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Effects of Neighborhood Disadvantage and Peer Deviance on Conduct Problems: Interactions with Age of Onset

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EFFECTS OF NEIGHBORHOOD DISADVANTAGE AND PEER DEVIANCE ON CONDUCT PROBLEMS: INTERACTIONS WITH AGE OF ONSET

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Arts

in

The Department of Psychology

by
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B.A., Michigan State University, 2017
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Abstract

Youth with conduct problems (CP) generally fall into two developmental classifications, child-onset and adolescent-onset, which exhibit different causal processes and life course trajectories. Research suggests that child-onset CP is more likely to be related to individual predispositions, while adolescent-onset CP is more associated with social factors, such as peer delinquency. Living in impoverished and disorganized neighborhoods increases the risk for associating with deviant peers. Thus, the current study tested the hypothesis that neighborhood factors would be more strongly associated with adolescent-onset CP than child-onset CP, which would be explained by a greater association with deviant peers. Linear and negative binomial regressions were used to test these associations in a sample of 1,127 justice-involved adolescents using surveys, official arrest data, and census-derived neighborhood data. Age of onset moderated the associations between neighborhood disadvantage (ND) and official arrests but not self-reported offending. As predicted, the association between ND and official arrests was stronger in youth with adolescent-onset CP. Similarly, age of onset moderated the associations between peer delinquency and arrests but not self-reported offending, and again, the effect was stronger in youth with adolescent-onset CP. Finally, peer delinquency mediated all relationships between ND and antisocial behavior. The results of this study support the importance of peer delinquency when trying to explain how living in a disadvantaged neighborhoods may be related to antisocial behavior.

Introduction

A large amount of research has shown that youth with conduct problems (CP) generally fall into one of two developmental classifications – child-onset and adolescent-onset (also termed life course persistent and adolescence-limited, respectively). The DSM-V defines the child-onset specifier as showing one at least one symptom characteristic of conduct disorder before age 10, and adolescent-onset as showing no symptoms prior to age 10 (American Psychological Association, 2013). This distinction has proven to be clinically important because youth with child-onset CP not only start their conduct problems earlier, but they are more likely to exhibit severe and aggressive antisocial behavior that persists throughout life (Burt et al., 2011; Lahey et al., 1999; Moffitt, 1993). For example, a comprehensive review by Moffitt (2018) details evidence that those with child-onset antisocial behavior are 2.5 times more likely than those with adolescent-onset antisocial behavior to be convicted of adult crimes, including violent crime. In a study of 539 adult men followed from birth, 55% of men with child-onset antisocial behavior had been convicted of a crime at age 26, compared to 34% of men with adolescent-onset antisocial behavior and only 4% of controls (Moffitt et al., 2002).

In addition to the differences in their life course trajectory, there is evidence that there may be different causal processes operating for the two groups with CP. Specifically, research suggests that child-onset CP is more likely to be related to individual predispositions, while adolescent-onset is more associated with social factors, such as peer deviancy (Assink, 2015; Frick & Viding, 2009; McCabe, 2001; Moffitt, 2018). For example, in an assessment of risk factors in 1,037 males, youth with adolescent-onset conduct disorder were significantly elevated only on peer delinquency, whereas youth with child-onset conduct disorder showed pathological personality traits (e.g., impulsivity, hostility, callousness) and poorer scores on

neuropsychological tests (n=1037) (Moffitt, 2018; Moffitt & Caspi, 2001). Another systematic review of research reported that youth with child-onset CP were significantly more elevated on several emotional and behavioral risk factors (e.g., aggression, ADHD, internalizing/externalizing symptoms) in comparison to youth with adolescent-onset CP (Assink, 2015). In study of 990 families, children with child-onset CP showed significantly lower cognitive abilities compared to youth with adolescent-onset CP, based on scores collected yearly from kindergarten to 6th grade (Roisman et al., 2010).

Given the consistent findings on the two subtypes of CP, this distinction between child and adolescent patterns of onset has been included in diagnostic classification systems for CP for the past several decades (i.e., American Psychiatric Association, 1994). It is important to note that some researchers have suggested that there may be other important taxonomic distinctions within children and adolescents with CP. For example, some studies support the existence of a third classification – a childhood-limited subtype, in which youth desist from externalizing behavior before adolescence (Barker et al., 2010; Fairchild et al., 2013). Studies have also suggested that the classifications based on patterns of onset may be better considered as differing quantitatively (i.e., different levels of risk factors) rather than qualitatively (i.e., different risk factors altogether; Assink et al., 2015; Fairchild et al., 2013). For example, a 2013 review of research reported that, regardless of subtype, children with conduct problems exhibited similar brain structure and function and emotional processing, as well as physiological, genetic, and personality risk factors that were significantly different than controls. It was only the levels of these risk factors that differentiated the two groups (Fairchild, 2013). It has also been suggested that the group of youth who first display antisocial behavior in adolescence should be termed adolescent-onset (AO) conduct disorder versus adolescence-limited, because many youth in this

group do not desist from conduct problems by young adulthood (Fairchild, 2013; Odgers et al., 2007). Thus, adolescent-onset is the terminology used in the DSM-V (American Psychiatric Association, 2013). Finally, some researchers have suggested that there may be additional distinctions that need to be made within the child-onset subtype based on the type of individual predispositional risk factors present. For example, a subgroup of those in the child-onset group show elevated callous-unemotional traits, defined by a lack of guilt or empathy, unconcern about their performance in important activities, and a restricted display of affect. Evidence suggests that these children may exhibit more proactive, severe, and violent antisocial behavior that is more difficult to treat (Frick & Viding, 2009). This work has resulted in the addition of a diagnosis specifier, “with limited prosocial emotions,” to the DSM-V (American Psychiatric Association, 2013).

Despite some limitations in the distinction made between youth with child-onset and adolescent-onset conduct problems, this typology still could be important for guiding causal theory and for designing more effective treatments that specifically target risk factors unique to each subgroup. As noted previously, social factors are considered to be more critical for the development of adolescent-onset conduct problems. However, research has not been clear on which of the many social factors that have been linked to conduct problems may be most important to the development of problem behavior for this group. Moffitt’s influential theory could provide some clues to such factors. Specifically, Moffitt (1993) posits that adolescent-onset CP is likely to be attributable to strain during the period between biological and social maturity; this period has been termed the “maturity gap”. Thus, adolescent-onset conduct problems are likely to involve behaviors that are related to rebellion against authority and control that is encouraged by a deviant peer group (Lahey, 1999; Moffitt, 2003; Piquero & Brezina,

2001). Further, living in impoverished and disorganized neighborhoods increases the risk for associating with delinquent peers. Thus, neighborhood factors may be more strongly associated with adolescent-onset CP than child-onset CP, which may be explained by a greater association with delinquent peers. While these links among neighborhood and peer risk factors have not been explicitly tested to date, there is evidence to support them.

