Exposure to Intimate Partner Violence: Gendered and Contextual Effects on Adolescent Interpersonal Violence, Drug Use, and Mental Health Outcomes

Final Report

Prepared for the National Institute of Justice

2009-IJ-CX-0043

Submitted by:

Emily M. Wright, Ph.D.
ewright@mailbox.sc.edu

Abigail A. Fagan, Ph.D.
fagana@mailbox.sc.edu

Courtney A. Crittenden, M.S.
cacrittenden@gmail.com

Department of Criminology and Criminal Justice

University of South Carolina

1305 Greene Street

Columbia, SC 29208

ABSTRACT

Although research has indicated that intimate partner violence (IPV) increases the likelihood of a range of negative outcomes for children, few studies have examined the short- and long-term consequences of IPV while controlling for other relevant experiences, investigated the multi-level nature of exposure to IPV among youth, or explored gender differences in the relationships. This study sought to aid in this research by examining three questions:

1. What are the direct effects of IPV exposure on youths' interpersonal violence, drug use, and internalizing symptoms?
2. What are the main effects of neighborhood characteristics (i.e., concentrated disadvantage and collective efficacy) on neighborhood rates of youth violence, drug use, and internalizing symptoms?
3. Does the effect of IPV exposure vary across neighborhoods? If so, is the relationship between IPV exposure and youth violence, drug use, and internalizing symptoms conditioned by neighborhood characteristics?

Data from the Project on Human Development in Chicago Neighborhoods (PHDCN) were utilized to answer these questions. The short- and long-term effects of IPV exposure were examined using longitudinal data collected at three time points, when youth participants were aged 8-17 (wave 1), 9-20 (wave 2), and 12-22 (wave 3). Each research question was examined for the full sample (N=2,344 youth at wave 1 from 79 neighborhood clusters), and separately by gender (N=1,180 males and 1,164 females). Data were analyzed using hierarchical modeling techniques (HLM) to account for the multi-level structure of the data.

The results of the study indicated that, in regards to the first research question, controlling for other factors that may be related to outcomes, exposure to IPV was not significantly related to youth violence, and was associated with increased drug use frequency (but not prevalence), and internalizing (i.e., depression, anxiety, withdrawn, and somatic) symptoms at wave 1 only. Across all outcomes, only one significant gender difference was demonstrated—IPV exposure was more strongly related to the frequency of drug use at wave 1 for males compared to females.

The results for the second research question indicated that, controlling for individual factors, concentrated disadvantage (i.e., neighborhood poverty) was associated with more violent acts at wave 1, but was not related to drug use, collective efficacy (i.e., the degree to which neighborhood residents trust each other and are willing to work together) increased the prevalence (i.e., any) of violence and (any) drug use at wave 2 only. Both neighborhood factors were related to reduced youth internalizing symptoms (at wave 1 for collective efficacy and at wave 2 for disadvantage). When analyzed by gender, neighborhood characteristics were not related to outcomes among females, but collective efficacy significantly increased the prevalence of drug use (at wave 2) and was associated with fewer internalizing symptoms among males (at wave 1).

Regarding the third research question, the negative effects of IPV exposure on youths' number of violent acts and on the prevalence and frequency of drug use at wave 1 became weaker as neighborhood disadvantage increased. Collective efficacy did not moderate the effects of IPV exposure on any of the outcomes, and no gender differences in any of these relationships were demonstrated.

Overall, this project found that youth exposed to IPV were at-risk for negative consequences, but the size of these effects was weaker than found in many prior studies and

some of the findings were not consistent with some of the literature related to neighborhood influences. Overall, the results suggest that youth development is a complex process and further research is needed to explore, for example, how the impact of IPV and/or neighborhood factors may vary according to children's age or race/ethnicity, the extent to which collective efficacy and concentrated disadvantage have interacting effects on development, and the specific pathways that lead from IPV to problem behaviors. Policy implications stemming from the current project include the need to reduce the prevalence of IPV and provide services to children exposed to IPV to minimize its harmful effects.

TABLE OF CONTENTS

ABSTRACT ……. 2

EXECUTIVE SUMMARY ……. 9

INTRODUCTION ……..... 19

The Effects of Exposure to Intimate Partner Violence on Youth …….. 20

Neighborhood Context, Intimate Partner Violence, and Youth Outcomes ……... 22

Gender, IPV Exposure, and Neighborhood Characteristics …….. 25

Methodological Challenges Associated with Past Research ……...…….. 28

Research Questions and Hypotheses ……. 30

METHODS ……...……..... 31

Data: Project on Human Development in Chicago Neighborhoods ……. 31

Sample ……... 33

Measures …… 34

Analytic Strategy ……... 44

RESULTS ……..……...……..……. 48

Research Question 1: What are the direct effects of IPV exposure on youths' interpersonal violence, drug use, and internalizing symptoms?…….…….. 48

Research Question 2: What are the main effects of neighborhood characteristics (e.g., disadvantage and collective efficacy) on neighborhood rates of youth violence, drug use, and internalizing symptoms?.....…… 68

Research Question 3: Does the effect of IPV exposure vary across neighborhoods? If so, is the relationship between IPV exposure and youth violence, drug use, and mental health problems conditioned by neighborhood characteristics?..... 82

CONCLUSION .....…… 97

Discussion of Main Findings…..…… 97

Study Limitations……... 108

Implications for Research, Policy, and Practice …… 112

REFERENCES ……..…….. 116

Appendix A: Description of Measures …….. 124
Appendix B: Collective Efficacy Item Response Model ……..…….. 134
Appendix C: Supplemental Tables ……..... 136
Dissemination of Research Findings ……. 138

LIST OF TABLES

Table 1: Descriptive Statistics, Total Sample…….. 36
Table 2: Descriptive Statistics, by Gender ……..…….. 37-8
Table 3a: The Percentage (N) of the Total Sample Reporting Any Violence, Any Drug Use, and Mean Scores of Internalizing Symptoms across Waves, by Exposure to IPV …….. 49
Table 3b: The Percentage (N) of Males and Females Reporting Any Violence, Any Drug Use, and Mean Scores of Internalizing Symptoms across Waves, by Exposure to IPV …….. 51
Table 4: Random Coefficients Models Predicting Violence, Total Sample, by Wave….. 53
Table 5: Random Coefficients Models Predicting Drug Use, Total Sample, by Wave..... 55
Table 6: Random Coefficients Models Predicting Internalizing Symptoms, Total Sample, By Wave ……...…… 57
Table 7: Random Coefficients Models Predicting Count Violence, by Gender, by Wave ……... 59
Table 8: Random Coefficients Models Predicting Any Violence, by Gender, by Wave.. 61
Table 9: Random Coefficients Models Predicting Drug Use Frequency, by Gender, by Wave…… 63
Table 10: Random Coefficients Models Predicting Any Drug Use, by Gender, by Wave ……..... 64
Table 11: Random Coefficients Models Predicting Internalizing Symptoms, by Gender, by Wave……... 66
Table 12: Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Violence, Total Sample, by Wave …….. 70
Table 13: Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Drug Use, Total Sample, by Wave ...…….. 71
Table 14: Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Internalizing Symptoms, Total Sample, by Wave …….. 72
Table 15: Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Violence Count, by Gender, by Wave ……... 75
Table 16: Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Any Violence, by Gender, by Wave …..…… 76
Table 17: Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Drug Use Frequency, by Gender, by Wave …… 78
Table 18: Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Any Drug Use, by Gender, by Wave …..…… 80
Table 19: Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Internalizing Symptoms, by Gender, by Wave ….…….. 81

Table 20: Level-Two (Empirical Bayes Slopes as Outcomes) Predicting Violence, Total Sample, by Wave……... 84
Table 21: Level-Two (Empirical Bayes Slopes as Outcomes) Predicting Drug Use, Total Sample, by Wave …….. 87
Table 22: Level-Two (Empirical Bayes Slopes as Outcomes) Predicting Internalizing Symptoms, Total Sample, by Wave …… 88
Table 23: Level-Two (Empirical Bayes Slopes as Outcomes) Predicting Violence Count, by Gender, by Wave …….. 89
Table 24: Level-Two (Empirical Bayes Slopes as Outcomes) Predicting Any Violence, by Gender, by Wave …….. 90
Table 25: Level-Two (Empirical Bayes Slopes as Outcomes) Predicting Drug Use Frequency, by Gender, by Wave…… 92
Table 26: Level-Two (Empirical Bayes Slopes as Outcomes) Predicting Any Drug Use, by Gender, by Wave……... 93
Table 27: Level-Two (Empirical Bayes Slopes as Outcomes) Predicting Internalizing Symptoms, by Gender, by Wave…… 95
Table 28: Summary of Findings…… 96

EXECUTIVE SUMMARY

Statement of the Problem

Millions of children and adolescents are exposed to intimate partner violence (IPV) between their parents each year (Finkelhor, Turner, Ormond, Hamby, & Kracke, 2009; Zinzow et al., 2009), and previous research has shown that exposure to IPV may increase the likelihood of children's violence (Fergusson & Horwood, 1998; Herrera & McCloskey, 2001), drug use (Dube & Anda, 2002; Fergusson & Horwood, 1998), and mental health problems (Graham-Bermann, DeVoe, Mattis, Lynch, & Thomas, 2006; Kitzmann, Gaylord, Holt, & Kenny, 2003). However, many prior studies have had methodological challenges (e.g., reliance on small samples or non-representative samples, failure to control for other relevant predictors of problems) that limit the impact of their findings (Clements, Oxtoby, & Ogle, 2008; Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003), and few have identified the conditions under which or individuals for whom IPV exposure may be most detrimental.

Research has also demonstrated that neighborhoods are important contexts that may directly and indirectly affect children's development (Leventhal & Brooks-Gunn, 2000). In particular, neighborhoods characterized by structural characteristics such as high rates of poverty (i.e., concentrated disadvantage) increase the likelihood of crime, drug use, and other problem behaviors among youth (De Coster, Heimer, & Wittrock, 2006; Haynie, Silver, & Teasdale, 2006; Jacob, 2006; Mrug & Windle, 2009; Neumann, Barker, Koot, & Maughan, 2010; Peeples & Loeber, 1994). Structural deficits may also impede neighborhood levels of "collective efficacy;" that is, disadvantaged communities are more likely to have lower levels of trust between residents and fewer informal social controls, such that residents are unlikely to monitor youth activities and intervene when they see disorderly conduct. Thus, while structural problems

tend to exacerbate youth problems, social processes such as collective efficacy can help to reduce negative outcomes (Elliott et al., 1996; Mayberry, Espelage, & Koenig, 2009; Meier, Slutske, Arndt, & Cadoret, 2008; Simons, Gordon Simons, Burt, Brody, & Cutrona, 2005; Xue, Leventhal, Brooks-Gunn, & Earls, 2005).

Although prior research has examined the effects of IPV exposure and neighborhood residence on a range of negative outcomes, few studies have assessed the combined impact of these experiences on children. Likewise, prior work has failed to systematically investigate gender differences in the effects of exposure to partner violence or neighborhood characteristics, and the empirical evidence regarding gender differences is limited and mixed (Beyers, Bates, Pettit, & Dodge, 2003; Gottfredson, McNeil, & Gottfredson, 1991; Jacob, 2006; Karriker-Jaffe, Foshee, Ennett, & Suchindran, 2009; Kling, Ludwig, & Katz, 2005; Leventhal & Brooks-Gunn, 2003; Meier et al., 2008; Molnar, Cerda, Roberts, & Buka, 2008; Mrug & Windle, 2009; Simons, Johnson, Beaman, Conger, & Whitbeck, 1996). This oversight is somewhat surprising, given that gender differences in the rates of violence, mental health problems and (to a lesser extent) substance use, can be significant. For example, the IPV literature has suggested that male witnesses of violence in the family are at increased risk for developing externalizing behaviors while females are at greater risk for internalizing disorders (Clements et al., 2008; Doumas, Margolin, & John, 1994; Evans, Davies, & DiLillo, 2008; Kennedy, Bybee, Sullivan, & Greeson, 2010; Yates, Dodds, Sroufe, & Egeland, 2003).

Additionally, while numerous studies have examined the deleterious effects of exposure to IPV on children's social and emotional development, findings must be viewed with some caution given methodological limitations of many studies. Much of the research has relied on very small samples and non-representative samples, such as women and children living in

domestic violence shelters (Clements et al., 2008). Results from these types of investigations often have limited generalizability, as participants may be significantly different than the general population of IPV victims. Much prior research has also assessed exposure to IPV retrospectively over a very long period of time, which may affect the reliability of the results. Furthermore, much research has been based on cross-sectional rather than longitudinal data, making causality and the long-term effects of exposure to violence difficult to establish (Clements et al., 2008; Evans et al., 2008). Prior research focusing on neighborhood contexts has also had limitations, including a limited number of neighborhoods in the sample, which can limit statistical power to find effects, and lack of attention to social processes compared to structural characteristics, likely because the latter are easier to measure than the former (Leventhal & Brooks-Gunn, 2000). Some studies have also failed to conduct multi-level analyses, or have measured neighborhood factors using surveys of youth (or their parents) whose behaviors are being assessed, which are then aggregated up to the neighborhood level, a method which risks over-stating results and precludes examination of cross-level interactions.

Purpose of the Study

In summary, while prior work has suggested that exposure to intimate partner violence and neighborhood characteristics may influence youth development, some of this research has had methodological challenges which limit the impact of the findings, and very few studies have considered gender differences in these relationships or the ways in which the effects of IPV may be conditioned by neighborhood factors. The current study was intended to address these issues and, in doing so, increase our understanding of how both exposure to IPV and neighborhood characteristics lead to negative outcomes among youth. Three research questions were examined

using longitudinal data from the Project on Human Development in Chicago Neighborhoods (PHDCN).

1. What are the direct effects of IPV exposure on youths' interpersonal violence, drug use, and internalizing symptoms?

   Hypothesis 1: IPV exposure will negatively impact each of these three outcomes, but the size of the effects will be smaller than in past research, given the use of longitudinal data and multiple control variables in the current study.

2. What are the main effects of neighborhood characteristics (i.e., concentrated disadvantage and collective efficacy) on neighborhood rates of youth violence, drug use, and internalizing symptoms?

   Hypothesis 2: Concentrated disadvantage will increase problem outcomes while collective efficacy will reduce problem outcomes, but the magnitude of the direct effects is likely to be small.

3. Does the effect of IPV exposure vary across neighborhoods? If so, is the relationship between IPV exposure and youth violence, drug use, and internalizing symptoms conditioned by neighborhood characteristics?

   Hypothesis 3: Given the lack of prior research in this area, it is uncertain if the effects of IPV exposure will vary. If such effects are found, it is expected that concentrated disadvantage will increase the negative effects of exposure to IPV while collective efficacy will decrease the negative effects of IPV exposure.

Research Design

The PHDCN includes three linked datasets from which information for this study were derived, including: 1) surveys of adult residents of Chicago neighborhoods, who reported on

perceived levels of collective efficacy (i.e., the degree of informal social control and social cohesion between neighbors); 2) archival data from the U.S. Census data, used to measure neighborhood concentrated disadvantage; and 3) interviews with youth and their caregivers, which were used to assess youth behavioral outcomes, IPV, and other psycho-social risk factors experienced by youth (e.g., family SES, peer deviance, child physical abuse, etc.) that were used as control variables in the analyses. The longitudinal sample of youth was ethnically diverse, including 46% Hispanic, 36% African-American, and 14% non-Latino Caucasian youth.

Each research question was examined for the full sample (N=2,344 youth at wave 1 living in 79 neighborhood clusters in Chicago), and separately by gender (N=1,180 males and 1,164 females) in order to examine gender differences in these relationships. Both the short- and long-term effects of IPV exposure were examined using longitudinal data collected at three time points, when youth participants were aged 8-17 (wave 1), 9-20 (wave 2), and 12-22 (wave 3). Data were analyzed using hierarchical linear modeling (HLM) to account for the multi-level nature of the PHDCN dataset (i.e., that information was collected on both neighborhood- and individual-level characteristics).

Findings

The results of the study indicated that, in regards to the first research question, controlling for other risk factors, youth exposed to severe IPV were no more likely to engage in violence compared to those whose caregivers did not report severe IPV. IPV exposure had both short- and long-term effects on the frequency but not the prevalence of drug use, and it was associated with increased internalizing symptoms among youth victims in the short-term (wave 1) only. Across all outcomes, only one significant gender difference in the strength of these relationships was

demonstrated—IPV exposure was more strongly related to the frequency of drug use at wave 1 for males compared to females.

The results of the second research question indicated that neighborhood factors had direct effects on some of the youth outcomes (after controlling for the effects of individual factors). Concentrated disadvantage increased the number of violent acts reported by youth, but had no effects on drug use; collective efficacy increased the likelihood that youth would engage in any violence and any drug use; and both neighborhood factors reduced internalizing symptoms. When analyzed by gender, neighborhood characteristics were not related to outcomes among females; among males, collective efficacy significantly increased the prevalence of drug use and decreased the number of internalizing symptoms, while disadvantage was unrelated to any outcomes.

The findings demonstrated some support for the third research question and indicated that neighborhood characteristics sometimes conditioned the relationship between IPV exposure and youth outcomes. Specifically, the negative effects of IPV exposure on the number of violent acts reported by youth, as well as on the frequency and prevalence of their drug use, became weaker as neighborhood disadvantaged increased. No gender differences in these relationships were demonstrated.

To summarize these results, the current study found that while exposure to IPV did increase the likelihood of negative consequences for youth, the strength of this relationship was weaker than prior studies of family violence would suggest. However, the current study also represented a very rigorous test of the first research question, given the inclusion of numerous control variables and reliance on longitudinal data, both of which guard against mis-specifying and likely over-stating the impact of IPV. That some direct effects of IPV on outcomes were

found given these conditions is notable. The limited number of gender differences in the direct and moderating effects of IPV and neighborhood characteristics suggests that these risk factors may operate similarly for boys and girls, a finding consistent with some prior research.

Some of the findings were inconsistent with some of the theoretical and empirical literature related to neighborhood influences, given that collective efficacy *increased* violence and drug use among youth, concentrated disadvantage *decreased* internalizing symptoms, and neighborhood risk sometimes *reduced* the negative effects of IPV exposure on outcomes. Our interpretations of these unexpected findings are post hoc, and more research is needed to explore and potentially replicate these findings. Nonetheless, it may be that as neighborhood levels of collective efficacy increase, parents feel more comfortable allowing their children to spend time alone in the neighborhood because they trust that their neighbors will look out for and protect their children if necessary. An unintended consequence is that youth may have increased opportunities to engage in delinquency. It is also possible that in disadvantaged neighborhoods, which were associated with increased levels of internalizing symptoms, parents are less likely to report mental health problems, thus creating a negative relationship between disadvantage and these outcomes. Finally, although we expected that the effects of IPV exposure would be exacerbated in disorganized neighborhoods, the results consistently suggested otherwise. It is possible that areas characterized by neighborhood disadvantage are more tolerant of deviance; thus, the negative effect of exposure to IPV could be weakened in such neighborhoods because violence between parents would not be seen as particularly problematic. Drawing from Raine's (2002) "social push" hypothesis, it may also be that within neighborhoods experiencing multiple risk factors (e.g., IPV and disadvantage), the effect of any *one* risk factor (such as exposure to parental IPV) is diluted.

Conclusions

The current study is one of few methodologically rigorous studies exploring contextual and gender differences in the negative effects of exposure to IPV. Clearly, more research is needed to examine these relationships, particularly given that some of these results were not consistent with prior theoretical or empirical research. The findings do underscore the fact that IPV and neighborhoods may affect youth in complex ways, and future research is needed to continue to identify the conditions under which and individuals for whom negative outcomes are most likely. Future research may wish to examine the effects of IPV exposure on additional outcomes of concern (e.g., dating violence, binge drinking, or depression), ideally using longitudinal data that can identify the specific pathways or mediating mechanisms by which IPV exposure leads to behavioral disorders. Additional research may also wish to explore differences in the impact of IPV according to the nature or frequency of its occurrence, whether effects vary according to the race/ethnicity or age of the youth victim, and how other neighborhood characteristics may condition the effects of IPV.

Although additional research will help to increase our understanding of the ways in which IPV and neighborhoods affect youth, the current findings have some relevant implications for policy and practice. Given others' research demonstrating higher rates of IPV in neighborhoods characterized by concentrated disadvantage, (Benson & Fox, 2004; Benson, Fox, DeMaris, & Van Wyk, 2003; Lauritsen & Schaum, 2004; Miles-Doan, 1998; Wright, 2011), it is important that prevention and treatment services target youth and adults living in these areas. This includes both primary prevention services that seek to reduce the occurrence of violence between caregivers and intervention services for families experiencing IPV (e.g., domestic violence shelters, "safe zones," access to counselors, access to safety officers, and access to safe

places for children of violent families). In addition, training for police officers patrolling and responding to calls in disadvantaged areas would be useful to help ensure they respond appropriately to intimate partner violence and know how to refer families to local service providers. Services should also be directed at youth living in homes in which IPV is present in order to help alleviate the immediate distress caused by victimization and to prevent the development of long-term problems. While interventions targeted to youth victims are needed, more universal interventions that take place in schools and/or community agencies can also be beneficial. Such services may include programs delivered in schools and in the community that enhance youth behavioral and emotional competence by, for example, providing them with skills to avoid drug use offers, cope with stress and anxiety, and recognize and respond appropriately to negative emotions.

Limitations of the Current Project

While the current findings contribute to the extant literature on the effects of IPV exposure and overcome many of the methodological limitations of past research, this study had challenges of its own that must be noted. First, the analyses relied on self-reports of both IPV (from caregivers) and the outcomes assessed (from caregivers and youth participants). Although there is evidence that self-reports can produce valid measures of youth's participation in substance use and other illegal activities (Bachman, Johnston, & O'Malley, 1996; Thornberry & Krohn, 2000), it is still possible that respondents may have under-reported the prevalence of problem behaviors given social desirability. Another limitation is that we restricted the measure to the most serious forms of violence between caregivers; therefore the results cannot be generalized to families experiencing less severe conflict. Third, we restricted the IPV measure to a dichotomous assessment of whether or not either parent was violent in the relationship. We did

not assess the frequency of violence, and it is possible that outcomes would be different if the frequency, rather than the prevalence, of IPV were examined. Similarly, we did not examine the potential for differential effects of exposure to different forms of IPV (e.g., using a weapon towards a partner versus slapping a partner). Given these limitations, future research may wish to assess the degree to which different forms of parental violence, as well as who perpetrates the violence, may impact youth differently. Fourth, we cannot ensure that all children whose parents reported IPV actually witnessed or knew about the events. Fifth, respondents in this study were primarily Hispanic and African American adolescents from urban neighborhoods in just one city (Chicago); we cannot be sure that the results are generalizable to youth and families living in other geographical regions or from other racial/ethnic backgrounds. Finally, it is likely that our study suffered from low statistical power when assessing neighborhood effects by gender, given that these analyses reduced the sample size by half.

INTRODUCTION

It is estimated that intimate partner violence (IPV) between parents or primary caregivers exposes millions of children and adolescents to violent incidents annually (Finkelhor, Turner et al., 2009; 2006; Zinzow et al., 2009), with between three (Brush, 1990) and 16 percent (Straus, Gelles, & Steinmetz, 2006) of U.S. couples engaging in IPV each year. Evidence suggests that youth who are exposed to IPV or who witness violence between their parents are at increased risk for a multitude of behavioral and emotional problems including delinquency and interpersonal violence (Fergusson & Horwood, 1998; Herrera & McCloskey, 2001), alcohol and drug use (Dube & Anda, 2002; Fergusson & Horwood, 1998), and mental health problems such as depression and anxiety (Graham-Bermann et al., 2006; Kitzmann et al., 2003). Exposure to IPV may not only disrupt children's healthy development in the short-term, but also jeopardize their success and well-being in the future. Children who begin offending early in the lifecourse are at increased risk for longer, more frequent, and more violent criminal careers (Farrington, 2003); the early onset of drinking has been associated with an increased likelihood of alcohol dependence during adulthood (Hingson, Heeren, & Winter, 2006); and mental health problems experienced during adolescence may lead to psychological disorders that persist into adulthood (Macmillan, 2001; National Research Council and Institute of Medicine, 2009).

This study examines the relationship between children's exposure to IPV and their subsequent likelihood of engaging in interpersonal violence, using illegal substances, and developing mental health problems (i.e., internalizing symptoms). The findings from this research can be used to inform our theoretical understanding of the impact of exposure to IPV as well as suggest prevention and intervention strategies to help reduce the likelihood of problem outcomes among youth victims of partner violence.

The Effects of Exposure to Intimate Partner Violence on Youth

Meta-analyses of studies examining the relationship between exposure to IPV and youth psycho-social problems have reported median effect sizes from 0.28 to 0.48 (Evans et al., 2008; Kitzmann et al., 2003; Wolfe et al., 2003), which can be considered small to medium in size. Although there has been much research investigating the effects of IPV exposure on youth, many studies have had methodological limitations (e.g., reliance on small samples or non-representative samples, failure to control for other relevant predictors of problems) which limit the impact of their findings (Clements et al., 2008; Wolfe et al., 2003). In addition, some studies have failed to find a significant relationship between IPV and children's problems (Ho & Cheung, 2010; Huth-Blocks & Hughes, 2008; Margolin et al., 2009; Moylan et al., 2009; Spilsbury et al., 2007), indicating that the effects of IPV may not be uniform across child populations.

Nonetheless, some well-conducted cross-sectional and longitudinal investigations have demonstrated that exposure to IPV increases the likelihood of children's developmental problems in both the short- and long-term. Following social learning theory (Akers, 1985), which posits that children learn to be violent by modeling the behaviors of significant others, research has shown a relationship between witnessing IPV and subsequent externalizing, aggressive, and violent behaviors (Ireland & Smith, 2009; Maxwell & Royo Maxwell, 2003; Moretti, Obsuth, Odgers, & Reebye, 2006; Mrug & Windle, 2010; Sousa et al., 2010; Sternberg, Baradaran, Abbott, Lamb, & Guterman, 2006). For example, Ireland and Smith (2009) found that, among high-risk children living in Rochester, NY, parent reports of intimate partner violence were associated with an increased likelihood of delinquency and violence (e.g., robbery, assault, and involvement in gang fights) reported by children six years later. A study of adolescents in

Arizona indicated that children exposed to IPV were three times as likely to have an arrest for a violent offense compared to non-victims (Herrera & McCloskey, 2001).

Empirical research regarding the effects of IPV on children has also been guided by General Strain Theory (Agnew, 1992), which views victimization as a form of strain or "noxious" stressor that can result in strong, emotional states such as depression and anxiety (as well as anger), particularly in the short-term as victims cope with the on-going or immediate aftermath of the victimization. Victims may also engage in drug use in order to alleviate the trauma and negative emotions produced by victimization (Agnew, 1992). Strains are most likely to negatively impact youth when they are high in magnitude and duration, are viewed as unjust, and when they threaten the child's core values and beliefs. Exposure to IPV fulfills all of these criteria, and victimization experienced in the home is considered one of the strains most likely to jeopardize children's prosocial development (Agnew, 2001).

