aggressively (Hirschi 1969; Sykes and Matza 1957).

Relevant to the current study, when norms are more tolerant of family violence, and neighbors are less willing to intervene, the potential for child abuse to increase children's perpetration of violence may be heightened. Children in these areas are likely to receive lower levels of social support from adult residents, and thus may be more harmed by the stressors of abuse (Agnew 2006). In addition, children in these neighborhoods are more likely to be exposed

to attitudes favorable to violence (Stewart and Simons 2006); as a result, they may be more likely to perpetrate violent behaviors themselves.

Alternatively, neighborhood disadvantage and cultural norms may *mitigate* or *weaken* the relationship between child abuse and violence. Research indicates that disadvantaged areas have higher rates of child abuse and maltreatment (Coulton et al. 2007; Coulton, Korbin, and Su 1999; Molnar et al. 2003), and that residents in these areas are more likely than residents living in suburban areas to be investigated for child maltreatment (Coulton et al. 2007) and to hold different views about why child abuse occurs (Korbin et al. 2000) or how to respond to it (e.g., regarding formal or informal responses, Kirk and Papachristos 2011). It is therefore plausible that within disadvantaged neighborhoods, child abuse may be considered more typical or commonplace. If child abuse occurs more often in disadvantaged areas, and residents in such areas have greater acceptability of various views regarding family violence (Berg et al. 2012), then these behaviors are more likely to be "normalized" (Anderson 1999; Stewart, Simons, and Conger 2002). In turn, the effects of being a victim may be less severe. For example, youth in these areas may be more likely to either have experienced abuse or received harsh/severe physical discipline from their parents, or to know others who have experienced these things, and may therefore be less likely to view such behaviors as aberrant or 'abusive.' Stewart and colleagues (2002) suggested that youth in disadvantaged neighborhoods may become "desensitized" to the violence and victimization that surrounds them, and we suggest that this desensitization may reduce the negative impact of child abuse on victims' later violence.

To summarize, the literature demonstrates that that child abuse can lead to violence (Widom 1989), but there may be moderating factors that influence this relationship. Neighborhood disadvantage and cultural norms regarding the acceptability of deviance and/or

the use of aggression within families or close groups could each moderate the effects of child abuse on violence, but very few studies have examined the potential for these contextual variables to do so. Building from and integrating these lines of research, we investigate the relationship between neighborhood disadvantage, cultural norms, child physical abuse, and violence. We examine three research questions: a) what is the main effect of child abuse on later violence, controlling for other relevant risk factors for adolescent violence?; b) if the relationship between child abuse and violence varies across neighborhoods, is this relationship conditioned by neighborhood disadvantage?; c) if the relationship between child abuse and violence varies across neighborhoods, is this relationship moderated by neighborhood tolerance for deviance and tolerance for fighting between family members and friends, controlling for neighborhood disadvantage?

METHODS

DATA

This study used data from the Project on Human Development in Chicago Neighborhoods (PHDCN; Earls et al. 2002). The PHDCN collected data from 343 neighborhood clusters (NCs) in Chicago. The NCs were derived from 847 contiguous census tracts in the city. Each of the NCs comprises about 8,000 residents. From these NCs, data for the PHDCN were collected in several different components – we used data from the Community Survey, the Longitudinal Cohort Study, and the 1990 United States Census in the current study.

Individual-level measures were created from data collected during the first and second waves of the Longitudinal Cohort Study (LCS), between 1994 – 1997 and 1997 – 2000, respectively. The 343 NCs described above were grouped by seven categories of racial/ethnic composition (e.g., 75 percent or more African American) and three levels of socioeconomic

status (e.g., high, medium, low); from these 21 strata, 80 NCs were selected via stratified probability sampling from which respondents were sampled for the LCS. In the first wave, 6,226 children, adolescents, and young adults aged 0 to 18 living in these 80 NCs were surveyed, along with their primary caregivers, most of whom (93.2 percent) were females.

Data for neighborhood disadvantage were abstracted from the 1990 United States Census. Recall that each neighborhood cluster was comprised of a number of contiguous census tracts. Census tract information was matched with corresponding neighborhood clusters, and census-derived information for each NC was calculated in order to measure the structural disadvantage of the 80 NCs. The matching process was conducted by staff at the Interuniversity Consortium for Political and Social Research (ICPSR) to ensure the confidentiality of the subjects of the PHDCN.

The neighborhood measures of tolerance for deviance and tolerance for fighting among family and friends were derived from the Community Survey portion of the PHDCN. The Community Survey took place between 1994 and 1995 and surveyed a sample of residents from all 343 NCs. Residents were asked questions regarding their neighborhood's political and organizational groups, cultural values, and social networks, among other topics. The Community Survey followed a three-stage sampling design where city blocks were sampled within each NC, dwelling units were then sampled within blocks, and one adult resident was sampled within each dwelling unit. This study relies on data only from the 80 neighborhood clusters in which the individual respondents from the LCS were nested.

Given our focus on child abuse and later adolescent violence, the current study includes respondents from three cohorts of youth (aged 9, 12, and 15 at wave one, n = 1,372) and their caregivers. Table 1 describes the measures used in this study.

