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IMPULSIVITY, OFFENDING, AND THE NEIGHBORHOOD:

INVESTIGATING THE PERSON-CONTEXT NEXUS

by

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## ABSTRACT

A key assumption of the traditional trait-based approach to the study of crime is that personality traits cause people to act similarly across a wide array of contexts. This approach has been challenged for its failure to acknowledge differences in the social environments to which individuals are exposed. Similarly, community-level explanations of crime have been criticized for failing to acknowledge that there are important individual differences between criminals and non-criminals. Ultimately, a full understanding of crime requires the consideration of both individual and environmental differences, perhaps most importantly because they may interact to produce offending behavior. In particular, the influence of individual traits may be context-dependent, or viewed differently, individual traits may affect how individuals respond to their social environments.

This dissertation extends the knowledge base on person-context interactions by examining how an important individual-level factor – impulsivity – is related to offending in different neighborhood contexts. First, a theoretical basis is provided for an impulsivity-context interaction. Next, a review of the literature outlines studies that have examined the relationships among individual factors, neighborhood context, and offending behaviors. Finally, using the Project of Human Development in Chicago Neighborhoods (PHDCN), multivariate, multilevel item response models are used to examine if the effects of impulsivity on offending are amplified in lower risk neighborhoods.

Analysis using two waves of data from a sample of approximately 1,200 respondents, combined with 1990 census data and a comprehensive survey of Chicago

neighborhoods, largely supported the predictions. Over time, higher levels of impulsivity were associated with higher levels of property and violent offending. There was also evidence of an amplification process whereby the effects of impulsivity on offending were enhanced in neighborhoods with higher levels of socioeconomic status. Further, the effects of impulsivity were enhanced in neighborhoods with higher levels of collective efficacy, and lower levels of criminogenic behavior settings and pro-criminal definitions. Finally, a social process risk composite (i.e., an index of collective efficacy, criminogenic behavior settings, and pro-criminal definitions) reduced the effects of socioeconomic status on the slope of impulsivity, indicating that the impulsivity-SES interactions were explained, at least in part, by the proposed theoretical mechanisms.

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# CHAPTER 1:  INTRODUCTION

A key assumption of the traditional trait-based approach to the study of crime is that personality traits cause people to act similarly across a wide array of contexts. This approach has been challenged for its failure to acknowledge differences in the social environments to which individuals are exposed (Farrington, 1993; Mischel, 1968). Too often, the trait-based approach ignores the fact that social context matters and can alter the decision-making process. A key assumption of community-level explanations of crime is that forces outside of individuals influence their offending behaviors. Theories in this tradition have been criticized for failing to acknowledge that there are important individual differences between criminals and non-criminals (Glueck & Glueck, 1950; Gottfredson & Hirschi, 1990). Community-level theories generally neglect the possibility that individual traits can affect how individuals perceive and react to their environments. Ultimately, a full understanding of crime requires the consideration of both individual and environmental differences, perhaps most importantly because they may interact to produce offending behavior. In particular, the influence of individual traits (on offending) may be context-dependent, or viewed differently, individual traits may affect how individuals respond to their social environments.

This study joins the trait-based approach to the study of crime with theories focusing on the characteristics of social units. The trait-based approach stresses that certain individuals possess undeniable qualities that make them more likely to engage in criminal behavior. Researchers in this tradition have linked persistent antisocial behavior to cognition, behavioral characteristics and personality traits (Eysenck, 1977; Farrington, 1995a; Patterson, 1982; Patterson, Reid, & Dishion, 1992). Impulsivity is perhaps the

most common factor associated with these individual-level explanations of offending (Gottfredson & Hirschi, 1990; Lynam et al., 2000; Moffitt, 1993; Wilson & Herrnstein, 1985). Moreover, researchers have demonstrated that impulsivity is a strong predictor of offending behaviors across a variety of theoretical perspectives, settings, and study designs (Ellis & Walsh, 1999; Vazsonyi, Cleveland, & Wiebe, 2006; White et al., 1994).

An alternate perspective contends that certain areas have community characteristics that are more likely to generate criminal behavior (see, e.g., Bursik & Grasmick, 1993; Shaw & McKay, 1942). Studies in this tradition have demonstrated that areas high in crime also tend to be characterized by factors such as poverty, residential instability, and ethnic heterogeneity (Sampson, 2006, p. 149). Although early studies largely assumed that these sociodemographic characteristics undermine a neighborhood's ability to maintain social control and thus prevent crime and delinquency (Kubrin & Weitzer, 2003), researchers in the last two decades have concentrated on examining the community social mechanisms that are ultimately responsible for neighborhood offending patterns (Kornhauser, 1978; Rosenfeld, Messner, & Baumer, 2001; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997; Stark, 1987). For example, researchers have focused on informal social control, social capital, anomie/strain, oppositional and attenuated culture, and collective efficacy.

Despite theoretical and empirical support for both traditions of research, trait-based theories of crime have largely ignored community-level influences, while community-level explanations have downplayed the importance of individual influences (Elliott et al., 1996; Farrington, 1993; Wikstrom & Sampson, 2003). For example, Gottfredson and Hirschi (1990), Wilson and Herrnstein (1985), and Eysenck (1977)

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emphasize that certain personality traits (established early in life) predispose individuals to offending, remain relatively stable, and are correlated with a wide variety of reckless behaviors throughout the life course, regardless of individuals' environmental settings. Similarly, community-level theories focus on the detrimental effects of criminogenic environments, downplaying individual differences between criminals and non-criminals (Cullen & Agnew, 2003, p. 27). Yet both traditions of research have been criticized for their failure to recognize the other perspective. In a review of over 50 years of personality research, Mischel (1968) found, contrary to the key assumption of trait-based theories of crime, that behavior is situationally-dependent. This cast doubt on the utility of global traits as causal explanations of behavior (Horney, 2006, p. 3-4). Similarly, Glueck and Glueck (1950), in a period of time dominated by sociological explanations of crime, showed that biological and psychological factors play a crucial role in explaining crime, particularly in explaining why individuals respond differently to the same settings.