Influence of Peer Delinquency

First, a substantial amount of research has shown that youth with conduct problems are more likely to associate with more delinquent peers than other youth (Chen et al., 2015; Moffitt & Caspi, 2001), and that this delinquent peer influence is linked to the development of conduct problems (Chen et al., 2015; Vitaro et al., 1997). For example, a temporal analysis of 500 boys' disruptive and delinquent behavior demonstrated that exposure to delinquent peers predicted the onset of delinquent behavior in previously non-delinquent boys (Keenan et al., 1995). What is less clear from existing research, however, is whether exposure to deviant peers is differentially related to conduct problems in child-onset and adolescent-onset youth. For example, many studies have shown that child-onset youth often show similar or even greater levels of delinquent peer affiliation as adolescent-onset youth (see Dandreaux & Frick, 2009; McCabe et al 2001; Moffitt et al., 2002). However, while both groups may be associated with delinquent peers, this association may still be more directly related to the development of conduct problems in the adolescent-onset group. For example, while delinquent peer affiliation was related to both child-onset and adolescent-onset CP, peer influence no longer predicted delinquency in child-onset youth but continued to predict delinquency in adolescent-onset youth when controlling for other predictors such as history of antisocial behavior (Moffitt & Caspi, 2001). Further, a longitudinal study of 354 adolescents showed that, while child-onset youth had many more delinquent friends

than adolescent-onset youth at age 10, this difference was no longer significant by late adolescence. Further, while the child-onset youth experienced many chronic risk factors throughout their lives (e.g., racial discrimination, family transitions, harsh parenting, single parent), adolescent-onset youth experienced higher risk exposure in adolescence than in childhood, including increased exposure to deviant peers (Evans et al., 2016). Further, it has been proposed that youth in the child-onset group may act as models of deviant behavior for those in the adolescent-onset group (Moffitt, 2003, Vitaro et al. 1997). Thus, one possible explanation is that although child-onset youth associate with deviant peers, it is a *result* of their antisocial behavior that develops from other causes, whereas peer delinquency may be a more direct *cause* of delinquency in adolescent-onset youth (Simons et al., 1994).

Influence of Neighborhood Disadvantage (ND)

Another social influence that has been linked to conduct problems but has not been consistently studied in relation to the two subtypes of CP is neighborhood risk. Specifically, neighborhood factors, such as neighborhood disadvantage, exposure to community violence, and residential instability, have long been shown to be predictors of CP in several studies (see Cleveland, 2003; Goodnight, 2012; Jennings, 2018; Ludwig et al., 2000; Wikstrom and Loeber, 2000). For example, a quasi-experimental study of 11,601 children and adolescents demonstrated that neighborhood disadvantage was robustly related to conduct problems, even when controlling for other family (e.g., family income and maternal education level, IQ, and alcohol use) and individual characteristics (e.g., race, sex, maternal age at childbearing; Goodnight et al., 2012). Another study of 336 juvenile-justice-involved teens found that children who remained in neighborhoods with low socioeconomic status had higher rates of both violent and non-violent crime than those who moved away (Ludwig et al., 2000). A 2012 study of 208 adolescents

demonstrated that when adolescents perceived their neighborhoods more positively, their ratings of their externalizing behavior problems decreased (White & Renk, 2012). Further, in a sample of 3225 children, Briggs et al. (2015) demonstrated a strong relationship between community adversity and externalizing problems.

It is important to note that neighborhood disadvantage can be measured using many different structural or experiential dimensions. Specifically, many structural neighborhood variables have been linked to conduct problems, such as level of poverty (Hay et al., 2006; Katz et al., 2012; Sampson, 1997) and concentration of public housing (Ingoldsby & Shaw, 2002; Wikstrom & Loeber, 2000). One unique study used Google maps to systematically characterize neighborhood based on things like presence of litter/graffiti, physical decay, and presence of green space. The authors showed that these indicators of neighborhood disorder predicted antisocial behavior in children (Odgers et al., 2012). Experiential dimensions of the neighborhood have also been linked to conduct problems. These dimensions include perceived neighborhood disadvantage (Goodnight et al., 2012; Leventhal & Brooks-Gunn, 2000), neighborhood dangerousness/safety (Pettit et al., 1999; Trentacosta, 2009), and collective efficacy (i.e., neighborhood supervision and maintenance of public order; Sampson 1997). Such factors are usually measured using questionnaires to obtain the perspective of the informant. For example, Goodnight and colleagues (2012) administered an eight-item scale of neighborhood disadvantage completed by mothers, which was strongly associated with mother-reported conduct problems and youth-reported delinquency. While objective structural variables can provide reliable, valid information about the socioeconomic status and physical attributes of a community, subjective experiential variables provide information about residents' own views of their communities and the advantages and disadvantages of residing within them. Considering

the strengths and limitations of objective and subjective variables, it seems ideal to use both types of data for a more comprehensive understanding of neighborhood influence (Hay et al., 2006; Ingoldsby & Shaw, 2002; Leventhal and Brooks-Gunn, 2000; Sampson et al. 1997).

Despite the consistent link between neighborhood disadvantage and conduct problems in children and adolescents, research has not extensively studied whether its influence differs for CO and AO youth. However, there is both theory and research to suggest that this may be the case. Specifically, one common mechanism to explain the link between neighborhood risk and conduct problems in adolescents is through exposure to deviant peers. Youth in disadvantaged neighborhoods are more likely to be exposed to deviant peers (Dupéré et al., 2007; Sampson, 1997; Wikstrom & Loeber, 2000). For example, a study of 3,522 adolescents found that both economic disadvantage and residential instability predicted gang involvement (Dupéré et al., 2007). In addition, it seems that not only do youth in disadvantaged neighborhoods experience more exposure to deviant peers, but there is also evidence that the influence of deviant peers is stronger in these neighborhoods (Dubow et al., 1997; Eamon, 2001; Pettit et al., 1999). For example, a study of 438 male adolescents showed a significant interaction between peer interaction and neighborhood safety in predicting externalizing behavior (Pettit et al., 1999). The effect of peer interaction on externalizing behavior was reported to be significantly stronger in unsafe neighborhoods.

Therefore, it is possible that neighborhood disadvantage could be related to conduct problems through its influence on exposure to deviant peers. As a result, it could be particularly important for predicting conduct problems in those in the AO group. While this mediational relationship has not been tested, there are findings that would be consistent with this theoretical predication. For example, Wikstrom and Loeber (2000) reported that serious late-onset

offending was three times more likely among youth living in disadvantaged neighborhoods with high concentrations of public housing than youth in advantaged neighborhoods, while rates of child-onset offending were similar across neighborhood types. However, this study did not consider whether this risk was due to an association with deviant peers.

The Current Study

In summary, research has shown that youth with conduct disorder (CP) generally fall into one of two developmental classifications – child-onset and adolescent-onset. This distinction has proven to be clinically important as youth with child-onset CP are likely to exhibit more severe and aggressive antisocial behavior that persists throughout life. Existing theory and research suggest that child-onset CP is more likely to be related to individual predispositions and adolescent-onset is more associated with social factors, such as peer deviancy. Specifically, Moffitt (2018) posits that adolescent-onset conduct disorder is distinct from child-onset conduct disorder in that it is more likely to be attributable to strain during the period between biological and social maturity (termed the “maturity gap”). Thus, adolescent-onset conduct problems are likely to involve behaviors that are related to rebellion against authority and control that is encouraged by a deviant peer group.

In addition, neighborhood factors such as neighborhood disadvantage, exposure to community violence, and residential instability have been suggested as predictors of CP. Existing theories on the developmental subtypes of CP suggest that there may be a differential relationship with neighborhood disadvantage, but this has not been firmly established in research. Considering that the presence of deviant peers has been linked to impoverished and disorganized neighborhoods, neighborhood disadvantage may be more strongly associated with adolescent-onset CP than child-onset CP, which could be accounted for by a greater association

with deviant peers. Given that these theoretical predictions have not been tested to date, we examined the associations among neighborhood disadvantage, delinquent peer affiliation, and antisocial behavior by testing whether a) the age of onset of antisocial behavior modifies these associations and b) whether delinquent peer affiliation accounts for the association of neighborhood disadvantage with CP.