MEASURES

Dependent Variable. The violence measures were taken from the Self-Report Delinquency Questionnaire (Huizinga, Esbensen, and Weiher 1991) and were self-reported by the youth subjects. At waves one and two, youth were asked to report whether in the past year they had committed each of seven violent acts: throwing objects at someone, hitting someone, hitting someone you live with, carrying a weapon, attacking with a weapon, being involved in a gang fight, and committing robbery. Our analysis focuses on whether a youth engaged in any of these violent behaviors at wave two. To predict the odds of engaging in each violent behavior, we utilized a multivariate, multilevel Rasch model (Raudenbush, Johnson, and Sampson 2003). The three-level model nests violent item responses within persons within neighborhoods. The level-one model (items within persons) produces a latent variable which represents each person's *propensity for violence* (i.e., their likelihood of engaging in various violent behaviors). This continuous variable is assumed to be normally distributed on a logit metric and is the outcome variable for the level-two (person-level) and level-three (neighborhood-level) models (Osgood, McMorris, and Potenza 2002).

Child Physical Abuse. Child physical abuse[2] was assessed with the Conflict Tactics Scale for Parent and Child and reflected whether the parent reported using any of four serious forms of physical abuse against the youth (kicked, bit, or hit child with fist; hit child with something; beat child up; burned or scalded child) during the past year (coded no = 0; yes = 1).

Control variables. Multiple control variables were included in the analysis to account for other possible predictors of youth violence. Adolescents reported on their age, demographic information, prior violence, and friends' delinquency. *Male* indicated that the youth was male

[2] Victims of child physical abuse span a range of ages and include both younger children (e.g., 9 years old) and adolescents (e.g., 15 years old). We refer to this form of violence as "child" abuse to be consistent with the broader literature on family violence.

(no = 0, yes = 1). *Age* was the youth's age in years. *Hispanic* and *African American* were dichotomous variables denoting the race/ethnicity of the participant, with Caucasians (non-Latino Whites) serving as the reference category. *Peer delinquency* was based on child reports of the number of their friends who engaged in 11 delinquent acts (alpha = 0.82), including vandalism, stealing, breaking and entering, car theft, fighting, robbery, selling drugs, etc. Youth responded to each item using a four-point scale (1 = none; 2 = some of them; 3 = most of them; 4 = all) and responses were summed across the 11 items. Youths' own *prior violence* was a dichotomous variable indicating reports of any violence, based on seven items (throwing objects at someone, hitting someone, hitting someone you live with, carrying a weapon, attacking with a weapon, being involved in a gang fight, or robbery; alpha = 0.66) assessed at wave one.

Responses from the primary caregiver or interviewer impressions were used to measure four additional variables, all taken at wave one: youth self-control, parental warmth, family socioeconomic status, and parental criminality. Following Gibson et al. (2010), youth's *low self-control* was measured according to 17 items (alpha = 0.75) reported by parents on the Emotionality, Activity, Sociability, and Impulsivity (EASI) Temperament survey (Buss and Plomin 1975). Parents were asked to report on a five-point Likert scale how characteristic each attitude or behavior was for their child, with items relating to inhibitory control (e.g., "has trouble resisting temptation"), decision time (e.g., "often acts on the spur of the moment"), sensation seeking (e.g., "will try anything once"), and persistence (e.g., "tends to give up easily"). Responses were summed across items and scored such that higher values indicate lower levels of self-control. *Parental warmth* towards the youth reflects the number of acts displayed by parents towards children, as observed by trained PHDCN staff conducting in-home interviews, who rated the occurrence of each of nine behaviors (alpha = 0.76; e.g., praise,

encouragement, and affection offered to children from parents) using a dichotomous rating scale (not observed = 0; observed = 1). *Family SES* was a factor score based on parent education, employment and income (alpha = 0.58). *Parental criminality* was a dichotomous variable (no = 0; yes = 1) indicating that either biological parent of the child had "trouble with the police or been arrested."

Neighborhood Variables. A measure of concentrated disadvantage was created through principal components factor analysis of the neighborhood cluster census data described above. *Concentrated disadvantage* included the percentage of residents in a neighborhood cluster who were below the poverty line, receiving public assistance, and unemployed (alpha = .81) (e.g., Cerda et al. 2008; Molnar et al. 2008).

We use two measures to assess the cultural context of neighborhoods. The first measure reflects neighborhood attitudes regarding deviance in general, while the second assesses neighborhood attitudes towards violence among family and friends specifically. Regarding deviance in general, we followed the procedures used in previous analyses of the PHDCN data (e.g., Raudenbush and Sampson 1999; Sampson, Raudenbush, and Earls 1997; Wright and Benson 2010), and used a three-level item response model to create a *tolerance for deviance* scale. This scale measured neighborhood residents' attitudes about the wrongfulness of drinking, drug use, and fighting among teenagers. Residents were asked how wrong they considered it to be for 13- to 19-year olds to smoke cigarettes, use marijuana, drink alcohol, and get into fist fights (neighborhood internal consistency reliability =.511; see Raudenbush and Sampson 1999 for more details regarding item response scale reliabilities across aggregates). Responses were originally given from one to five on a Likert-type scale ranging from "extremely wrong" to "not wrong at all." Due to the skew in responses, answers to each item were subsequently

dichotomized; categories of "not wrong at all" and "a little wrong" were combined and coded as 1, whereas "wrong," "very wrong," and "extremely wrong" were combined and coded as 0. As such, the tolerance for deviance measure for the item response model indicates the degree to which neighborhoods tolerated deviance. Although these forms of deviance may seem far removed from child physical abuse, we include them in our models for methodological and theoretical reasons. First, this measure has been used in prior research on race/ethnicity and street violence (Sampson and Bartusch 1998), as well as other forms of familial violence (Wright and Benson 2010) with the PHDCN data. Second, we theorize that since tolerance of minor forms of deviance is often associated with more serious forms of crime (Kelling and Coles 1996), neighborhoods that do tolerate these minor forms of deviance may also tolerate more serious forms of interpersonal or family violence, including child abuse. Finally, it is also likely, but largely untested, that residence in such environments will moderate the likelihood that children who are physically abused will become violent themselves, because either the child abuse or violence is seen as more normative behavior.