The reality is that persons and situations never exist in isolation (Sarason, 1977, p. 263). Individuals live and act in social settings with different criminogenic influences, and social environments influence the decision-making processes of individuals, who ultimately decide whether to engage in or refrain from criminal behavior. As a result, researchers have argued that linking these two divergent approaches to the study of crime is necessary (Tonry, Ohlin, & Farrington, 1991; Wikstrom & Loeber, 2000). Moreover, since the characteristics of individuals tend to vary with the characteristics of the neighborhoods in which they reside, Farrington (1993) contends that research accounting for either individual- or community-level processes may be inconclusive, at best.

The vast majority of studies considering individual- and community-level factors simultaneously have been concerned with either (1) proving that community-level effects on area crime rates exist after controlling for the aggregated characteristics of the individuals living there, or (2) demonstrating that community-level effects on individual variation in offending exist after controlling for individual risk factors. For example, at the neighborhood level of analysis, Sampson et al. (1997) demonstrated that collective efficacy predicts neighborhood violence after controlling for the aggregated characteristics of individuals in the neighborhoods. At the individual level of analysis, researchers have found that neighborhood characteristics are significantly, albeit weakly, correlated with offending (see, e.g., Lizotte, Thornberry, Krohn, Chard-Weirschem, & McDowall, 1994).

Although such studies are important, they neglect the critical question of how individual and community factors interact to produce offending behavior (Wikstrom & Loeber, 2000). That is, the relationships between individual traits and offending may differ as a function of community variations (Lynam et al., 2000, p. 564). The basic conceptual argument is that crime is not dependent on either individual or community characteristics; rather, offending behavior is "always dependent *on who is in what setting. In other words, it is not about 'kinds of individuals' or 'kinds of settings' but about 'kinds of individuals in kinds of settings'*" (Wikstrom, 2004, pg. 19). Therefore, a full understanding of criminal behavior requires a consideration of how individual and community characteristics interact to produce offending behavior.

A complete understanding of person-context interactions will inform research as well as preventive strategies. That is, research may have substantiated the relationship

between an individual-level trait and offending, but the relationship may be stronger in some contexts than others; or more notably, the relationship may only be significant in certain situations. If true, previous research is incomplete. In addition, preventive strategies can be informed by person-context interactions. For example, the success of social prevention strategies aimed at reducing individual propensity to crime (e.g., cognitive-behavioral interpersonal skills training and mentoring programs such as Big Brothers Big Sisters of America) may depend on the characteristics of the communities in which they are implemented. Similarly, the success of situational prevention measures focused on reducing criminal opportunities in the neighborhood (e.g., target-hardening techniques) may depend on the characteristics of the residents in the targeted neighborhoods. Thus, rather than implement social and situational prevention programs indiscriminately, interventions should be informed by research on person-context interactions (Farrington, 1995b, p. 345). Such interventions are likely to have higher potentials for success than those that focus on either the individual or the environment (Wikstrom & Loeber, 2000, p. 1111).

Despite the potential benefits of a research agenda that considers person-context interactions, only a small number of studies have examined them. Among these studies, there are questions as to how, if at all, the influence of individual-level factors on offending varies across different neighborhood contexts. This is due, in part, to the lack of theoretical focus on specific individual- and community-level processes and the inconsistent conceptualization and measurement of individual risk across studies. In addition, previous studies have classified neighborhoods by their socioeconomic characteristics (i.e., SES and concentrated disadvantage) even though there is an

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evidentiary foundation that the effect of these characteristics on offending is mediated, at least in part, by community social processes such as collective efficacy (Kubrin & Weitzer, 2003; Sampson, 2006). Thus, research on person-context interactions has examined if there are interactions, rather than focus on explaining them.

As a result, research needs to extend the knowledge base on person-context interactions by (1) focusing on the theoretical convergence of specific individual and community-level factors, and (2) testing which neighborhood social processes moderate the influence of individual-level factors on offending (Lynam et al., 2000, p. 571). Accordingly, this study will examine how an important individual-level factor – impulsivity – is related to offending in different neighborhood contexts.

The dissertation begins by discussing extant research on impulsivity and neighborhood context. Chapter 2 reviews the interdisciplinary research base on impulsivity and the individual-difference paradigm. Chapter 3 starts by discussing the social disorganization tradition and the movement to identify, measure, and examine neighborhood social processes related to crime. The chapter concludes by identifying collective efficacy and culture as two of these neighborhood social processes. In Chapter 4, a theoretical basis is provided for an impulsivity-neighborhood context interaction. Chapter 5 follows by reviewing studies that have examined the relationships among individual factors, neighborhood context, and offending behaviors. Chapter 6 reviews the Project of Human Development in Chicago Neighborhoods (PHDCN) and discusses statistical methodology. Chapter 7 presents the results. Chapter 8 concludes by discussing the study's limitations, extensions for future research, and implications for designing effective policy interventions.

## CHAPTER 2: IMPULSIVITY

The inclination to associate criminal behavior with impulsivity has been popular among researchers working from various disciplines and theoretical perspectives. This tendency to view impulsivity as a cause of criminal conduct is consistent with the long-standing criminological tradition of explaining crime with individual traits. Accordingly, Chapter 2 reviews the interdisciplinary research base on impulsivity and the individual-difference paradigm.