Relatively few studies have assessed the relationship between IPV exposure and adolescent alcohol and drug use, although use in early adulthood has been demonstrated, lending credence to the long-term impact of IPV (Smith, Elwyn, Ireland, & Thornberry, 2010). Fergusson and Horwood (1998) found that youth in New Zealand who were exposed to parental IPV were more likely to report alcohol abuse at age 18 compared to those who did not witness IPV, and Smith et al. (2010) found that IPV exposure during adolescence increased the likelihood of problem alcohol use for adults in their early 20s. More research has examined the impact of IPV on mental health problems, including depression, anxiety, and other internalizing problems (Fergusson & Horwood, 1998; Finkelhor, Ormond, & Turner, 2009; Graham-Bermann et al., 2006; Mrug & Windle, 2010; Sternberg et al., 2006; Zinzow et al., 2009). Data from a nationally representative household survey (Zinzow et al., 2009), for example, found that

children who witnessed violence between their parents were significantly more likely to report depression compared to non-victims. A longitudinal investigation involving adolescents in Birmingham, Alabama (Mrug & Windle, 2010) demonstrated that witnessing violence in the home predicted increased anxiety and aggression, although not depression.

While there is evidence to support the negative consequences of witnessing IPV on youth development, the empirical research has demonstrated significant variation in effects across studies, and the degree to which IPV has stronger effects in the short-term or long-term, or differing effects for youth from different backgrounds, is uncertain (Kitzmann et al., 2003; Wolfe et al., 2003). As a result, recent investigations have focused on identifying factors that may moderate the impact of IPV on youth; that is, attempting to better understand the circumstances under which or individuals for whom the effects of IPV are stronger or weaker. In this study, we focus on two such factors: the neighborhoods in which children live and the sex of the child.

Neighborhood Context, Intimate Partner Violence, and Youth Outcomes

Within criminology, neighborhoods are considered important contexts that may directly and indirectly affect children's development. Shaw and McKay's (1942) social disorganization theory, and expansions of it (Anderson, 1999; Sampson, Raudenbush, & Earls, 1997; Wilson, 1987), postulate that neighborhoods have direct effects on residents' behaviors that cannot be attributed simply to the characteristics of individuals living in these areas. Rather, features of the neighborhoods themselves, particularly their structural characteristics and social mechanisms, affect residents' involvement in crime, drug use, and other problem behaviors. In particular, these theories point to the importance of structural characteristics such as high rates of poverty (i.e., concentrated disadvantage), residential instability, and immigrant concentration in shaping

outcomes. Areas characterized by such structural deficits tend to have higher rates of crime and more criminal role models compared to more advantaged communities. In such areas, youth have more limited educational, social, and physical resources (e.g., lower quality schools, fewer youth-serving agencies such as Boys and Girls Clubs, etc.) and fewer opportunities to learn new skills or interact with positive adult role models. Structural deficits also negatively impact neighborhood social mechanisms by impeding the ability of residents to know and trust each other (Kornhauser, 1978), which is important in order to establish "collective efficacy" (Sampson et al., 1997). According to Sampson et al. (1997), residents can help reduce crime rates by exercising informal social controls and acting collectively to enforce norms and standards for behavior, such as monitoring youth (and youth gang) activities and intervening when they see disorderly behavior occurring. Thus, both structural and social features of the neighborhood have been posited to have direct effects on crime and deviance, with structural problems tending to exacerbate these problems and social processes such as collective efficacy tending to reduce them. Expansions of social disorganization have also posited more complex interactions between these types of characteristics, with social features thought to mediate and potentially moderate the effects of structural characteristics (Sampson et al., 1997). We focus on the unique, independent effects of these factors in this report.

Research guided by the social disorganization theory has shown neighborhood characteristics to be significantly associated with youth aggression and violence, drug use or abuse, and internalizing behaviors such as depression or anxiety (Leventhal & Brooks-Gunn, 2000). More specifically, children living in neighborhoods marked by concentrated disadvantage (e.g., high rates of poverty, unemployment, or female-headed households) have been demonstrated to be at increased risk for engaging in delinquency and violence (De Coster et

al., 2006; Haynie et al., 2006; Jacob, 2006; Mrug & Windle, 2009; Neumann et al., 2010; Peeples & Loeber, 1994) and internalizing behaviors (Simons et al., 1996; Xue et al., 2005). Effects of structural characteristics on drug use have not been well established, largely due to scant research examining these relationships, and at least one study has shown that concentrated disadvantage *decreases* drug use (Snedker, Herting, & Walton, 2009). Neighborhood social processes such as informal social control and collective efficacy have been shown to reduce delinquency or violence, drug use, and internalizing problems among youth (Elliott et al., 1996; Mayberry et al., 2009; Meier et al., 2008; Simons et al., 2005; Xue et al., 2005), although such research is relatively uncommon. Some studies have also failed to demonstrate significant direct effects of neighborhood social characteristics on youth problems (Chung & Steinberg, 2006; De Coster et al., 2006; Karriker-Jaffe et al., 2009; Mrug & Windle, 2009).

In addition to examining effects on children, contextual research has found that neighborhood residence influences adult outcomes, including the prevalence of IPV between couples (Benson, Fox, DeMaris, & Van Wyk, 2000; Benson et al., 2003; Browning, 2002; Lauritsen & Schaum, 2004; Miles-Doan, 1998; Wright, 2011; Wright & Benson, 2010). Studies have indicated that IPV is not randomly distributed across neighborhoods (Miles-Doan, 1998; Sherman & Berk, 1984), but is more likely to occur in disadvantaged neighborhoods (Benson et al., 2003; Browning, 2002; Lauritsen & White, 2001; Miles-Doan, 1998; Van Wyk, Benson, Fox, & DeMaris, 2003; Wright, 2011; Wright & Benson, 2010). Variation in neighborhood informal social control (e.g., collective efficacy) can also affect IPV rates (Browning, 2002; Wright, 2011). It is possible that neighborhood context may influence not only the prevalence of IPV, but also its consequences for children's development. For example, the effects of IPV may be more severe in more disadvantaged communities, or may be tempered (i.e., lessened) in areas

marked by high collective efficacy. There has been very little investigation of these hypotheses, however, which is why they are the focus of the third research question in this study.

Gender, IPV Exposure, and Neighborhood Characteristics on Youth Outcomes

Theoretical and empirical literature examining the effects on youth development of both IPV exposure and neighborhood context have considered but not systematically investigated gender differences in the effects of exposure to partner violence and the effects of neighborhood characteristics on youth outcomes. This oversight is somewhat surprising, given that gender differences in the rates of problem behaviors can be significant. It is well established that males are much more likely than females to engage in physically violent and aggressive behaviors (Elliott, 1994; Puzzanchera, 2009), and that girls are more at risk for internalizing symptoms (notably depression) during adolescence (Knopf, Park, & Paul Mulye, 2008). Rates of drug use are more similar for males and females during adolescence, although males appear to engage in more binge drinking and other drug use during late adolescence and early adulthood (Johnston, O'Malley, Bachman, & Schulenberg, 2008)

The IPV literature has suggested that male witnesses of violence in the family are at increased risk for developing externalizing behaviors, compared to females, and that females are at greater risk for internalizing disorders (Clements et al., 2008; Doumas et al., 1994; Evans et al., 2008; Kennedy et al., 2010; Yates et al., 2003). This view has largely followed from General Strain Theory (Broidy & Agnew, 1997), which posits that, faced with strains such as exposure to IPV, males are more likely to respond with frustration, anger, and violent behaviors, while females are more likely to react with internalizing symptoms such as depression and anxiety. However, the empirical literature is mixed. A meta-analysis based on 53 empirical studies

(Evans et al., 2008) identified an average effect size between exposure to IPV and externalizing behaviors of 0.46 for boys compared to 0.23 for girls, but effects on internalizing problems were similar for both sexes. In contrast, some studies have found that girls exposed to IPV are more likely than boys to display internalizing and externalizing problems (Cummings, Pepler, & Moore, 1999; O'Keefe, 1994; Spilsbury et al., 2007). For example, a study of 10-year old children exposed to IPV demonstrated that girls were over twice as likely as boys to develop clinically significant levels of anxiety and aggression, although no sex differences were found for depression (Spilsbury et al., 2007). Although research examining gender differences in the effects of IPV exposure on drug use is scant, Smith and colleagues (2010) reported that females exposed to inter-parental violence during adolescence were more likely to develop alcohol use problems in early adulthood compared to males. Finally, other research – including meta-analyses relying on data from multiple studies and varied samples – has failed to find gender differences in the effects of IPV (Bradford, Burns Vaughn, & Barber, 2007; Fergusson & Horwood, 1998; Ireland & Smith, 2009; Kitzmann et al., 2003; Moylan et al., 2009; Sternberg et al., 2006). A 'mega' analysis using data from 15 studies and 1870 subjects aged 4 to 14 years old found no evidence that gender moderated the relationship between witnessing IPV in the home and externalizing or internalizing outcomes (Sternberg et al., 2006).

Because social disorganization theory has largely overlooked gender, the prevailing assumption has been that neighborhoods affect males and females in similar ways (Kroneman, Loeber, & Hipwell, 2004; Zahn & Browne, 2009). However, there is also reason to expect that boys and girls may vary in their exposure and susceptibility to neighborhood influences, particularly given differences in socialization and supervision practices. Much research suggests that parents are more likely to restrict girls' activities and monitor their behaviors more closely

compared to boys, who are allowed greater freedom and thus have more opportunities to spend time in and be influenced by the neighborhood (Cernkovich & Giordano, 1987). Adult residents, like parents, may also view girls as in need of more protection and oversight, and thus be more likely to regulate the behavior of girls compared to boys (Browning, Leventhal, & Brooks-Gunn, 2005). However, it is also possible that neighborhood residents will more actively attempt to control the behaviors of boys, who could be perceived as more dangerous and more likely to commit crime compared to girls.

While scant, empirical evidence regarding gender differences in the effects of the neighborhood context reflects this mixed view of gender differences in neighborhood influences. Some studies have reported similar neighborhood influences on male and female externalizing problems, aggression/violence, and delinquency (Jacob, 2006; Karriker-Jaffe et al., 2009; Molnar et al., 2008; Mrug & Windle, 2009; Simons et al., 1996). In contrast, studies have found that neighborhood poverty is more likely to increase violence among females compared to males (Karriker-Jaffe et al., 2009) and to produce psychological problems among males compared to females (Simons et al., 1996), while other research has found that neighborhood affluence (Beyers et al., 2003) and collective efficacy (Meier et al., 2008) are more protective for males. Finally, two studies reported mixed and somewhat unexpected findings related to gender and neighborhood context. Gottfredson et al. (1991) found that neighborhood affluence *increased* theft for males but had no effects on female offending. The Moving to Opportunities study (Kling et al., 2005; Leventhal & Brooks-Gunn, 2003) found that girls who moved from highly disadvantaged communities to more affluent areas had fewer arrests for violent offending and property offenses than girls who had not moved, while boys who had moved were *more* likely to commit property offenses but less likely to have internalizing problems than non-relocated boys.

The limited and often contradictory findings of past research regarding gender differences in the direct and interactive effects of IPV exposure and neighborhood context on youth outcomes emphasizes the need for further investigation of these relationships. A major focus of the current study is to explore the extent to which boys and girls may react differently to violence in their homes and to neighborhood structural and social conditions. In doing so, this investigation also seeks to avoid some of the methodological limitations associated with past family violence and neighborhood context research, as described next.

Methodological Challenges Associated with Past Research

Although numerous studies have examined the deleterious effects of exposure to IPV on children's social and emotional development, findings generated by much of the research must be viewed with some caution given methodological limitations. Much of the research has relied on very small samples – usually fewer than 500 youths and often less than 100 subjects (Clements et al., 2008) and non-representative samples, such as women and children living in domestic violence shelters. Results from these types of investigations often have limited generalizability, as participants may be significantly different than the general population of IPV victims. Much prior research has also assessed exposure to IPV retrospectively over a very long period of time, sometimes asking adolescent or young adult participants to recall IPV that occurred many years previously – all of which may affect the reliability of the results. Additionally, much research has been based on cross-sectional rather than longitudinal data, making causality and the long-term effects of exposure to violence difficult to establish (Clements et al., 2008; Evans et al., 2008). Finally, many studies have failed to control for other variables that may be related to either IPV or the outcomes examined. For example, parents who

are violent towards one another may also engage in ineffective or abusive parenting practices, or may have substance abuse or mental health problems, all of which may increase the likelihood of adolescent problem behaviors (Fergusson & Horwood, 1998; Herrenkohl & Herrenkohl, 2007; Holt, Buckley, & Whelan, 2008). Studies which fail to control for these or other relevant experiences may mis-specify and likely overstate the relationship between exposure to IPV and delinquency.

Investigations of contextual effects on children can also be methodologically challenging. These types of studies require large samples of both neighborhoods and individuals in order to ensure enough variability in neighborhood features and individuals exposed to these conditions to conduct multilevel statistical modeling (Leventhal & Brooks-Gunn, 2000). Likely due to the expense and difficulty in obtaining large samples, some prior investigations have been conducted with relatively small samples of individuals and/or neighborhoods, which can limit the ability to find significant effects if they are present. Small sample size is even more problematic when assessing gender differences, given that samples are necessarily halved.

Many neighborhood studies have focused on assessing the effects of structural variables such as poverty, because such information is readily available (e.g., by matching respondents' addresses to data from the U.S. Census Bureau), while the social processes of neighborhoods, which are much more difficult to assess, have been under-examined. When they are measured, constructs such as informal social control or collective efficacy should ideally be based on data collected from objective sources (e.g., via systematic observations) or individuals whose behaviors are not being examined (e.g., other adults or key leaders in the community). Doing so ensures that these measures reflect characteristics of the community rather than the individuals living in that community and avoids inflating the strength of the relationship under examination

(Sampson & Raudenbush, 1999; Van Horn, Hawkins, Arthur, & Catalano, 2007). Most studies, however, measure social processes using surveys of youth (or their parents) whose behaviors are being assessed, which are then aggregated up to the neighborhood level. This technique not only risks over-stating results, but also precludes examination of cross-level interactions; for example, investigating how neighborhood factors impact the relationship between IPV and youth outcomes.

Research Questions and Hypotheses

In summary, while prior work has suggested that exposure to intimate partner violence and neighborhood characteristics may influence youth development, some of this research has had methodological challenges which limit the impact of the findings, and very few studies have considered gender differences in these relationships or the ways in which the effects of IPV may be conditioned by neighborhood factors. The current study was intended to address these issues and focuses on three specific research questions:

1. What are the direct effects of IPV exposure on youths' interpersonal violence, drug use, and internalizing symptoms?

   Hypothesis: IPV exposure will negatively impact each of these three outcomes, but the size of the effects will be smaller than in past research, given the use of longitudinal data and multiple control variables in the current study.

2. What are the main effects of neighborhood characteristics (concentrated disadvantage and collective efficacy) on neighborhood rates of youth violence, drug use, and internalizing symptoms?

Hypothesis: Concentrated disadvantage will increase problem outcomes while collective efficacy will reduce problem outcomes, but the magnitude of the direct effects is likely to be small.

3. Does the effect of IPV exposure vary across neighborhoods? If so, is the relationship between IPV exposure and youth violence, drug use, and internalizing symptoms conditioned by neighborhood characteristics?

   Hypothesis: Given the lack of prior research in this area, it is uncertain if the effects of IPV exposure will vary. If such effects are found, it is expected that concentrated disadvantage will increase the negative effects of exposure to IPV while collective efficacy will decrease the negative effects of IPV exposure.

METHODS

Data: Project on Human Development in Chicago Neighborhoods

The data for this study were derived from interviews gathered during the Project on Human Development in Chicago Neighborhoods (PHDCN) (Earls, Brooks-Gunn, Raudenbush, & Sampson, 2002). The original purpose of the PHDCN was to examine the development of prosocial and antisocial behaviors and to assess the effects of families, schools, and neighborhoods on adolescent development. The project represents an interdisciplinary approach to studying the sociological, biological, and inter-individual factors that influence the onset, development, continuance, and desistance of antisocial behavior over time.[1]

For the PHDCN project, data were collected from 343 neighborhood clusters (NCs) in Chicago. The NCs were derived from 847 contiguous census tracts within the city. Each of the

[1] A full description of the development, design, and implementation of the PHDCN can be found on the project's website: http://www.icpsr.umich.edu/PHDCN

NCs comprises about 8,000 residents.[2] From these NCs, data for the PHDCN were collected in four separate components – the Community Survey, the Systematic Social Observation Study, the 1990 United States Census, and the Longitudinal Cohort Study. This study used data collected during the Community Survey, the 1990 Census, and the Longitudinal Cohort Study, described below.

Community Survey

The Community Survey (CS) took place from 1994 through 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, social networks, informal and formal social control, and the level of social cohesion between neighbors. The CS segment of the PHDCN 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. The final sample size of the Community Survey was 8,682 Chicago residents.

1990 Census Data

Recall that each NC was comprised of a number of contiguous census tracts. To provide census information at the NC level, staff at the International Consortium for Political and Social Research (ICPSR) matched census tract information with corresponding neighborhood clusters[3] and calculated census-derived information for each NC. This study used the data from the ICPSR to examine disadvantage indicators related to poverty and income for each neighborhood cluster.

[2] "Neighborhood clusters" and "neighborhoods" will be used interchangeably throughout the remainder of this study.
[3] The matching process was conducted by researchers at ICPSR in order to ensure the confidentiality of the participants of the PHDCN.

Longitudinal Cohort Study

The 343 NCs 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)[4]; from these 21 strata, 80 NCs were selected via stratified probability sampling. The Longitudinal Cohort Study (LCS) sampled 6,226 children, adolescents, and young adults from these 80 NCs and followed them over seven years. Three waves of data collection were gathered from these individuals: data for wave 1 were collected from 1994-1997, wave 2 during 1997-2000, and wave 3 from 2000-2002. Participants of the LCS were grouped into seven cohorts based on their ages (i.e., 0, 3, 6, 9, 12, 15, and 18), so that subjects who were 12 years old at the time of data collection belonged to cohort 12, and so forth. As mentioned above, the subjects of the PHDCN were children, adolescents, and young adults, but interviews were also conducted with the primary caregivers[5] of the subjects, and PHDCN interviewers also assessed their impressions of the home environment through home visits. In-home interviews and telephone interviews were used to collect data.

Sample

This study focused on youth delinquency, violence, and mental health outcomes among adolescents and young adults, and thus included only subjects from cohorts 9, 12, and 15 of the PHDCN. The sample included a total of 2,344 youth living within 79 neighborhood clusters,[6] with comparable numbers of males (n=1,180) and females (n=1,164). Data from all three waves of the PHDCN project were used, and measures were derived using data gathered from all three

[4] The socioeconomic status levels were defined with the use of a scale from the 1990 U.S. Census that included neighborhood cluster level indicators of poverty, public assistance, income, and education (see Sampson et al., 1997).
[5] Hereafter referred to interchangeably as the parents of the youth subjects.
[6] One neighborhood cluster was lost when the sample was limited to participants in cohorts 9, 12, and 15.

sources of information (e.g., subjects, primary caregivers/parents, and PHDCN interviewers). Follow-up retention rates for the PHDCN were very good: 86% and 78% of cohort 9 were retained at waves 2 and 3, respectively, while 86% (wave 2) and 75% (wave 3) of cohort 12 were retained, and 83% (wave 2) and 71% (wave 3) of cohort 15 were retained. In all, this study analyzed 2,344 males and females from cohorts 9, 12, and 15 at wave 1, 1,959 males and females at wave 2, and 1,747 youth at wave 3. As shown in Table 1 (descriptive statistics, total sample), at wave 1, the sample was evenly distributed by age (mean age 11.99 years) and gender (50% female), and was ethnically diverse, with 46% of youth reporting their race/ethnicity as Hispanic, 36% as African-American, and 14% as non-Latino Caucasian. When examined by gender (see Table 2), none of the age, race, or socioeconomic variables were significantly different between males and females.

Measures

Individual- and family-related variables were derived from the LCS interviews, while neighborhood collective efficacy was derived from Community Survey (CS) and neighborhood concentrated disadvantage was derived from the NC-level 1990 U.S. Census dataset, all described above. Coding descriptions for the variables included in the final analyses are provided in Appendix A. Descriptive statistics are provided in Tables 1 and 2. Because this study analyzed data from both a pooled sample of male and female subjects, as well as separate samples of males and females in order to examine gender differences, the remainder of this study refers the pooled sample as the "total sample" and the separate male and female samples as the "gendered samples."

Dependent Variables

The primary outcome measures of this study were youth violence, drug use, and mental health problems. Each outcome was assessed at waves 1, 2, and 3. Youth violence and drug use were examined with both prevalence ("any") and count or frequency outcomes, while mental health internalizing symptoms were measured as a metric scale. In the gendered samples, each outcome reflects violence, drug use, and mental health problems among males and females separately.

Youth Violence. The violence measures at each wave were self-reported by the youth subjects. At each wave of data collection, youth were asked to report the number of times in the past year they had committed each violent act. At all waves, each act of violence was dichotomized (no violence = 0; any violent act = 1) and summed to measure the total number (count) of violent acts reported. *Violence* at wave 1 included 7 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 robbery (alpha = 0.66). Waves 2 and 3 *violence* examined 11 violent acts, including the seven items from wave 1 (e.g., 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 robbery), as well as having: chased someone, shot someone, shot at someone, and hurt someone in other way (wave 2 violence, alpha = 0.69; wave 3 violence, alpha = 0.70). For each wave of data, a dichotomous measure, *any violence*, was used to differentiate those youth who reported no violence (coded as 0) and those who reported one or more acts violence (coded as 1).

Table 1 Descriptive Statistics, Total Sample[a]

	$\bar{x}$	Standard Deviation	Min – Max	Skewness	Standard Deviation
Dependent Variables					
Wave 1 Outcomes					
Violence	0.62	1.11	0 – 7	2.25	0.05
Any Violence[b]	0.33	0.47	0 – 1	0.71	0.05
Drug Use Frequency	0.55	1.85	0 – 23	5.11	0.05
Any Drug Use[b]	0.17	0.37	0 – 1	1.80	0.05
Internalizing Symptoms[b]	8.34	7.23	0 – 52	1.57	0.05
Wave 2 Outcomes					
Violence	0.66	1.27	0 – 9	2.64	0.06
Any Violence	0.32	0.47	0 – 1	0.77	0.06
Drug Use Frequency	1.02	2.58	0– 22	3.63	0.06
Any Drug Use	0.25	0.44	0 – 1	1.13	0.06
Internalizing Symptoms	9.20	8.11	0– 52	1.41	0.06
Wave 3 Outcomes					
Violence	0.59	1.21	0 – 10	3.01	0.06
Any Violence	0.29	0.46	0 – 1	0.90	0.06
Drug Use Frequency	1.99	3.47	0 – 23	2.34	0.06
Any Drug Use	0.45	0.50	0 – 1	0.21	0.06
Internalizing Symptoms	10.89	7.27	0 – 37	0.74	0.06
Level-One Independent Variables					
IPV exposure	0.21	0.41	0 – 1	1.42	0.06
Female	0.50	0.50	0 – 1	0.02	0.05
Age	11.99	2.43	7.77 – 16.9	0.10	0.05
African American	0.36	0.48	0 – 1	0.59	0.05
Hispanic	0.46	0.50	0 – 1	0.17	0.05
Caucasian	0.14	0.35	0 – 1	2.05	0.05
Family SES	0.06	1.00	-2.07 – 1.72	-0.16	0.05
Child Abuse	0.68	0.47	0 – 1	-0.76	0.05
Low Self Control	46.27	11.55	14 – 85	0.25	0.05
Parental Criminality	0.13	0.33	0 – 1	2.24	0.05
Parental Drug Use	0.15	0.36	0 – 1	1.19	0.05
Parental Depression	0.13	0.34	0 – 1	2.17	0.05
Parental Supervision	9.05	1.18	3 – 10	-1.59	0.05
Parental Warmth	6.11	2.07	0 – 9	-0.66	0.05
Peer Delinquency	14.75	3.20	7 – 28	1.15	0.05
Peer Drug Use	5.12	1.60	3 – 12	1.31	0.05
Level-Two Independent Variables					
Concentrated Disadvantage	-0.01	1.00	-1.59 – 2. 42	0.49	0.27
Collective Efficacy	-0.00	0.22	-0.46 – 0.64	0.34	0.27

[a]Descriptive statistics are based on 2,344 individuals within 79 neighborhood clusters
[b]Used as control variables for prior problems in waves 2 and 3 analyses.

Table 2 Descriptive Statistics, by Gender[a]

	Males			Females			
	$\bar{x}$	Standard Deviation	Min – Max	$\bar{x}$	Standard Deviation	Min – Max	*t-test*
Dependent Variables							
Wave 1 Outcomes							
Violence	0.68	1.13	1 – 7	0.55	1.08	0 – 6	2.852**
Any Violence[b]	0.37	0.48	0 – 1	0.29	0.45	0 – 1	4.199**
Drug Use Frequency	0.55	1.70	0 – 16	0.56	1.98	0 – 23	-0.073
Any Drug Use[b]	0.18	0.38	0 – 1	0.15	0.36	0 – 1	1.494
Internalizing Symptoms[b]	8.05	7.16	0 – 49	8.43	7.29	0 – 52	-1.271
Wave 2 Outcomes							
Violence	0.81	1.41	0 – 9	0.51	1.09	0 – 8	5.177**
Any Violence	0.38	0.49	0 – 1	0.26	0.44	0 – 1	5.715**
Drug Use Frequency	1.12	2.76	0 – 22	0.92	2.37	0 – 22	1.663
Any Drug Use	0.26	0.44	0 – 1	0.25	0.43	0 – 1	0.790
Internalizing Symptoms	8.98	7.91	1 – 47	9.42	8.31	0 – 52	-1.110
Wave 3 Outcomes							
Violence	0.78	1.43	0 – 10	0.40	0.91	0 – 7	6.341**
Any Violence	0.36	0.48	0 – 1	0.23	0.42	0 – 1	5.469**
Drug Use Frequency	2.29	3.73	0 – 22	1.70	3.17	0 – 23	3.460**
Any Drug Use	0.46	0.50	0 – 1	0.43	0.50	0 – 1	1.297
Internalizing Symptoms	9.43	6.68	0 – 36	12.29	7.53	0 – 37	-8.023**
Level-One Independent Variables							
IPV exposure	0.20	0.40	0 – 1	0.22	0.42	0 – 1	- 0.985
Age	11.92	2.45	7.8 – 16.9	12.06	2.42	7.9 – 16.4	-1.385
African American	0.34	0.48	0 – 1	0.37	0.48	0 – 1	-1.382
Hispanic	0.47	0.50	0 – 1	0.45	0.50	0 – 1	0.921

Table 2 Descriptive Statistics, by Gender[a]

	Males			Females			
	$\bar{x}$	Standard Deviation	Min – Max	$\bar{x}$	Standard Deviation	Min – Max	*t-test*
Family SES	0.10	1.00	-2.1 – 1.7	0.02	0.99	-2.1 – 1.7	1.855
Child Abuse	0.70	0.46	0 – 1	0.65	0.48	0 – 1	2.448*
Low Self Control	47.38	11.60	19 – 85	45.14	11.40	14 – 85	4.678**
Parental Criminality	0.12	0.32	0 – 1	0.14	0.34	0 – 1	-1.227
Parental Drug Use	0.15	0.36	0 – 1	0.16	0.36	0 – 1	-0.231
Parental Depression	0.13	0.34	0 – 1	0.13	0.34	0 – 1	0.051
Parental Supervision	9.06	1.16	3 – 10	9.05	1.20	3 – 10	0.315
Parental Warmth	6.06	2.08	0 – 9	6.15	2.07	0 – 9	-1.057
Peer Delinquency	15.04	3.21	7 – 28	14.44	3.16	8 – 27	4.482**
Peer Drug Use	5.10	1.50	3 – 11	5.12	1.71	3 – 12	-0.657
Level-Two Independent Variables							
Concentrated Disadvantage	-0.01	1.00	-1.6 – 2.4	0.02	1.01	-1.6 – 2.4	--
Collective Efficacy	-0.00	0.22	-0.5 – 0.6	-0.00	0.23	-0.5 – 0.6	--

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters .
[b]Used as control variables for prior problems in waves 2 and 3 analyses.
* p<.05 **p< .01

Youth Drug Use. Drug use at each wave was also self-reported by youth and was based on six items derived from the National Household Survey on Drug Abuse (1991). Subjects reported the number of days (on a 9-point scale ranging from 0 days to 200 or more days) in the past year they used each of six drugs: alcohol, marijuana or hashish, cocaine, crack, inhalants, and hallucinogens. Responses were summed to measure *drug use frequency* at each wave of data collection (wave 1 alpha = 0.45; wave 2 alpha = 0.48; wave 3 alpha = 0.45). A dichotomous variable at each wave, *any drug use*, was also created to differentiate those subjects who reported no use of any drug in the past year (coded 0) and those who reported using one or more drugs (coded 1).