Hypotheses

1. We predicted that neighborhood disadvantage would predict conduct problems, and that this relationship would be moderated by age of onset. We predicted that the association between neighborhood disadvantage and antisocial behavior would be stronger in youth with adolescent-onset CP than in youth with child-onset CP.
2. We also hypothesized that association with delinquent peers would predict antisocial behavior and that this would be moderated by age of onset. Specifically, we hypothesized that this association would be stronger in youth with adolescent-onset CP than in youth with child-onset CP.
3. Finally, we predicted that when controlling for the interaction between peer delinquency and age of onset, the relationship between neighborhood disadvantage and conduct problems would no longer be significant.

Methods

Participants

The sample included 1,127 adolescents who were participants in the Crossroads Study, which drew from the juvenile justice systems of Jefferson Parish, LA (n=139); Orange County, CA (n=508); and Philadelphia, PA (n=480). To be eligible for the Crossroads Study, juveniles had to be first-time male offenders, be English speakers between the ages of 13 to 17 ($M=15.29$; $SD=1.29$) at the time of arrest, and have an eligible offense. Eligible charges were mid-range offenses, such as theft of goods, simple battery, and vandalism. The sample is predominately White-Latino (46.4%) and Black (35.9%), followed by White-non-Latino (15.0%), and other (2.7%). Participants' average Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler 1999) Full-Scale Intelligence Quotient (FSIQ), as estimated by two subtests (Vocabulary and Matrix Reasoning), was 88.53 ($SD=11.66$).

Procedures

Institutional Review Board approval was obtained at each site before data collection began. Before the baseline interview, assent was obtained from the participant and consent was obtained from their parent/guardian. The parent/guardian and youth were informed that participation in the research project would not influence how the participant was treated in the justice system and that the research project had obtained a Certificate of Confidentiality from the Department of Justice, allowing the research information to be protected from being subpoenaed for use in legal proceedings. Youth completed the baseline assessment within six weeks of the disposition date for their first arrest. The interview was administered using a laptop with an interviewing program that included the items and measures for convenience and standardized administration. To control for reading ability, interviewers read all items to the participant.

Participants were reassessed every six months for 36 months. Retention rates ranged from 95.48% at the 6-month follow-up to 91.34% at the 36-month follow-up with an average retention rate of 93.38% across the 6 follow-up points. For the current study, those who participated in at least four of the six follow-up interviews were included in analyses. This led to the elimination of 89 (7.32%) participants. The participants were compensated for their participating at each time point, beginning at \$50 for the baseline interview and then increasing by \$15 for each subsequent interview.

Measures

Outcome Variable: Conduct Problems

Self-Reported Delinquency. The self-report of offending scale (SRO; Huizenga et al., 1991) asks participants whether they have engaged in 24 types of crime during the past 6 months, such as destroying or damaging property, stealing, selling drugs, carrying a gun, and killing someone. For the current analyses, the outcome variable was the number of different types of delinquent behavior that the participant reported engaging in during the six months prior to each assessment. Scores from the six follow-up interviews were averaged to measure the participants' self-reported delinquent behavior over the 36-month follow-up period. Existing research supports the reliability and validity of self-report delinquency measures (Huizenga & Elliot, 1986; Sampson, 1985; Thornberry & Krohn, 2000). For example, Sampson (1985) showed that the SRO demonstrated significant correlations with official reports of offending in a sample of 1214 male juvenile offenders aged 15-18. In this sample, the internal consistency of the SRO scores ranged from $\alpha = .81$ at the 18-month follow up to $\alpha = .83$ at the 30-month follow up.

Official Arrest Records. Data from participants' official records of juvenile and adult

arrests were obtained during the 36-month follow-up periods within the jurisdictions in which the participant was initially arrested. Only new charges during the follow-up periods were included. Over the 36-month period, 47.8% (n = 539) were arrested for any offense. Among the entire sample, 21.9% were arrested once, 12.2% were arrested twice, 6.6% were arrested three times, and 7.1% were arrested four or more times. The arrest outcome variable was the total number of arrests across the 36-month follow-up period.

Predictor Variables: Neighborhood Disadvantage

Structural Neighborhood Disadvantage. Since baseline interviews took place between 2011 and 2013, data from the 2013 American Community Survey administered by the United States Census Bureau was used for analyses. Participant addresses were geocoded to census block groups. Block groups are the smallest geographic unit summarized by the census and are more demographically homogenous than census tracts. There are typically four to five block groups per census tract, each containing about 1,110 people (Cleveland, 2003).

Existing research has utilized groups of three to six census variables to create a composite of neighborhood disadvantage (Sampson et al., 1997; Wikstrom & Loeber, 2000; Winslow & Shaw, 2007). For example, Wikstrom & Loeber used median income, percent of single-parent households, percent of residents below the poverty line, percent of families on public assistance, percent of residents who are unemployed, and percent of residents who are Black (2000). Considering that we controlled for participant race and ethnicity in our analysis, we did not include this in our composite. Additionally, we chose only one income variable - proportion of residents below the poverty line - to avoid redundancy. Finally, we added a variable to our composite that has been used in other studies – education level (Hay et al., 2006; Winslow & Shaw, 2007). Altogether, we used a composite of five census variables: percent of households

below poverty line, percent of households receiving public assistance, percent unemployed, percent of single-parent households, and percent of households with a Bachelor's degree or higher.

As informed by Wikstrom & Loeber (2000), a principal components analysis with oblique rotation was conducted to assess whether these variables loaded onto a single factor. The factor analysis confirmed a single-factor structure that explained 60% of the variance. Factor loadings on this single were as follows: percent of households below poverty line, .85; percent of households receiving public assistance, .75; percent unemployed, .71; percent of single-parent households, .82; and percent of households with a Bachelor's degree or higher, .73. Next, a composite score was created by weighting each variable by its factor loading on the first component and then combining this weighted variable into a composite index of neighborhood disadvantage.

Experiential Neighborhood Disadvantage. Self-reported neighborhood disorder (ND) was assessed at baseline using the 21-item Neighborhood Conditions Measure, which was adapted from Sampson and Raudenbush's (1999) measure of physical (e.g., cigarettes on the street or in the gutters, boarded up windows on buildings) and social (e.g., people drunk or passed out, adults fighting or arguing loudly) disorder. Participants endorsed the physical and social disorganization items on a 4-point Likert scale ranging from 1 (Never) to 4 (Often), such that higher total scores indicate more disorganization in the neighborhood. The neighborhood disorganization scale and self-reported offending were significantly correlated in a sample of serious juvenile offenders (Chung and Steinberg 2006). In the current sample, the coefficient alpha for the Neighborhood Conditions Measure was .94.

Predictor Variables: Peer Delinquency

Peer Delinquency Scale. Peer delinquency was measured at baseline using the 13-item Peer Deviancy Scale (PDS; Thornberry et al., 1994) assess peer antisocial behaviors. The items ask about 13 different delinquent acts (e.g., “Carried a knife?”, “Hit or threatened to hit someone?”), and participants responded with how many of their friends have done the specific behavior, ranging from 1 (none of them) to 5 (all of them). The scores are summed, with higher scores indicating a higher number of friends who are perceived to engage in the range of behaviors. The PDS was correlated with both neighborhood disorder and self-reported offending in a sample of serious male juvenile offenders (Chung & Steinberg, 2006). In the current sample, the coefficient alpha for the PDS was .93.

