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**A COMPREHENSIVE INVESTIGATION OF THE ROLE OF THE INDIVIDUALS,
THE IMMEDIATE SOCIAL ENVIRONMENT, AND NEIGHBORHOODS IN
TRAJECTORIES OF ADOLESCENT ANTISOCIAL BEHAVIOR**

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

Study Background

Adolescent substance use and delinquency are important public health concerns as they possess the possibility of severe consequences for the youth involved and society more broadly (Albert & Steinberg, 2011; Cohen & Piquero, 2009). Understanding developmental patterns and possible influences on those patterns is important in developing insights on prevention strategy targeted at these behaviors. The desire to understand and prevent long-term patterns of antisocial behavior first led to the compilation of comprehensive lists of risk factors found to increase the likelihood of antisocial behavior and, more recently, has prompted linkage of those risk factors to underlying causal processes. This approach, which draws on the study of individuals over time in explaining behavior, sets the stage for the development of interventions that are informed by an understanding of the onset and continuance of antisocial behavior (Loeber & Farrington, 2000). The current study draws on the literature relating individual constitutional factors, family influences and adolescent peer associations to substance use and delinquency. It also recognizes the emerging literature relating community social environment and processes to youth development. A “launch” perspective is used to relate these factors to the onset point of the developmental trend and its stability and/or change from that level in the latent growth curve analyses used in this study (see Hussong et al., 2008).

Rationale and Research Questions

Longitudinal cohort data from the Project on Human Development in Chicago Neighborhoods (PHDCN) were analyzed. The PHDCN is a large study of youth, families, and communities designed to collect systematic information about development and connect that to broader social institutions and settings (Earls & Visser, 1997). This analysis used multiple cohort and multilevel latent growth models as well as several ancillary approaches to answer

questions on the development of adolescent antisocial behavior. The first question was: (1) *How are trajectories of substance use and delinquency across adolescence best described?* This involved (a) an assessment of sample-average initial levels (Intercept) and trends (Slope) and their variance estimates; (b) plotting observed and expected trends across ages 9 to 19; and (c) testing group (cohort) differences in the latent growth factors. The second question was (2) *To what extent do key individual and social influence measures available in PHDCN (e.g., self control, family influence, peer influence) impact the initial level of substance use/delinquency?* This entails (a) testing the effects of individual, family, and peer covariates on the intercept and (b) assessing relevant interaction effects for individual and family/peers. Third, (3) *To what extent do key individual and social influences impact the progression (slope) of substance use/delinquency over time?* The same process as in question two was undertaken, but the focus was on the slope rather than the intercept. The emphasis there is on the enduring impact of these risk or protective factors. Fourth, and finally, the analysis considered (4) *Do youth trajectories of substance use and delinquency vary across neighborhoods?* The process for answering this question is: (a) assess neighborhood cluster-level variance components for the Intercept and Slope; (b) assess neighborhood cluster-level variance components for covariate effects (i.e., neighborhood influences) where appropriate

Key Findings

This analysis of the PHDCN data led to a number of findings with implications for understanding the development of antisocial behavior which in turn offers practical insight:

- The results of the unconditional models of these behaviors both fit with expectations based on previous research and also offer some departures from it. Specifically, looking at the entire age span, the rise in delinquency and subsequent decline later in the

observation window generally follows the general age-crime curve (see Farrington, 1986). Substance use appears to rise across the time window studied here, however.

This indicates a distinct developmental trend in that behavior.

- Cohort differences in initial levels and longitudinal trends in antisocial behavior as well as relationships with covariates were identified both descriptively and in formal tests. The models identified some gender differences in the trajectories. This is distinct from a simple difference in levels of antisocial behavior in that these gender differences might have an impact on where youth start as well as behavioral change/stability over time.
- Exposure to delinquent peers has consistent effects on the initial level of antisocial behavior in most analyses of delinquency and substance use and also has some effects on developmental trends later in adolescence.
- Individual self control has a significant effect on the latent growth factors in a number of tests for the delinquency measures, but no significant effects in the analysis of substance use. In general where it did have significant effects, lower self control was associated with higher initial levels of delinquency.
- Although the analyses identify some family influence and SES effects, these are inconsistent across cohorts and outcome measures and were somewhat limited. It seems that these measures do not have a strong influence on these antisocial behavioral trajectories—even initial behavioral levels—in this study. Supplementary analysis did show that they may be partially mediated by other factors (e.g., deviant peer association) in the case of substance use and had interactive effects in some instances as well (e.g., parental lack of hostility and antisocial peers).