Finally, as a measure of neighborhood culture more directly related to our focus on the negative consequences of family violence, we drew on one item from the Community Survey in which respondents were asked how much they agreed or disagreed with the statement that "fighting between friends or within families is nobody else's business." The five response categories ranged from "strongly disagree" to "strongly agree." Responses were dichotomized to create the *tolerance for fighting among family and friends* measure, which indicates the proportion of residents in a neighborhood cluster who either agreed or strongly agreed (coded as 1) with the statement. In the current study, 32 percent of residents agreed or strongly agreed that fighting between friends or family was nobody else's business. We theorize that neighborhoods

in which fighting among family members and friends is viewed as a private matter create more opportunities for and acceptance of family violence, including child abuse, and that this level of support will condition the likelihood that victims of abuse will subsequently engage in violence themselves.

(TABLE 1 ABOUT HERE)

STATISTICAL ANALYSES

Following Raudenbush and colleagues (2003), Sampson and colleagues (2005), and Zimmerman and colleagues (Zimmerman and Messner 2010, 2011), we employ a multilevel logistic regression model to predict the odds that a respondent living in a given neighborhood will engage in a specific violent offense. This allows us to utilize all 9,593 responses to the wave two violence items provided by all 1,372 of the participants living in 79 neighborhoods[3] in our sample. Thus, our analytic technique includes any subject who responded to at least one violence item asked at wave two. This technique effectively avoids the loss of data due to missing item responses (Osgood, McMorris, and Potenza 2002). This modeling technique is also beneficial in that it takes item difficulty into account (i.e., that some of the violent behaviors are more serious and thus less prevalent than others), and allows simultaneous estimation of the impact of individual-, family-, and neighborhood-level influences on the likelihood of violence (Sampson, Morenoff, and Raudenbush 2005).

The multivariate multilevel Rasch model is a three-level model in which dichotomous violence items are nested within persons, who are nested within neighborhoods (Raudenbush, Johnson, and Sampson 2003). The level-one outcome is the log-odds of responding affirmatively to item *i* of *m-1* violence items, by *j* person, living in *k* neighborhood, and has been referred to as an individual's "criminal propensity" (Zimmerman and Messner 2010, 2011), or "propensity for

[3] One neighborhood dropped out when we limited our analyses to youth in cohorts 9-15.

violence" in the current analyses. This variable locates item severities on the logit scale (Raudenbush, Johnson, and Sampson 2003). Thus, the level-one model adjusts the within-person propensity for violence by item severity, missing data, and measurement error. The level-one intercept serves as the outcome for the level-two and level-three models and is assumed to be normally distributed on a logit scale.

The level-two model examines the effects of person-level correlates (e.g., age, gender, child physical abuse) on the level-one intercept (propensity for violence), while also controlling for item severities at level-one. All of the person-level effects were grand-mean centered. The effects of all covariates were assumed to be fixed across neighborhoods, except for the effect of child abuse, which varied across neighborhoods ($p < .05$), permitting the examination of the cross-level interactions.

The level-three model allows estimation of the propensity for violence across neighborhood clusters. The level-three intercepts-as-outcomes model examines the effects of neighborhood concentrated disadvantage and cultural norms on the level-two intercept (i.e., the propensity for violence, controlling for person-level correlates at level-two and item severities at level-one). The level-three slopes-and-intercepts-as-outcomes model allows for examination of the cross-level interaction between neighborhood concentrated disadvantage and cultural norms and the level-two relationship between child physical abuse and propensity for violence.

RESULTS

Tables 2 and 3 present the results of our three research questions. The results shown in Table 2 are based on models that control only for demographic background characteristics (age, race, gender, family SES) at the individual-level. We use these models to be consistent with and allow comparison of our findings with most previous examinations of the cycle of violence (e.g.,

Schuck and Widom 2005). Because abused children may be at increased risk for exposure to other risk factors known to increase violence (e.g., criminal parents, exposure to delinquent peers, and/or individual risk factors such as impulsivity or low self-control, see Dodge, Bates, and Pettit 1990; Fergusson and Lynskey 1997), it is also important to control for such experiences. Doing so helps to ensure that the impact of child abuse on violence is not overstated or mis-specified. We examine the impact of abuse on violence controlling for a range of psycho-social risk factors, as well as demographic characteristics, in the "fully specified" models shown in Table 3.

Table 2, Model 1 depicts the main effect of child abuse on violence controlling for concentrated disadvantage and individual-level background characteristics. Consistent with many previous examinations of the cycle of violence (e.g., Schuck and Widom 2005), the results demonstrate that child abuse increased youths' subsequent violence (.29*, $p \leq .05$). Additionally, males, older youth, and African American youth reported significantly more violence than females, younger youth, and non-Latino Whites.

The effect of child abuse on the propensity for violence did significantly vary across neighborhoods ($p \leq .05$), both in models controlling only for demographic characteristics and in the fully specified models, meaning that in some neighborhoods, the influence of child abuse on violence appeared to be stronger, while its influence was weaker in other neighborhoods. The purpose of the cross-level interactions, provided in the top halves of Tables 2 and 3, is to explain this variation and determine whether or not neighborhood disadvantage and cultural norms moderated the effect of child physical abuse on violence.