Moderator Variable: Age of Onset of Conduct Problems

Using data from the baseline interview, two indicators were used to determine age of onset of conduct problems. First, at baseline, the SRO was administered and each participant was asked to report (yes or no) on every behavior that they had ever committed. For every delinquent act endorsed on the SRO, the participant then reported on the age at which they first engaged in the behavior. Consistent with the DSM-5 (APA, 2013) definition of childhood-onset, youth who engaged in any delinquent behavior prior to age 10 were coded as having child-onset conduct problems. In addition, participants were asked questions related to four school-related behavior problems: bullying, fighting, being suspended, and being expelled. Participants reported whether they engaged in the behavior and, if so, the age the behavior began. If participants reported having school behavior problems prior to age 10, they were coded as having child-onset conduct problems. Any participant who is not coded as having child-onset conduct problems from either of these two measures was coded as having adolescent-onset conduct problems.

Data Analysis

The study hypotheses were tested through multiple regression analyses with ND and peer delinquency, age of onset, the interaction between age of onset and ND, and the interaction between age of onset and peer delinquency as predictors and using age, race, and IQ as covariates. Separate regression analyses were conducted for each of the measures of neighborhood disadvantage. The continuous neighborhood disadvantage and peer delinquency variables were mean centered to prevent multi-collinearity from influencing results. Since the arrest variable was highly skewed, these analyses were conducted using negative binomial regression. For any significant interaction, the form of the interaction was tested by using the regression equation from the full sample to plot the simple slopes of the predicted association between neighborhood disadvantage and SRO for the childhood and adolescent-onset groups separately.

Results

Descriptive statistics and zero-order correlations for study variables are described in Table 1. Experiential ND was positively correlated with child-onset CP ($r = .16, p < .01$), structural ND ($r = .44, p < .01$), and peer delinquency ($r = .37, p < .01$). Structural ND was negatively correlated with peer delinquency ($r = -.06, p < .05$) and SRO ($r = -.12, p < .01$), and positively correlated with child-onset CP ($r = .16, p < .01$). Peer delinquency was positively correlated with child-onset CP ($r = .10, p < .01$), SRO ($r = .23, p < .01$), and arrests ($r = .14, p < .01$). SRO was positively correlated to arrests ($r = .14, p < .01$).

The study covariates (age, race/ethnicity, and IQ) also showed significant correlations with the predictor and outcome variables. Age was negatively correlated with structural ND ($r = -.13, p < .01$), and positively correlated with peer delinquency ($r = .17, p < .01$). IQ was negatively correlated with experiential ND ($r = -.06, p < .05$), structural ND ($r = -.22, p < .01$), and arrests ($r = -.11, p < .01$); and positively correlated with SRO ($r = .09, p < .01$). Black race was positively correlated with child-onset CP ($r = .21, p < .01$), experiential ND ($r = .19, p < .01$), and structural ND ($r = .41, p < .01$); and negatively correlated with peer delinquency ($r = -.10, p < .01$) and SRO ($r = -.16, p < .01$). Hispanic ethnicity was negatively correlated with child-onset CP ($r = -.17, p < .01$), experiential ND ($r = -.07, p < .05$), and structural ND ($r = -.13, p < .01$); and positively correlated with self-reported offending ($r = .14, p < .01$).

Hypothesis 1

Outcome: Self-Reported Offending

Hierarchical linear regression analyses were used to determine if neighborhood disadvantage and age of onset predicted conduct problems, while covarying age, race/ethnicity, and IQ. The results of these analyses are reported in Table 2. For both experiential ND and structural ND, there were

Table 1. Descriptive statistics and correlations

	Mean(SD) or %	1	2	3	4	5	6	7	8	9
1. Age	15.29(1.28)									
2. IQ	88.53(11.66)	.06*								
3. Race – Black	36%	-.10**	-.12**							
4. Ethnicity – Hispanic	46%	.03	-.04	-.70**						
5. Child-onset CP	55%	-.05	.02	.21**	-.17**					
6. Experiential ND	2.06(.67)	.01	-.06*	.19**	-.07*	.16**				
7. Structural ND	150.76(47.81)	-.13**	-.22**	.41**	-.13**	.16**	.44**			
8. Peer delinquency	4.95(1.62)	.17**	.02	-.10**	.04	.10**	.37**	-.06*		
9. Self-reported offending	1.02(1.01)	.04	.09**	-.16**	.14**	.01	.05	-.12**	.23**	
10. Arrests	1.03(1.54)	-.04	-.11**	-.01	.06	.00	.05	.01	.14**	.14**

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

Note. SD = standard deviation; IQ = Weschler Abbreviated Scale of Intelligence Full Scale IQ; ND = neighborhood disadvantage

Table 2. Hierarchical linear regressions of neighborhood disadvantage (ND) predicting self-reported offending

Predictor	Experiential ND					Structural ND				
	Unstd. B	S.E.	Std. β	R ²	Δ R ²	Unstd. B	S.E.	Std. β	R ²	Δ R ²
Step 1				.043***	-				.041***	-
Constant	-.02	.079				-.11	.082			
Race - Black	-.25	.090	-.12**			-.13	.097	-.06		
Ethnicity - Hispanic	.15	.084	.08			.21	.086	.10*		
Age	.02	.023	.02			.02	.023	.02		
IQ	.01	.003	.08**			.01	.003	.07*		
ND	.11	.045	.08**			-.00	.001	-.07*		
Age of onset	.08	.061	.04			.11	.061	.06		
Step 2				.043***	.001				.041***	.000
Constant	-.03	.079				-.12	.082			
Race - Black	-.25	.090	-.12**			-.12	.097	-.06		
Ethnicity - Hispanic	.15	.084	.08			.21	.097	.11*		
Age	.02	.023	.02			.02	.023	.02		
IQ	.01	.003	.08**			.01	.003	.07*		
ND	.07	.069	.05			-.00	.001	-.09		
Age of onset	.08	.061	.04			.11	.061	.06		
ND x age of onset	.08	.090	.04			.00	.001	.02		

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

Note: Unstd. = unstandardized; S.E. = standard error; Std. = standardized; IQ = intelligence quotient

significant main effects for predicting self-reported offending ($\beta = .08, p < .05$; $\beta = -.07, p < .05$, respectively) in the first step of the analyses. Consistent with the hypothesis, more experiential ND was associated with more delinquency. However, contrary to predictions, greater structural ND was associated with less self-reported delinquency. Also, the age of onset by structural ND interaction did not add to the prediction of self-reported delinquency when entered in the second step of these analyses. Thus, age of onset did not moderate the association between ND and self-reported delinquency.

Outcome: Arrests

Hierarchical negative binomial regressions were used to determine if neighborhood disadvantage and age of onset predicted arrests, while covarying age, race/ethnicity, and IQ. The results of these analyses are reported in Table 3. For both experiential and structural ND, there were no significant main effects of ND in the first step. However, the interaction between ND and age of onset was significant for experiential ND (Exp (B) = .72, $p < .01$) when it was added in the second step. The form of this interaction was plotted and provided in Figure 1. As predicted, experiential ND was positively associated with arrests for the adolescent-onset group ($B = .32, SE = .10, z = 3.10, p = .002, 95\% CI = .17 \text{ to } .51$) but not for the childhood onset group. Pairwise comparison showed that the difference between the simple slopes was significant ($p = .01$).