- In some cases, the covariate models identified directional differences in effects on initial levels and trends. These generally signify that a covariate has an influence on the outcome of interest initially but also has an impact on the level of change over the few years that follow. This could represent regression to the mean over time for those who start higher or lower on antisocial behavior or a distinct effect for the initial part of the developmental trend and its later course. This highlights the importance of understanding developmental risk/protection in a framework that captures both immediate and long-term effects.
- Interaction terms for individual and social influences were included at the final stage of the latent growth curve analysis. These interaction terms generally did not have significant influences on the initial level of antisocial behavior or its trend over time. The few significant interaction terms (e.g., deviant peers and self control) that were identified suggest potential interdependencies among risk and protective factors in their influence on developmental trends.
- The results from the multilevel growth curve models focused on community-level effects indicate that, in several of the tests, the variation around the estimated growth factors (initial levels, trends over time) was statistically significant. This suggests that these trajectories tend to differ somewhat across neighborhoods. The use of neighborhood-level factors to try to explain such variation was not particularly helpful as measures such as collective efficacy and social disorder did not have significant effects, however.

Implications for Intervention with At-Risk and Delinquent Youth

The assessment of developmental trends in antisocial behavior using the approach taken here offers some insight into prevention efforts both in terms of prospects and potential problems. In

particular, the investigation of a “launch” perspective on antisocial behavioral development with multiple domains of risk provides a sense of how to prioritize leverage points in designing strategies to prevent problem behaviors on the part of adolescents—both among those who are likely to be serious and sustained offenders as well as those youth whose antisocial behavior may be more fleeting. The findings for cohort and gender differences suggest two general sensitizing themes that might be considered in intervention. First, given some identified differences across cohorts, the potential for differential risk/protection relationships by age should be considered in programming. So, while it is important to identify effective prevention strategies, it is also necessary to identify and implement interventions that are appropriately timed in terms of the developmental stage in which youth are situated (Nation et al., 2003). Second, the gender differences suggest more scrutiny of initial levels and developmental patterns of antisocial behavior. The degree to which boys and girls differ in the mechanisms that underlie such behavior has important implications for the need for gendered explanations of behavior and prevention strategies (e.g., Gorman-Smith & Loeber, 2005; Moffitt et al., 2001).

The findings for individual and social influences on the trajectories for antisocial behavior have practical relevance as well. First, although it was somewhat surprising that self control did not have consistent effects across cohorts and outcomes based on the underlying theory and previous findings, the results suggest that, on balance, individual propensity should be considered in pursuing other intervention strategies (i.e., use of the risk principle) and appropriate measures should be taken to develop and use programming that has demonstrated effectiveness in bolstering skills related to self regulation in children and adolescents (Piquero, Farrington, & Jennings, 2010). Still, the fact that self control did not have an impact on longitudinal trends in substance use suggests that other risk/protection mechanisms must be considered in prevention efforts directed at that behavior. Second,

a number of the currently recognized best practices directed towards at-risk youth are built around family-based programming. These initiatives are important and address a salient risk for many substance using and delinquent youth, but consideration of situational/peer risk should be central to the discussion of prevention and intervention during adolescence as well. The robustness of delinquent peer exposure as a significant influence—even in the cohort observed starting in late childhood—points to the need to develop interventions that can counteract this risk (Sullivan & Jolliffe, 2012).

Although the analyses were somewhat exploratory, the identified differences in developmental trajectories across communities also offer useful insights for intervention. First, although the precise neighborhood influences on antisocial behavior were elusive here, it is apparent that not all of the influence on developmental trends in adolescent antisocial behavior rests in individual factors or proximal social influences. This suggests that interventions that do not explicitly consider the community as part of the process of the development of antisocial behavior may fall short in terms of redirecting at-risk youth towards prosocial outcomes. It is important to involve communities in taking stock of those factors that can exacerbate or attenuate the individual and family difficulties that could lead to problematic outcomes. This mirrors the first stage of the Communities that Care program where residents are asked to report about specific risks and needs with respect to children and adolescents in the area. The process then continues with experts offering some direction on interventions that might be implemented to help youths in that particular community (see Hawkins, 1999; Hawkins et al., 2008). This type of program may be useful in developing both a platform for other intervention as well as directing youth, families, and communities toward appropriate programming to prevent and respond to delinquency and substance use. It may also blend well with a broad framework like the Office of Juvenile Justice and Delinquency Prevention’s (OJJDP) “Comprehensive Strategy”

to structure prevention and remediation across the range of at-risk and delinquent youth (Howell, 2003).

Methods

Existing data from the Project on Human Development in Chicago Neighborhoods (PHDCN) were analyzed using latent growth curve models to assess patterns of substance use and delinquency across three waves for three age cohorts (n=752 [Cohort 9]; 752 [Cohort 12]; 626 [Cohort 15]). Each of the cohorts was interviewed approximately two years apart (e.g., a Cohort 9 youth was observed at ages 9, 11, and 13). Units of observation were selected based on a multi-stage design where a random sample of 343 neighborhood clusters was initially chosen. Eighty of these clusters were then selected based on a stratified sampling strategy that focused on socioeconomic and racial composition. The selection of participants for the longitudinal cohort study followed from that process (Earls & Visher, 1997). Seventy-five percent of those in Cohort 9, 74% in Cohort 12, and 72% in Cohort 15 who were invited to participate in the longitudinal cohort study actually did so (Molnar et al., 2008). The analysis was expanded to the neighborhood level (N=78) through use of data from a community survey. Approximately 8700 Chicago residents (25 to 50 per neighborhood) were surveyed regarding their perception of their neighborhood (Earls & Visher, 1997; Liberman, 2007).