Model 1 in Table 2 also displays the cross-level interaction of concentrated disadvantage on the relationship between child abuse and violence, as well as the direct effect of disadvantage,

while Models 2 and 3 add the tolerance measures. Results indicate that the direct effect[4] of disadvantage on adolescent propensity for violence (bottom section of Table 2) was largely not significant, except in Model 3, where it reached a marginally significant level (.12†, $p \leq .10$). In Model 1, the cross-level interaction term was significant (-.27*, $p \leq .05$) and indicated that concentrated disadvantage significantly reduced the effect of child abuse on subsequent violence. The direction of this effect suggested that the relationship between child abuse and the likelihood of youth violence became *weaker* as neighborhood disadvantage increased. The moderating effect of disadvantage continued to be significant and negative in models including tolerance for deviance (-.30*, $p \leq .05$; Model 2) and tolerance for fighting in among family and friends (-.31*, $p \leq .05$; Model 3).

Models 2 and 3 demonstrate that cultural norms maintained direct effects on youth violence, with norms tolerant of delinquency in general (.68**, $p \leq .01$) and for fighting specifically within intimate groups (1.74**, $p \leq .01$) significantly increasing youth subsequent violence. Yet, these norms did not moderate the relationship between child abuse and violence, as did disadvantage.

(TABLE 2 ABOUT HERE)

The results of the "fully specified" models shown in Table 3 demonstrate the importance of controlling for additional risk factors for violence. The effect of child abuse on violence became nonsignificant when controlling for youths' prior violence, peer delinquency, low self-control, parental criminality, and parental warmth, many of which were related to children's propensity for violence. As shown in Model 1, although child abuse had no effect on later violence, males, older youth, African American youth, those with lower self-control, those with

[4] Recall that since individual-level variables were grand mean centered, the "main" or direct effects of neighborhood factors indicate the average effect across all neighborhood clusters included in the analyses.

more friends who had been delinquent, and those who had previously engaged in violence were significantly more likely to engage in violent behavior. These findings did not change substantively when various neighborhood-level variables were entered into Models 2, 3, or 4.

That child abuse was not significantly related to the propensity for violence three years later was somewhat surprising, given prior support for the cycle of violence theory in longitudinal investigations (Schuck and Widom 2005; Smith and Thornberry 1995; Widom 1989). However, our analyses, particularly those shown in Table 3, are based on a very rigorous test of the cycle of violence theory compared to some prior research. First, as mentioned, some of these studies have included only demographic controls (e.g., Schuck and Widom 2005; Smith and Thornberry 1995; Widom 1989), and have not controlled for other known predictors of violence. Additionally, many tests of the cycle of violence have utilized official data to assess maltreatment and/or offending (Mersky and Reynolds 2007; Schuck and Widom 2005; Widom 1989), which may reflect only the most serious cases and, by extension, children most likely to become involved in violence (Dodge, Bates, and Pettit 1990). Our study, in contrast, relied on maternal self-reports of physical abuse, not substantiated, official reports of abuse, and youth self-reports of violence. Given that our study includes a range of control variables, relies on measures which potentially include a greater range of violence that occurs but is not subject to official intervention, and uses independent sources of data to measure independent and dependent variables, we avoid the potential to inflate the strength of the relationship between child abuse and violence.

Model 2 in Table 3 presents the direct effect of neighborhood disadvantage on youths' propensity for violence, as well as its moderating effect on the relationship between child physical abuse and the propensity for violence. Once more, disadvantage was not significantly

related to the propensity for violence. These results again differ from the findings of Schuck and Widom (2005), who reported that neighborhood disadvantage predicted higher arrest rates among adults. It is worth reiterating that they examined official arrest records of adults, whereas we relied on self-reports of youth violence, and it may be that disadvantage increases the likelihood of arrest, but not necessarily offending in general, or that disadvantage does not have a direct impact on violence during adolescence. In fact, our null findings in this regard are consistent with previous and more recent evidence that has also failed to find significant, direct effects of neighborhood disadvantage on self-reported youth violence (e.g., Maimon and Browning 2010; Zimmerman and Messner 2011).

More interesting, however, are the results of the cross-level interaction between disadvantage and the relationship between child abuse and violence in the fully specified models. The cross-level interaction was marginally significant (-.25†, $p \leq .10$) and indicated that concentrated disadvantage somewhat reduced the effect of child abuse on subsequent violence. While weaker in terms of statistical significance (most likely due to the additional individual-level controls), the direction of this effect was similar to that found in Table 2, and suggested that the relationship between child abuse and violence became *weaker* as neighborhood disadvantage increased. Figure 1 depicts the cross-level interaction shown in Model 2 of Table 3. As can be seen, the relationship between child abuse and violence was steep and positive in neighborhoods characterized by low (one standard deviation below the mean) disadvantage, indicating that child abuse strongly increased later violence when experienced in such neighborhoods. The relationship between child abuse and violence became weaker (as indicated by the flattening slope) as the level of disadvantage within neighborhoods increased. Finally, in highly (one standard deviation above the mean) disadvantaged neighborhoods, the slope of child physical

abuse and violence tilted in the negative direction, signifying that disadvantage weakened the relationship between childhood abuse and later violence.

(FIGURE 1 ABOUT HERE)

We conducted several additional analyses (not shown) to confirm the robustness of the finding that concentrated disadvantage alleviated the effect of child abuse on violence. These results indicated that the cross-level interaction of disadvantage was *not* dependent upon having tolerance measures, prior violence, and/or peer delinquency in the models, nor was it dependent upon using certain codings of child abuse and measures of cultural norms. Specifically, the cross-level interaction was statistically significant (at $p \leq .05$) when prior violence was excluded from the fully specified models (in models which included and excluded tolerance measures). When peer delinquency was excluded from the fully specified models and tolerance measures were included, the interaction term also remained statistically significant (at $p \leq .05$), and became marginally significant ($p \leq .10$) when peer delinquency was dropped from the analysis. Further, the interaction term was negative and marginally significant ($p \leq .10$) in models where a count variable was used to measure child abuse and when a continuous measure was used to represent tolerance.[5] Since similar patterns of findings were demonstrated across all of these analyses, we believe that the interactions presented in Tables 2 and 3 are robust and reliable.