Youth Internalizing Symptoms. Mental health internalizing symptoms were reported by the youths' parents at waves 1 and 2, and were self-reported at wave 3. Waves 1 and 2 *internalizing symptoms* included 31 items on the Child Behavior Checklist measuring withdrawn (e.g., child: likes to be alone; refuses to talk; is secretive; is shy; stares blankly; sulks; is underactive; is unhappy/sad/depressed; is withdrawn), somatic (e.g., child: is dizzy; is overtired; is achy; experiences headaches; experiences nausea; experiences eye problems; gets rashes; has stomach cramps; experiences vomiting), and depression/anxiety (e.g., child: is lonely; cries a lot; fears doing bad; feels s/he has to be perfect; feels unloved; feels that others are out to get them; feels worthless; feels nervous; is fearful; feels guilty; is self conscious; is suspicious; worries) symptoms. Each item was reported on a three-point scale (0 = not true, 1 = somewhat true or sometimes true, and 2 = very true or often true) and then summed (wave 1 alpha = 0.86; wave 2 alpha = 0.89). Wave 3 *internalizing symptoms* included 29 self-reported items measuring withdrawn (e.g., likes to be alone; refuses to talk; is secretive; is shy; is unhappy/sad/depressed; is withdrawn), somatic (e.g., feels dizzy; feels overtired; feels achy; experiences headaches;

experiences nausea; experiences eye problems; gets rashes; has stomach cramps; experiences vomiting), and depression/anxiety (e.g., lonely; cries a lot; fears doing bad; feels s/he has to be perfect; feels unloved; feels that others are out to get me; feels worthless; feels nervous; is fearful; feels guilty; is self conscious; is suspicious; is unhappy; worries) symptoms. Each item was reported on a three-point scale (0 = not true, 1 = somewhat true or sometimes true, and 2 = very true or often true) and then summed (alpha = 0.86).

Primary Independent Variables

Exposure to Intimate Partner Violence. Youths' exposure to intimate partner violence was assessed using six items from the Conflict Tactics Scale indicating severe violence (Straus, 1979; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The subjects' primary caregivers were asked how many times during an argument with their partner in the past year their partner had: kicked, bit, or hit them with their fist; hit or tried to hit them with something; beat them up; choked them; threatened them with a knife or a gun; and used a knife or fired a gun (alpha = 0.80). The parent who was interviewed also reported their own violence by answering the same questions (alpha = 0.77). The dichotomous variable, *IPV exposure*, indicated if any of the six acts of severe IPV by either parent were reported (coded as 1) or not (coded as 0).

Neighborhood Concentrated Disadvantage. Following Sampson et al. (1997), *concentrated disadvantage* was based on principal components factor analysis using information from the 1990 U.S. Census. Six poverty-related variables (alpha = 0.70) loaded highly on one factor representing economic disadvantage: the percentage of residents in a neighborhood cluster who were below the poverty line, receiving public assistance, African American, unemployed,

younger than 18 years old, and living under female headed households. Higher numbers on this variable reflect greater concentrated disadvantage.

Neighborhood Collective Efficacy. *Collective efficacy* measured the degree of informal social control and social cohesion between neighbors and was derived from the Community Survey data using the same items as Sampson and colleagues (1997). To assess informal social control, residents were asked five items regarding the likelihood (assessed on a five-point Likert scale, from "very unlikely" to "very likely") that neighbors could be counted on to intervene if: children were skipping school and hanging out on a street corner; children were spray painting graffiti on a local building; children were showing disrespect to an adult; a fight broke out in front of their house; and the fire station closest to their home was threatened with budget cuts. To measure social cohesion and trust between neighbors, residents were asked five items regarding how strongly (on a five-point Likert scale ranging from "strongly disagree" to "strongly agree") they agreed with the following statements: people around here are willing to help their neighbors; this is a close-knit neighborhood; people in this neighborhood can be trusted; people in this neighborhood generally don't get along with each other (reverse coded); and people in this neighborhood do not share the same values (reverse coded). Given that collective efficacy cannot be directly observed, it was modeled as a latent variable (Raudenbush & Bryk, 2002). Following Sampson et al. (1997), Browning and colleagues (2004), and Morenoff et al. (2001), a three-level item response model[7] was used to construct the measure based on the 10 indicators above. Like these researchers, the level-three residuals from the item response model were used in this study as the neighborhood scores of collective efficacy (alpha at the neighborhood level = 0.85).

[7] A description of the item response model is provided in Appendix B.

Control Variables

Control variables related to gender (total sample analyses only), race/ethnicity, age, peer influences, parental influences, physical abuse, self control, family socioeconomic status; the youth's prior violence, substance use, and mental health problems reported at wave 1 were included in the analyses where relevant. All control variables were measured at wave 1 of the LCS and were based on youth and caregiver surveys or interviewer observations.

Youth self reports were used to assess demographic variables (e.g., gender, age, race/ethnicity), peer delinquency and drug use, and prior delinquency and drug use. *Female* indicated that the youth was female (no = 0, yes = 1). *Age* was the youth's age in years. Two separate dichotomous variables, *Hispanic* and *African American*, tapped the race/ethnicity of the youth, with non-Latino Caucasians serving as the reference category. *Peer delinquency* was included in analyses which focused on youth violence and 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. *Peer drug use* was included in models assessing drug use and was based on four items (alpha = 0.77) measuring the number of friends who used tobacco, alcohol, marijuana, and other drugs in the past year. Youths' own *prior violence* (reported at wave 1) was included in models assessing violence at waves 2 and 3 and *prior drug use* (reported at wave 1) was included in models assessing drug use at waves 2 and 3; both were dichotomous variables indicating any violence (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) or drug use (alcohol, marijuana or hashish, cocaine, crack, inhalants, or hallucinogens; alpha = 0.45) in the past year.

Responses from the primary caregiver or interviewer impressions were used to measure nine additional variables: family socio-economic status, child physical abuse, youth self control, parental criminality, parental drug use, parental depression, parental monitoring, parental warmth, and youths' prior internalizing symptoms. *Family SES* was a factor score based on parent education, employment and income (alpha = 0.58). *Child abuse* was assessed with the Conflict Tactics Scale for Parent and Child and reflected whether the parent reported using any minor or severe forms of physical abuse against the youth (e.g., threw something at; slapped; pushed, grabbed; kicked, bit, or hit with fist; hit with something; beat up; burned or scalded) during the past year (coded no = 0; yes = 1). The 7 items of this variable had an alpha reliability of 0.66. Following Gibson et al. (2010), youth's *low self control* was measured according to 17 items (alpha = 0.74) reported by parents on the Emotionality, Activity, Sociability, and Impulsivity (EASI) Temperament survey (Buss & 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"). Higher scores on this measure indicate lower levels of self-control.

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." Similarly, *parental drug use* indicated that either parent had problems with "health, family, job or police" due to drinking or drug use (coded as no = 0; yes = 1). *Parental depression* was also a dichotomous variable indicating that either parent suffered from depression, or "felt so low for a period of two weeks that they hardly ate or slept, or couldn't work or do whatever they usually do" at some

point during the previous year. These three variables were included in models assessing violence, drug use, and internalizing problems, respectively, at waves 2 and 3. *Parental supervision* was based on in-home interviews conducted by PHDCN staff in which the primary caregiver was asked to report whether or not he/she used each of 10 supervision techniques (alpha = 0.46), including making and enforcing rules, interacting with children's peers, and involvement in children's schooling (e.g., child: has a curfew for school and weekend nights; is not allowed to wander alone; parent: makes rules about homework; requires child to sleep at home on weekday; knows where child is when not at home; provides supervision afterschool; has rules about peers; interacts with peers; visits with the school). *Parental warmth* towards the youth reflects the overall warmth displayed by parents towards children, as observed by trained PHDCN staff conducting in-home interviews, who rated the occurrence of each of 9 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). Finally, youth *prior internalizing symptoms* were based on 31 items from the Child Behavior Checklist reported by parents measuring withdrawn, somatic, and depression/anxiety symptoms at wave 1. Each item was reported on a three-point scale (0 = not true, 1 = somewhat true or sometimes true, and 2 = very true or often true) and then summed (alpha = 0.86). This variable was included in models assessing internalizing problems at waves 2 and 3.

Analytic Strategy

Bivariate Analyses. The first set of analyses examined the bivariate relationships between exposure to IPV and all outcomes for the total sample as well as for males and females separately across waves. Chi-square analysis was used to assess violence and drug use

(dichotomous) outcomes while analysis of variance (ANOVA) was used to assess internalizing symptoms.

Hierarchical Linear Models. Due to the multi-level nature of the PHDCN dataset, hierarchical modeling (Raudenbush & Bryk, 2002) with HLM software (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004) was used to estimate the effects of IPV exposure on youths' violence, drug use, and mental health problems, the direct effects of neighborhood-level characteristics on these outcomes, and the conditioning/moderating influence of neighborhoods on the relationship between IPV exposure and the outcomes. Prevalence measures of each outcome were examined using Bernoulli models, while violence count measures and drug use frequency measures were examined with negative binomial models which take into account over-dispersed (i.e., large variance) and skewed outcome measures (Raudenbush & Bryk, 2002). Finally, internalizing symptoms were measured using linear regression in HLM.

The bi-level analyses proceeded in several steps. HLM examines different outcomes at level-one and level-two. Specifically, when examining prevalence outcome measures, the level-one outcome in the hierarchical Bernoulli model are the log-odds of a youth participating in the PHDCN LCS (specifically, those in cohorts 9 through 15 for this study) engaging in violence (or other outcome) at least one time during the past year, whereas the outcome at level-two is the proportion of youths within each NC engaging in violence in the past year. Likewise, for the count/frequency measures, the level-one outcome is the number of times a youth engaged in violence (or other outcome) in the past year, while the outcome at level-two is the average number of times youth violence occurred within a NC.

Due to the different outcomes used in multi-level modeling, multiple steps are necessary in order to determine whether each outcome significantly varies across individuals as well as

aggregates. The first step for each bi-level model involved estimating an unconditional model to determine whether the variation in each outcome between neighborhoods was significant; this information was needed to justify the examination of neighborhood effects. These analyses revealed that some outcomes varied significantly across neighborhoods, while others did not, as reported throughout the Results section. Intraclass correlation coefficients are not provided in this report because they are less informative when modeling nonlinear outcomes due to the heteroskedastic nature of the data (see Raudenbush & Bryk, 2002); however, sigma-square and tau values for all models are presented in Appendix C.

The second step, the "random coefficients" models, involved the estimation of individual-level (level-one) predictors on each youth outcome. This allowed for the examination of the significance and magnitude of those effects, as well as a determination of which level-one effects differed significantly ($p < .05$) across neighborhoods. This step of the analyses answered the first research question: what are the direct effects of IPV exposure on youths' interpersonal violence, drug use, and internalizing symptoms? Determination of whether the level-one relationships vary across neighborhoods is a necessary prerequisite for estimating cross-level interactions (i.e., whether the level-one slopes are influenced by neighborhood characteristics). This step of the analyses also answered a portion of our third research question: whether the effect of IPV exposure on each outcome varies across neighborhoods. The level-one effects, which did not vary across neighborhoods, were "fixed" for all subsequent models (e.g., "intercepts-as-outcomes"). Allowing the level-one slopes to vary randomly in the level-one models is a more rigorous test of the contextual effects because such predictors could account for some variation in the levels of youth violence, drug use, or internalizing symptoms that might otherwise be explained by neighborhood predictors. Random coefficients are denoted in Tables 4

through 11 with italicized font. All level-one predictors were grand mean-centered in order to control for the between-neighborhood variation in each outcome which was explained by the compositional differences of neighborhoods.

The third step, the "intercepts-as-outcomes" models, examined the main effects of neighborhood characteristics (i.e., concentrated disadvantage, collective efficacy) on the outcomes at level-two (i.e., neighborhood rates of youth violence, drug use, and internalizing symptoms). This step also allowed all fixed and varying level-one predictors to influence the outcomes before the effects of neighborhood disadvantage and collective efficacy were estimated. Thus, this model allowed for the estimation of neighborhood effects on outcomes after individual-level effects had been controlled, thus enabling analysis of the second research question: what are the main effects of neighborhood characteristics on neighborhood rates of youth violence, drug use, and internalizing symptoms? Because we examined all models separately for males and females, the numbers of youth nested within each neighborhood cluster were reduced, which raised concerns about the reliability of the level-one intercepts and random coefficients. To adjust for this situation, the Empirical Bayes estimates of level-one intercepts and slopes were modeled at level-two (Raudenbush & Bryk, 2002; Raudenbush et al., 2004).

The last stage of the analysis, the "slopes-as-outcomes" models, or cross-level interactions, examined the effects of neighborhood disadvantage and collective efficacy on the level-one *slopes* of IPV exposure and each outcome (i.e., the relationship between IPV exposure and each outcome). This model allowed us to estimate whether differences in neighborhood characteristics coincided with significant differences in the effects of IPV exposure on each youth outcome (i.e., cross-level interactions) and addressed the third research question: if the effect of IPV exposure varies across neighborhoods, is the relationship between IPV exposure

and youth violence, drug use, and internalizing symptoms conditioned by neighborhood characteristics?

Tests for Gender Differences. Once the full models were estimated for males and females separately, both the level-one and level-two coefficients were compared using the equality of coefficients test developed by Clogg, Petkova, and Haritou (1995). Tests of statistical significance were based on a more relaxed level of statistical significance at the neighborhood ($p \leq .10$) compared to the individual ($p \leq .05$) level of analysis given the more restricted sample size of the former (which was based on the number of neighborhood clusters) compared to the latter (based on the number of youth). Multicollinearity was not a problem for any of the statistical models, with tolerance values $\geq .48$ (see Allison, 1999).[8]

RESULTS

Results are presented for each research question below. The results are presented for the total sample first, for each outcome (i.e., violence, drug use and internalizing symptoms) assessed at each of the three waves of data collection, and then separately by gender.

Research Question 1: What are the direct effects of IPV exposure on youths' interpersonal violence, drug use, and internalizing symptoms?

Tables 3 through 11 provide the results of bivariate and multivariate analyses conducted to answer the first research question of this study.

[8] Correlations between control variables at wave 1 ranged from -.687** to .563**. The most highly correlated items were African American and Hispanic (r = -.687), followed by age and peer drug use (r = .563). All other control variables were correlated at or below .270.

Bivariate Analyses

The findings shown in Tables 3a and 3b analyze the bivariate relationship between any exposure to IPV in the past year (at wave 1) and each of the three outcomes. Chi-square analyses were used to assess the prevalence of violence and drug use, and analysis of variance was performed to examine the incidence of internalizing symptoms; no control variables were included in these analyses. The results for the full sample (see Table 3a) indicated a significant relationship between exposure to IPV at wave 1 and the likelihood of engaging in any violence in each of the three waves of data collection. Youth exposed to IPV at wave 1 were more likely to report engaging in any violence at waves 1, 2, and 3. In contrast, exposure to IPV at wave 1 was not significantly related to drug use at any of three time points, indicating that youth whose parents engaged in IPV were no more likely than those not exposed to IPV to use illegal drugs. The incidence of internalizing systems was significantly higher among youth exposed to IPV compared to youth not exposed to violence in the home at waves 1 and 2, and was marginally (p<.10) higher at wave 3.

Table 3a The Percentage (N) of the Total Sample Reporting Any Violence, Any Drug Use, and Mean Scores on Internalizing Symptoms across Waves, by Wave 1 Exposure to IPV

	Wave One	Wave Two	Wave Three
		Any Violence	
IPV Exposure (no)	30.7% (439)	29.1% (351)	27.1% (281)
IPV Exposure (yes)	37.6% (145)**	38.3% (120)**	35.4% (96)**
		Any Drug Use	
IPV Exposure (no)	15.9% (219)	24.2% (290)	42.9% (444)
IPV Exposure (yes)	16.1% (59)	27.5% (86)	45.0% (122)
		Internalizing Symptoms	
IPV Exposure (no)	7.53 (1445)	8.38 (1088)	11.00 (1007)
IPV Exposure (yes)	9.95 (389)**	11.12 (283)**	11.86 (259)†

†p < .10 *p < .05 **p < .01

The results in Table 3b present bivariate relationships by gender. Among males, exposure to IPV at wave 1 significantly increased their likelihood of violence at waves 2 and 3, but this relationship was not significant at wave 1. Among females, IPV exposure increased the prevalence of violence at waves 1 and 2, but not at wave 3. Exposure to IPV at wave 1 was not related to increased drug use among males at any of the three time points; for females, IPV exposure increased drug use at wave 2 only. Finally, both male and female youth living in violent homes had significantly greater internalizing symptoms at waves 1 and 2; this relationship was marginally ($p<.10$) significant for males at wave 3 but was not significant for females.

Multivariate Analyses

The results in Tables 4 through 11 are based on multivariate, random coefficients models that analyzed the main effects of youth exposure to IPV on outcomes, controlling for a range of individual and family (level-one) variables that might also affect these relationships. The models also allowed for the effects of IPV and other level-one variables to vary across neighborhood clusters. Italicized coefficients in the tables denote variables that varied significantly across neighborhoods; these outcomes will only be discussed as they relate to the IPV measure. Given the inclusion of numerous control variables assessing risk factors from different contexts, the models represent a rigorous test of the direct relationship between exposure to IPV and violence, drug use, and mental health problems.

Table 3b The Percentage (N) of Males and Females Reporting Any Violence, Any Drug Use, and Mean Scores on Internalizing Symptoms across Waves, by Wave 1 Exposure to IPV

	Wave One		Wave Two		Wave Three	
	Males	Females	Males	Females	Males	Females
			Any Violence			
IPV Exposure (no)	35.9% (262)	25.2% (177)	34.9% (214)	23.1% (137)	32.9% (167)	21.5% (114)
IPV Exposure (yes)	41.2% (77)	34.2% (68)**	45.2% (70)*	31.6% (50)*	45.7% (59)**	26.1% (37)
			Any Drug Use			
IPV Exposure (no)	18.0% (126)	13.7% (93)	27.0% (165)	21.3% (125)	45.5% (231)	40.5% (213)
IPV Exposure (yes)	15.7% (28)	16.4% (31)	23.9% (37)	31.0% (49)*	42.6% (55)	47.2% (67)
			Internalizing Symptoms			
IPV Exposure (no)	7.45 (740)	7.62 (705)	8.18 (553)	8.59 (535)	9.39 (494)	12.55 (513)
IPV Exposure (yes)	9.81 (189)**	10.09 (200)**	10.35 (138)**	11.86 (145)**	10.56 (122)†	13.01 (137)

†$p < .10$ *$p < .05$ **$p < .01$

Total Sample Results

Youth Violence (Count). Table 4 presents the results of the relationship between IPV exposure and the number of violent acts reported by the total sample of youth, for each wave of data collection. As indicated in italics, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 1. Exposure to IPV did not significantly impact the number of reported violent acts at any point in time, controlling for other variables. These findings are in contrast to the results of the bivariate analyses and to past research that has demonstrated a significant relationship between exposure to IPV and youth violence (Herrera & McCloskey, 2001; Ireland & Smith, 2009; Maxwell & Royo Maxwell, 2003; Sousa et al., 2010). Unlike some past investigations, however, the current analyses controlled for numerous other predictors of violence.

Regarding the control variables, those who had previously engaged in violence were more likely than those who did not to report a greater number of violent acts in waves 2 and 3, while those whose peers engaged in delinquency were more likely than those without delinquent peers to report multiple violent acts at all three time points. Other control variables consistently related to the outcomes were gender and race/ethnicity, with females being less likely than males and African Americans more likely than Caucasians to report violent acts at all waves. Age was positively associated with the number of violent acts at waves 1 and 2, while low self control was related to a greater number of violent acts at all waves. These findings are all generally consistent with prior literature that demonstrates that a variety of risk factors are related to adolescent violence (Hawkins et al., 2000; Lipsey & Derzon, 1998), and emphasizes that studies failing to take these predictors into account may risk inflating the relationship between exposure to IPV and violent behaviors.

Table 4 Random Coefficients Models Predicting Violence, Total Sample, by Wave[a]

	Wave One		Wave Two		Wave Three	
	Count β (se)	Any β (se)	Count β (se)	Any β (se)	Count β (se)	Any β (se)
Intercept	-0.86** (0.06)	-0.75** (0.05)	-0.69** (0.06)	-0.87** (0.07)	-0.76** (0.07)	-1.00** (0.08)
Female	*-0.21*** (0.07)	*-0.28*** (0.09)	-0.35** (0.10)	-0.52** (0.13)	-0.65** (0.10)	-0.67** (0.15)
IPV exposure	*-0.12* (0.09)	*-0.05* (0.12)	-0.03 (0.11)	0.07 (0.17)	0.06 (0.14)	0.03 (0.19)
Age	0.20** (0.01)	0.25** (0.02)	0.11** (0.02)	0.13** (0.03)	0.02 (0.02)	-0.02 (0.03)
African American	*0.34*** (0.12)	*0.51*** (0.14)	0.47** (0.16)	0.64** (0.22)	*0.76*** (0.19)	*0.96*** (0.20)
Hispanic	*-0.17* (0.10)	*-0.18* (0.15)	0.17 (0.15)	0.07 (0.22)	0.23 (0.20)	0.00 (0.22)
Family SES	*0.01* (0.05)	0.11 (0.06)	-0.06 (0.05)	-0.06 (0.06)	-0.12* (0.06)	-0.17* (0.08)
Child Abuse	*0.25*** (0.09)	*0.21* (0.12)	0.05 (0.12)	0.04 (0.17)	0.19 (0.11)	0.13 (0.15)
Low Self Control	0.01* (0.00)	0.01 (0.00)	0.01** (0.00)	0.02** (0.01)	0.01* (0.00)	0.02** (0.01)
Parental Criminality	0.08 (0.09)	0.15 (0.12)	0.21 (0.12)	0.35 (0.18)	0.15 (0.16)	-0.11 (0.22)
Parental Supervision	*0.00* (0.03)	-0.03 (0.05)	0.01 (0.05)	0.01 (0.06)	-0.01 (0.04)	-0.01 (0.07)
Parental Warmth	-0.04* (0.02)	0.01 (0.02)	-0.03 (0.02)	0.01 (0.04)	-0.01 (0.02)	-0.02 (0.04)
Peer Delinquency	*0.15*** (0.01)	*0.18*** (0.02)	0.06** (0.02)	0.05* (0.02)	0.05** (0.02)	0.07* (0.03)
Prior Violence	--	--	0.86** (0.13)	1.23** (0.15)	*0.80*** (0.13)	1.25** (0.15)
χ^2	54.70**	50.43**	92.32	85.56	73.03**	60.17*

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

Note: Italicized coefficients indicate significantly varying effects across neighborhood clusters

*$p < .05$ **$p < .01$ (2-tailed)

Youth Violence (Any). Table 4 also presents the results of the relationship between IPV exposure and the likelihood that youth will engage in *any* violence at each wave. The findings were nearly identical to those relating to the number of violent acts. As indicated in italics, the effect of IPV exposure on the prevalence of violence varied significantly across neighborhood

clusters only at wave 1. It did not significantly impact the likelihood that youth would engage in any violence at any point in time, controlling for other variables. Effects of the control variables on the prevalence of violence were similar to those found for the number of violent acts, with the likelihood of violence elevated among males, older individuals (waves 1 and 2 only), African Americans (compared to Caucasians), and those with low self control (waves 2 and 3 only), delinquent peers, and prior engagement in delinquency.

Youth Drug Use (Frequency). Table 5 presents the results of the relationship between IPV exposure and the frequency of drug use across each wave of data collection. As indicated in italics, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 1. Exposure to IPV was significantly related to increased frequency of drug use at waves 1 and 3, but not wave 2, controlling for other variables. These findings are notable given that the bivariate analyses did not indicate significant relationships between IPV exposure and drug use at any wave, but adding control variables to the model resulted in a stronger impact of IPV exposure. The results are consistent with some prior research (Fergusson & Horwood, 1998; Smith et al., 2010), although very few studies have examined the effects of IPV exposure on drug use (see Emery, 2011).

In addition to IPV exposure, other variables that affected the frequency of substance use included gender, age, peer drug use, and prior drug use. Consistent with much prior literature (Hawkins, Catalano, & Miller, 1992), more frequent drug use was reported by males (at waves 2 and 3 only), older individuals, youth who had peers that used drugs, and individuals with prior drug use (waves 2 and 3 only).