The PHDCN measures used in this study focused on two major aspects of adolescent antisocial behavior (Substance Use, Delinquency) and a number of domains that have been utilized in explaining them. Self-reported substance use and delinquency were measured at three waves for each cohort. Substance use items tap into the frequency of use of alcohol, marijuana, cocaine, inhalants, and other illicit drugs (National Institute on Drug Abuse, 1991). The delinquency scale comprises Item Response Theory Rasch scores for property offenses, public

order and status offenses, and violent offenses (Huizinga, Esbensen, & Weiher, 1991; Kirk, 2006; Raudenbush, Johnson, & Sampson, 2003). The covariates were measured at Wave 1. A self control measure was developed based on the EASI temperament instrument (Buss & Plomin, 1975) with subscales tapping impulsivity, inhibitory control, sensation seeking, and persistence. Composites for parental warmth, parental lack of hostility, and parental monitoring and supervision were drawn from the Home Observation for Measurement of the Environment (HOME) Inventory (Caldwell & Bradley, 1984; Leventhal et al., 2004). The Provision of Social Relationships (PSR) instrument asks questions about the degree to which the youth feels respected and has people (family, friends) whom they can count on if necessary (Turner, Frankel, & Levin, 1983). Peer influence measures were drawn from a set of 15 items that ask the youth participant about the degree to which their “friends or people [they] spend time with” engage in delinquent activities and substance use (Huizinga et al., 1991). Some community-level variables were incorporated into the final stage of the analysis. Consistent with previous work (e.g., Sampson, Raudenbush, & Earls, 1997), the main measure used at the community level is collective efficacy. Additionally, two other neighborhood-level composite measures were explored to assess their potential effects on the growth trends (social capital, social disorder).

Several latent growth curve models were estimated in MPlus 6.0 with Full Information Maximum Likelihood. First, to respond to *Research Question 1*, unconditional latent growth curve models for substance use and delinquency were estimated and tested using the multiple cohort procedure (see Figure 1). Models were evaluated in terms of the initial level of the behavior in question (Intercept) as well as its rate of change over time (Slope). Five key parameters were estimated: Means for the (a) Intercept and (b) Slope; their respective Variances (c, d); and their Covariance (e), which captures the relationship between starting point and

growth over time (Lawrence & Hancock, 1998; Singer & Willett, 2003). This Intercept-Slope Covariance estimate considers continuity (or discontinuity) in antisocial behavior by capturing the relationship between its initial level and pattern of endurance across adolescence. Within-sample variation in initial starting points and rates of change was expected. Additionally, in the multiple cohort models, group effects (i.e., cohort differences) on the growth factors were tested to determine whether the model based on the accelerated cohort data could be used as a proxy for a trend measured in a single cohort across several years (Duncan, Duncan, & Hops, 1996; Duncan et al., 2006).

The estimation of the initial models provides a general description of trajectories of adolescent antisocial behavior in the PHDCN sample. Two sets of estimates were then assessed at the next stage of the process (aimed at *Research Questions 2 and 3*). Key indicators representing the domains described above, measured at the initial measurement wave, were incorporated to determine whether these influences have an effect on the growth factors (Intercept, Slope). At the final step of this phase of the analysis, several interaction terms for and the covariates described above were added to the models.

Although typically acknowledged as important in youth development, community context is infrequently incorporated into latent growth curve models of antisocial behavior. In the final phase of the analysis, the models described above were specified in a multilevel framework to (a) assess the degree to which latent slopes and intercepts vary across neighborhood clusters and (b) consider potential neighborhood effects on developmental trends. This analysis provided information associated with *Research Question 4*.

Conclusion

The understanding of adolescent antisocial behavior has increased markedly in recent years. Nevertheless, more can be done to pinpoint the etiology of antisocial behavioral trajectories to inform prevention and intervention strategy. This study utilized multi-wave data from the Project on Human Development in Chicago Neighborhoods (PHDCN) on three cohorts spanning ten years (age 9 to 19) to investigate longitudinal trends in adolescent substance use and delinquency along with key individual, social, and community influences. Although the data and the analytic strategy have some limitations, a number of findings relevant to understanding the development of antisocial behavior and response to it emerged in this study. Through consideration of a contextualized, launch model of antisocial behavioral trajectories, the study found significant variation in six year developmental trajectories in antisocial behavior across individuals and neighborhoods. Some of the plausible individual and social influences captured at the initial stage of PHDCN measurement and neighborhood of residence were helpful in explaining this variation in developmental trends as well. These findings offered some useful insights for understanding the developmental processes that may give rise to trends in antisocial behavior in adolescence while simultaneously identifying relevant points for prevention strategy.