Model 3 in Table 3 adds tolerance for deviance as a neighborhood predictor. Tolerance for deviance maintained a significant direct effect on youth violence at wave two (.57**, $p \leq .01$) controlling for a variety of individual-level influences, suggesting that, in general, areas of higher tolerance for general delinquency (i.e., substance use and fighting) experienced a higher propensity for youth violence. This variable did not significantly alter the relationship between

[5] The only model in which the cross-level interaction was not significant was when disadvantage was dichotomized to differentiate neighborhood clusters at the highest quartile of disadvantage versus all others, and this finding may be due to limited statistical power.

child abuse and violence, though, as indicated by the non-significant cross-level interaction term. However, when this interaction term was included, the coefficient representing the cross-level interaction for disadvantage became stronger in terms of statistical significance (moving from $p \leq .10$ to $p \leq .05$).

Similar results were found in Model 4 when neighborhood tolerance for family violence was added to the analysis. Like the direct effect of tolerance for deviance, tolerance for violence within families and friends significantly increased the likelihood of youth violence; higher levels of tolerance for this violence predicted higher rates of adolescent violence (1.47**, $p \leq .01$; see Model 4). Further, the cross-level interaction term indicated that tolerance for violence among family and friends did not significantly impact variation in the effect of child physical abuse on violence across neighborhoods, but its addition to the model did enhance the moderating effect of concentrated disadvantage on this relationship. As in Model 3, the results showed that disadvantage significantly (-.29*, $p \leq .05$) reduced the effect of child abuse on subsequent violence once tolerance for violence among family and friends was included. Taken together, the results from the cross-level interactions presented in Tables 2 and 3 suggest that concentrated disadvantage reduced the impact of child abuse on subsequent youth violence, but this effect was strengthened (to the $p \leq .05$ level in the fully specified models) when cultural norms that condone the use of violence generally (tolerance for deviance) as well as within families and intimate groups specifically (tolerance for fighting among family and friends) were included. That the moderating effect of concentrated disadvantage was strengthened (to the $p \leq .05$ level) when cultural norms were included suggests a potential suppression effect. These findings may indicate that the effect of child abuse on subsequent youth violence was weaker in disadvantaged areas which were also more tolerant of deviance.

(TABLE 3 ABOUT HERE)

DISCUSSION AND CONCLUSIONS

Although some scholars have speculated about the various mechanisms by which neighborhoods moderate individual-level relationships, few studies have specifically examined these complex phenomena. Our study sought to advance this literature and extend the cycle of violence theory by exploring whether neighborhood disadvantage and cultural norms moderated the impact of child abuse on subsequent violence. Our results suggest that the cycle of violence may be contextualized by neighborhood conditions, especially structural disadvantage. Further, the effect of neighborhood disadvantage may be particularly salient when paired with cultural norms that are more tolerant of deviant behaviors and fighting among intimate social groups. We discuss our findings below.

A first goal of our study was to test the cycle of violence theory using a methodologically rigorous approach, which relied on independent sources of information to assess key constructs, and involved an ethnically diverse, representative sample of children living in Chicago. Our results indicated that controlling only for demographic/background characteristics, child abuse predicted subsequent self-reported violence among adolescents. While this is consistent with prior evidence regarding the cycle of violence (e.g., Schuck and Widom 2005; Widom 1989), we also found that this effect was diluted to nonsignificance once additional important controls were added. Therefore, while child abuse is a salient risk factor for problem behavior among youth, it is important to consider other – perhaps more proximate risk factors (e.g., peer delinquency) – when assessing this relationship, so as not to overstate the impact of child abuse.

We next explored the direct and moderating effects of disadvantage, and our results add to a growing body of recent research that suggests while the direct impact of neighborhoods may

be weak, the indirect or moderating effects may be more pronounced. To illustrate, we found that disadvantage consistently, across multiple models including a variety of individual-level control variables and neighborhood cultural norms, failed to directly impact youth violence, yet weakened the effect of child abuse on subsequent violence. These moderating effects are consistent with recent studies showing that neighborhood disadvantage reduces the strength of other individual-level relationships (Gibson 2012; Zimmerman and Messner 2011). Nonetheless, the findings were somewhat surprising, given that we posited that the effect of child abuse could be exacerbated in disadvantaged areas, as it would add to the pool of risk factors that youth were already exposed to within their neighborhood. Further, some prior research has supported this perspective, and has shown that risk factors can be more salient when experienced in combination with neighborhood structural disadvantage (e.g., Beaver et al. 2012; Brody et al. 2003; Schuck and Widom 2005). Our results suggest otherwise, and we speculate as to why this may be so below.