### The Interdisciplinary Study of Impulsivity and Offending

Researchers and practitioners from various fields have linked impulsivity to antisocial conduct. For example, psychiatrists consider impulsivity an important part of many antisocial personality disorders including attention deficit hyperactivity disorder (ADHD), borderline personality disorder (BPD), and conduct disorder (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). In the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (American Psychiatric Association, 1994), impulsivity is included in the diagnostic criteria for ADHD and BPD. Impulsivity is also part of the working definition of the psychopathic personality (Cleckley, 1964; Lykken, 1995) and has been associated with the criminally insane since the latter part of the 18th century (Pinel, 1806). As part of various antisocial personality disorders, impulsivity has been associated with substance abuse/dependence, suicide, and delinquency in childhood and adulthood (Farrington, Loeber, & Van Kammen, 1990), as well as anger, aggressiveness, and violence (Fossati et al., 2004). Moreover, some psychiatrists consider impulsivity the foremost predictor of antisocial and delinquent disorders (Tremblay, Pihl, Vitaro, & Dobkin, 1994).

Neuro- and psycho-biologists, psychopathologists, and personality psychologists have also investigated the relationships between impulsivity and antisocial behaviors such as aggression, violence, gambling, substance abuse, suicide, anxiety, and child abuse (Vigil-Colet & Codorniu-Raga, 2004). For example, Eysenck's (1977) personality theory links impulsivity to offending through conditionability. According to Eysenck (1977), poor conditionability, along with sociability (extroversion), neuroticism, and psychoticism, prevents children and young adolescents from properly associating antisocial behaviors with pain and fear arousal. Other researchers have linked impulsivity to offending through physiological differences in response modulation, rather than to differences in conditionability or arousal (Ellis, 1987). Gray (1977), in a reformulation of Eysenck's personality theory, focuses on the differential susceptibility to rewards and punishments, and Gorenstein and Newman (1980) and Schalling (1978) link impulsivity to criminality through disinhibition, or the inability to defer immediate for prospective gratification (see Newman, 1987). Common to these theories is the view that impulsivity is a personality characteristic predisposing individuals to "long-term, recidivistic antisocial behavior" (White et al., 1994, p. 192). Appropriately, Moffitt (1993) argues that impulsivity is a relatively stable personality trait (Klintberg, Magnusson, & Schalling, 1989) that can lead to "life-course persistent" antisocial behavior through direct (e.g., disinhibition) and indirect (e.g., academic failure) means.

### Individual Differences in the Propensity to Offend

This conceptualization of impulsivity is consistent with the long-standing criminological tradition of explaining crime with reference to time-stable individual differences in the propensity to offend (Nagin & Paternoster, 1993). For example,

Goddard (1912) attributed crime to feeblemindedness, Hooton (1939) to mental deficiencies and physical inferiorities, Sutherland (1931) to IQ (see also Herrnstein & Murray, 1994; Hirschi & Hindelang, 1977), and Glueck and Glueck (1950) to a number of personality traits including mental instability and a lack of concern for others. These theories imply that some underlying personality trait, established before or early on in life, predisposes individuals to crime and delinquency throughout the life course (Robins, 1978).

Impulsivity is perhaps the most common personality trait associated with individual-difference research on offending (Eysenck, 1977; Lynam et al., 2000; Miller & Lynam, 2001; Moffitt, 1993). In addition, impulsivity is the centerpiece of two recent and influential texts (Gottfredson & Hirschi, 1990; Wilson & Herrnstein, 1985). In *Crime and Human Nature*, Wilson and Herrnstein (1985) maintain that the key determining factor in an individual's decision to engage in or refrain from crime is the extent to which the benefits of crime outweigh the consequences. However, the benefits of crime, including fiscal reward and sexual satisfaction, are often contemporaneous, while the consequences, including the risk of capture, arrest, guilt, and social disapproval, are often uncertain and/or deferred. Since impulsivity is characterized by a "present orientation" (i.e., the inability to plan for the future or defer gratification), impulsive individuals will be more likely to engage in offending behaviors that provide immediate gratification but are associated with negative consequences in a devalued future. Consequently, Wilson and Herrnstein (1985) consider impulsivity the "major determinant of offending" (Farrington, 1994, p. XX).

Whereas Wilson and Herrnstein (1985) regard impulsivity as the key individual-difference factor, Gottfredson and Hirschi (1990) contend that low self-control is the principal individual-level factor that predisposes individuals to crime and delinquency. Low self-control, considered the conceptual equivalent to impulsivity by psychiatrists (Critchfield, Levy, & Clarkin, 2004, p. 556; White et al., 1994, p. 93), represents the extent to which individuals are vulnerable to the temptations of the moment. As a result, individuals with low self-control have trouble resisting immediate gratification and are unaffected by the future consequences of their actions, thereby enabling criminal behavior. However, self-control, as described in *A General Theory of Crime*, is broader than impulsivity; in addition to being impulsive, individuals with low self-control are risk-taking, self-centered, have little interest in planning for the future, lack empathy, and possess below-average cognitive and academic skills (Gottfredson & Hirschi, 1990).

Consistent with the trait-based approach to crime, Wilson and Herrnstein (1985) and Gottfredson and Hirschi (1990) emphasize that certain personality traits are established early in life, remain relatively stable, predispose individuals towards offending, and are correlated with a wide variety of reckless behaviors throughout the life course. In addition, Gottfredson and Hirschi (1990) argue that the relationship between individual traits and offending should be invariant to environmental context. They contend that (1) the percentage of individuals predisposed to crime should "remain reasonably stable with change in the social location of individuals", and (2) the ability of individual differences to predict antisocial behavior will remain consistent "whatever the circumstances in which [individuals] find themselves" (p. 87). According to Gottfredson and Hirschi (1990), every community will contain individuals with low self-control, and

lower levels of self-control will predict higher rates of offending regardless of community context (Vazsonyi et al., 2006, p. 6-7).[1] Wilson and Herrnstein (1985) also suggest that the relationship between individual characteristics and offending is relatively stable across time and space. They claim that persistent offenders "… begin their offending very early in their lives, well before communal factors – whether peers who are 'rotten apples' or neighborhood social processes that set boundaries, supply targets, or provide surveillance – could play much of a role" (p. 311). These viewpoints are indicative of trait-based theories that emphasize the influence of individual characteristics on crime and generally de-emphasize the import of community-level influences on crime.