Table 3. Negative binomial regression of neighborhood disadvantage (ND) predicting arrests

Predictor	Experiential neighborhood disadvantage						Structural neighborhood disadvantage					
	B	S.E.	95% C.I.	Exp(B)	χ^2 [†]	df	B	S.E.	95% C.I.	Exp(B)	χ^2 [†]	df
Model 1					26.245***	6					24.050***	6
Intercept	-.15	.115	(-.37, .08)	.86			-.21	.119	(-.44, .03)	.815		
Race - Black	.12	.132	(-.15, .37)	1.12			.20	.141	(-.08, .47)	1.215		
Ethnicity - Hispanic	.25	.123	(.01, .49)	1.28*			.29	.125	(.04, .53)	1.332*		
Age	-.04	.033	(-.11, .02)	.96			-.04	.033	(-.11, .02)	.959		
IQ	-.01	.004	(-.02, -.01)	.99***			-.02	.004	(-.02, -.01)	.986***		
ND	.11	.064	(-.01, .24)	1.12			.00	.001	(-.003, .001)	.999		
Age of onset	.00	.087	(-.17, .17)	1.00			.02	.087	(-.15, .20)	1.025		
Model 2					32.933***	7					24.057***	7
Intercept	-.13	.115	(-.36, .09)	.88			-.21	.121	(-.44, .03)	.81		
Race -Black	.10	.132	(-.16, .36)	1.11			.20	.142	(-.08, .47)	1.22		
Ethnicity - Hispanic	.25	.124	(.00, .49)	1.28*			.29	.126	(.04, .53)	1.33*		
Age	-.04	.033	(-.11, .02)	.96			-.04	.033	(-.11, .02)	.96		
IQ	-.01	.004	(-.02, -.01)	.99***			-.02	.004	(-.02, -.01)	.99***		
ND	.31	.100	(.11, .51)	1.36**			.00	.002	(-.004, .002)	1.00		
Age of onset	.01	.087	(-.17, .18)	1.01			.03	.087	(-.15, .20)	1.03		
ND x age of onset	-.34	.130	(-.59, -.08)	.72**			.00	.002	(-.004, .004)	1.00		

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

[†]Likelihood ratio Chi-square

Note: S.E = standard error; C.I. = confidence interval; Exp = exponentiated; df = degrees of freedom; IQ = intelligence quotient

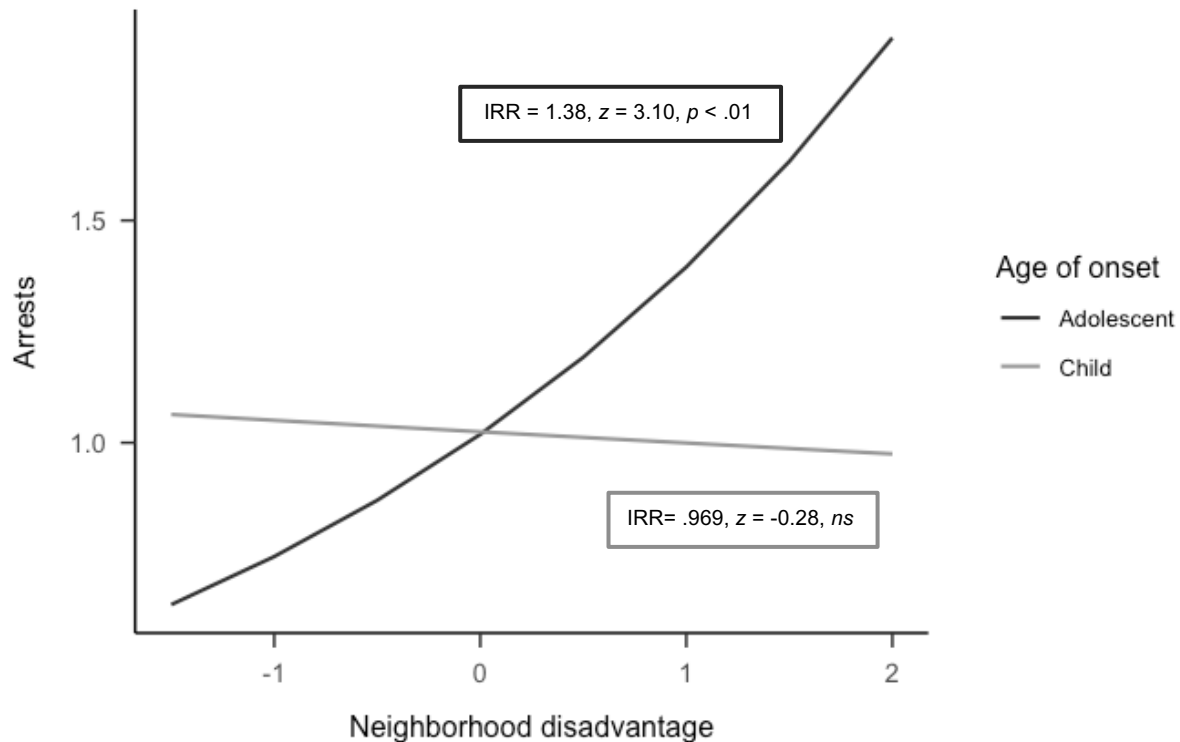


Figure 1. Interaction between neighborhood disadvantage and age of onset of conduct problems

Hypothesis 2

Outcome: Self-Reported Offending

Hierarchical linear regression analyses were used to examine whether peer delinquency and age of onset predicted self-reported offending, while covarying age, race/ethnicity, and IQ. The results of these analyses are reported in Table 4. There were significant main effects of peer delinquency in the first step of the analysis ($\beta = .22$, $p < .001$). Consistent with Hypothesis 2, peer delinquency was positively associated with self-reported offending. Contrary to the hypothesis, age of onset did not moderate this association when its interaction with peer delinquency was added to the second step of the regression analysis.

Table 4. Hierarchical linear regression of peer delinquency (PD) predicting self-reported offending

Predictor	Unstd. B	S.E.	Std. β	R ²	ΔR^2
Step 1				.081***	.081
Constant	-.06	.08			
Race - Black	-.14	.09	-.07		
Ethnicity - Hispanic	.19	.08	.10*		
Age	-.01	.02	-.01		
IQ	.01	.003	.08**		
PD	.36	.05	.22***		
Age of onset	.04	.06	.02		
Step 2				.082***	.001
Constant	-.06	.08			
Race - Black	-.14	.09	-.07		
Ethnicity - Hispanic	.20	.08	.10*		
Age	-.01	.02	-.01		
IQ	.01	.003	.08**		
PD	.40	.08	.24***		
Age of onset	.04	.06	.02		
PD x age of onset	-.07	.10	-.03		

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

Note. Unstd. = unstandardized; S.E. = standard error; Std. = standardized; IQ = intelligence quotient

Outcome: Arrests

Hierarchical negative binomial regression analyses were used to determine if peer delinquency and age of onset predicted arrests while covarying age, race/ethnicity, and IQ. The results of these negative binomial regression analyses are reported in Table 5. There were significant main effects of peer delinquency in the first step ($B = .33$, $S.E. = .070$, $p < .001$). Consistent with the hypothesis, peer delinquency was positively associated with arrests. Also consistent with the hypothesis, age of onset moderated this association, as indicated by the significant interaction between age of onset and peer delinquency when it was added to the second step of the regression analysis ($B = -.33$, $S.E. = .136$, $p = .01$).