Our final aim was to explore the degree to which cultural norms tolerant of deviance and violence among family or friends impacted youths' propensity for violence directly and whether they moderated the effect of child abuse on their propensity for violence, controlling for structural disadvantage. The results of these analyses showed that neighborhood cultural norms which were more tolerant of deviance in general, as well as violence within families and friendship groups, significantly increased the likelihood that youths engaged in violent behaviors. Relatively few studies have examined the impact of cultural norms on adolescent violence (for exceptions, see e.g., Berg et al. 2012; Kirk and Matsuda 2011), and our study adds to and supports the findings in this area by demonstrating that community norms can influence adolescent behavior. Although the direct effects of cultural norms on violence were significant,

their moderating effects on the relationship between child abuse and subsequent propensity for violence were not. Additionally, they did not mediate the effect of disadvantage, as some other neighborhood social constructs (e.g., collective efficacy or legal cynicism, Kirk and Matsuda 2011; Sampson, Raudenbush, and Earls 1997) have. Instead, including these cultural norms appeared to *strengthen* (in terms of statistical significance) the mitigating effect of disadvantage on the relationship between child abuse and violence, implying a suppression effect. Certainly, more research is needed to disentangle the precise relationship between norms and disadvantage, especially using data on norms at the aggregate level as we employed here. To help guide such research, we propose two possible explanations for our results which we hope can be further explored in future research.

First, it is plausible that in disadvantaged areas, where violent behaviors are in general more abundant, violence is more likely to be seen as a somewhat common, legitimate, or a necessary way of interacting with others (Anderson 1999; Berg et al. 2012; Kirk and Papachristos 2011), at least under some circumstances. In these areas, violence in the home may also be more plentiful and somewhat more tolerated, among at least some residents. In fact, in supplemental analyses (not shown), we found that both tolerance measures independently predicted the prevalence of child abuse, with greater levels of tolerance associated with increased levels of child abuse.[6]

The effect of experiencing physical abuse from caregivers, therefore, might be diluted in these areas, because such behavior occurs more often and may not, as a result, be viewed as particularly aberrant or "abusive." Therefore, the long-term detrimental effect of child abuse on youth violence may be weakened in more disadvantaged areas. This explanation is similar to the

[6] Controlling for individual-level age, race, gender, and family socioeconomic status, as well as concentrated disadvantage, both tolerance measures independently and significantly ($p \leq .05$) predicted the prevalence of child abuse.

"saturation" and "desensitization" arguments put forth by Zimmerman and Messner (2011) and Stewart et al. (2002), respectively. The saturation hypothesis posits that exposure to risk factors (e.g., child abuse) is often higher in disadvantaged areas, and when this exposure reaches a "saturation point," its impact weakens. This may occur, at least in part, because the "messages" conveyed by risk factors (i.e., that physical aggression is one way of interacting with others)[7] become redundant and are no longer "novel" or new (Zimmerman and Messner 2011). At a certain point, when the messages are no longer different enough from existing beliefs or behaviors, they lose their impact and are ignored. Put another way, adolescents become "tolerant" of such risk factors and/or the messages they convey, and their behavior ceases to be influenced by these experiences.

Stewart and colleagues (2002) suggest very similar mechanisms. They stipulate that children exposed to high rates of violence (or, by extension, any other risk factor) may become "desensitized" to it, which weakens its impact on their behavior. We suspect that these saturation and desensitization processes are also very similar to the process of becoming tolerant of such behaviors, and might thus account for our finding that the effect of child abuse on subsequent violence is weaker in more disadvantaged areas (as depicted by the flattening slope in Figure 1), where tolerance for violence may also be greater (Sampson and Bartusch 1998).

A second explanation may be drawn from the "social push" hypothesis, which has posited that biological factors have a stronger impact on deviant behaviors when children live in environments that lack the factors that would otherwise "push" them into crime (e.g., social risk factors, such as living in disadvantaged neighborhoods or residing in a criminal household, see Raine 2002). Drawing from this perspective, we speculate that for youth who experience few risk

[7] We suggest that "messages" can be conveyed or transmitted in direct ways, such as discussion with or interaction with others, as well as in indirect ways, such as by observing others' behaviors or hearing stories of others' behaviors (see also Kirk and Papachristos, 2011).

factors (i.e., who live in more advantaged communities), the effect of any one risk factor (e.g., exposure to violence or abuse) is more readily expressed and potentially more detrimental. Our results suggest that abused children in more advantaged neighborhoods reported engaging in more violence than non-abused children in more disadvantaged neighborhoods, as represented in Figure 1. This pattern is surprising at first glance, given the tendency to consider high-poverty areas as teeming with violence. Yet, we believe that the social push hypothesis is a useful perspective for understanding this relationship (i.e., the stronger negative effect of a risk factor, such as child abuse, in a relatively benign environment, such as an advantaged community). Thus, youth who experience the discontinuity of living in a relatively affluent and more benign community, who are simultaneously exposed to violence in the home, may be more at-risk for experiencing problematic outcomes because they lack other risk factors in their environments. Or, borrowing from Zimmerman and Messner (2011), because the "messages" this risk factor conveys are novel or at odds with the other messages they are routinely exposed to, it thus has a stronger effect on behavior.

Certainly, our results suggest that the mechanisms by which neighborhoods moderate the effect of risk factors on delinquent behaviors are complicated, and it is possible that different mechanisms operate in different "types" of neighborhoods (affluent versus disadvantaged). Our explanations are tentative and speculative at this point, and we encourage future research to continue to explore the various moderating processes involved in different types of neighborhoods.