Consistent with medical-based research, criminological research in the individual-difference paradigm suggests that personality traits are established early in life and predispose individuals to offending throughout the life course, net of environmental factors (Nagin & Farrington, 1992; Wikstrom & Loeber, 2000). This model of offending has been challenged by personality researchers and criminologists in the last few decades for failing to acknowledge the possibility that traits may be expressed differently in different environments (Farrington, 1993; Mischel, 1968).

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[1] Gottfredson and Hirschi (1990) are explicit that individuals with low self-control will be equally likely to engage in reckless behavior across different social environments. However, they do suggest that criminal opportunities and incentives play crucial roles in the commission of crime. Other researchers have argued that this "opportunity" argument is consistent with a person-context interaction (see Nagin and Paternoster, 1993, p. 468-473).

## CHAPTER 3:  NEIGHBORHOOD CONTEXT

Unlike the trait-based approach to crime, research associated with the field of sociology focuses primarily on the criminogenic effects of area, particularly neighborhood or community characteristics. This chapter discusses research in the social disorganization tradition that has explained criminal behavior with structural neighborhood characteristics such as poverty, and social process variables such as collective efficacy. The chapter concludes by discussing the connections between social disorganization theory and culture.

### The Social Disorganization Tradition

Although the idea of "community" is intrinsic to social life, sociological definitions of community began with Park and Burgess and the Chicago School of Urban Sociology in the early twentieth century. Park and Burgess (1924) defined a local community as a "natural area" developing from the natural competition over real estate, property, and resources in a newly industrialized and urbanized city (i.e., Chicago in the early 1900s) (see Sampson, Morenoff, & Gannon-Rowley, 2002, p. 445). Since then, a neighborhood has been loosely defined as a geographical and social subsection of a larger community in which residents share a common sense of identity that persists over time (see Bursik & Grasmick, 1993, p. 5-12; Park, 1916, p. 147-154). In empirical work, researchers have approximated neighborhoods primarily by geographical (e.g., rivers) and political (e.g., census tracts and block groups) boundaries.

Based on Park and Burgess' (1924) theories of urban ecology, Shaw and McKay (1942) provided a systematic explanation for the unequal distribution of crime in urban areas. By mapping out the residential location of juvenile court-referred youths over time,

they found that crime rates were highest in lower-class neighborhoods concentrated towards the inner-city (i.e., what Park and Burgess called the "zone in transition") and decreased outwardly towards higher-class neighborhoods. They also found that crime rates in areas of the city remained relatively stable over time, regardless of the (aggregate properties of the) individuals residing there. This suggested that something about the area, and not the characteristics of the individuals living there, was responsible for the crime rates. Shaw and McKay (1942) hypothesized that the intersection of area-enduring factors such as poverty, population heterogeneity, and transiency, disproportionately present in lower-class areas of the city, cause social disorganization, or the breakdown of social institutions. Socially disorganized neighborhoods, in turn, are unable to control its residents and compete against criminal elements in the community. This confluence of factors is extremely "criminogenic".

Since the classic work of Shaw and McKay (1942), researchers have consistently confirmed the non-random distribution of crime in neighborhoods characterized by high levels of concentrated disadvantage, residential mobility, and population heterogeneity (Bursik & Grasmick, 1993; Sampson, 2006; Shaw & McKay, 1942). Yet differences in neighborhood offending rates may not necessarily reflect "neighborhood effects"; instead, they may simply be the result of the spatial distribution of individuals with similar demographic characteristics (Sampson, 1989). That is, individuals more likely to engage in criminal behavior, or parents more likely to raise children predisposed towards offending, may self-select into disadvantaged neighborhoods. In this case, higher levels of offending would reflect the aggregation of at-risk individuals within the neighborhoods rather than neighborhood effects. Consequently, without some causal

mechanism to link structural neighborhood characteristics to offending rates, research has "tended toward a risk-factor rather than an explanatory approach" to crime (Sampson, 2006, p. 149). In other words, although many studies have associated static neighborhood characteristics with a wide range of criminal and delinquent behaviors (for an overview, see Brooks-Gunn, Duncan, & Aber, 1997a, 1997b), these studies ultimately fail to explain why certain neighborhoods have high rates of offending.

### Toward a Causal Neighborhood Explanation of Offending

Early studies in the social disorganization tradition relied on Shaw and McKay's (1942) broad suggestions that social disorganization leads to crime through a breakdown of societal institutions and weakened social controls. Consequently, they largely assumed that sociodemographic characteristics such as poverty, heterogeneity, and transiency undermine a neighborhood's ability to maintain social control and thus prevent crime and delinquency (Kubrin & Weitzer, 2003, p. 376). More recently, however, researchers have concentrated on investigating these assumptions. For example, Kornhauser (1978), Stark (1987), and Bursik (1988) advocated specific measures of social ties that may increase neighborhood social controls, thereby reducing disorder, delinquency, crime, and victimization. In addition, Sampson and Groves (1989) found that sparse local friendship networks, the presence of unsupervised and uncontrolled teenage peer groups, and low levels of participation in informal and voluntary neighborhood organizations mediate much of the effect of structural neighborhood characteristics (i.e., low economic status, ethnic heterogeneity, residential mobility, and family disruption) on crime and victimization.

Research in the last two decades has placed a particular emphasis on studying the social mechanisms that are ultimately responsible for neighborhood offending patterns (Bursik & Grasmick, 1993; Rosenfeld et al., 2001; Sampson et al., 1997). For example, researchers have focused on neighborhood levels of informal social control, the strength of social ties in the neighborhood, and the resources that these social ties produce (i.e., social capital) (Sampson, 2006, p. 151). Although there is a considerable amount of research linking informal social control to crime and victimization (Bursik & Grasmick, 1993), there is evidence that certain social ties, such as those based on personal gain and survival, may actually inhibit rather than enhance social control aimed at reducing crime (Wilson, 1987). Accordingly, Pattillo (1998) and Warner & Rountree (1997) show that strong social ties between gang members and drug dealers actually impede efforts to achieve social control. Thus, it is important to pay attention to whom the ties connect (Patillo, 1999).