Table 5 Random Coefficients Models Predicting Drug Use, Total Sample, by Wave[a]

	Wave One		Wave Two		Wave Three	
	Freq β (se)	Any β (se)	Freq β (se)	Any β (se)	Freq β (se)	Any β (se)
Intercept	-1.98** (0.10)	-1.27** (0.08)	-0.81** (0.10)	-1.30** (0.06)	-0.79** (0.11)	-0.21** (0.07)
Female	*-0.13* (0.15)	-0.04 (0.07)	*-0.36*** (0.11)	-0.34** (0.11)	-0.35** (0.11)	-0.22 (0.14)
IPV exposure	*0.89*** (0.16)	*-0.08* (0.11)	0.08 (0.14)	0.09 (0.15)	0.13** (0.14)	0.13 (0.18)
Age	*0.46*** (0.03)	*0.14*** (0.02)	0.38** (0.04)	0.38** (0.03)	0.39** (0.04)	0.42** (0.04)
African American	-0.14 (0.19)	*-0.18* (0.16)	-0.27 (0.17)	-0.33 (0.19)	-0.25 (0.17)	-0.66** (0.19)
Hispanic	0.33 (0.18)	0.06 (0.12)	-0.22 (0.12)	-0.05 (0.15)	-0.25* (0.13)	-0.17 (0.18)
Family SES	0.24* (0.11)	0.14** (0.04)	0.03 (0.05)	-0.02 (0.06)	0.02 (0.05)	0.07 (0.07)
Child Abuse	0.24 (0.12)	*0.16* (0.10)	0.18 (0.12)	0.11 (0.12)	0.14 (0.12)	0.01 (0.17)
Low Self Control	*-0.00* (0.01)	*-0.00* (0.00)	0.00 (0.00)	*0.01*** (0.01)	0.00 (0.00)	0.01 (0.01)
Parental Drug Use	0.30 (0.17)	*0.13* (0.12)	0.13 (0.11)	0.16 (0.15)	0.11 (0.09)	0.20 (0.22)
Parental Supervision	*-0.13** (0.06)	*-0.07* (0.05)	*-0.06* (0.04)	*-0.05* (0.05)	*-0.05* (0.04)	-0.11 (0.06)
Parental Warmth	-0.16** (0.04)	-0.00 (0.02)	-0.03 (0.03)	0.01 (0.02)	-0.03 (0.03)	-0.02 (0.03)
Peer Drug Use	*0.57*** (0.03)	*0.37*** (0.05)	*0.19*** (0.03)	*0.16*** (0.05)	*0.18*** (0.03)	0.16* (0.06)
Prior Drug Use	--	--	*0.74*** (0.15)	*1.28*** (0.18)	*0.76*** (0.14)	0.65* (0.27)
χ^2	242.22**	22.63	110.39**	110.31**	100.54**	71.96

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

Note: Italicized coefficients indicate significantly varying effects across neighborhood clusters

*$p < .05$ **$p < .01$ (2-tailed)

Youth Drug Use (Any). Table 5 also presents the results of the relationship between IPV exposure and the likelihood of any drug use at each wave. As indicated, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 1. Unlike the models predicting the frequency of drug use, exposure to IPV was not significantly related to the

likelihood of any drug use at any time point, controlling for other variables. These results indicate that youth living in violent homes do not differ from non-victims in their likelihood of engaging in any drug use, but they are more likely to be frequent drug users. As with the prior analyses, consistent predictors of any drug use included age (i.e., older youth), peer drug use, and prior drug use. In addition, gender was related to the prevalence of drug use, but only at wave 2, with males more likely to engage in any drug use compared to females.

Youth Internalizing Symptoms. Table 6 presents the results of the relationship between IPV exposure and the number of internalizing symptoms among youth. As indicated in italics, the effect of IPV exposure varied significantly across neighborhood clusters at waves 1 and 2, but not wave 3. Unlike the bivariate analyses, which showed significant relationships between IPV exposure on internalizing symptoms at all time points, the multivariate analyses indicated that exposure to IPV was related to significantly increased internalizing symptoms at wave 1, but not waves 2 and 3. That is, IPV exposure had an immediate, but not a long-term, direct effect on mental health. These findings differ from prior research that has indicated significant long-term relationships between exposure to IPV and mental health problems such as internalizing symptoms (Fergusson & Horwood, 1998; Mrug & Windle, 2010; Sternberg et al., 2006). It should also be noted that many past studies have not utilized longitudinal data and therefore could not assess the long-term impact of IPV exposure.

The current study also controls for many other child and family variables that have not been included in much prior research. The current findings indicated that, of the control variables, internalizing symptoms were predicted in two of the three models by age (with older youth having more symptoms in waves 1 and 2), parental depression (at waves 1 and 2) and

Table 6 Random Coefficients Models Predicting Internalizing Symptoms, Total Sample, by Wave[a]

	Wave One	Wave Two	Wave Three
	β (se)	β (se)	β (se)
Intercept	8.12 ** (0.20)	9.16** (0.19)	11.07** (0.19)
Female	0.55 (0.29)	0.34 (0.33)	2.93** (0.45)
IPV exposure	*1.82*** 0.45	*0.69* (0.55)	0.68 (0.55)
Age	0.30** (0.06)	0.19** (0.07)	0.04 (0.08)
African American	-0.77 (0.41)	-0.13 (0.50)	-0.20 (0.58)
Hispanic	1.30** (0.49)	*0.78* (0.47)	0.57 (0.60)
Family SES	-0.44* (0.19)	-0.10 (0.18)	0.25 (0.21)
Child Abuse	2.71** (0.35)	0.64 (0.38)	-0.26 (0.50)
Parental Depression	3.20** (0.63)	1.80** (0.63)	1.04 (0.73)
Parental Warmth	-0.08 (0.09)	-0.03 (0.10)	0.13 (0.11)
Prior Internalizing Symptoms	--	*0.62*** (0.04)	0.14** (0.03)
χ^2	105.74**	53.21	65.51

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

Note: Italicized coefficients indicate significantly varying effects across neighborhood clusters

*$p < .05$ **$p < .01$ (2-tailed)

internalizing problems reported in prior waves (for waves 2 and 3). In addition, at wave 1 only, Hispanic youth (versus Caucasian), respondents from lower SES backgrounds, and victims of child physical abuse had more internalizing symptoms, but these differences were not found at later time points.

Summary of Results for the Total Sample. The bivariate analyses demonstrated significant relationships between exposure to IPV at wave 1 and the prevalence of violence

reported at waves 1, 2, and 3, but IPV exposure was not related to substance use at any wave of data collection. Youth exposed to IPV had a significantly higher number of internalizing symptoms compared to youth who did not live in households experiencing IPV at waves 1 and 2, and the relationship was marginally significant at wave 3. Adding some of the most important predictors of problem behaviors to these models appeared to weaken the influence of IPV exposure. In multivariate models, IPV was no longer significantly related to violence, using either outcome measure, and it was related to an increased number of internalizing symptoms at wave 1, but no longer had a long-term impact on mental health at waves 2 and 3. Interestingly, the addition of the control variables resulted in significant relationships between IPV exposure and the frequency – but not prevalence – of substance use at waves 1 and 3, with victims being more frequent drug users than non-victims.

Gendered Samples Results

Youth Violence (Count). Table 7 presents the results of the analyses assessing the effects of IPV exposure on the number of violent acts reported by males and females, respectively, for each wave of data collection. For males, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 3. Exposure to IPV did not significantly impact the number of reported violent acts by males at any point in time, controlling for other variables. For females, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 2. As with males, exposure to IPV did not significantly impact the number of violent acts reported by females at any point in time, controlling for other variables. Overall, these findings indicate gender similarities in the effects of IPV exposure on the number

Table 7 Random Coefficients Models Predicting Count Violence, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males B (se)	Females β (se)	*Z-test*
Intercept	-0.63** (0.07)	-1.16** (0.08)	4.986**	-0.44** (0.07)	-0.78** (0.08)	3.198**	-0.34** (0.08)	-1.28** (0.09)	7.81**
IPV exposure	-0.13 (0.12)	0.06 (0.11)	-1.167	-0.01 (0.13)	*0.27* (0.15)	-1.411	*0.09* (0.17)	-0.08 (0.18)	0.687
Age	0.17** (0.02)	0.25** (0.03)	-2.219*	0.15** (0.02)	*0.08*** (0.02)	2.475*	0.05* (0.02)	-0.02 (0.04)	1.565
African American	*0.27* (0.14)	0.44* (0.17)	-0.772	0.45** (0.17)	0.99** (0.22)	-1.942	0.71** (0.20)	*0.89*** (0.29)	-0.511
Hispanic	-0.07 (0.15)	*-0.27* (0.17)	0.882	0.23 (0.16)	0.36 (0.19)	-0.523	0.32 (0.23)	-0.03 (0.31)	0.907
Family SES	0.03 (0.05)	0.01 (0.08)	0.212	-0.03 (0.05)	*-0.17** (0.07)	1.627	-0.02 (0.06)	-0.20* (0.09)	1.664
Child Abuse	0.33** (0.12)	*0.04* (0.12)	1.709	0.07 (0.14)	*0.03* (0.13)	0.209	0.34* (0.16)	0.05 (0.14)	1.364
Low Self Control	0.01 (0.00)	0.01 (0.00)	0.000	0.02** (0.00)	0.03** (0.00)	0.000	-0.00 (0.00)	0.03** (0.01)	-3.000**
Parental Criminality	-0.20 (0.16)	0.31* (0.15)	-2.325*	0.25 (0.14)	0.56** (0.12)	-1.681	0.09 (0.23)	0.00 (0.17)	0.315
Parental Supervision	-0.01 (0.04)	*0.00* (0.05)	-0.156	0.12* (0.05)	*0.01* (0.06)	1.408	-0.02 (0.07)	0.01 (0.06)	-0.325
Parental Warmth	0.00 (0.02)	*-0.11*** (0.03)	3.051**	-0.01 (0.03)	-0.03 (0.02)	0.555	0.00 (0.03)	-0.03 (0.04)	0.600
Peer Delinquency	0.12** (0.01)	0.17** (0.01)	-3.536**	*0.08*** (0.02)	0.03 (0.02)	1.768	0.03 (0.02)	0.06* (0.02)	-1.061
Prior Violence	--	--	--	*0.74*** (0.14)	*1.09*** (0.12)	-1.898	*0.66*** (0.16)	*0.91*** (0.20)	-0.976
χ^2	60.90**	36.01		55.16	76.35**		77.38**	53.09**	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

Note: Italicized coefficients indicate significantly varying effects across neighborhood clusters

*$p < .05$ **$p < .01$ (2-tailed)

of violent acts reported by respondents, which differs from research suggesting that living in households characterized by IPV will have a greater impact on externalizing and violent behaviors for males versus females (Evans et al., 2008). However, some other investigations have also shown IPV exposure to have a similar effect on these outcomes for females and males (Bradford et al., 2007; Fergusson & Horwood, 1998; Moylan et al., 2009; Sternberg et al., 2006).[9]

Youth Violence (Any). Table 8 presents the results of the analyses assessing the effects of IPV exposure on the likelihood that youth will engage in any violence, as reported by males and females, respectively, for each wave of data collection. These results are very similar to the analyses assessing the count of violent acts. For males, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 3. Exposure to IPV did not significantly impact the prevalence of violence reported by males at any point in time, controlling for other variables. These findings are in contrast to the results of the bivariate analyses, which indicated an increased likelihood of violence for male victims compared to non-victims in waves 2 and 3. For females, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 2. As with males, exposure to IPV did not significantly impact the likelihood of any violence at any point in time, controlling for other variables. These outcomes also differ from the bivariate analyses, which indicated a significant relationship for females between exposure to IPV and any violence at waves 1 and 2. The results demonstrated no gender differences in the effects of IPV exposure on the prevalence of violence in any wave.

[9] For space considerations, discussions of the relationships between the control variables and outcomes among the gendered samples are not provided.

Table 8 Random Coefficients Models Predicting Any Violence, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Intercept	-0.60** (0.07)	-1.24** (0.11)	4.909**	-0.54** (0.08)	-1.19** (0.09)	5.398**	-0.55** (0.10)	-1.41** (0.10)	6.081**
IPV exposure	-0.12 (0.17)	0.13 (0.24)	-0.850	0.08 (0.20)	*0.04* (0.27)	0.119	*0.20* (0.25)	-0.21 (0.26)	1.137
Age	*0.25*** (0.04)	0.37** (0.04)	-2.120*	0.17** (0.04)	0.07 (0.04)	0.000	0.00 (0.04)	-0.04 (0.04)	0.707
African American	0.39 (0.21)	0.79** (0.30)	0.090	0.70** (0.24)	0.60 (0.32)	0.250	1.06** (0.27)	0.86** (0.32)	0.478
Hispanic	*-0.20* (0.22)	-0.49 (0.30)	0.309	0.15 (0.24)	-0.05 (0.33)	0.490	-0.09 (0.26)	0.09 (0.34)	-0.421
Family SES	0.13 (0.08)	0.17 (0.12)	-0.045	-0.06 (0.08)	-0.05 (0.10)	-0.078	-0.13 (0.10)	-0.14 (0.11)	0.067
Child Abuse	0.52** (0.17)	-0.15 (0.24)	0.728	0.01 (0.21)	0.08 (0.23)	-0.225	0.24 (0.22)	-0.05 (0.15)	1.089
Low Self Control	0.01 (0.01)	0.01 (0.01)	0.000	0.03** (0.01)	0.02** (0.01)	0.707	0.01 (0.01)	*0.03*** (0.01)	-1.414
Parental Criminality	0.00 (0.19)	0.31 (0.26)	-0.963	0.44 (0.28)	0.34 (0.24)	0.271	-0.15 (0.32)	-0.07 (0.29)	-0.185
Parental Supervision	-0.03 (0.07)	-0.09 (0.08)	0.564	0.01 (0.07)	0.03 (0.09)	-0.175	0.03 (0.08)	-0.03 (0.08)	0.530
Parental Warmth	0.06 (0.04)	-0.09 (0.05)	2.343*	0.05 (0.05)	-0.04 (0.04)	1.406	0.03 (0.06)	-0.10 (0.05)	1.664
Peer Delinquency	0.17** (0.02)	0.25** (0.03)	-2.218*	0.04 (0.03)	0.05 (0.03)	-0.024	*0.08** (0.03)	0.07 (0.03)	0.236
Prior Violence	--	--	--	*1.15*** (0.21)	1.32** (0.21)	-0.572	1.21** (0.21)	*1.31*** (0.25)	-0.306
χ^2	31.74	79.47		58.02	46.07		77.04*	64.86	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

Note: Italicized coefficients indicate significantly varying effects across neighborhood clusters

*$p < .05$ **$p < .01$ (2-tailed)

Youth Drug Use (Frequency). Table 9 presents the results of the analyses assessing the effects of IPV exposure on the frequency of drug use reported by males and females, respectively, for each wave of data collection. For males, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 1. Exposure to IPV was related to significantly increased drug use frequency for males at wave 1, controlling for other variables, but not at other waves. For females, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 2. Exposure to IPV did not significantly impact drug use frequency at any point in time, controlling for other variables. Comparing the sexes, the effect of IPV on increasing the frequency of drug use was significantly stronger for males, compared to females, at wave 1, but no sex differences were found at other time points. These findings indicate mixed support for gender differences in the effects of IPV exposure on the frequency of drug use, with stronger, short-term effects for males, but no gender differences in the long-term effects of IPV exposure. It is difficult to compare these results to those produced by other investigations, given that very few studies have examined these issues using longitudinal data.

Youth Drug Use (Any). Table 10 demonstrates that among males, the effect of IPV exposure varied significantly across neighborhood clusters at all three waves. However, IPV was not significantly related to the prevalence of drug use, controlling for other variables, at any time point. For females, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 2. As for males, exposure to IPV did not increase the likelihood of drug use at any wave, controlling for other variables. The results of the Z-tests indicated no gender differences in the effects of IPV exposure on the prevalence of drug use.

Table 9 Random Coefficients Models Predicting Drug Use Frequency, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females B (se)	*Z-test*
Intercept	10.04** (2.03)	-2.51** (0.26)	6.132**	-0.49** (0.09)	-0.77** (0.18)	1.391	0.50** (0.08)	0.20* (0.09)	2.491*
IPV exposure	*6.14** (2.88)	0.45 (0.23)	1.969*	0.08 (0.15)	*0.49* (0.25)	-1.406	0.19 (0.15)	0.03 (0.11)	0.860
Age	0.74 (0.42)	0.44** (0.11)	0.691	*0.51*** (0.05)	0.34** (0.06)	2.177*	0.33** (0.03)	0.24** (0.03)	2.121*
African American	2.27 (2.23)	0.01 (0.27)	1.006	-0.39 (0.31)	-0.56* (0.24)	0.434	-0.03 (0.16)	*-0.03* (0.16)	0.000
Hispanic	0.60 (2.25)	*0.62* (0.34)	-0.009	0.62** (0.23)	0.11 (0.27)	1.438	0.15 (0.18)	-0.34** (0.12)	2.265*
Family SES	*1.70* (2.24)	0.48 (0.26)	0.541	0.17** (0.06)	0.14 (0.13)	0.210	0.08 (0.07)	0.11 (0.08)	-0.282
Child Abuse	*-0.92* (5.13)	0.11 (0.23)	-0.201	*0.21* (0.14)	*0.29* (0.18)	-0.351	*0.14* (0.13)	0.07 (0.12)	0.396
Low Self Control	*-0.03* (0.17)	0.02 (0.01)	-0.294	*0.02*** (0.01)	*0.01* (0.01)	0.707	0.00 (0.00)	0.01 (0.01)	-1.000
Parental Drug Use	*-5.51* (4.26)	0.27 (0.24)	-1.355	-0.04 (0.17)	0.02 (0.21)	-0.222	0.27 (0.17)	-0.16 (0.20)	1.638
Parental Supervision	*-0.49* (1.82)	-0.14 (0.08)	-0.192	0.13 (0.07)	-0.08 (0.05)	2.411*	-0.01 (0.05)	-0.03 (0.04)	0.312
Parental Warmth	0.31 (0.55)	*0.00* (0.06)	0.560	*0.02* (0.03)	*-0.05* (0.05)	1.200	-0.04 (0.03)	-0.04 (0.03)	0.000
Peer Drug Use	*0.48* (1.05)	*0.61*** (0.04)	-0.123	*0.53*** (0.08)	*0.15*** (0.04)	4.249**	*0.09** (0.04)	0.10** (0.03)	-0.200
Prior Drug Use	--	--	--	*0.10* (0.21)	*0.91*** (0.27)	-2.368*	*0.21* (0.15)	0.54** (0.14)	-1.608
χ^2	102.64**	74.57**		78.26**	33.65		63.61**	51.23**	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

Note: Italicized coefficients indicate significantly varying effects across neighborhood clusters

*$p < .05$ **$p < .01$ (2-tailed)

Table 10 Random Coefficients Models Predicting Any Drug Use, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females B (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Intercept	-1.16** (0.11)	-1.49** (0.06)	2.634**	-0.75** (0.08)	-1.17** (0.06)	4.200**	-0.03 (0.09)	-0.30** (0.10)	2.007*
IPV exposure	*0.05* (0.20)	-0.06 (0.14)	0.451	*-0.26* (0.22)	*0.07* (0.19)	-1.135	*0.09* (0.22)	0.24 (0.22)	-0.482
Age	0.19** (0.03)	0.12** (0.03)	1.650	0.30** (0.04)	0.21** (0.03)	1.800	0.40** (0.04)	0.34** (0.05)	0.937
African American	-0.12 (0.26)	-0.51 (0.27)	1.040	0.37 (0.25)	-0.69** (0.25)	2.998**	-0.44 (0.24)	-0.64* (0.26)	0.565
Hispanic	0.21 (0.16)	-0.32 (0.18)	2.201*	0.31 (0.26)	-0.37 (0.27)	1.814	-0.07 (0.17)	-0.05 (0.28)	-0.061
Family SES	*0.08* (0.10)	0.13 (0.07)	-0.410	-0.13 (0.08)	-0.01 (0.08)	-1.061	*-0.10* (0.10)	0.15 (0.10)	-1.768
Child Abuse	0.30* (0.15)	*0.26** (0.13)	0.202	*0.01* (0.17)	*-0.12* (0.16)	-0.471	*0.02* (0.18)	0.14 (0.25)	0.519
Low Self Control	*-0.01* (0.01)	0.00 (0.01)	-0.707	0.01 (0.01)	*0.01* (0.01)	0.000	-0.01 (0.01)	0.02 (0.01)	-2.121*
Parental Drug Use	0.40** (0.14)	-0.01 (0.21)	1.624	-0.01 (0.14)	-0.14 (0.18)	0.570	0.12 (0.23)	0.13 (0.26)	-0.029
Parental Supervision	-0.12* (0.05)	*-0.02* (0.09)	-0.971	0.02 (0.07)	-0.11 (0.07)	1.313	-0.06 (0.07)	-0.04 (0.09)	-0.175
Parental Warmth	-0.04 (0.03)	*0.04* (0.03)	-1.886	0.02 (0.04)	*0.00* (0.04)	0.354	-0.02 (0.04)	-0.01 (0.05)	-0.156
Peer Drug Use	*0.45*** (0.08)	*0.35*** (0.05)	1.060	*0.22*** (0.08)	*-0.02* (0.06)	2.400*	*0.14* (0.07)	0.16 (0.09)	-0.175
Prior Drug Use	--	--	--	*0.99*** (0.27)	*1.40*** (0.31)	-0.997	*0.37* (0.27)	0.92** (0.30)	-1.362
χ^2	236.29**	334.82**		372.34**	61.13**		36.98	66.34	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

Note: Italicized coefficients indicate significantly varying effects across neighborhood clusters

*$p < .05$ **$p < .01$ (2-tailed)

Youth Internalizing Symptoms. Table 11 presents the results of the analyses assessing the effects of IPV exposure on internalizing symptoms for males and females at each wave. For males, the effect of IPV exposure varied significantly across neighborhood clusters only at wave 2. Exposure to IPV was significantly associated with an increased number of internalizing symptoms for males at wave 1, controlling for other variables, but not at other waves. For females, the effect of IPV exposure varied significantly across neighborhood clusters at waves 2 and 3, but not wave 1. As with males, exposure to IPV increased internalizing symptoms at wave 1, but not at other time points. The effect of IPV on increasing internalizing symptoms was not significantly different for males and females at any wave, which is in contrast to literature suggesting that females exposed to IPV are at greater risk for mental health problems like internalizing symptoms compared to males (Clements et al., 2008; Doumas et al., 1994; Kennedy et al., 2010; Yates et al., 2003). Some other studies, however, have not demonstrated gender differences in mental health outcomes (Evans et al., 2008; Sternberg et al., 2006).

Table 11 Random Coefficients Models Predicting Internalizing Symptoms, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females B (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Intercept	7.89** (0.25)	8.40** (0.25)	-1.442	8.65** (0.25)	9.38** (0.28)	-1.944	9.59** (0.27)	12.49** (0.30)	-7.185**
IPV exposure	1.42** (0.57)	2.18** (0.61)	-0.910	*-0.02* (0.72)	*1.31* (0.88)	-1.170	1.23 (0.76)	*0.28* (0.83)	0.844
Age	0.14 (0.10)	0.45** (0.09)	-2.304*	0.19* (0.08)	0.22 (0.12)	-0.208	0.05 (0.11)	0.02 (0.13)	0.176
African American	-0.91 (0.54)	-0.45 (0.56)	-0.576	-0.52 (0.70)	*0.12* (0.69)	-0.651	-0.46 (0.72)	-0.10 (0.85)	-0.323
Hispanic	0.91 (0.57)	1.95** (0.70)	-1.152	0.50 (0.63)	1.06 (0.65)	-0.619	0.35 (0.87)	0.68 (0.89)	-0.265
Family SES	-0.58* (0.25)	-0.34 (0.27)	-0.652	0.00 (0.25)	-0.06 (0.29)	0.157	0.23 (0.33)	0.27 (0.28)	-0.092
Child Abuse	2.85** (0.45)	2.54** (0.47)	0.461	*0.71* (0.58)	0.53 (0.49)	0.237	-1.03 (0.67)	0.47 (0.68)	-1.571
Parental Depression	3.10** (0.84)	3.31** (0.85)	-0.176	1.57 (0.88)	1.85* (0.86)	-0.228	1.12 (0.96)	0.69 (1.04)	0.304
Parental Warmth	-0.02 (0.10)	-0.17 (0.12)	0.960	-0.14 (0.15)	-0.01 (0.13)	-0.655	0.11 (0.16)	0.18 (0.18)	-0.291
Prior Internalizing Symptoms	--	--	--	0.59** (0.04)	0.60** (0.07)	-0.124	0.13** (0.05)	0.15** (0.05)	-0.283
χ^2	95.07	78.97		68.46	12.82		61.91	54.45	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

Note: Italicized coefficients indicate significantly varying effects across neighborhood clusters

*$p < .05$ **$p < .01$ (2-tailed)

Summary of Results by Gender. The bivariate analyses demonstrated significant relationships between exposure to IPV at wave one and the prevalence of violence reported at waves 2 and 3 among males and waves 1 and 2 among females. The prevalence of drug use was increased at wave 2 only among females exposed to IPV; no other effects were found for drug use for either sex at any time point. Finally, IPV exposure increased the number of internalizing symptoms for both sexes at waves 1 and 2, and the relationship was marginally significant at wave 3 for males only. Adding other predictors to the models and taking neighborhood residence into account appeared to weaken the relationship between IPV exposure and outcomes for both sexes. Specifically, IPV was no longer significantly related to violence, using either outcome measure, for either sex at any wave, and there were no gender differences in these relationships. The frequency of drug use at wave 1 was increased among males exposed to IPV, and this effect was significantly stronger for males than for females. IPV exposure did not affect drug use frequency at other time points, and it was not related to *any* drug use for either sex at any wave.

Finally, IPV was associated with increased internalizing symptoms at wave 1 only in multivariate models, and this effect was significant for both sexes with no gender differences in the strength of the relationship. In short, across all the models and waves of data collection, only one significant gender difference in the strength of the relationship between IPV exposure and problem outcomes was demonstrated—IPV exposure was more strongly related to the frequency of drug use at wave 1 for males compared to females.

<u>Research Question #2</u>: What are the main effects of neighborhood characteristics (e.g., disadvantage and collective efficacy) on neighborhood rates of youth violence, drug use, and internalizing symptoms?

Tables 12 through 19 provide the results of the main effects of neighborhood variables on youth outcomes, controlling for individual-level effects, and answer the second research question of this study. Therefore, these analyses "build upon" the individual-level analyses presented above, so that the results depicted in Tables 12 through 19 denote the direct effects of neighborhood characteristics on youth outcomes *after* the individual-level correlates (e.g., age, peers, etc) had been accounted for. Each neighborhood variable was assessed separately, so as to examine its independent and unique effect on the outcome; neighborhood disadvantage and collective efficacy were not assessed simultaneously (i.e., controlling for the other neighborhood variable).[10] Social disorganization theory stipulates that both neighborhood disadvantage and collective efficacy may exert independent and direct effects on individual outcomes, with disadvantage primarily serving to exacerbate problematic outcomes, while collective efficacy is theorized to alleviate many problematic behaviors. The results are presented for the total sample first, for each outcome across waves, and then by gender and are discussed accordingly. This section describes only the main effects shown in the tables.

<u>Total Sample Results</u>

Youth Violence (Count). Table 12 presents the results for the total sample regarding any youth violence and the count of violent acts across waves. As can be seen, concentrated disadvantage significantly increased the number of violent acts that youth (males and females

[10] Concentrated disadvantage and collective efficacy were correlated at -.487**; upon inspection, none of the 79 neighborhood clusters examined here were high (defined as the top 25%) in both disadvantage and collective efficacy.

combined) engaged in, but this effect was only significant at wave 1; further, the effect of concentrated disadvantage explained roughly 4% of the variation in youth violence rates at level-two. Concentrated disadvantage was not a significant predictor of the number of violent acts that youth engaged in at waves 2 or 3.

Neighborhood collective efficacy was not a significant predictor of the count of youth violent acts at any wave of data collection. Our results therefore suggest that collective efficacy does not impact the number of violent acts youth engage in during a given year, once individual-level correlates have been accounted for. This finding is somewhat different from previous analyses of collective efficacy and youth behavior (Maimon & Browning, 2010); however, these researchers examined a different outcome of youth violence and utilized item response modeling techniques for estimation purposes.