While we believe that this study has built upon and helped extend the cycle of violence theory by considering neighborhood context, we nonetheless must acknowledge some limitations of our research. Most importantly, our study would have benefited from neighborhood-level

cultural norms measures that tapped into beliefs regarding child abuse in particular, and not proxy measures of general delinquency and family or friend violence as employed here. Additionally, we restricted our measure of child abuse to serious physical abuse (e.g., beating up or hitting one's child, etc.) because we believed more extreme forms of physical discipline would be most likely to lead to violence among victims, but it would be useful to test if other types of violence in families (e.g., more minor forms of abuse) are impacted differently by neighborhood factors. We also used a dichotomous measure of child abuse that does not reflect the incidence or frequency in which children were physically punished; while our supplementary analyses indicated similar results when using a continuous measure of abuse, future studies may wish to examine the relationship between abuse, neighborhood context, and violence using alternate measures. We also utilized caregiver reports of child abuse, which allowed us to avoid the problems associated with official data and with using the same source to measure the primary independent and dependent variables, but it is possible that caregivers under-estimated their use of physically abusive behaviors, due to social desirability, or shame/embarrassment at being identified as an abuser, which would make this a more conservative test of the cycle of violence. It should be noted, however, that some literature has shown that official and self-reports of child maltreatment have similar predictive validity (Smith et al. 2008). Additionally, while the vast majority of the sample was located in the same neighborhood at waves one and two, some participants did move out of their original neighborhood (where the abuse occurred) and we were unable to assess whether this movement impacted the results presented here. Finally, participants in this study spanned a range of ages, and our measure of abuse therefore captured abuse occurring during childhood and adolescence. Some literature suggests that the impact of abuse

on outcomes may vary according to when the abuse occurred (e.g., Finkelhor et al. 2009), and this may have affected our results.

Nonetheless, we believe that our study provides important insights into how and for whom the cycle of violence operates and the mechanisms by which neighborhoods impact individual-level outcomes, and adds to the relatively limited research on neighborhood moderation and cultural norms. Our study contributes to a growing body of research regarding the violence that occurs "behind closed doors" and suggests that neighborhood factors should not be neglected when examining these forms of violence. Overall, these results suggest that neighborhoods may affect youth in very complex ways, and rather than directly impacting youth behavior, neighborhoods may enhance or inhibit the effects of other risk factors. Investigation of the moderating effects of neighborhoods is therefore important, and research needs to continue to identify additional mechanisms by which the neighborhood context impacts behavior.

Table 1. Sample Means and Standard Deviations

	Mean	SD	Min-Max
Outcome			
Propensity for Violence[a]	.07	.26	0-1
Individual-Level Variables			
Child Physical Abuse	.34	.47	0-1
Male	.51	.50	0-1
Age[b]	14.03	2.49	9.11 – 19.89
African American	.32	.47	0-1
Hispanic	.47	.50	0-1
Caucasian	.17	.38	0-1
Low Self-control	46.31	11.50	14 - 85
Parental Warmth	6.25	1.97	0-9
Peer Delinquency	14.65	3.05	7-27
Family SES	.19	1.00	-2.07 - 1.72
Parental Criminality	.12	.33	0-1
Prior Violence	.32	.46	0-1
Neighborhood-Level Variables[c]			
Concentrated Disadvantage	-.00	1.01	-1.51 - 2.35
Tolerance for Deviance	-.00	.27	-.52 - .61
Tolerance for Fighting among Family/Friends	.32	.12	.13 - .70

[a]Based on 9,593 responses across 1,372 respondents living within 79 neighborhood clusters
[b]At wave two
[c]Based on 79 neighborhood clusters
Source: Project on Human Development in Chicago Neighborhoods, waves 1-2.

Table 2. The Direct Effects of Child Abuse and Neighborhood Characteristics on Violence Propensity, and Cross-Level Interactions between Neighborhood Characteristics and the Child Abuse—Propensity for Violence Relationship, Demographic Models[a]

	Model 1		Model 2		Model 3	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept	-3.16**	*.08*	-3.16**	*.07*	-3.19**	*.07*
Individual-level Effects and Cross-Level Interactions						
Child Physical Abuse	.29*	*.13*	.31*	*.13*	.33*	*.13*
xConcentrated Disadvantage	-.27*	*.12*	-.30*	*.13*	-.31*	*.13*
xTolerance for Deviance	--	--	.68	*.48*	--	--
xTolerance for Fighting among Family/Friends	--	--	--	--	-.89	*1.14*
Male	.53**	*.10*	.54**	*.10*	.52**	*.10*
Age[b]	.20**	*.02*	.20**	*.02*	.19**	*.02*
African American[c]	.71**	*.18*	.74**	*.18*	.93**	*.19*
Hispanic[c]	-.01	*.16*	.03	*.16*	.12	*.16*
Family SES	-.03	*.06*	-.03	*.06*	-.02	*.06*
Variance Component	1.48254		1.48217		1.49278	
Neighborhood Direct Effects						
Concentrated Disadvantage	.09	*.07*	.08	*.07*	.12†	*.06*
Tolerance for Deviance	--	--	.68**	*.22*	--	--
Tolerance for Fighting among Family/Friends	--	--	--	--	1.74**	*.52*
Variance Component, Violence Propensity intercept	.05362		.03361		.01545	
Variance Component, Child Abuse intercept	.50205		.26579		.50933	