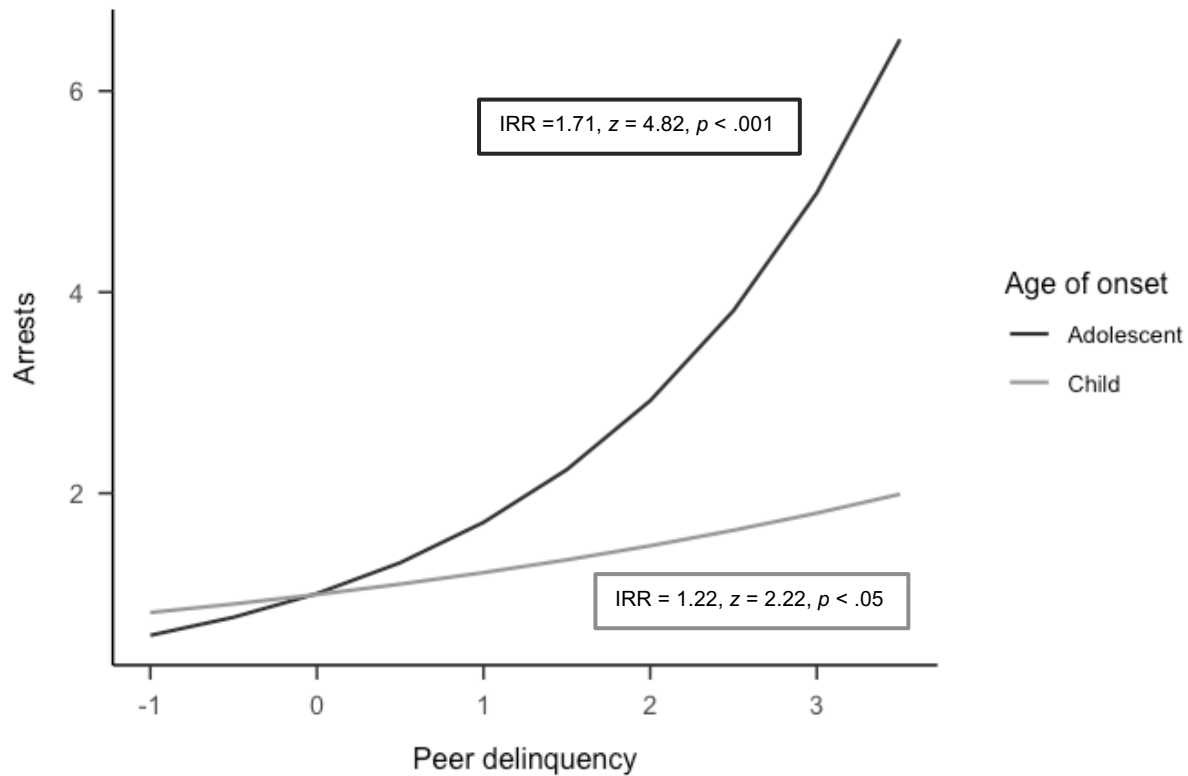
Table 5. Negative binomial regression of peer delinquency (PD) predicting arrests

	B	S.E.	95% C.I.	Exp(B)	χ^2 [†]	df
Model 1					47.662***	6
Intercept	-.22	.115	(-.45, .003)	.800		
Black	.24	.133	(-.02, .50)	1.273		
Hispanic/Latino	.30	.124	(.06, .55)	1.356*		
Age	-.06	.034	(-.13, .01)	.941		
IQ	-.01	.004	(-.02, -.01)	.986***		
PD	.33	.067	(.20, .46)	1.391***		
Age of onset	-.02	.087	(-.20, .15)	.977		
Model 2					53.710***	7
Intercept	-.23	.116	(-.46, -.002)	.80*		
Black	.24	.133	(-.02, .50)	1.27		
Hispanic/Latino	.31	.125	(.07, .56)	1.37*		
Age	-.06	.034	(-.13, .01)	.94		
IQ	-.02	.004	(-.02, -.01)	.99***		
PD	.53	.108	(.32, .74)	1.70***		
Age of onset	-.01	.088	(-.18, .16)	.99		
PD x age of onset	-.33	.136	(-.60, -.07)	.72*		

* $p < .05$; ** $p < .01$; *** $p < .001$ [†]Likelihood ratio Chi-square

Note. S.E. = standard error, C.I. = confidence interval; Exp = exponentiated; df = degrees of freedom; IQ = intelligence quotient

The form of the interaction and simple slopes are provided in Figure 2. The simple slopes for adolescent-onset CP ($B = .53$, $S.E. = .111$, $z = 4.82$, $p < .001$, 95% CI = .32 to .75) and child-onset CP ($B = .20$, $S.E. = .090$, $z = 2.22$, $p = .03$, 95% CI = .02 to .38) were both significant and showed that peer delinquency was related to arrests. Further, pairwise comparison showed that the association was stronger for the adolescent-onset group ($p = .02$), as predicted.



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

Figure 2. Interaction between peer delinquency and age of onset of conduct problems.

Hypothesis 3

Outcome: Self-reported offending

In the analyses for Hypothesis 1, there was a significant main effect of both experiential ND on self-reported offending in the predicted direction. Thus, hierarchical linear regression analyses were used to determine whether peer delinquency mediated the relationships between experiential ND and SRO as predicted. The first step entered the study covariates, ND and age of onset. The second step introduced peer delinquency. For experiential ND, there was a significant main effect of ND in the first step ($\beta = .08, p < .05$). In the second step, ND was no longer significant, but there was a significant main effect of peer delinquency ($\beta = .37, p < .001$). Further, the size of the indirect effect was tested using bootstrapped mediation analysis. These

results indicated that the indirect effect for experiential ND on self-reported delinquency through peer delinquency was significant ($B = .14$, $S.E. = .025$, $95\% CI = .09-.19$).

Outcome: Arrests

For predicting arrests, the predicted interaction between experiential ND and age-of-onset and between peer delinquency and age-of-onset was significant. Thus, a hierarchical negative binomial regression analysis was performed to determine if peer delinquency accounted for the relationship between experiential ND and future arrests. In the first step, experiential ND, age of onset, and the interaction between ND and age of onset as well as the study covariates were entered as predictors. In the second step, the main effect of peer delinquency and the interaction term peer delinquency \times age of onset were added. At this second step, the main effect of experiential ND and its interaction with age of onset were no longer significant. However, the main effect of peer delinquency ($B = .49$, $S.E. = .117$, $p < .001$) remained significant.

Sensitivity Analyses

As noted in the introduction, some researchers have suggested that the effects of age onset should be considered continuously and not as a dichotomous taxonomy. Thus, all analyses were repeated using age of onset as a continuous variable, rather than grouping the sample into those with onsets prior to age 10 and those with onsets after this. For predicting SRO, a significant interaction between experiential ND and age of onset was significant ($\beta = .06$, $p \leq .05$), which was not the case when age of onset was used dichotomously. Further, the form of the interaction was consistent with hypotheses. The simple slope for age of onset one standard deviation above the mean was significant ($B = .21$, $SE = .066$, $t = 3.16$, $p = .002$, $95\% CI = .08$ to $.34$). Pairwise comparison showed that the difference between the slopes was significant ($p \leq .05$). Further, this interaction was no longer significant when peer delinquency and the

interaction between peer delinquency and age of onset was introduced in a second step.

However, when predicting arrests using continuous rather than dichotomous age of onset, neither the interaction between experiential ND with age of onset nor the interaction between peer delinquency and age of onset was significant.

Discussion

This study aimed to advance developmental theories of conduct problems by examining the differential influence of neighborhood disadvantage and peer delinquency. Broadly, the findings seem to depend on how neighborhood disadvantage and antisocial behavior were measured. One consistent finding was that experiential ND was associated with both self-reported delinquency and arrests. This relationship between experiential ND and antisocial behavior was predicted and has been documented in number of previous studies, such as a study of over 10,000 youth that reported that mother-reported neighborhood disadvantage was robustly related to youth conduct problems (Goodnight et al., 2012). These findings are also consistent with Shaw and McKay's social disorganization theory (1969), which suggests that neighborhoods can influence antisocial behavior through informal social control, which tends to be lower in disadvantaged neighborhoods due to disruption caused by factors such as low socioeconomic status and high residential mobility.