It may also be possible to achieve high levels of informal social control and fight crime in the absence of strong neighborhood ties. For example, studies by Bellair (1997) and Hampton and Wellman (2003) illustrate the positive benefits of many neighborhood residents being connected by weak non-personal ties (e.g., email, internet chat-rooms, and list-serves) instead of fewer residents being connected by strong intimate bonds. These findings contrast the traditional view of neighborhoods as "urban villages" (Sampson, 2006, p. 150-151).

Finally, social ties and resources may be necessary but not sufficient for social control. That is, intended effects (e.g., fighting crime) cannot be achieved just through the presence of interpersonal bonds and potential resources; rather, social ties need to be

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activated and resources mobilized in order to achieve social control (Kubrin & Weitzer, 2003, p. 377).

## Collective Efficacy

Researchers have introduced the concept of collective efficacy largely in response to these conceptual problems. First, collective efficacy does not depend on the strength of social ties in the community; rather, it relies on a basic level of working trust among neighbors. Thus, collective efficacy "recognizes the transformed landscape of modern urban life, holding that while community efficacy may depend on working trust and social interaction, it does not require that my neighbor… be my friend" (Sampson, 2006, p. 153). Second, collective efficacy incorporates the key factor of purposeful action that other "social capital" variables assumed; it unites social cohesion, or trust and mutual support among neighbors, with shared expectations for social control, or the willingness to intervene for the common good (Kubrin & Weitzer, 2003; Sampson et al., 1997; Sampson, 2006). Collective efficacy emphasizes that social networks and public resources ultimately need to be activated in order to be meaningful; in the absence of a stimulus for action, strong social ties mean little. Third, by pairing mutual trust and solidarity with expectations for social action, collective efficacy underscores that cohesion and control are about repeated interactions and therefore expectations about the future. In other words, neighborhood residents will likely decline to engage in efforts for social control when they anticipate mistrust with other residents; conversely, the willingness to intervene for the common good will be enhanced under conditions of trust and solidarity. Finally, like self-efficacy, collective efficacy is task-specific; it involves intentions and actions towards a specific goal. In this case, collective efficacy refers to a

neighborhood's collective belief in and active intention to establish social control and maintain a crime-free environment (see also Kubrin & Weitzer, 2003, p. 374-379; Sampson, 2006, p. 152-153; Sampson et al., 1997).

Research has demonstrated that collective efficacy is a robust predictor of neighborhood crime rates and mediates much of the effects of structural neighborhood characteristics on crime. For example, Sampson et al. (1997) demonstrated that collective efficacy (1) is inversely associated with rates of violence (measured by official homicide counts and self-reported victimization), controlling for prior violence, demographic variables, structural neighborhood characteristics, and community social process variables; and (2) reduces the effects of concentrated disadvantage and transiency on rates of violence (see also Morenoff, Sampson, & Raudenbush, 2001 and Sampson, Morenoff, & Earls, 1999). In addition, researchers have examined the wide-reaching effects of collective efficacy; spatial analysis has revealed that levels of collective efficacy in one neighborhood are positively associated with levels of collective efficacy and inversely associated with rates of crime in surrounding neighborhoods (Morenoff et al., 2001; Sampson et al., 1999). Finally, collective efficacy has been extended to explain social behaviors such as community well-being and health (Morenoff, 2003; Sampson, 2003).

## The Importance of Culture

Social disorganization research has focused primarily on the regulatory capacity of neighborhood ties, communication, and mobilization. In doing so, it has left undeveloped the role that culture has played in achieving social control, or conversely, in promoting antisocial behavior (Warner, 2003, p. 73). Yet Shaw and McKay (1942)

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argued that high rates of delinquency in socially disorganized areas are the result of exposure to criminal cultures, in addition to weakened informal social controls. Shaw and McKay (1942) maintained that concentrated disadvantage isolates lower-class neighborhoods from middle- and upper-class resources and opportunities (e.g., Sampson & Wilson, 1995). In turn, social, economic, and political isolation not only weakens residents' conventional value systems, but causes some residents to embrace an alternative set of norms that condone delinquent behavior and criminal activity (e.g., Anderson, 1999; Krivo & Peterson, 1996; Massey & Denton, 1993). As a result, residents of these areas face divergent value systems that are "culturally transmitted" through successive generations.

Sutherland (1947) also argued that there is culture conflict in poverty-dense, socially isolated areas, where criminal and conventional cultures compete for the loyalty of neighborhood residents. Sutherland (1947) equated Shaw and McKay's (1942) observation that crime is culturally transmitted to a process of learning through social interactions. That is, he argued that individuals ultimately come into contact with "definitions favorable to violation of law" and "definitions unfavorable to violation of law" through differential associations. It is the strength of these competing definitions that determines whether an individual embraces or rejects crime.

Similarly, Akers and Jensen (2006) argued: "The greater the extent to which one has learned and endorses general or specific attitudes that either positively approve of, or provide justification (neutralizations) for, the commission of criminal or deviant behavior in situations discriminative for it, the greater the chances are that one will engage in that behavior" (p. 39). Like Sutherland (1947), Akers and colleagues (Akers, 1977, 1998;

Akers & Jensen, 2006; Burgess & Akers, 1966) believed that individuals learn criminal behavior through exposure to, and approval of definitions favorable to crime. In addition, Akers (1998) argued that pro-criminal definitions are learned through the same process as conventional beliefs, including imitation and differential reinforcement.