Youth Violence (Any). Unlike the results for the number of violent acts youth engaged in during the past year, concentrated disadvantage was not a significant predictor of the likelihood that youth engaged in any violence once individual-level predictors had been considered. The relationship was not significant in any of the waves of data.

On the other hand, neighborhood collective efficacy significantly increased the likelihood that male and female youths engaged in violence at wave 2, and explained approximately 6% of the variation in this outcome. The effect of collective efficacy was non-significant at waves 1 and 3, however. This finding suggests that youth's likelihood of engaging in any violence during the past year actually *increased* as the neighborhood level of collective efficacy increased. This finding is contradictory to previous theorizing on the effects of collective efficacy on crime outcomes (Sampson et al., 1997), but it may reflect increased opportunity for violence. For

Table 12 Level-Two Effects (Empirical Bayes Intercepts Outcomes) Predicting Violence, Total Sample, by Wave[a]

	Wave One		Wave Two		Wave Three	
	Count β (se)	Any β (se)	Count β (se)	Any β (se)	Count β (se)	Any β (se)
Main Effects						
Intercept	-0.96**	-0.92**	-0.70**	-0.87**	-0.80**	-1.00**
	(0.02)	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)
Concentrated	0.04†	0.03	0.00	0.00	0.02	0.01
Disadvantage	(0.02)	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)
r^2	0.04	0.03	0.00	0.00	0.01	0.02
Intercept	-0.96**	-0.92	-0.70	-0.87**	-0.80**	-1.00**
	(0.02)	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)
Collective Efficacy	-0.02	-0.02	0.01	0.06*	0.07	0.03
	(0.10)	(0.11)	(0.03)	(0.03)	(0.11)	(0.05)
r^2	0.00	0.00	0.00	0.06	0.01	0.01

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

instance, it may be that parents in neighborhoods marked by trust between residents and high levels of informal social control may feel more comfortable allowing their children more freedom, which may in turn lead to greater opportunities for engaging in violence (Simons et al., 2005).

Youth Drug Use (Frequency). The unconditional model for youths' drug use frequency at wave 1 revealed that this outcome did not vary significantly across neighborhoods, and neighborhood effects were therefore not estimated for this outcome. They did vary significantly at waves 2 and 3, but the results depicted in Table 13 show that concentrated disadvantage did not directly impact youths' frequency of drug use. Collective efficacy also was not a significant predictor of the frequency of youths' drug use for waves 2 or 3. Again, it is difficult to compare

these results to previous neighborhood-level analyses, as research on collective efficacy and drug use has been very limited.

Youth Drug Use (Any). The unconditional models for any youth drug use at waves 1 and 3 revealed that these outcomes did not vary significantly across neighborhoods, so neighborhood effects were not estimated. Neighborhood effects were examined at wave 2, and the results (see Table 13) show that while concentrated disadvantage was not a significant predictor of this outcome, collective efficacy was. Specifically, collective efficacy significantly *increased* the likelihood of drug use among adolescents at wave 2. While this finding was somewhat unexpected given social disorganization theory, it is similar to the pattern found for any youth violence and collective efficacy, above. The results suggest that the likelihood that youth will engage in drug use increases as the level of collective efficacy within a neighborhood

Table 13 Level-Two Effects (Empirical Bayes Intercepts Outcomes) Predicting Drug Use, Total Sample, by Wave[a]

	Wave One		Wave Two		Wave Three	
	Freq β (se)	Any β (se)	Freq β (se)	Any β (se)	Freq β (se)	Any β (se)
Main Effects						
Intercept	--	--	-0.98** (0.04)	-1.62** (0.04)	-0.93** (0.04)	--
Concentrated Disadvantage	--	--	-0.02 (0.04)	-0.01 (0.04	-0.02 (0.04)	--
r^2	--	--	0.00	0.00	0.00	--
Intercept	--	--	-0.98** (0.04)	-1.62** (0.04)	-0.93** (0.04)	--
Collective Efficacy	--	--	0.21 (0.19)	0.31† (0.17)	0.16 (0.17)	--
r^2	--	--	0.02	0.04	0.01	--

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

increases. Again, it might be that youth who live in efficacious neighborhoods with higher levels of social control are allowed more freedom because parents trust their neighbors to intervene when bad behavior among youths occur. However, this could also increase the opportunities for youth to engage or experiment in forms of delinquency, such as drug use.

Youth Internalizing Symptoms. The unconditional model for youths' internalizing symptoms at wave 3 revealed that this outcome did not vary significantly across neighborhoods; as such, neighborhood effects were not estimated at wave 3. Table 14 demonstrates that concentrated disadvantage did not directly influence youths' internalizing symptoms at wave 1, but it did significantly reduce these problems at wave 2. Further, the effect at wave 2 was quite strong (significant at the $p<.01$ level), and explained roughly 8% of the variance in this outcome at the neighborhood level. Thus, it appears that youths' internalizing problems decrease as the

Table 14 Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Internalizing Symptoms, Total Sample, by Wave[a]

	Wave One	Wave Two	Wave Three
	β (se)	β (se)	B (se)
Main Effects			
Intercept	8.12**	9.15**	--
	(0.06)	(0.05)	
Concentrated Disadvantage	0.04	-0.12 **	--
	(0.06)	(0.05)	
r^2	0.01	0.08	--
Intercept	8.12**	9.16**	--
	(0.06)	(0.05)	
Collective Efficacy	-0.50†	0.26	--
	(0.27)	(0.23)	
r^2	0.05	0.02	--

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

neighborhood level of disadvantage increases. Again, these results are contradictory to theoretical expectations of the detrimental effects of concentrated disadvantage (Anderson, 1999; Ross & Mirowsky, 2009; Wilson, 1987). One explanation could be that as the level of disadvantage increases, children and their parents are less likely to report mental health problems or consult with a doctor about the problems, thus creating the illusion that disadvantage somehow alleviates these problems.

Consistent with theory regarding collective efficacy, the results in Table 14 suggest that, at wave 1, collective efficacy reduces youths' internalizing problems. Sampson and colleagues (2002; Sampson et al., 1997) suggest that neighbors' trust of one another and willingness to help when needed might help to alleviate negative outcomes such as youth behavioral or mental health problems. Although the effect of collective efficacy became non-significant at wave 2, the wave 1 outcomes suggest that neighborhoods with higher levels of cohesion and trust among its residents may help reduce depression, anxiety, withdrawn, and somatic symptoms among the youth population.

Gendered Samples Results

Youth Violence (Count). The unconditional model for males' count of violent acts at wave 2 revealed that this outcome did not vary significantly across neighborhoods, so neighborhood effects were not estimated for males at this wave. Although there was a modest but significant effect ($p<.10$) of concentrated disadvantage on youth violence in the total sample (males and females combined), results in Table 15 show that neither neighborhood disadvantage nor collective efficacy significantly impacted violence counts for males or females across any wave of data (where applicable) when examined by gender. This may be due to a loss in power

when splitting the samples in half for the gendered analyses. Further, the tests for gender differences in the effects of each neighborhood predictor revealed no significant differences in the effect of these variables on males' or females' violence.

Youth Violence (Any). Similar to the neighborhood results regarding males' and females' number of violent acts, the results in Table 16 demonstrate that neighborhood factors did not directly impact the likelihood that youth engaged in any violence in the past year. Although there was a significant effect of collective efficacy on any youth violence in the total sample, neither neighborhood disadvantage nor collective efficacy was significantly related to the likelihood that males and females engaged in violence when examined by gender. The tests for gender differences also indicated that none of the neighborhood effects were stronger for males or females.

Table 15 Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Violence Count, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females B (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Main Effects									
Intercept	-0.65** (0.01)	-1.32** (0.02)		--	-1.58** (0.05)		-0.47** (0.03)	-1.35** (0.05)	
Concentrated Disadvantage	0.01 (0.01)	0.01 (0.02)	-0.048	--	0.00 (0.05)	--	-0.01 (0.03)	0.01 (0.02)	-0.465
r^2	0.01	0.01		--	0.00		0.00	0.00	
Intercept	-0.65** (0.01)	-1.32** (0.02)		--	-1.58** (0.05)		-0.47** (0.03)	-1.35** (0.02)	
Collective Efficacy	-0.02 (0.05)	0.10 (0.08)	-1.259	--	0.34 (0.22)	--	-0.03 (0.14)	-0.00 (0.07)	-0.169
r^2	0.00	0.02		--	0.03		0.00	0.00	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

Table 16 Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Any Violence, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Main Effects									
Intercept	-0.63**	-1.24**		-0.54**	-1.23**		-0.58**	-1.44**	
	(0.00)	(0.01)		(0.01)	(0.01)		(0.03)	(0.02)	
Concentrated Disadvantage	-0.00	0.01	-1.093	0.00	0.01	-0.636	-0.01	0.01	-0.372
	(0.00)	(0.01)		(0.01)	(0.01)		(0.03)	(0.02)	
r^2	0.00	0.01		0.00	0.01		0.00	0.00	
Intercept	-0.63**	-1.24**		-0.54**	-1.23**		-0.58**	-1.44**	
	(0.00)	(0.01)		(0.00)	(0.01)		(0.03)	(0.02)	
Collective Efficacy	0.02	-0.01	1.140	0.03	-0.05	1.827	-0.03	0.03	-0.378
	(0.02)	(0.02)		(0.02)	(0.03)		(0.14)	(0.08)	
r^2	0.02	0.01		0.02	0.03		0.00	0.00	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

Youth Drug Use (Frequency). The unconditional models for males' drug use frequency at waves 1 and 3 and females' drug use frequency at waves 1 and 2 revealed that these outcomes did not vary significantly across neighborhoods, and neighborhood effects were therefore not estimated. Accordingly, gender differences were not examined for any drug use frequency outcome in Table 17. The neighborhood results that were estimated again suggested that neither disadvantage nor collective efficacy impacted the frequency of male and female drug use. The results are consistent with those of the total sample, whereby neither neighborhood predictor significantly impacted the frequency that youth used drugs across any wave of data.

Youth Drug Use (Any). The unconditional models for males' likelihood of drug use at waves 1 and 3 and females' likelihood of drug use at wave 1indicated that these outcomes did not vary significantly across neighborhoods, so neighborhood effects were not estimated for these outcomes. The results shown in Table 18 revealed that concentrated disadvantage did not significantly impact the likelihood of drug use for males or females across any wave of data (where estimated), and there were no gender differences in these effects at wave 2. The lack of gender differences is consistent with the literature, although few studies have assessed gender differences in the effects of neighborhood factors (Zahn & Browne, 2009).

Collective efficacy was positively related to the likelihood of drug use among males at wave 2 of data collection, but it was not related to females' drug use at any wave of data (when estimated). Further, the effect of collective efficacy on any drug use was significantly stronger for males than females at wave 2. The results suggested that as neighborhood collective efficacy increased, the likelihood that males engaged in any drug use also increased, and this effect was stronger for males than females. These results parallel the results of the total sample, where

Table 17 Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Drug Use Frequency, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Main Effects									
Intercept				-1.90**				0.13**	
				(0.08)				(0.03)	
Concentrated Disadvantage	--	--	--	-0.02 (0.08)	--		--	0.01 (0.03)	--
r^2	--	--		0.00	--		--	0.00	
Intercept				-1.89**				0.13**	
				(0.08)				(0.03)	
Collective Efficacy	--	--	--	-0.49 (0.37)	--		--	0.17 (0.13)	--
r^2	--	--		0.02	--		--	0.02	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

collective efficacy increased the likelihood of drug use among participants as a whole. The findings for the gendered samples presented here may suggest that those findings were driven primarily by collective efficacy's effect on males, not females.

Youth Internalizing Symptoms. The unconditional models for males' internalizing symptoms at waves 2 and 3 and females' internalizing symptoms at wave 3 revealed that these outcomes did not vary significantly across neighborhoods, and therefore neighborhood effects were not estimated. Table 19 reveals that concentrated disadvantage did not directly influence youths' internalizing symptoms for males or females across any wave of data (where applicable). Further, no gender differences were found.

Neighborhood collective efficacy significantly reduced ($p<.05$) males' internalizing symptoms, but not females' symptoms. Although there were no gender differences in the effects of collective efficacy, the results suggest again that the effect of collective efficacy in the total sample was driven primarily by collective efficacy's effect on males' internalizing symptoms, rather than females' internalizing symptoms. Taken together, these results and the findings regarding males' drug use suggest that collective efficacy is a more influential neighborhood factor for males compared to females. This may be because parents are more willing to allow their male children to be outside of the house unsupervised, compared to their female children. Few empirical studies have tested gender differences in neighborhood effects, but the few that have generally report similar effects of neighborhood characteristics on offending for girls and boys (Beyers et al., 2003; Jacob, 2006; Karriker-Jaffe et al., 2009; Molnar et al., 2008; Mrug & Windle, 2009; Simons et al., 1996). However, many of these investigations have examined different outcomes than the current investigation, have not statistically compared the relative strength of neighborhood variables for males and females, and, importantly, have often failed to

Table 18 Level-Two Effects (Empirical Bayes Intercepts as Outcomes) Predicting Any Drug Use, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Main Effects									
Intercept	--	--	--	-3.32** (0.20)	-2.90** (0.08)		--	-0.30** (0.00)	
Concentrated Disadvantage	--	--	--	-0.22 (0.20)	0.00 (0.08)	-1.052	--	0.00 (0.00)	--
r^2				0.02	0.00			0.00	
Intercept	--	--	--	-3.31** (0.20)	-2.90** (0.08)		--	-0.30** (0.00)	
Collective Efficacy	--	--	--	2.07** (0.89)	0.00 (0.34)	2.169†	--	0.00 (0.00)	--
r^2				0.07	0.00			0.02	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

Table 19 Level-Two Effects (Empirical Bayes Intercepts and Slopes as Outcomes) Predicting Internalizing Symptoms, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Main Effects									
Intercept	7.89**	8.40**			9.38**				
	(0.05)	(0.03)			(0.04)				
Concentrated Disadvantage	0.04	0.01	0.488	--	-0.02	--	--	--	--
	(0.05)	(0.03)			(0.04)				
r^2	0.01	0.00		--	0.00		--	--	
Intercept	7.89**	8.40**			9.38**				
	(0.05)	(0.03)			(0.04)				
Collective Efficacy	-0.53*	-0.08	-1.716	--	-0.04	--	--	--	--
	(0.23)	(0.12)			(0.16)				
r^2	0.06	0.01		--	0.00		--	--	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

assess the effects of collective efficacy on youth outcomes. Studies that have examined collective efficacy have largely relied on measures collected from the same youth whose behaviors were being assessed. Given these methodological differences, it is difficult to compare our findings to other research, and more investigation of gender differences in contextual effects on youth problem behaviors is clearly warranted.

Summary of Neighborhood Direct Effects on Youth Outcomes. The results of this study indicated that disadvantage was related to increased total amounts of violence that youth (males and females combined) engaged in, while collective efficacy was related to increased likelihoods of youth engaging in any violence and any drug use. Both disadvantage and collective efficacy were associated with significantly fewer internalizing symptoms among youth. When analyzed by gender, the results revealed that neither neighborhood characteristic directly influenced violence, drug use, or internalizing symptoms among females. In fact, concentrated disadvantage failed to predict any outcome when examined among males and females separately. Collective efficacy was associated with a higher likelihood of drug use and fewer internalizing symptoms among males. These results may suggest that the effect of collective efficacy on drug use and internalizing symptoms in the total sample may be due primarily to its effect on males but not females.

<u>Research Question #3</u>: Does the effect of IPV exposure vary across neighborhoods? If so, is the relationship between IPV exposure and youth violence, drug use, and mental health problems conditioned by neighborhood characteristics?

Tables 20 through 27 also provide the results of the cross-level analyses which answer the third research question of this study. The results are presented in the same format as the main

effects (above), but focus on the cross-level interactions. Again, each neighborhood variable was assessed separately, after controlling for individual-level effects, and did not control for the potential effect of the other neighborhood variable. Gender differences in the magnitude of effects were examined only when possible (e.g., when the same outcome was estimated for males and females at the same wave of data collection).

Total Sample Results

Youth Violence (Count). The results of the random effects models at level-one (Table 4) showed that the relationship between IPV exposure and the count of youth violence only differed significantly across neighborhoods at wave 1. As such, cross-level interactions were only examined for this time period. The answer to the first part of the research question – does the effect of IPV exposure vary across neighborhoods – therefore, is yes, but only at wave 1. The findings in Table 20 revealed that concentrated disadvantage significantly tempered the impact of IPV exposure on youths' count of violent acts. That is, the relationship between IPV exposure and the count of youths' violence became *weaker* as neighborhood disadvantage increased; conversely stated, the relationship between IPV exposure and youth violence became stronger as neighborhood disadvantage decreased. Collective efficacy, on the other hand, did not condition the relationship between IPV exposure and youths' violence count at wave 1.

The inhibitory effect of neighborhood disadvantage on IPV exposure's relationship to violence is not altogether unexpected. Two explanations are possible. First, areas characterized by neighborhood disadvantage and other social disorganization indicators have been found to be more tolerant of deviance (Sampson & Bartusch, 1998; Sampson & Wilson, 1995), meaning that such areas are less likely to frown upon certain deviant acts like interpersonal violence or drug

use. It is thus likely that in disadvantaged neighborhoods, violence in general is tolerated and seen as normative to an extent, and intimate partner violence may also be more tolerated among residents. The effect of being exposed to violent parents, therefore, might be diluted in these areas, if such behavior is viewed as commonplace and/or not particularly problematic. Indeed, numerous studies have shown higher rates of IPV in disadvantaged areas compared to affluent ones (Benson et al., 2003; Miles-Doan, 1998; Van Wyk et al., 2003; Wright, 2011; Wright & Benson, forthcoming). A second explanation can be drawn from the "social push" hypothesis in the biosocial field of criminology, which essentially states that biological factors may explain deviant behavior more strongly when a deviant child lives in an environment that lacks the factors that 'push' him or her into crime (e.g., social risk factors, such as living in disadvantaged neighborhoods or residing in a criminal household, see Raine, 2002). Stated conversely,

Table 20 Level-Two Effects (Empirical Bayes Slopes as Outcomes) Predicting Violence, Total Sample, by Wave[a]

	Wave One		Wave Two		Wave Three	
	Count β (se)	Any β (se)	Count β (se)	Any β (se)	Count β (se)	Any β (se)
Cross-Level Interactions						
IPV Exposure Slope	-0.06*	0.06	--	--	--	--
	(0.03)	(0.05)				
Concentrated Disadvantage	-0.06*	-0.07	--	--	--	--
	(0.03)	(0.05)				
r^2	0.05	0.02	--	--	--	--
IPV Exposure Slope	-0.06†	0.06	--	--	--	--
	(0.03)	(0.05)				
Collective Efficacy	0.15	0.08	--	--	--	--
	(0.14)	(0.21)				
r^2	0.01	0.00	--	--	--	--

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

environments with more abundant social risk factors may camouflage the biological contribution to antisocial behavior. Extending this perspective, it could be argued that within environments characterized by multiple risk factors for violence, delinquency, and other negative outcomes, the effect of any *one* risk factor (such as exposure to parental IPV) may be diluted. On the other hand, in environments or neighborhoods that lack risk factors (e.g., protective neighborhoods), the effect of any one risk factor may be more readily expressed and may have a more detrimental effect on behavior. Unfortunately, social disorganization theory does not explicitly address the conditioning effects of neighborhoods, so these are post-hoc explanations (Wilcox, Land, & Hunt, 2003). Future research in this area is needed to examine whether neighborhoods exacerbate or temper the effects of risk factors on criminological outcomes.

Youth Violence (Any). The results of the random effects models at level-one (Table 4) showed that the relationship between IPV exposure and the likelihood of youth violence only differed significantly across neighborhoods at wave 1. As such, cross-level interactions were only examined at this time period. Table 20 shows that neither concentrated disadvantage nor collective efficacy conditioned the relationship between IPV exposure and the likelihood that youth engaged in any violence. That is, the relationship between IPV exposure and any youth violence did not become stronger or weaker in different 'types' of neighborhood contexts (e.g., disadvantaged neighborhoods or efficacious neighborhoods).

Youth Drug Use (Frequency). The relationship between IPV exposure and the frequency of youth drug use only differed across neighborhoods at wave 1 (see Table 5); therefore, cross-level interactions were only examined at this wave. The results in Table 21 revealed that neighborhood disadvantage strongly ($p<.01$) reduced or tempered the effect of IPV exposure on youths' frequency of drug use. Recall from the level-one models in Table 5 that IPV

exposure significantly increased the frequency of drug use among males and females at wave 1; the results of the cross-level interactions presented here suggest that this effect became weaker as the level of disadvantage increased. Stated differently, the detrimental impact of IPV exposure on the frequency of drug use among youth became stronger as the level of neighborhood disadvantage decreased. These results are consistent with those of the cross-level interactions related to the number of violent acts reported by youth. As with violence, it may be that the effect of any one risk factor such as exposure to IPV is diluted in areas where drug use is more tolerated (Sampson & Bartusch, 1998) and other social or environmental risk factors for drug use are prevalent.

The cross-level interactions in Table 21 demonstrated that collective efficacy did not significantly condition the relationship between exposure to partner violence and the frequency of drug use among adolescents. It could be argued, therefore, that the impact of IPV exposure on drug use frequency does not depend upon the level of collective efficacy within a neighborhood.

Youth Drug Use (Any). The level-one relationship between IPV exposure and any youth drug use only differed significantly across neighborhoods at wave 1 (Table 5). As such, cross-level interactions were only examined for this time period. Table 21 reveals that concentrated disadvantage again significantly ($p<.01$) reduced the impact of IPV exposure on the likelihood that youth engaged in any drug use. That is, the relationship between IPV exposure and the likelihood that youths used any drugs became weaker as neighborhood disadvantage increased; conversely, the relationship between IPV exposure and the likelihood of youth drug use became stronger as neighborhood disadvantage decreased. These results are consistent with the cross-level interactions of the frequency of drug use as well as the count of youth violence.

Also consistent with the previous findings, neighborhood collective efficacy did not condition the relationship between IPV exposure and youths' likelihood of using drugs.

Table 21 Level-Two Effects (Empirical Bayes Slopes as Outcomes) Predicting Drug Use, Total Sample, by Wave[a]

	Wave One		Wave Two		Wave Three	
	Freq β (se)	Any β (se)	Freq β (se)	Any β (se)	Freq β (se)	Any β (se)
Cross-Level Interactions						
IPV Exposure Slope	0.08	-0.07†				
	(0.11)	(0.33)				
Concentrated Disadvantage	-0.32**	-0.82**	--	--	--	--
	(0.11)	(0.33)				
r^2	0.10	0.08	--	--	--	--
IPV Exposure Slope	0.08	-0.64*				
	(0.11)	(0.34)				
Collective Efficacy	0.62	1.57	--	--	--	--
	(0.50)	(1.51)				
r^2	0.02	0.01	--	--	--	--

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

Youth Internalizing Symptoms. The findings in Table 6 demonstrated that the level-one relationship between IPV exposure and youth internalizing symptoms differed significantly across neighborhoods at waves 1 and 2, so cross-level interactions were only examined for these outcomes. Table 22 revealed that neither concentrated disadvantage nor collective efficacy conditioned the relationship between IPV exposure and youths' internalizing symptoms at either wave of data collection. Based on these results, it can be concluded that the relationship between IPV exposure and youths' internalizing symptoms does not become stronger or weaker in different 'types' of neighborhood contexts.

Table 22 Level-Two Effects (Empirical Bayes Slopes as Outcomes) Predicting Internalizing Symptoms, Total Sample, by Wave[a]

	Wave One	Wave Two	Wave Three
	β (se)	β (se)	β (se)
Cross-Level Interactions			
IPV Exposure Slope	1.83**	0.68**	--
	(0.09)	(0.17)	
Concentrated Disadvantage	0.10	-0.12	--
	(0.09)	(0.17)	
r^2	0.01	0.01	--
IPV Exposure Slope	1.82**	0.68**	--
	(0.09)	(0.17)	
Collective Efficacy	0.01	-0.21	--
	(0.42)	(0.75)	
r^2	0.00	0.00	--

[a]Analyses are based on 2,344 individuals within 79 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

Gendered Samples Results

Youth Violence (Count). The relationship between IPV exposure and the count of violence only differed significantly across neighborhoods for males at wave 3 and for females at wave 2 (Table 7). As such, cross-level interactions were only examined for these outcomes. The results of the cross-level interactions shown in Table 23 illustrated that concentrated disadvantage did not moderate the effect of IPV exposure on the number of violent acts that males or females engaged in.

Collective efficacy conditioned the relationship between IPV exposure and females' violence at wave 2, but it did not condition the effect of IPV exposure on males' violence count. The results showed that collective efficacy significantly *increased* the effect of IPV exposure (which was non-significant at level-one) on females' violence, meaning the relationship between IPV exposure and females' violence became stronger in areas of higher collective efficacy. This

Table 23 Level-Two Effects (Empirical Bayes Slopes as Outcomes) Predicting Violence Count, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females B (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Cross-Level Interactions									
IPV Exposure Slope				--	-0.22† (0.12)		0.09 (0.07)	--	
Concentrated Disadvantage	--	--	--	--	-0.15 (0.12)	--	0.07 (0.07)	--	--
r^2	--	--			0.02		0.02	--	
IPV Exposure Slope				--	-0.21† (0.12)		0.09 (0.07)	--	
Collective Efficacy	--	--	--	--	1.04† (0.53)	--	0.17 (0.30)	--	--
r^2	--	--		--	0.05		0.00	--	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

Table 24 Level-Two Effects (Empirical Bayes Slopes as Outcomes) Predicting Any Violence, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Cross-Level Interactions									
IPV Exposure Slope					-0.03		0.22**		
					(0.09)		(0.07)		
Concentrated Disadvantage	--	--	--	--	-0.07 (0.09)	--	0.10 (0.07)	--	--
r^2	--	--		--	0.01		0.03	--	
IPV Exposure Slope					-0.03		0.22**		
					(0.09)		(0.07)		
Collective Efficacy	--	--	--	--	0.62 (0.41)	--	0.09 (0.32)	--	--
r^2	--	--		--	0.03		0.00	--	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

finding is somewhat contrary to theoretical expectations, since collective efficacy should theoretically reduce the negative impact of stressors and other risk factors among children. However, our results suggest the opposite: that the impact of stressors (i.e., exposure to IPV) became stronger as neighborhood collective efficacy increased. Again drawing from Raine (2002) and the social push hypothesis, it is possible that the effect of a risk factor such as exposure to violence is more readily expressed and may have a more detrimental effect on youth behavior when youth are situated within environments that *lack* the social "pushes" into crime (e.g., neighborhoods that are characterized by social trust and cohesion).

Youth Violence (Any). The effect of IPV exposure on any violence varied across neighborhoods for males at wave 3 and females at wave 2 only (see Table 8); cross-level interactions were therefore only examined for these outcomes. The results in Table 24 revealed that neither concentrated disadvantage nor collective efficacy conditioned the effect of IPV exposure on the likelihood that males or females engaged in any violence.