An unexpected finding was that, while experiential ND was positively associated with self-reported delinquency, structural ND coded from census data was negatively associated with self-reported delinquency. That is, higher levels of poverty predicted less self-reported delinquency over time. This finding was unexpected because, while most research has not used census-based measures of poverty, studies that have done so have typically reported a positive relationship between structural ND and delinquency (e.g., Hay, 2006; Katz, 2012; Sampson et al., 1997). A possible explanation for this unexpected finding may be due to the type of sample used in the current study. The current sample consisted of adolescents who were recently arrested for the first time. Further, there is evidence that youth in impoverished neighborhoods are more likely to be arrested than other youth because of greater police presence in these

neighborhoods (Kirk, 2008). This leads to the possibility that youth in more structurally advantaged neighborhoods may engage in *more* antisocial behavior before they are arrested, while youth in disadvantaged neighborhoods engage in *less* antisocial behavior before their first arrest. Given that this finding was not predicted a priori, it needs to be tested in other samples and samples that include both arrested and non-arrested adolescents.

A finding that was consistent with our hypotheses and across both ways of measuring delinquency (i.e., self-report and official arrests) was that peer delinquency predicted later delinquency. This finding is not surprising, as associating with deviant peers is one of the strongest and most consistent predictors of antisocial behavior in adolescents (e.g., Dandreaux & Frick, 2009; McCabe et al., 2001; Moffitt, 2018; Simons, 1994). In fact, the model using peer delinquency explained nearly two times more of the variation in self-reported offending than the model using experiential neighborhood disadvantage ($R^2 = .081$ and $R^2 = .043$), respectively. However, the predicted differential relationship between peer delinquency and CP based on age of onset was less clear. In the current study, the relationship was not moderated by age of onset for self-reported offending, although the interaction approached significance. However, for arrests, the interaction was significant, and the form of the interaction was in the predicted direction. That is, effect of peer delinquency on later arrests was stronger in youth with adolescent-onset CP than in youth with child-onset CP. One possible explanation for this finding is that youth with adolescent-onset CP tend to engage in more publicly visible antisocial behavior, such as vandalism and shoplifting, or be more willing to directly confront and defy police, both of which could make them more likely to be arrested. This explanation could also explain why age of onset moderated the association between experiential ND for arrests only. It would also be consistent with Moffitt's developmental theory suggesting that adolescent-onset

CP is better conceptualized as an exaggeration of adolescent rebellion and willingness to reject status hierarchies and social conventions, including respecting the police (Assink et al., 2015; Moffitt, 2018; Moffitt & Caspi, 2001).

Our findings were quite supportive of our hypothesis that the association between ND and adolescent delinquency would be mediated by peer delinquency, although this was limited to experiential ND, given the unexpected positive relationship between structural ND and delinquency. That is, both the main effect for experiential ND predicting self-reported delinquency and the interaction between experiential ND and age of onset for predicting arrests were largely mediated by peer delinquency. Thus, while the importance of peer delinquency has been widely supported in past research, our results suggest that it could help to explain the influence of other risk factors, like ND. Further, our findings suggest that one of the more iatrogenic effects of living in disorganized neighborhoods may be because it is conducive of adolescents associating with antisocial peers (Dupéré et al., 2007; Sampson, 1997; Wikstrom & Loeber, 2000).

Limitations

This study had several methodological strengths, such as measuring key variables (e.g., ND and delinquency) with different methods, using a longitudinal design with multiple follow-up points, using a large sample with high rates of youth of color, and using a sample at high risk for the outcomes of interest (i.e., delinquency). However, it also had several limitations that should be considered when interpreting the results. First, the sample included only males, which limits the generalizability of the findings. In addition, the sample was made up of youth who had been previously arrested, which may have led to unexpected findings, such as the inverse relationship between structural ND and CP. Thus, these findings should be replicated in using

samples of youth from the general population. Additionally, while the predictors and outcome variables for this study were not measured at the same time, the mediator was measured at the same time as the predictors, which weakens the test of mediation (Cole & Maxwell, 2003). Further, while this study was longitudinal, the first assessment point took place when the participants were in adolescence (mean age of 15.29). As a result, age of onset had to be estimated through retrospective recall. Finally, the index used in this study to operationalize structural ND has not been validated. While we chose this index based on similar studies (Sampson et al., 1997; Wikstrom & Loeber, 2000; Winslow & Shaw, 2007), the results should be replicated using other census indices, such as the Child Opportunity Index (Acevedo-Garcia et al., 2014) or Area Deprivation Index (Singh, 2003).

Implications

Within the context of these limitations, the study has several important implications. First, our results support past research highlighting the importance of peer delinquency in the development of antisocial behavior. While this has been documented in a significant amount of past research, our results using a longitudinal study design suggests that peer delinquency may also help to explain other risk factors for delinquency, such as neighborhood disorganization. Explaining the influence of the many interrelated risk factors to antisocial is important for causal theory but it is also important for policy and practice. That is, our results support the use of interventions that aim to improve social skills and cultivate healthy peer relationships for children and adolescence to reduce and prevention antisocial behavior. Peer mentorship programs, like the Boys and Girls Club, have shown effectiveness in antisocial behaviors for many adolescents (Durlak et al., 2010; Enns et al., 2022). These programs also provide a free or low-cost intervention option that may be preferable for low-income families and take place after

school, providing quality child-care for working parents. However, these programs may not be effective for youth with callous-unemotional traits. For these youth, social-emotional learning programs that emphasize social skills and empathy development could be an effective strategy to reduce and prevent conduct problems. One such program, Fast Track, has demonstrated effectiveness in terms of reduced conduct problems, self-reported offending and arrests compared to controls (Conduct Problems Prevention Research Group, 2019). Other social-emotional learning programs have demonstrated similar results (Bierman et al., 2021; Li et al., 2011).

Second, our results also support developmental theories of CP. That is, the influence of neighborhood disadvantage and peer delinquency on antisocial behavior seemed to be stronger in those adolescents with later onset to their antisocial behavior. Moffitt's developmental taxonomy purports that causal processes for youth with adolescent-onset CP are more related to social factors, while causal processes for youth with child-onset CP are more related to individual predispositions. In the current study, both neighborhood disadvantage and peer delinquency were significantly stronger predictors of future arrests for youth with adolescent-onset CP.

Third, while in need of replication as it was not predicted a priori, our findings that less antisocial youth may be arrested in higher poverty areas could have important implications for policy. A significant amount of research has shown that formally processing youth in the justice system can have a negative effect on the youth's outcome, increasing the likelihood of future antisocial behavior and justice system involvement (Beardslee et al., 2019; Liberman et al., 2014) and negatively impacting academic achievement and career opportunities (McGee, 2015). These negative effects have been hypothesized to be due to modeling and labeling effects and increased exposure to violence (Robertson et al., 2020). Specifically, youth in the juvenile justice

system have increased contact with delinquent youth, who model and reinforce antisocial behavior (Thornberry et al., 1993). In addition, youth are labeled as criminal, which may influence identity development and lead to further conduct problems (Lieberman, et al, 2014). Furthermore, youth in the juvenile justice system are often exposed to violence, through witnessing or victimization, which may lead to increased offending (Siegel et al., 2019). Considering that youth in disadvantaged neighborhoods are already at risk for many negative outcomes (Briggs et al., 2015), the potential for exacerbating this disadvantage through involvement in the justice system could have serious implications.