Akers (1998) distinguished general definitions, such as religious and moral values, from specific definitions, or those orienting individuals to the acceptability and appropriateness of unlawful behavior in certain situations. In addition, Akers (1998) distinguished positive definitions toward criminal behavior from neutralizing definitions. Positive definitions are those that make criminal behavior morally desirable, while neutralizing definitions make criminal behavior justifiable, excusable, or necessary in certain situations. Thus, like Sykes and Matza (1957), Akers (1957) maintained that individuals who commit crime do not necessarily approve of criminal behavior; instead, they are able to engage in crime by employing "techniques of neutralization". That is, although they may hold general beliefs that condemn crime, individuals use one of many techniques to rationalize or justify criminal behavior (e.g., I was forced into it by unloving parents, delinquent peers, or a bad neighborhood; nobody was hurt, etc.).

This argument is consistent with the cultural attenuation approach to explaining criminal behavior, which maintains that residents in high-crime areas do not condone crime; rather, informal social control is compromised in these areas because residents' conventional value systems are distorted or disused (Kornhauser, 1978, p. 120). Kornhauser (1978) and other proponents of this approach (e.g., Warner, 2003; Warner & Rountree, 1997) contend that individuals do not vary in how they view the moral legitimacy of conventional values embedded in noneconomic institutions such as the

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family, school, and religion; instead, the strength of the attachments to these conventional values varies. When these attachments are weak, neighborhoods lose their ability to realize common goals such as crime-control. Several researchers have discussed the role of attenuated culture in producing criminal behavior. For example, Wilson (1987, 1996) argued that decreasing job opportunities and patterns of middle-class migration out of inner cities isolate poor, minority-dense neighborhoods from middle-class values, thereby weakening conventional value systems. In addition, theories in the anomie/strain tradition maintain that isolation from middle- and upper-class resources (e.g., educational, medical, and social programs), opportunities (e.g., employment), and other conventional avenues for success and status approval cause frustration and anger in lower-class individuals, thereby weakening value systems and increasing the likelihood of antisocial behavior (Agnew, 1992; Cloward & Ohlin, 1960; Cohen, 1955; Durkheim, 1951; Merton, 1938). For example, in *Crime and the American Dream*, Messner and Rosenfeld (1994) linked inflated U. S. crime rates to weakened value systems that favor economic success and devalue noneconomic institutions such as the family and school. They argued that the increase in national crime rates was the result, at least in part, of a discrepancy between the cultural obsession with monetary success and the lack of importance placed on noneconomic social institutions, which provide normative restraints against achieving success through illegitimate channels.

Still, Akers conceded that crime may be an anticipated, even required response to provocations in certain areas. That is, some pro-criminal definitions are so strongly held that they almost require violation of the law (Akers & Jensen, 2006, p. 39). This is consistent with Anderson's (1990, 1997, 1999) ethnographic study of underclass

neighborhoods, in which he argues that there are oppositional subcultures organized around law-violating, aggressive behavior in disadvantaged, residentially unstable, racially-mixed neighborhoods. Anderson (1999) described a "street" culture whose norms are in opposition to those of conventional society and whose "code" governs interpersonal interactions. He contended that a "code of the streets", present in many lower-class African American neighborhoods, shapes the behaviors of everyone living there. At the core of this code is respect, or deference, which may determine survival. One gains respect through toughness and by taking it from others, which often involves violence, theft, insults, and vengeance. Anderson's work is consistent with previous research on cultural deviance. For example, Miller (1958) argued that members of the lower-class, alienated from middle- and upper-class resources, develop their own set of "focal concerns", or values: trouble, or breaking the law and not getting caught; toughness, or physical prowess; smartness, or the ability to con others; excitement, or risk-taking; fatalism; and autonomy. By exhibiting these characteristics, lower-class individuals gain status and acceptance among their peers. In addition, Wolfgang and Ferracuti (1982), in their "subculture of violence" thesis, argued that violence is a normal, even required response to a wide range of provocations among certain members of the lower-class. In particular, they found that lower-class, young, disproportionately African American males use violence as a response to an excessively broad range of situations, including minor disputes with acquaintances, friends, and family members over seemingly marginal issues (also see Wolfgang, 1958). They concluded that protecting one's reputation and the honor of one's family and friends is of utmost important in deprived, lower-class communities, where violence is not necessarily viewed as illicit

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behavior. A similar argument has been made regarding the Southern subculture of violence (e.g., Ellison, 1991; Messner, 1988; Nisbett & Cohen, 1996).

Despite social learning theory's critique as a "cultural deviance" theory (see Akers, 1996), Akers (1998) ultimately argued that pro-criminal definitions do not motivate criminal behavior directly. Rather, definitions favorable to crime act as (1) cognitive cues, making an individual more willing to engage in crime when faced with criminogenic stimuli, and (2) behavioral cues, indicating the normal, appropriate, or expected responses in any given situation. Thus, pro-criminal definitions "are conventional beliefs so weakly held that they fail to function as definitions unfavorable to crime, or they are learned approving, justifying, or rationalizing attitudes that, however weakly or strongly endorsed, facilitate law violation in the right set of circumstances by providing approval, justification, or rationalization" (Akers & Jensen, 2006, p. 39).

The research discussed above links criminal behavior to neighborhood characteristics: persistent neighborhood poverty, low levels of collective efficacy, criminogenic behavior settings, and pro-criminal cultural definitions. Yet these neighborhood factors may affect criminal behavior through more than parenting and socialization practices, informal social control, and the attraction of at-risk individuals to the neighborhood. They may also condition the relationships between individual-difference factors and offending. That is, neighborhood factors may enhance or suppress the expression of individual traits. As a result, the trait-based approach to crime should account for community processes that may influence offending behavior directly, as well as indirectly through the expression of individual traits.