Youth Drug Use (Frequency). The random effects model at level-one (Table 9) demonstrated that the relationship between IPV exposure and the frequency of drug use among males varied across neighborhoods at wave 1 only and among females at wave 2 only, so cross-level interactions were only examined at these time periods. The results in Table 25 showed that neither neighborhood variable conditioned the effect of IPV exposure on males' or females' frequency of drug use, suggesting that the relationship between IPV exposure and the frequency of drug use among males and females does not become stronger or weaker in areas of higher (or lower) disadvantage or collective efficacy.

Youth Drug Use (Any). The relationship between IPV exposure and any male drug use differed significantly across neighborhoods throughout all waves of data collection, while

Table 25 Level-Two Effects (Empirical Bayes Slopes as Outcomes) Predicting Drug Use Frequency, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Cross-Level Interactions									
IPV Exposure Slope	-1.21*				0.11				
	(0.54)				(0.08)				
Concentrated Disadvantage	-0.81 (0.53)	--	--	--	-0.05 (0.08)	--	--	--	--
r^2	0.03	--		--	0.00		--	--	
IPV Exposure Slope	-1.21*				0.11				
	(0.54)				(0.08)				
Collective Efficacy	0.68 (2.44)	--	--	--	-0.10 (0.37)	--	--	--	--
r^2	0.00	--		--	0.00		--	--	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

Table 26 Level-Two Effects (Empirical Bayes Slopes as Outcomes) Predicting Any Drug Use, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Cross-Level Interactions									
IPV Exposure Slope	-1.45*			-0.94*	0.57*		0.01		
	(0.59)			(0.44)	(0.25)		(0.13)		
Concentrated Disadvantage	-1.70** (0.59)	--	--	-0.15 (0.43)	-0.36 (0.25)	0.426	0.11 (0.13)	--	--
r^2	0.10	--		0.00	0.03		0.01	--	
IPV Exposure Slope	-1.41*			-0.94*	0.56*		0.01		
	(0.61)			(0.43)	(0.26)		(0.14)		
Collective Efficacy	3.98 (2.76)	--	--	0.31 (1.93)	-1.06 (1.14)	0.061	0.28 (0.61)	--	--
r^2	0.03	--		0.00	0.01		0.00	--	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

the relationship differed across neighborhoods only at wave 2 among females (see Table 10). As such, cross-level interactions were only examined for these outcomes. The findings in Table 26 demonstrated that concentrated disadvantage significantly (and strongly, $p<.01$) tempered, or weakened, the impact of IPV exposure on males' likelihood of drug use at wave 1. In other words, the effect of IPV exposure on males' drug use became stronger as neighborhood disadvantage decreased. This effect was not significant at waves 2 or 3. These results are consistent with the cross-level interactions of disadvantage and youth violence. Concentrated disadvantage did not condition the relationship between IPV exposure and females' likelihood of drug use at wave 2; further, there were no significant gender differences in the effect of disadvantage among males or females at this wave of data collection. Collective efficacy did not condition the effect of IPV exposure on either males' or females' likelihood of drug use.

Youth Internalizing Symptoms. The random effects models at level-one (Table 11) revealed that the relationship between IPV exposure and males' internalizing symptoms varied across neighborhoods at wave 2 only and among females at waves 2 and 3 only; cross-level interactions were therefore only examined at these time periods. The cross-level interactions in Table 27 showed that neither neighborhood concentrated disadvantage nor collective efficacy conditioned the effect of IPV exposure on males' or females' internalizing symptoms, and there were no gender differences in these effects at wave 2.

Summary of Neighborhood Conditioning Effects on Youth Outcomes. The results of this study indicate that neighborhood concentrated disadvantage conditioned the relationship between exposure to partner violence and youth (males and females combined) violence and drug use, but collective efficacy did not. Neither disadvantage nor collective efficacy conditioned the relationship between IPV exposure and youths' internalizing symptoms. In particular, and

Table 27 Level-Two Effects (Empirical Bayes Slopes as Outcomes) Predicting Internalizing Symptoms, by Gender, by Wave[a]

	Wave One			Wave Two			Wave Three		
	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*	Males β (se)	Females β (se)	*Z-test*
Cross-Level Interactions									
IPV Exposure Slope				-0.02	1.31**			0.28*	
				(0.16)	(0.24)			(0.14)	
Concentrated Disadvantage	--	--	--	-0.05	-0.11	0.238	--	-0.13	--
				(0.16)	(0.24)			(0.14)	
r^2	--	--		0.00	0.00		--	0.01	
IPV Exposure Slope				-0.02	1.31**			0.28*	
				(0.16)	(0.24)			(0.14)	
Collective Efficacy	--	--	--	0.10	-0.23	0.264	--	0.01	--
				(0.70)	(1.07)			(0.62)	
r^2	--	--		0.00	0.00		--	0.00	

[a]Male analyses are based on 1,180 males within 79 neighborhood clusters; female analyses are based on 1,164 females within 76 neighborhood clusters

†$p < .10$ *$p < .05$ **$p < .01$ (2-tailed)

Table 28 Summary of Findings[a]

	Total Sample					Males					Females				
	Violence		Drug Use		Internalizing Symptoms	Violence		Drug Use		Internalizing Symptoms	Violence		Drug Use		Internalizing Symptoms
	Count	Any	Freq	Any		Count	Any	Freq	Any		Count	Any	Freq	Any	
IPV Exposure	ns	ns	(+)	ns	(+)	ns	ns	(+)	ns	(+)	ns	ns	ns	ns	(+)
Main Effects															
Concentrated Disadvantage	(+)	ns	ns	ns	(-)	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Collective Efficacy	ns	(+)	ns	(+)	(-)	ns	ns	ns	(+)	(-)	ns	ns	ns	ns	ns
Cross-Level Interactions															
Concentrated Disadvantage	(-)	ns	(-)	(-)	ns	ns	ns	ns	(-)	ns	ns	ns	ns	ns	ns
Collective Efficacy	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	(+)	ns	ns	ns	ns

[a]Table summarizes any effect across waves
ns = not significant
(+) = positive relationship
(-) = negative relationship

somewhat contradictory to expectations, concentrated disadvantage tempered the effect of IPV exposure on youths' total violence counts, as well as their frequency and likelihood of drug use. The relationship between IPV exposure and each of these outcomes became weaker as the neighborhood levels of disadvantage increased.

When analyzed by gender, the conditioning effect of concentrated disadvantage largely vanished: only two significant cross-level interactions were demonstrated. Disadvantage only conditioned the effect of IPV exposure on the likelihood that males engaged in any drug use, but failed to moderate the effect of IPV exposure on any outcome among females. As with the results from the total sample, disadvantage tempered or weakened the impact of IPV exposure on males' drug use. Further, while collective efficacy did not condition the effect of IPV on any outcome among males and females combined (total sample), our results indicated that it did condition the effect of IPV exposure on the number of violence acts in which females engaged. Specifically, collective efficacy strengthened the effect of exposure to IPV and females' violence, so that the effect of being exposed to parental violence became stronger as the levels of neighborhood collective efficacy increased.

CONCLUSION

Discussion of Main Findings

Direct effects of IPV exposure on youth outcomes

The first research question analyzed the short- and long-term effects on exposure to IPV, assessed at wave 1 (when youth participants were aged 8-17) on a range of problem outcomes, assessed at waves 1, 2 (when participants were aged

12-22). Analyses were first conducted with the full sample, then separately for males and females to investigate the extent of gender differences in the relationships.

Among the full sample, and controlling for a range individual and other family risk factors, youth exposed to severe IPV were no more likely to engage in any violence or to report more violent acts compared to those whose caregivers did not report severe IPV. IPV exposure had both short- and long-term effects on the frequency but not the prevalence of drug use, being associated with more frequency of use at waves 1 and 3, but not wave 2. Finally, the impact of IPV exposure on increasing internalizing symptoms was found only in the short-term, at wave 1; IPV exposure did not predict mental health outcomes at waves 2 and 3. Across all the models and waves of data collection, only one significant gender difference in the strength of these relationships was demonstrated—IPV exposure was more strongly related to the frequency of drug use at wave 1 for males compared to females.

These findings contribute to the extant literature on the effects of IPV exposure in several ways. First, they represent a more rigorous test of the relationship than has typically been conducted. By including multiple control variables that may be related to the prevalence of IPV and/or to the outcomes assessed, the analyses guarded against mis-specifying and likely over-estimating the impact of IPV on violence, drug use, and mental health problems. The current findings demonstrated weaker support for the influence of IPV exposure on problem outcomes compared to much prior work. We interpret this disparity to be due, at least in part, to our inclusion of more relevant control variables compared to past research.

Secondly, the use of longitudinal data allowed us to more precisely estimate the influence of IPV exposure on subsequent outcomes and to examine both immediate and longer-term effects experienced during childhood (for some participants), adolescence, and young adulthood

(for some participants). This developmental framework is important given evidence that the effects of risk factors on problem behaviors may a) dissipate over time, b) differ at different developmental periods, and/or c) influence particular (i.e., mediating) behaviors which may then contribute to problems over the lifecourse (Sampson & Laub, 1993b). In the current study, IPV exposure affected drug use (frequency) at waves 1 and 3, but not wave 2. We also found that the negative impact of IPV on increasing internalizing symptoms was significant at wave 1, but not at later waves. It is difficult to explain differences in these relationships across the three waves – particularly the discontinuity in effects for drug use – especially because our analyses included youth varying in age who were experiencing different developmental changes at different waves. Nonetheless, another study using the PHDNC data (Emery, 2011) reported that the effects of IPV on internalizing behaviors became attenuated with age, suggesting, as our results did, that IPV may have an immediate but not long-term impact on mental health problems. Developmental criminologists have hypothesized that family influences generally weaken over the lifecourse, as children begin to assert their independence from families and become more exposed to and influenced by risk factors outside the home, notably peer influences (Dishion, Nelson, & Bullock, 2004; Thornberry, 1996). Thus, it may be that IPV has a significant, immediate impact on problems, and as the child ages, other risk factors take precedence. It is also very likely that the immediate problems caused by IPV (i.e., drug use and internalizing symptoms) may, in turn, lead to continuity in these same behaviors (i.e., adolescent drug use influencing drug use in early adulthood), and that these problems may also jeopardize children's outcomes in other areas (e.g. school performance, peer interactions, romantic relationships, etc.). That is, the early onset of problems may set children on a pathway of cascading, unsuccessful life transitions and performances (Macmillan, 2001; Sampson & Laub, 1993a). Although the current analyses add to

the literature by examining short- and long-term effects of IPV, additional research is needed to further explore and clarify these relationships, including studies that examine differences by age or developmental period and which seek to identify specific causal pathways that lead from IPV to detrimental outcomes over the lifecourse.

Third, our study was intended to assess gender differences in the strength of the relationship between IPV exposure and problem behaviors because research in this area has been under-developed. While past literature has often asserted that IPV is more likely to lead to externalizing behaviors in males and to internalizing behaviors in females, very few rigorous tests of this hypothesis have actually been conducted. Our study included enough respondents to identify gender differences in the direct effects of IPV exposure if present and involved statistical tests to determine if differences in relationships found in the gender-specific samples were significant, neither of which are common practice in the field. The results did not generally demonstrate gender differences in any of the outcomes—only one significant difference in effects was found for one outcome at one point in time. Although prior literature is limited, the lack of gender differences in the outcomes assessed are consistent with some meta-analyses of family violence studies (Kitzmann et al., 2003; Sternberg et al., 2006) as well as with a prior study of the relationship between IPV and children's outcomes using the PHDCN data (Emery, 2011).

Main effects of neighborhood characteristics on youth outcomes

The results pertaining to the second research question, investigating the direct effects of neighborhood disadvantage and collective efficacy on youth outcomes, suggest three broad conclusions. First, this study found evidence that neighborhoods do, in fact, directly influence

some youth outcomes, and this was primarily evident when males and females were examined in a pooled sample. In terms of the direct effects of neighborhood characteristics on youths' outcomes, disadvantage increased the total amount of violence that all youth (males and females combined) engaged in, while collective efficacy increased the likelihood that youth would engage in any violence and any drug use. Both neighborhood predictors significantly decreased internalizing symptoms among youth (at wave 1 for collective efficacy and wave 2 for disadvantage). The findings related to violence and internalizing symptoms are mostly consistent with other empirical evidence that has demonstrated significant relationships between neighborhood characteristics and youth outcomes (De Coster et al., 2006; Elliott et al., 1996; Haynie et al., 2006; Peeples & Loeber, 1994; Simons et al., 2005; Van Horn et al., 2007). However, in many cases, and particularly for the drug use outcomes, neighborhood characteristics had relatively modest (i.e., significant at the $p<.10$ level) or non-significant direct effects on outcomes, which is also consistent with the literature (Bernburg & Thorlindsson, 2007; Beyers et al., 2003; De Coster et al., 2006; Elliott et al., 1996; Gottfredson et al., 1991; Karriker-Jaffe et al., 2009; Maimon & Browning, 2010; Sampson, 2008). Some of the findings were, unexpectedly, not consistent with social disorganization theory. For instance, collective efficacy was related to *higher* likelihoods of violence and drug use among youth, while concentrated disadvantage was associated with *fewer* internalizing symptoms among males and females. There are many potential explanations for the former finding; however, these hypotheses should be taken with some caution given that they are post hoc. It is possible that as neighborhood levels of collective efficacy increase, parents feel more comfortable allowing their children to play and wander outside of the house because they trust that their neighbors will look out for their children and intervene if necessary to protect youth (Rankin & Quane, 2002; Simons

et al., 2005). In fact, an examination of the items in the parental supervision scale used in the current study indicated that parents in neighborhoods with the highest (top 25%) levels of collective efficacy were *less* likely than those in neighborhoods with lower levels of collective efficacy to report strict parental supervision – their children were less likely ($p<.05$) to be monitored by adults after school and were more likely ($p<.10$) to be allowed in the neighborhood without adult supervision. Thus, it may be that neighborhood collective efficacy could function to increase youths' deviance by increasing their time spent in unsupervised and unstructured activities, their exposure to deviant peer or adult role models in the neighborhood, and their opportunities for illegal behavior. It is also possible that collective efficacy – particularly social cohesion and trust between residents – increases youth problem behaviors if the norms and attitudes of the neighborhood are supportive of deviance and law-breaking rather than disapproving (Pattillo, 1998). It would be helpful for future research to disentangle the relationship between social norms, social cohesion, and informal social control to better understand if neighborhoods have varying combinations of these factors and how their interaction is related to outcomes.

We also found that concentrated disadvantage was associated with fewer internalizing symptoms, and it is possible that this effect is due to reporting biases; that is, as the level of disadvantage increases, children and their parents may be less likely to report mental health problems or consult with a doctor about the problems, thus creating a negative relationship between disadvantage and these outcomes. This hypothesis is consistent with research indicating that African American adolescents are less likely than youth from other backgrounds to receive mental health treatment services (Knopf et al., 2008), and these youth are also more likely to live

in disadvantaged areas. More research clearly needs to examine the interactions between disadvantage, race/ethnicity, and internalizing symptoms.

The results of our study differ from some other research examining the direct effects of neighborhood characteristics on adolescent problem behaviors, including other studies using the PHDCN, and further examination and replication of these findings is warranted. However, it should also be noted that the present study differed from other research in important ways, which may account for the disparity in findings. Focusing on studies that have also used the PHDCN data, given that these are most closely linked to our own analyses, Sampson et al.'s (1997) seminal work on collective efficacy found that collective efficacy was related to reduced neighborhood rates of violence. However, this study was based on data from the neighborhood level only, incorporated all 343 NCs in Chicago, and examined adult reports and official homicide data. Our analyses, in contrast, linked data from a more limited number of NCs (n=79) to individual rates of violence, drug use, and internalizing problems. Maimon and Browning (2010) found that collective efficacy was not significantly related to youth violence, but their study utilized a smaller sample (842 youth from cohorts 9 and 12), different items to assess violence, different individual-level control variables, and a different type of statistical modeling technique. Molnar and colleagues (2008) reported that collective efficacy reduced youth aggression (at $p<.10$) and was unrelated to delinquency, but their study used parent reports of children's deviance, a slightly different sample (youth from cohorts 9-15 who participated in all three waves), and a different statistical modeling technique that assessed outcomes at all three time points combined. Finally, Xue et al. (2005) found that concentrated disadvantage increased and collective efficacy decreased youth internalizing symptoms in bivariate analyses, but their sample focused on younger participants in cohorts 3-9 and examined waves 1 and 2 only.

Although none of these studies indicated that collective efficacy increased problem outcomes, their research designs are different enough to warrant caution in comparing their results to the current project.

Finally, the results of our study suggest that neighborhood characteristics generally have similar direct effects on females' and males' outcomes, although where differences exist, they appear to indicate stronger effects for males. When the results were analyzed by gender, we found that neither neighborhood characteristic directly influenced violence, drug use, or internalizing symptoms among females. Concentrated disadvantage was also unrelated to outcomes for males, while collective efficacy significantly increased the likelihood of drug use and decreased internalizing symptoms among males. As with the results for the full sample, the relationship between collective efficacy and outcomes may be accounted for by increased opportunities for deviance, assuming that parents either allow males more freedom than females and/or that unsupervised males will encounter more opportunities for deviant behavior compared to unsupervised females. However, this interpretation should be taken with caution given that only one of the findings demonstrated statistically significant differences between the sexes, with collective efficacy increasing the likelihood of drug use more for males than females. It should also be noted that Zimmerman and Messner (2010) reported a stronger effect of concentrated disadvantage on increasing violence (they did not examine collective efficacy, nor drug use as an outcome) for females versus males, but their analyses was restricted to youth in cohorts 12 and 15 and also relied on a somewhat different measure of violence and a different statistical modeling technique, which combined outcomes over all three waves. In general, much more research examining potential gender differences in the effects of neighborhood characteristics on

problem behaviors needs to be conducted, although according to the current body of literature, more similarities than differences have been evidenced.

Conditioning impact of neighborhoods on the relationship between IPV exposure and youth outcomes

The results of the conditioning effects of neighborhoods on the relationship between IPV exposure and youth outcomes also generate three main conclusions. First, the results of this study suggest that neighborhood disadvantage, but not collective efficacy, conditioned the relationship between IPV exposure for the full sample. Specifically, the relationship between IPV and the number of violent acts reported by youth, as well as on the frequency and prevalence of their drug use, became weaker as neighborhood disadvantage increased. That is, in neighborhoods with high levels of this risk factor (Anderson, 1999; Wilson, 1987), the impact of exposure to parental violence was diminished.

Based on social disorganization theory, one might expect that the effect of exposure to parental violence would be exacerbated in disadvantaged areas, as it would add to the pool of risk factors the youth is already exposed to within their neighborhood. However, the current results consistently suggest otherwise. There are several possible explanations for these outcomes. First, it is possible that areas characterized by neighborhood disadvantage are more tolerant of deviance (Sampson & Bartusch, 1998; Sampson & Wilson, 1995), and therefore IPV may be seen as somewhat normative and tolerated among residents. In essence, the negative effect of exposure to IPV would be weakened in such neighborhoods because violence between parents would not be seen as particularly problematic.

A second explanation can be drawn from Raine's (2002) "social push" hypothesis: in neighborhoods in which there are multiple risk factors for violence, delinquency, and other negative outcomes (i.e., concentrated disadvantage and intimate partner violence), the social pushes towards crime are so pervasive that the effect of any one risk factor (e.g., exposure to IPV) is diluted; in these areas, it may be that no single risk factor matters as much as the totality of risk factors in the neighborhood (Snedker et al., 2009). In contrast, for youth who experience few risk factors (i.e., who live in more advantaged communities), the effect of any one risk factor (e.g., exposure to IPV) is more readily expressed and potentially more detrimental. That is, youth who experience the discontinuity of living in a relatively affluent and stable community while simultaneously being exposed to violence in the home, may be more at-risk for experiencing problematic outcomes. It is important to note, however, that social disorganization has not explicitly posed hypotheses related to the potential conditioning influence of neighborhoods on individual-level relationships (Wilcox et al., 2003), and these are post hoc explanations of our results. Additional research is needed to further investigate cross-level interactions related to these and other outcomes.

In some cases (e.g., drug use), neighborhood factors had a moderating but not direct effect on youth outcomes. These results suggest that neighborhoods may affect youth in complex ways, and studies that fail to find significant, direct effects of neighborhood characteristics should not necessarily be discounted or viewed as failing to support social disorganization theory. Rather than directly impacting youth behavior, neighborhoods may enhance or inhibit the effects of other risk factors (e.g., exposure to intimate partner violence). Investigating these types of moderating effects, the goal of the third aim of the current study, is therefore important, as

such research can identify additional mechanisms by which the neighborhood context impacts youth development and contribute to our understanding of social disorganization theory.

The current findings produced little evidence of cross-level interactions when analyzing results by gender (i.e., for males and females separately). These results are not surprising, given that much of the previous, albeit limited, research in this area has also demonstrated a lack of gender differences in the direct or moderating effects of neighborhood context on youth outcomes (Beyers et al., 2003; Jacob, 2006; Karriker-Jaffe et al., 2009; Molnar et al., 2008; Mrug & Windle, 2009; Simons et al., 1996).

As with the overall findings, the two conditioning effects that were found to vary by gender were not entirely consistent with theoretical expectations: more concentrated disadvantage was associated with a weaker relationship between IPV exposure and the likelihood of drug use for males at wave 1, and collective efficacy *strengthened* the relationship between IPV exposure and the number of violent acts reported at wave 2 by females. The latter cross-level interaction was not demonstrated in the results for the full sample, but may also be explained by the "social push" hypothesis. That is, it may be that youth who live in neighborhoods characterized by high collective efficacy (i.e., strong levels of trust, cohesion, and informal social control) feel the detrimental effect of IPV more strongly because they are not accustomed to risk. Research examining gender difference in cross-level interactions is relatively rare, however, and the current analyses and interpretations of results should be considered somewhat explorative until additional research has been conducted.

Study Limitations

The current study was designed to overcome many of the challenges associated with prior research assessing the effects of exposure to IPV and neighborhood characteristics on youth outcomes, including using a large sample of male and female youth and their families from the general population as opposed to samples from domestic violence shelters. Further, this investigation utilized longitudinal prospective data, included a number of relevant control variables in the statistical models, and examined gender differences empirically (i.e., using tests of statistical significance) – all which are relatively uncommon in the literature.

Nonetheless, like all research, the current study had several limitations. First, the analyses relied on self-reports of both IPV (from caregivers) and the outcomes assessed (from caregivers and youth participants), and respondents may have under-reported the prevalence of these behaviors given social desirability. Although there is evidence that self-reports can produce valid measures of youth's participation in substance use and other illegal activities (Bachman et al., 1996; Thornberry & Krohn, 2000), self-reported data typically includes respondents whose behaviors have not necessarily resulted in criminal justice intervention or mental health services, and who, as a result, may not be representative of youth and families with the most severe problems. Reliance on official reports is also problematic, however, in that youth and families whose problems have resulted in official intervention may not be representative of the general population. It should also be noted that the violence and internalizing constructs were measured in somewhat different ways at different time points (e.g., using 7 items to assess violence at wave 1 versus 11 items at waves 2 and 3, and relying on parental reports of youth internalizing problems at waves 1 and 2 but youth self-reports at wave 3), which may have contributed to differences in results across the three waves of the study. Similarly, the outcomes included both

the prevalence and count/frequency of violence and drug use in order to examine how IPV affected involvement in *any* type of law-breaking behavior and, because most adolescents engage in some type of deviance, to differentiate one-time offenders from youth engaging in more frequent deviance. However, this decision to model both types of outcomes increased the number of statistical tests conducted and the potential for finding spurious results (e.g., those caused by chance).

Secondly, although the validity and reliability of our measure of IPV has been demonstrated in past research (Straus, 1979; Straus et al., 1996), we restricted the measure to the most serious forms of violence between caregivers, which we hypothesized would have the greatest impact on problem behaviors, but the results cannot be generalized to families experiencing less severe conflict. We also restricted the IPV measure to a dichotomous assessment of whether or not either parent was violent in the relationship. We did not assess the frequency of violence, nor the duration of (or discontinuity in) exposure to IPV, and it is possible that outcomes would be different if the frequency, rather than the prevalence, of IPV were examined. We did not examine the frequency of IPV exposure because we wanted this investigation to focus on what we considered the most basic, and yet still unanswered question , in the field: whether exposure to *any* IPV detrimentally impacted outcomes (the dichotomous variable of any IPV also allowed a more straight-forward analysis of cross-level interactions). Similarly, we did not examine differential effects of exposure to different forms of IPV (e.g., using a weapon towards a partner versus slapping a partner). Finally, some evidence (Jankowski, Leitenberg, Henning, & Coffey, 1999) suggests that the relationship between the perpetrator of the violence and the youth (e.g., IPV perpetrated by mothers versus fathers) may evoke different

reactions among male and females. Although we did not assess these relationships in the current study, future research should do so.

Third, we cannot ensure that all children whose parents reported IPV actually witnessed or knew about the events. The measure of IPV exposure used in this study may thus have under-estimated the effects of IPV if some youth coded as victims were actually unaware of their caregivers' violence. However, we feel confident that in most cases of reported IPV the child was aware of the violence, since evidence suggests that even if children do not directly witness parental violence, they are likely knowledgeable of it because they hear or see the aftermath of such altercations (e.g., broken furniture or parental bruises, see Holt et al., 2008).

Fourth, respondents in this study were primarily Hispanic and African American adolescents from urban neighborhoods in just one city (Chicago); we cannot be sure that the results are generalizable to youth and families living in other geographical regions or from other racial/ethnic backgrounds. Similarly, the sample included a diverse set of age groups, but developmental theories stress that the impact of risk factors may vary by age/developmental period. Our analyses controlled for age, but did not specifically investigate whether relationships differed according to the age of the respondent. Had we restricted our analysis to more homogenous age groups or dis-aggregated the sample by age (e.g., analyzing effects separately for cohorts 9, 12, and 15) a different pattern of results may have been evidenced. Doing so would have also allowed us to replicate the results; comparing, for example, outcomes at wave 1 for cohort 12 to outcomes at wave 2 for cohort 9. Finally, we did not compare whether relationships may have varied by race/ethnicity, which may be problematic given evidence for race/ethnic differences in the prevalence of all three outcomes assessed, although such differences do not necessarily indicate that youth from different backgrounds will vary in their reaction to IPV.

While an examination of results by age and race/ethnic group would have helped deepen our understanding of the effects of neighborhood and IPV on youth, it is likely that doing so in this study may have reduced statistical power to find effects, given that larger sample sizes (of both neighborhood clusters and number of individuals living within clusters) are much preferred in order to increase the reliability of estimates at the neighborhood level (Raudenbush & Bryk, 2002).

Finally, the PHDCN is noted in the field as one of the most well-positioned datasets from which to analyze neighborhood effects, and the neighborhood characteristics included in the current study are those examined most often in the field. We chose to model the two neighborhood variables in ways that were consistent with Sampson et al. (1997), but each therefore consisted of multiple constructs and thus limited our ability to thoroughly examine the ways in which the individual constructs may affect youth development. For example, the concentrated disadvantage variable included variables related to poverty, female-headed households, and racial composition, and these variables may have differential relationships to youth outcomes. Likewise, the measure of collective efficacy combined items related to social cohesion and informal social control, and did not allow examination of how each of these variables was related to the outcomes assessed. We also did not assess the potential impact of the *combination* of various neighborhood characteristics on outcomes, such as how youth may be affected by living in areas marked by both high disadvantage and high collective efficacy, or high social cohesion coupled with neighborhood norms that are conducive to law-breaking.