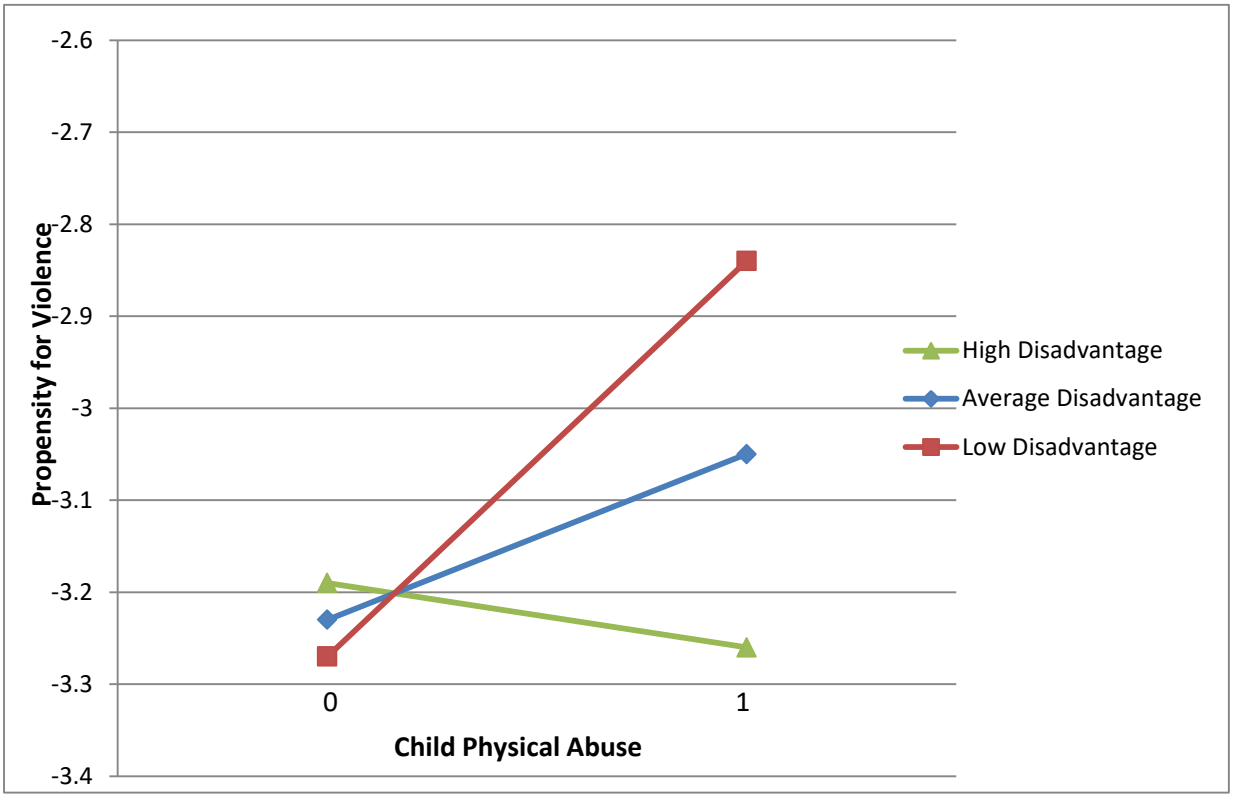
[a]Analyses are based on 9,593 responses across 1,372 respondents living within 79 neighborhood clusters
[b]At wave one
[c]Reference category is Non-Latino White
** $p \leq .01$ * $p \leq .05$ †$p \leq .10$
Source: Project on Human Development in Chicago Neighborhoods, waves 1-2.

Table 3. The Direct Effects of Child Abuse and Neighborhood Characteristics on Violence Propensity, and Cross-Level Interactions between Neighborhood Characteristics and the Child Abuse—Propensity for Violence Relationship, Fully Specified Models[a]

	Model 1		Model 2		Model 3		Model 4	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept	-3.23**	*.08*	-3.23**	*.08*	-3.33**	*.07*	-3.36**	*.08*
Individual-level Effects and Cross-Level Interactions								
Child Physical Abuse	.16	*.14*	.18	*.14*	.20	*.14*	.21	*.14*
xConcentrated Disadvantage	--	--	-.25†	*.14*	-.28*	*.14*	-.29*	*.14*
xTolerance for Deviance	--	--	--	--	.23	*.52*	--	--
xTolerance for Fighting among Family/Friends	--	--	--	--	--	--	-.91	*1.21*
Male	.43**	*0.11*	.43**	*.11*	.44**	*.11*	.43**	*.11*
Age[b]	.11**	*0.02*	.12**	*.02*	.12**	*.02*	.11**	*.02*
African American[c]	.53**	*0.16*	.50**	*.17*	.54**	*.17*	.72**	*.19*
Hispanic[c]	.10	*0.16*	.08	*.16*	.13	*.16*	.22	*.17*
Prior Violence	1.03**	*0.12*	1.03**	*.12*	1.03**	*.12*	1.03**	*.12*
Low Self-Control	.01**	*0.00*	.01**	*.00*	.01**	*.00*	.01**	*.00*
Parental Warmth	-.01	*0.03*	-.01	*.03*	-.01	*.03*	-.01	*.03*
Peer Delinquency	.07**	*0.02*	.07**	*.02*	.07**	*.02*	.06**	*.02*
Family SES	-.06	*0.06*	-.05	*.06*	-.05	*.06*	-.04	*.06*
Parental Criminality	.28†	*0.15*	.29†	*.15*	.30*	*.15*	.31*	*.15*
Variance Component	1.26852		1.27214		1.27416		1.27655	
Neighborhood Direct Effects								
Concentrated Disadvantage	--	--	.04	*.07*	.03	*.07*	.06	*.06*
Tolerance for Deviance	--	--	--	--	.57**	*.21*	--	--
Tolerance for Fighting among Family/Friends	--	--	--	--	--	--	1.47**	*.52*
Variance Component, Violence Propensity intercept	.02705		.02312		.00502		.00967	
Variance Component, Child Abuse intercept	.48491		.44422		.46185		.40326	

[a]Analyses are based on 9,593 responses across 1,372 respondents living within 79 neighborhood clusters
[b]At wave one
[c]Reference category is Non-Latino White
** $p \leq .01$ * $p \leq .05$ †$p \leq .10$
Source: Project on Human Development in Chicago Neighborhoods, waves 1-2.

Figure 1. The Relationship between Child Abuse and Propensity for Violence by Neighborhood Level of Structural Disadvantage



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