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## CHAPTER 4: THEORETICAL FRAMEWORK

Individuals live and act in social settings with different criminogenic influences. As a result, there is a substantial history of criminological thought that has attempted to link community- and individual-level processes (Coleman, 1990; Durkheim, 1951). For example, social disorganization theory (Bursik & Grasmick, 1993; Shaw & McKay, 1942), differential association theory (Sutherland, 1931), and strain theory (Merton, 1968) hypothesize linkages between specific micro- and macro-level processes.[2] This chapter advances a theoretical framework integrating individual- and community-level explanations of crime. Theoretical mechanisms linking impulsivity and neighborhood context to crime are discussed, followed by the rationale for an impulsivity-neighborhood context interaction. Specific contextual moderating variables are discussed.

### Impulsivity

This framework suggests that impulsivity is relevant to offending behavior primarily through an individual's perception of the rewards and costs of offending (or not offending) (Matsueda, Kreager, & Huizinga, 2006; Nagin, 1998; Pogarsky, Piquero, & Paternoster, 2004).[3] Based on traditional deterrence theory and the expected utility model from economics (Becker, 1968), Wilson and Herrnstein (1985) regard the extent to which the benefits of crime outweigh the costs as the key determining factor in an individual's

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[2] Researchers have also proposed theoretical frameworks linking (aggregated) individual risk and protective scores to community context (Wikstrom & Sampson, 2003). Although examining the connections between individuals and community context from a global viewpoint is important, additional insight can be gained by developing theories with attention to specific individual-level and contextual processes (Hoffman, 2002, p. 753). For it is likely that personality traits such as impulsivity and self-control interact with neighborhood context in a different way than social situational variables like family conflict and peer delinquency.

[3] Among other things, one's "risk" perception is based on (1) personal experiences with crime, punishment, and punishment avoidance; (2) vicarious experiences (i.e., second-hand accounts of family members, friends, and peers) with crime and punishment; (3) location in the social structure (e.g., age, race, gender, SES, family structure, residential stability); and (4) cognitive ability (see Matsueda et al., 2006).

decision to engage in or refrain from crime. Additionally, Gottfredson and Hirschi (1990) attribute the occurrence of crime to the willful participation of a motivated individual (someone with low self-control) in an attractive and advantageous criminal opportunity. These ideas are consistent with criminal decision-making models that ascribe crime to the rational calculation of the rewards and costs of offending (Nagin & Paternoster, 1993).[4] Among other things, the utility of a reward (i.e., how "good" it is) and the disutility of a cost (i.e., how "bad" it is) are based on intensity, duration, certainty, and propinquity (Bentham, 1948; Matsueda et al., 2006, p. 101). That is, more intense, long-lasting, certain, and immediate rewards have more value. Conversely, costs that are less severe, less restrictive, indeterminate, and delayed are devalued.

Criminological research on impulsivity has focused primarily on the certainty and timing of the rewards and costs of offending behavior. The rewards of offending, including tangible (e.g., wealth), intangible (e.g., social/peer acceptance and respect), and visceral (e.g., sexual satisfaction, power, and thrill) benefits, are often contemporaneous. On the other hand, the costs of crime, including formal (e.g., the risk of capture, arrest, jail, and/or imprisonment) and informal (e.g., guilt, loss of employment, and social disapproval) punishments, are often indeterminate and delayed. Since offending is determined primarily by the extent to which people are drawn towards immediate gratification as opposed to inhibited by delayed consequences, impulsive individuals are more likely to engage in immediately gratifying offending behaviors in the face of

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[4] These models, based on rational choice and deterrence theories, specify that an individual will engage in crime if the utility of rewards from crime outweigh the utility of costs, weighted by the probability of obtaining the reward and being caught, respectively:

$$P_r \, U(\text{Rewards}) > P_c \, U(\text{Costs}),$$

where $P_r$ is the probability of a reward, $P_c$ is the probability of a cost, and U is a utility function that measures perceived rewards and costs on a common metric (e.g., Becker 1968; Matsueda et al., 2006, p. 100-101; Nagin and Pogarsky 2001).

indeterminate and delayed consequences (Wilson & Herrnstein, 1985). In addition, since

impulsive individuals are disproportionately oriented to the present, they will be

insufficiently influenced by the uncertain and deferred consequences of offending

(Gottfredson & Hirschi, 1990). That is, punishments that may occur in a distant future are

discounted and appear less costly in the present (Nagin & Pogarsky, 2001). Finally, since

impulsivity is defined, in part, by rapid, unplanned actions without forethought,

impulsive individuals may lack conscious deliberation of the act (and its potential

consequences) and cue in on its instantaneous benefits, thereby enabling offending

behavior (Moeller et al., 2001, p. 1784).[5]

## Neighborhood Context

The framework also suggests that neighborhood context affects offending

primarily through an individual's perception of crime as a viable or necessary action or

reaction. Structural disadvantage, criminogenic behavior settings, pro-criminal

definitions, and levels of informal social control in the neighborhood contribute to one's

perception of criminal behavior as an option or necessity.

Structural neighborhood characteristics such as concentrated disadvantage,

concentrated immigration, and residential instability may provide behavioral cues to

criminals (see e.g., Broken Windows Theory, Wilson & Kelling, 1982). In addition, they

may inhibit the ability of residents to exercise social control and/or starve individuals of

vital resources, thereby pushing them to engage in crime as an illegitimate way to achieve

conventional successes (e.g., in the tradition of anomie/strain theory). These structural

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[5] This does not suggest that individuals who lack impulse control are entirely unaffected by the perceived
risks of criminal behavior or completely lack forethought. Instead, the degree to which individuals devalue
the future consequences of their actions, are "ones of degree, not kind"; impulsive individuals are "just (on
average) especially present oriented" (Gottfredson and Hirschi, 1990; Nagin & Paternoster, 1993, p. 471;
Wilson and Herrnstein, 1985).

neighborhood characteristics may also affect offending by encouraging pro-criminal definitions and criminogenic behavior settings. For example, social, economic, and political isolation in disadvantaged areas may expose some residents to definitions favorable to the commission of crime (e.g., Akers, 1998; Sutherland, 1947). In addition, criminogenic "behavior settings" may be disproportionately present in areas with high levels of concentrated disadvantage. That is, there may be time-stable patterns of behavior that produce opportunities and pressures to engage in crime (Moss, 1976, p. 214-216; see also Barker, 1968 and Wikstrom & Sampson, 2003).