Implications for Research, Policy, and Practice

Future Research

As indicated throughout this report, this was one of few studies to examine contextual and gender differences in the effects of exposure to IPV using a rigorous research design, and there is clearly a need for further investigation of these relationships. Future research may wish to examine the effects of IPV exposure on the problem outcomes assessed in this study, as well as additional negative consequences, such as the perpetration of violence against dating partners, binge drinking, or depression, to better specify the ways in which exposure to violence impacts children's development. Likewise, research should consider the ways that different forms of IPV (e.g., minor versus serious violence, one-time versus more frequent violence, or short-term versus more enduring violence), as well as which parental figure is engaging in the violence, may impact youth in different ways. Additional research based on longitudinal data is needed to continue to assess both the short- and long-term effects of IPV and to identify the specific pathways or mediating mechanisms by which IPV exposure leads to behavioral disorders. An important contribution to the field would be a prospective study following parents and children from birth onward to understand how the presence or absence of IPV truly shapes youth development, and how other factors mediate and moderate the impact of this experience over time. Additional research is needed to continue to explore the characteristics of individuals who are most likely to be at risk for the negative effects of IPV exposure. For example, future studies may wish to examine the degree to which age and race/ethnicity influences the relationship between IPV exposure and outcomes. Likewise, research regarding the ways in which neighborhoods factors may contextualize all of these relationships is needed. In particular, additional research should examine the impact of additional neighborhood features, such as

physical disorder, cultural norms, or ties between residents, as well as how different combinations of neighborhood risk factors (including both the accumulation of multiple risk factors as well as the protective effects of neighborhood processes) affect youth outcomes.

Policy and Practice

The results of the current study indicated that children living in homes characterized by intimate partner violence had a greater frequency of drug use and more internalizing symptoms compared to non-victims, and that, in bivariate relationships, IPV was associated with more violence. These outcomes are problematic in the short- and long-term. Youth who engage in heavy drug use or who have mental health problems may experience difficulties in school performance or in social interactions, for example, which will affect their well-being (Macmillan, 2001). Research has also demonstrated that violence, drinking and mental health problems experienced during adolescence increase the likelihood of prolonged, violent criminal careers (Farrington, 2003), alcohol dependence (Hingson et al., 2006), and psychological disorders during adulthood (Macmillan, 2001; National Research Council and Institute of Medicine, 2009).

Perhaps the most salient policy implication, therefore, is for increased prevention and intervention services to reduce the prevalence and consequences of IPV. While a few effective dating violence prevention programs have been identified (Foshee et al., 2004; Hahn et al., 2007), there are few models demonstrating effectiveness in preventing or reducing domestic violence among adults, and more scientific research should be dedicated to creating and evaluating such programs. Increased provision of services for families experiencing IPV are also needed, including domestic violence shelters, "safe zones," access to counselors, access to safety

officers, and access to safe places for children of violent families. It would also be beneficial for police officers to receive extra training in how to appropriately respond to intimate partner violence (Benson & Fox, 2004) and to ensure they are knowledgeable about local services and service providers who work victims and offenders of domestic violence so that they can make appropriate referrals when necessary.

The negative outcomes produced by IPV exposure emphasize the need to direct services to children living in homes in which violence between caregivers is present. Children exposed to IPV will need treatment to help alleviate the immediate distress caused by victimization and to prevent the development of long-term problems. While interventions targeted to youth victims are needed, more universal interventions that take place in schools and/or community agencies can also be beneficial. The National Research Council and Institute of Medicine (2009) have recently identified a number of interventions that have been demonstrated in high quality research trials to prevent mental and behavioral disorders among the youth population. Such services include universal programs delivered in schools and in the community that enhance youth behavioral and emotional competence by, for example, providing them with skills to avoid drug use offers, cope with stress and anxiety, and recognize and respond appropriately to negative emotions.

Given that we found few direct effects of neighborhood characteristics on children's outcomes, and those that were demonstrated were often counter-intuitive, it is difficult to make strong policy recommendations for changing neighborhood-level processes. Moreover, changing levels of community disadvantage or collective efficacy is notoriously difficult, and some attempts to do so have not been successful. For example, an innovative response to decreasing the negative impact of concentrated disadvantage on youth and families provided housing

vouchers for families to move to more affluent areas; however, the experiment produced mixed evidence of success (Leventhal & Brooks-Gunn, 2000, 2003). A few community-based prevention interventions have been shown to reduce delinquency and drug use (Hawkins et al., 2009; Spoth et al., 2007), and while the intent of such projects is often to foster increased communication and action among community residents (via the creation of broad-based coalitions, which work to change community norms regarding problem behaviors and to provide evidence-based prevention programs to youth and families), such interventions, to our knowledge, have not shown significant effects on changing neighborhood collective efficacy.

Our findings do suggest that youth from more advantaged neighborhoods were more negatively affected by exposure to IPV, and it is thus important to direct services at youth from all types of neighborhoods, not just those living in more impoverished areas where rates of IPV tend to be greatest (Benson & Fox, 2004; Benson et al., 2003; Lauritsen & Schaum, 2004; Miles-Doan, 1998; Wright, 2011). Beyond this, further research investigating the direct effects of neighborhood characteristics, and their interaction with IPV, is needed in order to better establish the need for and inform the development of specific policies and practices targeting neighborhood-level processes.

REFERENCES

Agnew, R. (1992). Foundation for a General Strain Theory of Crime and Delinquency. *Criminology, 30*, 47-88.

Agnew, R. (2001). Building on the Foundation of General Strain Theory: Specifying the Types of Strain Most Likely to Lead to Crime and Delinquency. *Journal of Research in Crime and Delinquency, 38*(4), 319-361.

Akers, R. L. (1985). *Deviant behavior: A social learning approach* (3rd ed.). Belmont, CA: Wadsworth.

Allison, P. D. (1999). *Multiple Regression: A Primer*. Thousand Oaks, CA: Pine Forge Press, Sage.

Anderson, E. (1999). *Code of the street: Decency, violence, and the moral life of the inner city*. New York: WW Norton & Co.

Bachman, J. G., Johnston, L. D., & O'Malley, P. M. (1996). *The Monitoring the Future project after twenty-two years: Design and procedures*. Ann Arbor, MI: Institute for Social Research, The University of Michigano. Document Number)

Benson, M. L., & Fox, G. L. (2004). *When violence hits home: How economics and neighborhoods play a role*. Washington, D.C.: National Institute of Justice.

Benson, M. L., Fox, G. L., DeMaris, A. A., & Van Wyk, J. (2000). Violence in families: The intersection of race, poverty, and community context. In G. L. Fox & M. L. Benson (Eds.), *Contemporary Perspectives in Family Research: Families, Crime and Criminal Justice* (Vol. 2, pp. 91-109). New York: Elsevier Science Inc.

Benson, M. L., Fox, G. L., DeMaris, A. A., & Van Wyk, J. (2003). Neighborhood disadvantage, individual economic distress and violence against women in intimate relationships. *Journal of Quantitative Criminology, 19*, 207-235.

Bernburg, J. G., & Thorlindsson, T. (2007). Community structure and adolescent delinquency in Iceland: A contextual analysis. *Criminology, 45*(2), 415-444.

Beyers, J. M., Bates, J. E., Pettit, G. S., & Dodge, K. A. (2003). Neighborhood structure, parenting processes, and the development of youths' externalizing behaviors: A multilevel analysis. *American Journal of Community Psychology, 31*(1-2), 35-53.

Bradford, K., Burns Vaughn, L., & Barber, B. K. (2007). When there is conflict: Interparental conflict, parent-child conflict and youth problem behaviors. *Journal of Family Issues, 29*, 780-805.

Broidy, L., & Agnew, R. (1997). Gender and Crime: A General Strain Theory Perspective. *Journal of Research in Crime and Delinquency, 34*(3), 275-306.

Browning, C. R. (2002). The span of collective efficacy: Extending social disorganization theory to partner violence. *Journal of Marriage and the Family, 64*(4), 833-850.

Browning, C. R., Feinberg, S. L., & Dietz, R. D. (2004). The paradox of social organization: networks, collective efficacy and violent crime in urban neighborhoods. *Social Forces, 83*(2), 503-534.

Browning, C. R., Leventhal, T., & Brooks-Gunn, J. (2005). Sexual initiation in early adolescence. *American Sociological Review, 70*(5), 758-778.

Brush, L. D. (1990). Violent acts and injurious outcomes in married couples: Methodological issues in the National Survey of Families and Households. *Gender & Society, 4*, 56-67.

Buss, A. H., & Plomin, R. (1975). *A temperament theory of personality development*. New York: Wiley.

Cernkovich, S., & Giordano, P. C. (1987). Family Relationships and Delinquency. *Criminology, 25*(2), 295-319.
Chung, H. L., & Steinberg, L. (2006). Relations between neighborhood factors, parenting behaviors, peer deviance, and delinquency among serious juvenile offenders. *Developmental Psychology, 42*(2), 319-331.
Clements, C. M., Oxtoby, C., & Ogle, R. L. (2008). Methodological issues in assessing psychological adjustment in child witnesses of intimate partner violence. *Trauma, Violence, and Abuse, 9*(2), 114-127.
Clogg, C., Petkova, E., & Haritou, A. (1995). Statistical methods for comparing regression coefficients between models. *American Journal of Sociology, 100*, 1261-1293.
Cummings, J. G., Pepler, D. J., & Moore, T. E. (1999). Behavior Problems in Children Exposed to Wife Abuse: Gender Differences. *Journal of Family Violence, 14*(2), 133-156.
De Coster, S., Heimer, K., & Wittrock, S. M. (2006). Neighborhood disadvantage, social capital, street context, and youth violence. *The Sociological Quarterly, 47*, 723-753.
Dishion, T. J., Nelson, S. E., & Bullock, B. M. (2004). Premature adolescent autonomy: parent disengagement and deviant peer process in the amplification of problem behaviour. *Journal of Adolescence, 27*, 515-530.
Doumas, D., Margolin, G., & John, R. S. (1994). The Intergenerational Transmission of Aggression Across Three Generations. *Journal of Family Violence, 9*, 157-174.
Dube, S. R., & Anda, R. F. (2002). Exposure to abuse, neglect, and household dysfunction among adults who witnessed intimate partner violence as children: Implications for health and social services. *Violence and Victims, 17*, 3-17.
Earls, F. J., Brooks-Gunn, J., Raudenbush, S. W., & Sampson, R. J. (2002). Project on Human Development in Chicago Neighborhoods (PHDCN) (Publication., from Ann Arbor, MI: Inter-university Consortium for Political and Social Research, Grant 93-IJ-CX-K005:
Elliott, D. S. (1994). Serious Violent Offenders: Onset, Developmental Course, and Termination-The American Society of Criminology 1993 Presidential Address. *Criminology, 32*(1), 1-21.
Elliott, D. S., Wilson, W. J., Huizinga, D., Sampson, R. J., Elliott, A., & Rankin, B. (1996). The effects of neighborhood disadvantage on adolescent development. *Journal of Research in Crime and Delinquency, 33*(4), 389-426.
Emery, C. R. (2011). Controlling for selection effects in the relationship between child behavior problems and exposure to intimate partner violence. *Journal of Interpersonal Violence, 26*(8), 1541-1558.
Evans, S. E., Davies, C., & DiLillo, D. (2008). Exposure to domestic violence: A meta analysis of child and adolescent outcomes. *Aggression and Violent Behavior, 13*, 131-140.
Farrington, D. P. (2003). Developmental and life-course criminology: Key theoretical and empirical issues-the 2002 Sutherland Award address. *Criminology, 41*(2), 221-255.
Fergusson, D. M., & Horwood, L. J. (1998). Exposure to interparental violence in childhood and psychosocial adjustment in young adulthood. *Child Abuse and Neglect, 22*(5), 339-557.
Finkelhor, D., Ormond, R., & Turner, H. A. (2009). Lifetime assessment of poly-victimization in a national sample of children and youth. *Child Abuse and Neglect, 33*, 403-411.
Finkelhor, D., Turner, H. A., Ormond, R., Hamby, S., & Kracke, K. (2009). *Children's exposure to violence: A comprehensive national survey*. Retrieved. from.
Foshee, V. A., Bauman, K. E., Ennett, S. T., Linder, F., Benefield, T., & Suchindran, C. (2004). Assessing the long-term effects of the Safe Dates Program and a booster in preventing

and reducing adolescent dating violence victimization and perpetration. *American Journal of Public Health, 94*, 619-624.
Gibson, C. L., Sullivan, C. J., Jones, S., & Piquero, A. R. (2010). "Does it take a village?" Assessing neighborhood influences on children's self control. *Journal of Research in Crime and Delinquency, 47*(1), 31-62.
Gottfredson, D. C., McNeil, R. J., & Gottfredson, G. D. (1991). Social area influences on delinquency: A multilevel analysis. *Journal of Research in Crime and Delinquency, 28*(2), 197-226.
Graham-Bermann, S. A., DeVoe, E. R., Mattis, J. S., Lynch, S., & Thomas, S. A. (2006). Ecological predictors of traumatic stress symptoms in Caucasian and ethnic minority children exposed to intimate partner violence. *Violence Against Women, 12*, 663-692.
Hahn, R., Fuqua-Whitley, D., Wethington, H., Lowy, J., Crosby, A., Fullilove, M., et al. (2007). Effectiveness of universal school-based programs to prevent violence and aggressive behavior: A systematic review. *American Journal of Preventive Medicine, 33*, S114-S129.
Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*(1), 64-105.
Hawkins, J. D., Herrenkohl, T. I., Farrington, D. P., Brewer, D., Catalano, R. F., Harachi, T. W., et al. (2000). *Predictors of Youth Violence*. Washington, D.C.: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.
Hawkins, J. D., Oesterle, S., Brown, E. C., Arthur, M. W., Abbott, R. D., Fagan, A. A., et al. (2009). Results of a type 2 translational research trial to prevent adolescent drug use and delinquency: A test of Communities That Care. *Archives of Pediatric Adolescent Medicine, 163*(9), 789-798.
Haynie, D., Silver, E., & Teasdale, B. (2006). Neighborhood characteristics, peer networks, and adolescent violence. *Journal of Quantitative Criminology, 22*, 147-169.
Herrenkohl, T. I., & Herrenkohl, R. C. (2007). Examining the overlap and prediction of multiple forms of child maltreatment, stressors and socioeconomic status: A longitudinal analysis of youth outcomes. *Journal of Family Violence, 22*, 553-562.
Herrera, V., & McCloskey, L. A. (2001). Gender differences in the risk for delinquency among youth exposed to family violence. *Child Abuse and Neglect, 25*, 1037-1051.
Hingson, R. W., Heeren, T., & Winter, M. R. (2006). Age at drinking onset and alcohol dependence: age at onset, duration, and severity. *Archives of Pediatrics and Adolescent Medicine, 160*(7), 739-746.
Ho, M. Y., & Cheung, F. M. (2010). The differential effects of forms and settings of exposure to violence on adolescents' adjustment. *Journal of Interpersonal Violence, 25*, 1309-1337.
Holt, S., Buckley, H., & Whelan, S. (2008). The impact of exposure to domestic violence on children and young people: A review of the literature. *Child Abuse and Neglect, 32*, 797-810.
Huth-Blocks, A. C., & Hughes, H. M. (2008). Parenting stress, parenting behavior, and children's adjustment in families experiencing intimate partner violence. *Journal of Family Violence, 23*, 243-251.

Ireland, T. O., & Smith, C. (2009). Living in partner-violent families: Developmental links to antisocial behavior and relationship violence. *Journal of Youth and Adolescence, 38*, 323-339.

Jacob, J. C. (2006). Male and female youth crime in Canadian communities: Assessing the applicability of social disorganization theory. *Canadian Journal of Criminology and Criminal Justice, 48*(1), 31-60.

Jankowski, M. K., Leitenberg, H., Henning, K. R., & Coffey, P. (1999). Intergenerational transmission of dating aggression as a function of witnessing only same sex parents vs. opposite sex parents vs. both parents as perpetrators of domestic violence. *Journal of Family Violence, 14*(3), 267-279.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2008). *Monitoring the Future national survey results on drug use, 1975-2007. Volume I: Secondary school students (NIH Publication No. 08-6418A)*. Retrieved. from.

Karriker-Jaffe, K. J., Foshee, V. A., Ennett, S. T., & Suchindran, C. (2009). Sex differences in the effects of neighborhood socioeconomic disadvantage and social organization on rural adolescents' aggression trajectories. *American Journal of Community Psychology, 43*, 189-203.

Kennedy, A. C., Bybee, D., Sullivan, C. M., & Greeson, M. (2010). The impact of family and community violence on children's depression trajectories: Examining the interactions of violence exposure, family social support, and gender. *Journal of Family Psychology, 24*(2), 197-207.

Kitzmann, K. M., Gaylord, N. K., Holt, A. R., & Kenny, E. D. (2003). Child witnesses to domestic violence: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 71*(2), 339-352.

Kling, J. R., Ludwig, J., & Katz, L. F. (2005). Neighborhood effects on crime for female and male youth: Evidence from a randomized housing voucher experiment *The Quarterly Journal of Economics*, 87-130.

Knopf, D., Park, M. J., & Paul Mulye, T. (2008). *The mental health of adolescents: A national profile, 2008*. San Francisco, CA: National Adolescent Health Information Center, University of California, San Franciscoo. Document Number)

Kornhauser, R. (1978). *Social sources of delinquency*. Chicago: University of Chicago Press.

Kroneman, L., Loeber, R., & Hipwell, A. E. (2004). Is neighborhood context differently related to externalizing problems and delinquency for girls compared to boys? *Clinical Child and Family Psychology Review, 7*(2), 109-122.

Lauritsen, J. L., & Schaum, R. J. (2004). The social ecology of violence against women. *Criminology, 42*, 323-357.

Lauritsen, J. L., & White, N. A. (2001). Putting violence in its place: The influence of race, ethnicity, gender, and place on the risk for violence. *Criminology and Public Policy, 1*(1), 37-60.

Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin, 126*(2), 309-337.

Leventhal, T., & Brooks-Gunn, J. (2003). Moving to Opportunity: An experimental study of neighborhood effects on mental health. *American Journal of Public Health, 93*, 1576-1582.

Lipsey, M. W., & Derzon, J. H. (1998). Predictors of Violent or Serious Delinquency in Adolescence and Early Adulthood: A Synthesis of Longitudinal Research. In R. Loeber & D. P. Farrington (Eds.), *Serious and Violent Juvenile Offenders: Risk Factors and Successful Interventions* (pp. 86-105). Thousand Oaks, CA: Sage Publications.

Macmillan, R. (2001). Violence and the life course: The consequences of victimization for personal and social development. *American Review of Sociology, 27*, 1-22.

Maimon, D., & Browning, C. R. (2010). Unstructured socializing, collective efficacy, and violent behavior among urban youth. *Criminology, 48*(2), 443-474.

Margolin, G., Vickerman, K. A., Ramos, M. C., Duman Serrano, S., Gordis, E. B., Iturralde, E., et al. (2009). Youth exposed to violence: Stability, Co-occurrence, and context. *Clinical Child and Family Psychology Review, 12*, 39-54.

Maxwell, C. D., & Royo Maxwell, S. (2003). Experiencing and witnessing familial aggression and their relationship to physically aggressive behaviors among Filipino adolescents. *Journal of Interpersonal Violence, 18*, 1432-1451.

Mayberry, M. L., Espelage, D. L., & Koenig, B. (2009). Multilevel modeling of direct effects and interactions of peers, parents, school, and community influences on adolescent substance use. *Journal of Youth and Adolescence, 38*, 1038-1049.

McDonald, R., Jouriles, E. N., Ramisetty-Mikler, S., Caetano, R., & Green, C. E. (2006). Estimating the number of American children living in partner-violent families. *Journal of Family Psychology, 20*(1), 137-142.

Meier, M. H., Slutske, W. S., Arndt, S., & Cadoret, R. J. (2008). Impulsive and callous traits are more strongly associated with delinquent behavior in higher risk neighborhoods among boys and girls. *Journal of Abnormal Psychology, 117*(2), 377-385.

Miles-Doan, R. (1998). Violence between spouses and intimates: Does neighborhood context matter? *Social Forces, 77*(2), 623-645.

Molnar, B. E., Cerda, M., Roberts, A. L., & Buka, S. L. (2008). Effects of neighborhood resources on aggressive and delinquent behaviors among urban youths. *American Journal of Public Health, 98*(6), 1086-1093.

Morenoff, J. D., Sampson, R. J., & Raudenbush, S. W. (2001). Neighborhood inequality, collective efficacy, and the spatial dynamics of urban violence. *Criminology, 39*(3), 517-560.

Moretti, M. M., Obsuth, I., Odgers, C. L., & Reebye, P. (2006). Exposure to maternal vs. paternal partner violence, PTSD, and aggression in adolescent girls and boys. *Aggressive Behavior, 32*, 385-395.

Moylan, C. A., Herrenkohl, T. I., Sousa, C., Tajima, E. A., Herrenkohl, R. C., & Russo, M. J. (2009). The effects of child abuse and exposure to domestic violence on adolescent internalizing and externalizing behavior problems *Journal of Family Violence, 25*(1), 53-63.

Mrug, S., & Windle, M. (2009). Mediators of neighborhood influences on externalizing behavior in preadolescent children. *Journal of Abnormal Child Psychology, 37*, 265-280.

Mrug, S., & Windle, M. (2010). Prospective effects of violence exposure across multiple contexts on early adolescents' internalizing and externalizing problems. *Journal of Child Psychology and Psychiatry, 51*(8), 953-961.

National Household Survey on Drug Abuse. (1991). *National Household Survey on Drug Abuse: Population estimates*. Rockville, MD: National Institute on Drug Abuseo. Document Number)

National Research Council and Institute of Medicine. (2009). *Preventing mental, emotional, and behavioral disorders among young people: Progress and possibilities. Committee on the Prevention of Mental Disorders and Substance Abuse Among Children, Youth, and Young Adults: Research Advances and Promising Interventions*. Washington, D.C.: Board on Children, Youth, and Families, Division of Behavioral and Social Sciences and Education. The National Academies Press

Neumann, A., Barker, E. D., Koot, H. M., & Maughan, B. (2010). The role of contextual risk, impulsivity, and parental knowledge in the development of adolescent antisocial behavior. *Journal of Abnormal Psychology, 119*(3), 534-545.

O'Keefe, M. (1994). Linking Marital Violence, Mother-Child/Father-Child Aggression and Child Behavior Problems. *Journal of Family Violence, 9*, 63-78.

Pattillo, M. E. (1998). Sweet mother and gangbangers: Managing crime in a middle class neighborohood. *Social Forces, 76*, 747-774.

Peeples, F., & Loeber, R. (1994). Do individual factors and neighborhood context explain ethnic differences in juvenile delinquency? *Journal of Quantitative Criminology, 10*(2), 141-157.

Puzzanchera, C. (2009). *Juvenile Arrests 2008*. Washington, DC: Office of Juvenile Justice and Delinquency Preventiono. Document Number)

Raine, A. (2002). Biosocial studies of antisocial and violent behavior in children and adults: A review. *Journal of Abnormal Child Psychology, 30*(4), 311-326.

Rankin, B., & Quane, J. M. (2002). Social contexts and urban adolescent outcomes: The interrelated effects of neighborhoods, families, and peers on African-American youth. *Social Problems, 49*(1), 79-100.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical Linear Models: Applications and Data Analysis Methods* (2 ed. Vol. 1). Thousand Oaks, CA: Sage.

Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., Congdon, R., & du Toit, M. (2004). *HLM 6: Hierarchical Linear and Nonlinear Modeling*. Lincolnwood, IL: Scientific Software International, Inc.

Ross, C. E., & Mirowsky, J. (2009). Neighborhood disorder, subjective alienation, and distress. *Journal of Health and Social Behavior, 50*, 49-64.

Sampson, R. J. (2008). Collective efficacy theory: Lessons learned and directions for future inquiry. In F. T. Cullen, J. P. Wright & K. R. Blevins (Eds.), *Taking stock: The status of criminological theory* (Vol. 15, pp. 149-168). New Brunswick, NJ: Transaction Publishers.

Sampson, R. J., & Bartusch, D. J. (1998). Legal cynicism and (subcultural?) tolerance of deviance: The neighborhood context of racial differences. *Law & Society Review, 32*(4), 777-804.

Sampson, R. J., & Laub, J. H. (1993a). Crime and Deviance in the Life Course. *Annual Review of Sociology, 18*, 63-84.

Sampson, R. J., & Laub, J. H. (1993b). *Crime in the Making: Pathways and Turning Points Through Life*. Cambridge, MA: Harvard University Press.

Sampson, R. J., Morenoff, J. D., & Gannon-Rowley, T. (2002). Assessing "neighborhood effects": Social processes and new directions in research. *Annual Review of Sociology, 28*, 443-478.

Sampson, R. J., & Raudenbush, S. W. (1999). Systematic social observation of public spaces: A new look at disorder in urban neighborhoods. *American Journal of Sociology, 105*, 603-651.

Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science, 277*(5328), 918-924.

Sampson, R. J., & Wilson, W. J. (1995). Toward a theory of race, crime, and urban inequality. In J. Hagan & R. D. Peterson (Eds.), *Crime and Inequality* (pp. 37-54). Stanford, CA: Stanford University Press.

Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas*. Chicago: University of Chicago Press.

Sherman, L. W., & Berk, R. A. (1984). The specific deterrent effects of arrest for domestic assault. *American Sociological Review, 49*, 261-272.

Simons, R. L., Gordon Simons, L., Burt, C. H., Brody, G., & Cutrona, C. (2005). Collective efficacy, authoritative parenting and delinquency: A longitudinal test of a model integrating community- and family-level processes *Criminology, 43*(4), 989-1029.

Simons, R. L., Johnson, C., Beaman, J., Conger, R., & Whitbeck, L. B. (1996). Parents and peer group as mediators of the effect of community structure on adolescent problem behavior. *American Journal of Community Psychology, 24*(1), 145-171.

Smith, C., Elwyn, L. J., Ireland, T., & Thornberry, T. P. (2010). Impact of adolescent exposure to intimate partner violence on substance use in early adulthood. *Journal of Studies on Alcohol and Drugs, 71*, 219-230.

Snedker, K. A., Herting, J. R., & Walton, E. (2009). Contextual effects and adolescent substance use: Exploring the role of neighborhoods. *Social Science Quarterly, 90*(5), 1272-1297.

Sousa, C., Herrenkohl, T. I., Moylan, C. A., Tajima, E. A., Klika, B., Herrenkohl, R. C., et al. (2010). Longitudinal study on the effects on child abuse and children's exposure to domestic violence, parent-child attachments, and antisocial behavior in adolescence. *Journal of Interpersonal Violence*.

Spilsbury, J. C., Belliston, L., Drotor, D., Drinkard, A., Kretschmar, J., Creeden, R., et al. (2007). Clinically significant trauma symptoms and behavioral problems in a community-based sample of children exposed to domestic violence. *Journal of Family Violence, 22*, 487-499.