Finally, our results highlight the importance of programs to alleviate poverty and provide support to those who are experiencing it. These programs could reduce criminal behavior directly by allowing families greater chances of obtaining housing in neighborhoods with less disorder and indirectly by reducing peer delinquency. For example, 2001 study suggested that housing-mobility programs that allow families to move from high poverty to lower poverty neighborhoods reduced violent behavior in adolescents (Ludwig, 2001). A more recent British study suggests that reduction in family difficulties with paying the rent predicted lower levels of antisocial and criminal behavior during middle childhood (Stevens, 2018). Improving economic conditions as part of social programs such as Head Start (Webster-Stratton, 2010) and the Women, Infants, and Children Nutritional Supplement (WIC) program (Dishion et al., 2014) have also shown promise for reducing the rate of criminal behavior in adolescents.

In summary, youth who show conduct problems face a number of negative legal, social, educational, occupational, and mental health outcomes, even into adulthood (McGee et al., 2015; Moffitt, 2018). Understanding the causal processes behind the development of conduct problems can aid in their prevention and treatment. Our results support the importance the importance of

the adolescent's peer context as both an important causal factor and a valuable target for intervention. In addition, alleviating socioeconomic disadvantage could reduce antisocial behavior among adolescents.

Appendix A. Self-Report of Offending Scale

In the past 12 months, have you....	If yes, how many times have you done this in the past twelve months?	Thinking about the last time you did this, was anyone with you at the time? (1) Yes (5) No
Purposely destroyed or damaged property that did not belong to you? (1) Yes (5) No		
Purposely set fire to a house, building, car, or vacant lot? (1) Yes (5) No		
Entered or broken into a building to steal something? (1) Yes (5) No		
Stolen something from a store (shoplifted)? (1) Yes (5) No		
Bought, received, or sold something that you knew was stolen? (1) Yes (5) No		
Used checks or credit cards illegally? (1) Yes (5) No		
Stolen a car or motorcycle to keep or sell? (1) Yes (5) No		
Sold marijuana? (1) Yes (5) No		
Sold other illegal drugs (cocaine, crack, heroine)? (1) Yes (5) No		
Carjacked someone? (1) Yes (5) No		
		Did you have a gun the last time you did this? (1) Yes (5) No

(table cont'd.)

In the past 12 months, have you....	If yes, how many times have you done this in the past twelve months?	Thinking about the last time you did this, was anyone with you at the time? (1) Yes (5) No	
Driven while you were drunk or high? (1) Yes (5) No			
Been paid by someone for having sexual relationship with them? (1) Yes (5) No			
Forced someone to have sex with you? (1) Yes (5) No			Did you have a gun the last time you did this? (1) Yes (5) No
Killed someone? (1) Yes (5) No			Did you have a gun the last time you did this? (1) Yes (5) No
Shot someone (where bullet hit the victim)? (1) Yes (5) No			
Shot AT someone (where you pulled the trigger)? (1) Yes (5) No			
Taken something from another person by force, using a weapon? (1) Yes (5) No			Did you have a gun the last time you did this? (1) Yes (5) No
Taken something from another person by force, without a weapon? (1) Yes (5) No			
Beaten up or physically attacked someone so badly that they probably needed a doctor? (1) Yes (5) No			
Been in a fight? (1) Yes (5) No			

(table cont'd.)

In the past 12 months, have you....	If yes, how many times have you done this in the past twelve months?	Thinking about the last time you did this, was anyone with you at the time? (1) Yes (5) No	
Beaten up, threatened, or physically attacked someone as part of a gang? (1) Yes (5) No			Did you have a gun the last time you did this? (1) Yes (5) No
Carried a gun? (1) Yes (5) No			
Broken into a car to steal from it? (1) Yes (5) No			
Gone joyriding? (1) Yes (5) No			

Appendix B. Neighborhood Conditions Measure

How often does each of the following occur within your neighborhood?

Physical Disorder				
	Never	Rarely	Sometimes	Often
Cigarettes on the street or in the gutters?	(1)	(2)	(3)	(4)
Garbage in the streets or on the sidewalk?	(1)	(2)	(3)	(4)
Empty beer bottles on the streets or sidewalks?	(1)	(2)	(3)	(4)
Boarded up windows on buildings?	(1)	(2)	(3)	(4)
Graffiti or tags?	(1)	(2)	(3)	(4)
Graffiti painted over?	(1)	(2)	(3)	(4)
Gang graffiti?	(1)	(2)	(3)	(4)
Abandoned cars?	(1)	(2)	(3)	(4)
Empty lots with garbage?	(1)	(2)	(3)	(4)
Condoms on sidewalk?	(1)	(2)	(3)	(4)
Needles or syringes?	(1)	(2)	(3)	(4)
Political messages in graffiti?	(1)	(2)	(3)	(4)
Social Disorder				
Gangs (or other teen groups) hanging out?	(1)	(2)	(3)	(4)
Adults hanging out on the street?	(1)	(2)	(3)	(4)
People drinking beer, wine or liquor?	(1)	(2)	(3)	(4)
People drunk or passed out?	(1)	(2)	(3)	(4)
Adults fighting or arguing loudly?	(1)	(2)	(3)	(4)
Prostitutes on the streets?	(1)	(2)	(3)	(4)
People smoking marijuana?	(1)	(2)	(3)	(4)
People smoking crack?	(1)	(2)	(3)	(4)
People using needles or syringes to take drugs?	(1)	(2)	(3)	(4)

Appendix C. Peer Delinquency Scale

During the past 6 months, how many of your friends have....

	None of them	Very few of them	Some of them	Most of them	All of them
Purposely damaged or destroyed property that did not belong to them?	(1)	(2)	(3)	(4)	(5)
Hit or threatened to hit someone?	(1)	(2)	(3)	(4)	(5)
Sold drugs?	(1)	(2)	(3)	(4)	(5)
Gotten drunk once in a while?	(1)	(2)	(3)	(4)	(5)
Gotten high on drugs?	(1)	(2)	(3)	(4)	(5)
Carried a knife?	(1)	(2)	(3)	(4)	(5)
Carried a gun?	(1)	(2)	(3)	(4)	(5)
Owned a gun?	(1)	(2)	(3)	(4)	(5)
Gotten into a physical fight?	(1)	(2)	(3)	(4)	(5)
Been hurt in a fight?	(1)	(2)	(3)	(4)	(5)
Stolen something worth more than \$100?	(1)	(2)	(3)	(4)	(5)
Taken a motor vehicle or stolen a car?	(1)	(2)	(3)	(4)	(5)
Gone in or tried to go into a building to steal something?	(1)	(2)	(3)	(4)	(5)

Appendix D. Institutional Review Board Approval

ACTION ON PROTOCOL CONTINUATION REQUEST



Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
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irb@lsu.edu
lsu.edu/research

TO: Paul Frick
Psychology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: August 2, 2017

RE: IRB# 3650

TITLE: Crossroads: Formal versus informal processing in the juvenile justice system

New Protocol/Modification/Continuation: Continuation

Review type: Full ☐ Expedited ☒ **Review date:** 8/1/2017

Risk Factor: Minimal ☒ Uncertain ☐ Greater Than Minimal ☐

Approved ☒ **Disapproved** ☐

Approval Date: 8/2/2017 **Approval Expiration Date:** 8/1/2018

Re-review frequency: (annual unless otherwise stated)

Number of subjects approved: 151

LSU Proposal Number (if applicable): 43721

Protocol Matches Scope of Work in Grant proposal: (if applicable)

By: Dennis Landin, Chairman 

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –

Continuing approval is **CONDITIONAL** on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: Make sure to use bcc when emailing more than one recipient.**

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>*

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Vita

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