Spoth, R. L., Redmond, C., Shin, C., Greenberg, M., Clair, S., & Feinberg, M. (2007). Substance use outcomes at eighteen months past baseline from the PROSPER community-university partnership trial. *American Journal of Preventive Medicine, 32*(5), 395-402.

Sternberg, K. J., Baradaran, L. P., Abbott, C. B., Lamb, M. E., & Guterman, E. (2006). Type of violence, age, and gender differences in the effects of family violence on children's behavior problems: A mega-analysis *Developmental Review, 26*, 89-112.

Straus, M. A. (1979). Measuring intra family conflict and violence: The Conflict Tactics Scale. *Journal of Marriage and the Family, 41*, 75-88.

Straus, M. A., Gelles, R. J., & Steinmetz, S. K. (2006). *Behind Closed Doors: Violence in the American Family*. New Brunswick: Transaction.

Straus, M. A., Hamby, S. L., Boney-McCoy, S., & Sugarman, D. B. (1996). The Revised Conflict Tactics Scale (CTS2). *Journal of Family Issues, 17*(3), 283-316.

Thornberry, T. P. (1996). Empirical Support for Interactional Theory: A Review of the Literature. In J. D. Hawkins (Ed.), *Delinquency and Crime: Current Theories* (pp. 198-235). Cambridge: Cambridge University Press.

Thornberry, T. P., & Krohn, M. D. (2000). The self-report method for measuring delinquency and crime. In D. Duffee (Ed.), *Measurement and analysis of crime and justice*. Rockville, MD: National Institute of Justice.

Van Horn, M. L., Hawkins, D., Arthur, M. W., & Catalano, R. F. (2007). Assessing community effects on adolescent substance use and delinquency. *Journal of Community Psychology, 35*(8), 925-946.

Van Wyk, J., Benson, M. L., Fox, G. L., & DeMaris, A. A. (2003). Detangling individual-, partner-, and community-level correlates of partner violence. *Crime and Delinquency, 49*(3), 412-438.

Wilcox, P., Land, K. C., & Hunt, S. A. (2003). *Criminal circumstance: A dynamic multicontextual criminal opportunity theory*. New York: Aldine De Gruyter.

Wilson, W. J. (1987). *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.

Wolfe, D. A., Crooks, C. V., Lee, V., McIntyre-Smith, A., & Jaffe, P. G. (2003). The effects of children's exposure to domestic violence: A meta-analysis and critique. *Clinical Child and Family Psychology Review, 6*(3), 171-187.

Wright, E. M. (2011). *Neighborhoods and intimate partner violence*. El Paso: LFB Scholarly Publishing.

Wright, E. M., & Benson, M. L. (2010). Immigration and intimate partner violence: Exploring the immigrant paradox. *Social Problems, 57*(3), 480-503.

Wright, E. M., & Benson, M. L. (forthcoming). Clarifying the effects of neighborhood disadvantage and collective efficacy on violence "behind closed doors" *Justice Quarterly*.

Xue, Y., Leventhal, T., Brooks-Gunn, J., & Earls, F. (2005). Neighborhood residence and mental health problems of 5- to 11-year olds. *Archives of General Psychiatry, 62*, 554-563.

Yates, T. M., Dodds, M. F., Sroufe, L. A., & Egeland, B. (2003). Exposure to partner violence and child behavior problems: A prospective study controlling for child physical abuse and neglect, child cognitive ability, socioeconomic status, and life stress. *Development and Psychopathology, 15*, 199-218.

Zahn, M. A., & Browne, A. (2009). Gender differences in neighborhood effects and delinquency. In M. A. Zahn (Ed.), *The Delinquent Girl* (pp. 164-181). Philadelphia, PA: Temple University Press.

ZImmerman, G. M., & Messner, S. F. (2010). Neighborhood context and the gender gap in adolescent violent crime. *American Sociological Review, 75*(6), 958-980.

Zinzow, H. M., Ruggiero, K. J., Resnick, H., Hanson, R., Smith, D., Saunders, B., et al. (2009). Prevalence and mental health correlates of witnessed parental and community violence in a national sample of adolescents. *Journal of Child Psychology and Psychiatry, 50*(4), 441-450.

APPENDIX A

Description of Measures

Variable Name	Variable Label	Description	Coding
N1	Subject ID	Unique identifier for each youth participant	Valid: 2345
N2	Neighborhood Cluster Link	ICPSR NC identifier to link to community data	Valid: 2345 Missing: 0
N3	Gender of Subject	Youth subject is male or female	Male = 1 Female = 2 Valid: 2345 Missing: 0
N4	Youth Internalizing Symptoms, Wave 1	Parent reported on 31 items from Child Behavior Checklist measuring withdrawn (child: likes to be alone; refuses to talk; is secretive; is shy; stares blankly; sulks; is underactive; is unhappy/sad/depressed; is withdrawn), somatic (child is dizzy; is overtired; is achy; experiences headaches; experiences nausea; experiences eye problems; gets rashes; has stomach cramps; experiences vomiting), and depression/anxiety (child is lonely; cries a lot; fears doing bad; feels s/he has to be perfect; feels unloved; feels that others are out to get them; feels worthless; feels nervous; is fearful; feels guilty; is self conscious; is suspicious; worries) symptoms	Rated how true each behavior was of child in the past six months: 0=not true 1=somewhat/sometimes true 2=very/often true The responses were then summed. Range: 0 – 52 Valid: 2303 Missing: 19
N5	Youth Internalizing Symptoms, Wave 2	Parent reported on 31 items from Child Behavior Checklist measuring withdrawn (child: likes to be alone; refuses to talk; is secretive; is shy; stares blankly; sulks; is underactive; is unhappy/sad/depressed; is withdrawn), somatic (child is dizzy; is overtired; is achy; experiences headaches; experiences nausea; experiences eye	Rated how true each behavior was of child in the past six months: 0=not true 1=somewhat/sometimes true 2=very/often true The responses were then summed.

Variable Name	Variable Label	Description	Coding
		problems; gets rashes; has stomach cramps; experiences vomiting), and depression/anxiety (child is lonely; cries a lot; fears doing bad; feels s/he has to be perfect; feels unloved; feels that others are out to get them; feels worthless; feels nervous; is fearful; feels guilty; is self conscious; is suspicious; worries) symptoms	Range: 0 – 52 Valid: 1701 Missing: 644
N6	Youth Internalizing Symptoms, Wave 3	Youth self – reported 29 items measuring withdrawn (likes to be alone; refuses to talk; is secretive; is shy; is unhappy/sad/depressed; is withdrawn), somatic (feels dizzy; feels overtired; feels achy; experiences headaches; experiences nausea; experiences eye problems; gets rashes; has stomach cramps; experiences vomiting), and depression/anxiety (lonely; cries a lot; fears doing bad; feels s/he has to be perfect; feels unloved; feels that others are out to get me; feels worthless; feels nervous; is fearful; feels guilty; is self conscious; is suspicious; is unhappy; worries) symptoms	Rated how true each behavior was in the past six months: 0=not true 1=somewhat/sometimes true 2=very/often true The responses were then summed. Range: 0 – 37 Valid: 1599 Missing: 746
N7	Youth Violence Count, Wave 1	Youth self –reported the number of times in the past year they had committed each of 7 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 robbery	Each act was dichotomized (0 = no times; 1 = 1or more times) then summed. Range: 0 – 7 Valid: 2279 Missing: 66
N8	Any Youth Violence, Wave 1	Youth self –reported committing any of the following 7 violent acts in the past year: 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 robbery	0 = no past year violence 1 = 1or more violent acts in past year Valid: 2279 Missing: 66
N9	Youth Violence Count, Wave 2	Youth self –reported the number of times in the past year they had committed each of 11 violent acts: throwing objects at someone, hitting someone, hitting someone you live with, carrying a weapon, attacking with a weapon,	Each act was dichotomized (0 = no times; 1 = 1 or more times) then summed. Range: 0 – 9

Variable Name	Variable Label	Description	Coding
		being involved in a gang fight, and robbery, chased someone, shot someone, shot at someone, and hurt someone in other way	Valid: 1896 Missing: 449
N10	Any Youth Violence, Wave 2	Youth self –reported committing any of the following 11 violent acts in the past year: 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 robbery, chased someone, shot someone, shot at someone, and hurt someone in other way	0 = no past year violence 1 = 1or more violent acts in past year Valid: 1896 Missing: 449
N11	Youth Violence Count, Wave 3	Youth self –reported the number of times in the past year they had committed each of 11 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 robbery, chased someone, shot someone, shot at someone, and hurt someone in other way	Each act was dichotomized (0 = no times; 1 = 1 or more times) then summed. Range: 0 – 10 Valid: 1638 Missing: 707
N12	Any Youth Violence, Wave 3	Youth self –reported committing any of the following 11 violent acts in the past year: 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 robbery, chased someone, shot someone, shot at someone, and hurt someone in other way	0 = no past year violence 1 = 1 or more violent acts in past year Valid: 1638 Missing: 707
N13	Any Youth Drug Use, Wave 1	Youth self – reported the use of any of the following 6 drugs in the past year: alcohol, marijuana, cocaine, crack, inhalants, hallucinogens	0=no drug use 1=use of 1or more drugs Valid: 2190 Missing: 155
N14	Youth Drug Use Frequency, Wave 1	Youth self – reported the number of days in the past year they used each of 6 drugs: alcohol, marijuana or hashish, cocaine, crack, inhalants, hallucinogens	Youth were asked how many times in the past year they used [each drug]: 0=never, 1=1-2 Days

Variable Name	Variable Label	Description	Coding
			2=3-5 Days 3=6-11 Days 4=12-24 Days 5=25-50 Days 6=51-99 Days 7=100-199 Days 8=200 or more Days These responses were then summed. Range: 0 -23 Valid: 2190 Missing: 155
N15	Any Youth Drug Use, Wave 2	Youth self – reported the use of any of the following 6 drugs in the past year: alcohol, marijuana, cocaine, crack, inhalants, hallucinogens	0=no drug use 1=use of 1or more drugs Valid: 1882 Missing 463
N16	Youth Drug Use Frequency, Wave 2	Youth self – reported the number of days in the past year they used each of 6 drugs: alcohol, marijuana or hashish, cocaine, crack, inhalants, hallucinogens	Youth were asked how many times in the past year they used [each drug]: 0=never, 1=1-2 Days 2=3-5 Days 3=6-11 Days 4=12-24 Days 5=25-50 Days 6=51-99 Days 7=100-199 Days 8=200 or more Days These responses were then summed. Range: 0 – 22 Valid: 1882 Missing: 463

Variable Name	Variable Label	Description	Coding
N17	Any Youth Drug Use, Wave 3	Youth self – reported the use of any of the following 6 drugs in the past year: alcohol, marijuana, cocaine, crack, inhalants, hallucinogens	0=no drug use 1=use of 1or more drugs Valid: 1634 Missing 711
N18	Youth Drug Use Frequency, Wave 3	Youth self – reported the number of days in the past year they used each of 6 drugs: alcohol, marijuana or hashish, cocaine, crack, inhalants, hallucinogens	Youth were asked how many times in the past year they used [each drug]: 0=never, 1=1-2 Days 2=3-5 Days 3=6-11 Days 4=12-24 Days 5=25-50 Days 6=51-99 Days 7=100-199 Days 8=200 or more Days These responses were then summed. Range: 0 – 23 Valid: 1634 Missing: 711
N19	IPV Exposure, Wave 1	Youth's parent/primary caregiver reported that they or their partner used severe (kicked, bit, or hit with their fist; hit or tried to hit with something; beat up; choked; threatened with a knife or a gun; used a knife or fired a gun) violence within the relationship in past year	0 = no violence 1 = one or more violent acts Valid: 1847 Missing: 498
N20	Age of Subject, Wave 1	Youth age in years	Range: 7.77 – 16.9 Valid: 2345 Missing: 0
N21	Youth is African American, Wave 1	Youth is African American	0 = no 1 = yes

Variable Name	Variable Label	Description	Coding
			Valid: 2345 Missing: 0
N22	Youth is Hispanic, Wave 1	Youth is Hispanic	0 = no 1 = yes Valid: 2345 Missing: 0
N23	Socioeconomic Status, Wave 1	Principle component analysis of parental salary, maximum education between primary caregiver and partner, and primary caregiver employment status	Range: -2.07 – 1.72 Valid: 2164 Missing: 181
N24	Child Abuse, Wave 1	Primary caregiver reported using minor (threw something at, push/grab/shove, slap/spank) or severe (kick/bit/hit with fist, hit with something, beat up, burned) physical abuse against the youth at least once in the past year	0 = no 1 = yes Valid: 2292 Missing: 53
N25	Youth Self Control, Wave 1	Parent reported self control sum of 17 items: **Inhibitory control =** Has trouble controlling his/her impulses; Usually cannot stand waiting; Can tolerate frustration better than most (reverse coded); Has trouble resisting temptation; Finds self-control easy to learn (reverse coded) **Decision time =** Often says the first thing that comes into his/her head; Likes to plan things way ahead of time (reverse coded); Often acts on the spur of the moment; Always likes to make detailed plans before she/he does something (reverse coded) **Sensation seeking =** Generally seeks new and exciting experiences and sensations; Will try anything once; Sometimes does "crazy" things just to be different; Tends to get bored easily **Persistence =** Generally likes to see things through to the end (reverse coded); Tends to give up easily; Unfinished	Parent rated the characteristics of their child: 1=uncharacteristic **(**not at all like your child) 2=Somewhat Uncharacteristic (not very much like your child) 3=Neither Uncharacteristic nor Characteristic 4=Somewhat Characteristic **(**sort of like your child) 5=Characteristic (very much like your child) These responses were then summed. Range: 14 – 85 Valid: 2304 Missing: 41

Variable Name	Variable Label	Description	Coding
		tasks really bother (reverse coded); Once gets going on something she/he hates to stop (reverse coded)	
N26	Parental Criminality, Wave 1	Primary caregiver reported that either biological parent of the child had "trouble with the police or been arrested."	0 = no 1 = yes Valid: 2284 Missing: 61
N27	Parental Drug Use, Wave 1	Primary caregiver reported that either parent had problems with "health, family, job or police" due to drinking or drug use	0 = no 1 = yes Valid: 2304 Missing: 41
N28	Parental Depression, Wave 1	Primary caregiver reported that either parent suffered from depression, or "felt so low for a period of two weeks that they hardly ate or slept, or couldn't work or do whatever they usually do" at some point during the previous year	0 = no 1 = yes Valid: 2314 Missing: 31
N29	Parental Supervision, Wave1	In-home interviews with primary caregiver and PHDCN staff where primary caregiver was asked to report whether or not he or she used each of 10 supervision techniques about making and enforcing rules and interacting with peers and schools: child has a curfew for school and weekend nights; is not allowed to wander alone; parent: makes rules about homework; requires child to sleep at home on weekday; knows where child is when not at home; provides supervision afterschool; has rules about peers; interacts with peers; visits with the school	Each item was dichotomized (no=0, yes =1) then summed. Range: 3 – 10 Valid: 2307 Missing: 38
N30	Parental Warmth, Wave 1	PHDCN staff observed parent interacting with child, and reported on whether the parent engaged in each of 9 behaviors with child: talks with child twice during visit; answers child's questions; encourages child; mentions	Each item was dichotomized (0 = not observed; 1 = observed) then summed. Range: 0 - 9

Variable Name	Variable Label	Description	Coding
		skill of child; praises child twice; uses diminutive for child's name; voices positive feelings to child; caresses, kisses, or hugs child; responds positively to praise of child	Valid: 2261 Missing: 84
N31	Peer Delinquency, Wave 1	Youth self-reported the number of their friends who engaged in 11 delinquent acts in the past year: vandalism, stealing something worth less than $5, stealing something worth $5-500, stealing something worth more than $500, breaking and entering, car theft, fights, hit someone or tried to hurt them, attacked with weapon, robbery, sold drugs	Youth were asked to report how many of the people they spend time with have [engaged in each delinquent act] during the past year: 1=none 2=some 3=all These responses were then summed Range: 7 – 28 Valid: 2268 Missing: 77
N32	Peer Drug Use, Wave 1	Youth self-reported the number of their friends who used 4 drugs in the past year: tobacco, marijuana, alcohol, and other drugs	Youth were asked to estimate how many of the people they spend time with have [used each drug] in the past year: 1=none 2=some 3=all These responses were then summed Range: 3 – 12 Valid: 2234 Missing: 111
N33	Youth is Caucasian, Wave 1	Youth is Caucasian	0 = no 1 = yes Valid: 2345 Missing: 0
N34	Cohort	Cohort in which the youth is classified	Range: 9 – 15 Valid: 2345

Variable Name	Variable Label	Description	Coding
			Missing: 0
NEIGHBORHOOD PREDICTORS			
M1	ICPSR NC Identifier	ICPSR NC Identifier to link to community data	
M2	Collective Efficacy	Item response model using 10 survey questions in Community Survey tapping informal social control and social cohesion and trust between neighbors. Item response model controlled for residents' age, gender, marital status, separated/divorced, home ownership, race, residential mobility, years in neighborhood, and socioeconomic status.	To measure informal social control, residents of the Community Survey were asked how likely it was that neighbors could be counted on to intervene if: children were skipping school and hanging out on a street corner; children were spray painting graffiti on a local building; children were showing disrespect to an adult; a fight broke out in front of their house; and the fire station closest to their home was threatened with budget cuts. 1=very unlikely 2=unlikely 3=neither (+Don't Know) 4=likely 5=very likely To measure social cohesion and trust, residents of the Community Survey were asked how strongly they agreed that: people around here are willing to help their neighbors; this is a close-knit neighborhood; people in this neighborhood can be trusted; people in this neighborhood generally don't get along with each other (reverse coded); people in this neighborhood do not share the same values (reverse coded). 1=strongly disagree 2=disagree

Variable Name	Variable Label	Description	Coding
			3=neither (+Don't Know) 4=agree 5=strongly agree Range: -0.46 – 0.64 Valid: 79 Missing: 1
M3	Concentrated Disadvantage	Principal components factor created from 6 census variables: Percent below poverty level; Percent households receiving public assistance; Percent female headed households; Percent unemployed; Percent youth, 17 years or younger; Percent African American	Range: -1.59 – 2.42 Valid: 79 Missing: 1

APPENDIX B

Collective Efficacy Item Response Model

Level 1 model. Following from Sampson et al. (1997) and using questions presented in the Methods section, collective efficacy was created using three-level linear item response models. The level-one models adjusted the within-person collective efficacy scores by item difficulty, missing data, and measurement error. Thus, within each person, Y_{ijk}, the *i*th response of person *j* in neighborhood *k*, depends on the person's latent perception of collective efficacy plus random error:

$$Y_{ijk} = \pi_{jk} + \sum_{p=1}^{t-1} \alpha_p D_{pijk} + e_{ijk}$$

> Where *j* is a person in neighborhood *k*; *p* is a survey question from the Community Survey; *i* is a response to a survey question; and *t – 1* represents the number of items measuring collective efficacy.

Here, D_{pijk}, are dummy variables representing *t – 1* of the *t* items that measure collective efficacy. α_p represents the 'difficulty' of item *p* represented by D_{pijk}, while π_{jk} is the level of collective efficacy for person *jk*. The level of collective efficacy for person *jk* was therefore adjusted for the difficulty level of the survey questions tapping each construct to which that person responded.

Level 2 model. The level-two model estimated neighborhood collective efficacy scores adjusting for the social composition of each neighborhood. In particular, potential biases in perceptions of each construct resulting from characteristics related to gender (1= female, 0 = male), marital status (dichotomous variables for married, separated or divorced, and single), homeownership (1 = yes, 0 = no), ethnicity and race (composed of dichotomous variables for

Latino and African American), residential mobility (measured as the number of moves in the past 5 years), years in the neighborhood, age, and a composite measure of socioeconomic status (measured by a factor of education, income, and occupational status) were controlled at level-two of each item response model. Thus, across residents within neighborhoods and controlling for potential respondent bias, the true scores of the latent construct collective efficacy vary randomly around the neighborhood mean:

$$\pi_{jk} = \beta_k + \sum_{q=1}^{11} \delta_q \chi_{qjk} + r_{jk}$$

Where β_k is the level of collective efficacy of neighborhood *k*; χ_{qjk} is the value of covariate *q* associated with respondent *j* in neighborhood *k*; and δ_q is the partial effect of that covariate on the expected response of resident *j* in neighborhood *k* to collective efficacy items.

Thus, π_{jk} is the level of collective efficacy for person *j* in neighborhood *k*. β_k is the neighborhood level of collective efficacy after adjusting for the social composition of the respondents in neighborhood *k*.

Level 3 model. Finally, the level-three model allowed each neighborhood's mean collective efficacy to vary randomly around a grand mean:

$$\beta_k = \gamma + u_k$$

So that γ is the grand mean of collective efficacy, and u_k is a normally distributed random effect associated with neighborhood *k*. The empirical Bayes residual from the level-three model constitutes the neighborhood level of collective efficacy after controlling for item difficulty and neighborhood social composition; the empirical Bayes residual was therefore used as the 'true' neighborhood score on collective efficacy.

APPENDIX C

Supplemental Tables

Appendix C Supplemental Tables, Outcomes by Wave, Total Sample

Violence Outcomes

	Wave One		Wave Two		Wave Three	
	Count	Any	Count	Any	Count	Any
Unconditional Model						
δ^2	1.74730	0.97473	2.24656	0.96965	0.16866	0.94833
τ	0.14941	0.17418	0.09001	0.20039	2.16449	0.33500
Final Level One Model						
δ^2	0.91650	0.83344	1.95143	0.97724	1.61231	0.96946
τ	0.08891	0.11020	0.03182	0.03576	0.15079	0.06743

Drug Use Outcomes

	Wave One		Wave Two		Wave Three	
	Freq	Any	Freq	Any	Freq	Any
Unconditional Model						
δ^2	5.70753	0.99032	5.69348	0.96770	5.69348	0.99128
τ	0.05366	0.01927	0.11026	0.14077	0.11026	0.04682
Final L1 Models						
δ^2	0.52041	0.23429	1.85815	0.70313	2.13984	1.02602
τ	1.24958	5.47645	0.30579	0.29643	0.26517	0.00026

Internalizing Symptoms

	Wave One	Wave Two	Wave Three
Unconditional Models			
δ^2	50.90234	64.74141	52.78355
τ	1.35205	1.01200	0.02736
Final L1 Models			
δ^2	41.45730	35.01589	50.78503
τ	0.95221	0.47686	0.03499

Appendix C Supplemental Tables: Violence Outcomes, by Wave, Gendered Samples

Violence Outcomes

	Wave One				Wave Two				Wave Three			
	Count		Any		Count		Any		Count		Any	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Unconditional Models												
δ^2	1.63144	1.78556	0.98239	0.94864	2.25269	1.87547	0.96458	0.94695	2.31128	1.57684	0.94293	0.90466
τ	0.10819	0.20286	0.08311	0.26741	0.06611	0.23909	0.22239	0.20240	0.11573	0.28694	0.35783	0.40245
Final L1 Models												
δ^2	1.22662	0.73752	0.87520	1.01363	1.32623	0.52682	0.94677	0.90071	1.38195	1.19866	0.84183	0.91645
τ	0.04755	0.06919	0.00498	0.03722	0.09183	0.41171	0.03496	0.01778	0.19646	0.07252	0.24515	0.10523

Drug Use Outcomes

	Wave One				Wave Two				Wave Three			
	Frequency		Any		Frequency		Any		Frequency		Any	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Unconditional Models												
δ^2	4.54345	7.02282	1.00084	0.96464	5.68912	5.64864	0.96164	0.96352	5.98836	4.99541	1.00121	0.97890
τ	0.11290	0.00188	0.00016	0.07353	0.13336	0.05998	0.13814	0.11831	0.01144	0.14472	0.00016	0.011646
Final L1 Models												
δ^2	0.11037	1.23024	0.13975	0.17404	0.50386	0.81381	0.18713	0.30676	2.52265	3.00343	0.52143	1.09025
τ	4.25378	0.10385	21.87575	5.94012	1.12208	0.33787	6.02308	1.05408	0.16104	0.18208	0.71367	0.00032

Internalizing Symptoms

	Wave One		Wave Two		Wave Three	
	Males	Females	Males	Females	Males	Females
Unconditional Models						
δ^2	50.12018	52.30843	62.52243	67.07905	44.67278	56.27093
τ	1.19466	0.88688	0.04468	1.90362	0.02736	0.44989
Final L1 Models						
δ^2	41.71719	42.57456	31.45670	42.37673	44.77966	54.94454
τ	1.06663	0.50061	0.36582	0.36481	0.04464	0.80741

DISSEMINATION OF RESEARCH FINDINGS

Research Presentations

Fagan, A.A. & Wright, E.M. (2011). Contextual Effects of Exposure to Intimate Partner Violence on Adolescent Violence and Drug Use. Poster to be presented at the 2011 National Institute of Justice Conference. Arlington, Virginia. June.

Wright, E.M. & Fagan, A.A. (2011). Exposure to Domestic Violence, Gender, and Adolescents' Mental Health Problems. Presented at the 24th Annual South Carolina Victim's Right's Week. Columbia, South Carolina. April.

Wright, E.M. & Fagan, A.A. (2010). Exposure to Intimate Partner Violence: Gendered and Contextual Effects on Adolescent Delinquency. Paper presented at the American Society of Criminology 2010 Annual Meeting, San Francisco, California. November 18, 2010.

Fagan, A.A. & Wright, E.M. (2010). Effects of Neighborhood Context on Youth Violence and Delinquency: Does Gender Matter? Invited talk at the Department of Sociology, Criminology, and Law, University of Florida. Sponsored by the Institute for Crime, Justice, and Policy Research. Gainesville, Florida. October 22, 2010.

Wright, E.M. & Fagan, A.A. (2010). Gender, Exposure to Partner Violence, and Adolescent Mental Health Problems. Poster presented at the Women's Health Research Forum, University of South Carolina, Columbia, South Carolina. October 29, 2010.

Wright, E.M. & Fagan, A.A. (2010). Gender, Exposure to Partner Violence, and Adolescent Mental Health Problems. Poster presented at the Institute on Violence Abuse and Trauma 2010 Conference, San Diego, California. September 12, 2010.

Fagan, A.A. & Wright, E.M. (2010). Gender Differences in the Effects of Exposure to Intimate Partner Violence on Adolescent Substance Use and Delinquency. Paper presented at the 2010 International Family Violence and Child Victimization Research Conference. Portsmouth, New Hampshire. July 12, 2010.

Research Publications

Fagan, A.A. & Wright, E.M. (forthcoming). The Effects of Neighborhood Context on Youth Violence and Delinquency: Does Gender Matter? *Youth Violence and Juvenile Justice*.

Fagan, A.A. & Wright, E.M. (forthcoming). Gender Differences in the Effects of Exposure to Intimate Partner Violence on Adolescent Violence and Drug Use. *Child Abuse & Neglect*.

Wright, E.M. & Fagan, A.A. (under review). Exposure to intimate partner violence: Does the gender of the perpetrator matter for adolescent mental health outcomes? *Criminal Justice and Behavior*.

Crittenden, C.A., Wright, E.M. & Fagan, A.A. (in preparation). The Negative Effects of Exposure to Intimate Partner Violence on Child and Adolescent Development. To be submitted to the *Family and Intimate Partner Violence Quarterly*.