### Joining Person- and Community-Level Explanations of Crime

The trait-based approach to crime suggests that impulsivity should predict offending similarly across neighborhood contexts. Despite the fact that neighborhoods vary in their criminogenic influences, opportunities for offending, and perceived risks of offending, individuals with poor impulse control should (1) engage in significantly higher levels of offending than non-impulsive individuals; and (2) offend at similar rates, regardless of the neighborhoods in which they reside. If true, the effect of impulsivity on offending will not vary by neighborhood context. That is, one will see additive and not interactive effects of impulsivity and context.

However, it is likely that neighborhood characteristics will affect how individual-difference traits are expressed. That is, the characteristics of certain social settings may dictate behavior, thereby suppressing the effects of individual-difference factors on crime. Specifically, criminogenic influences in underclass neighborhoods exert a strong pressure to offend on everyone living there. As a result, all individuals are confronted with decisions to offend, and the effect of individual traits on offending may be

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suppressed, despite between-person differences. Conversely, the absence of behavior-dictating factors in low risk areas may allow for or encourage the expression of individual traits. In these areas, individuals not pre-disposed to offending are not pushed and pulled into crime by external forces, while impulsive individuals who lack forethought and behavioral control will disproportionately take advantage of opportunities for crime. If this argument is valid, one will see interactive effects of impulsivity and context, in which the effect of impulsivity on crime is amplified in lower risk neighborhoods.

This argument is consistent with the original conceptualization of social disorganization theory, in which Shaw and McKay (1942) suggest that individuals living in low risk areas are insulated from criminogenic value systems as a result of high levels of social control. In these types of neighborhoods, one would expect high levels of social control, social capital, and group solidarity to constrain the behavior of non-impulsive individuals, who contemplate the social disapproval and loss of resources that may accompany illicit behavior. Conversely, these factors may not be able to constrain the behavior of impulsive individuals who discount, ignore, or fail to consciously deliberate the consequences of their actions.

Yet in high risk areas, where there is an absence of social controls, divergent value systems arise that compete for residents' allegiances, according to Shaw and McKay (1942), or value systems may be attenuated, in the language of Kornhauser (1978). These types of settings dictate the behavior of many residents. In other words, non-impulsive and impulsive individuals will both be pushed and pulled into crime in high risk areas, suppressing the effect of impulsivity on offending.

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For example, Anderson's (1997, 1999) ethnographic research on crime and street culture portrays underclass, predominantly African American neighborhoods as harsh and uncompromising, where "even the most decent child in the neighborhood must at some point display a degree of commitment to the street" (Anderson, 1999, p. 99). Thus, even straight "A" students in school and well-mannered children at home must sometimes resort to violence to protect themselves and their families.

In addition, Anderson (1999) contends that "decent", or conventional parents, as well as "street-oriented" parents, must teach their children to be tough and to adhere to the "code of the streets" in order to survive in underclass areas. Although "decent" parents accept conventional values and instill pro-social values in their children, they still stress toughness and may "… actually impose sanctions if a child is not sufficiently aggressive" when provoked, challenged, or insulted. "Appearing capable of taking care of oneself as a form of self-defense is a dominant theme among both street-oriented and decent adults, who worry about the safety of their children. There is thus at times a convergence in their child-rearing practices" (Anderson, 1997, p. 17). Thus, although many individuals living in underclass areas ideologically adhere to conventional value systems, they must ultimately adopt the code of the streets and project toughness, sometimes through violence and property crime, in order to survive. Other researchers have also documented how oppositional value systems organized around toughness and respect subjugate all individuals to criminal behavior in order to survive, achieve success, and gain status approval (Miller, 1958; Wolfgang and Ferracuti, 1982).

The argument is also consistent with research on fatalism (Harris, Duncan, & Boisjoly, 2002; Lewis, 1961), which suggests that "people imbued with a street

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orientation tend not to think far beyond the immediate present; their orientation toward

the future is either very limited or nonexistent. One must live for the moment, for they

embrace the general belief that 'tomorrow ain't promised to you'" (Anderson, 1997, p.

9). Thus, non-impulsive individuals, like impulsive individuals, are forced to "live for the

present" and discount the future consequences of their actions. Since non-impulsive

individuals may appear present-oriented in lower-class neighborhoods, the effects of

impulsivity on offending may be masked.

Finally, the contentions are consistent with psycho-physiological research by

Raine (1988), who concludes that "… if biological variables have an influence on

antisocial behavior, they are more likely to be uncovered in those situations (high social

classes, intact home backgrounds) where the 'social push' towards antisocial conduct is

minimized" (p. 234). In addition, Mischel (1977) distinguishes strong social settings that

dictate behavior and suppress the influence of individual factors, from weak settings that

provide ambiguous behavioral cues and allow individual-difference traits to be expressed

freely. Herein, neighborhoods with many criminogenic influences are considered strong

settings, while neighborhoods lacking these influences are considered weak settings.[6]

Under these arguments, one would expect to observe interaction effects in which

the relationship between impulsivity and offending is amplified in lower risk

neighborhoods. Still, an alternative argument suggests that impulsivity increases one's

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[6] It is also possible to construe neighborhoods with high levels of informal social control as "strong" areas.
That is, there are strong pushes towards nonconformity in high risk neighborhoods, but there are strong
pushes towards conformity (e.g., informal social control, collective efficacy) in low risk neighborhoods.
The difference is in the nature of these pushes. In high risk areas, criminogenic influences have "crowding
out" effects because they influence all individuals uniformly. In low risk areas, social control restrains the
criminal behavior of nonimpulsive individuals who contemplate the social disapproval, guilt, loss of
respect, and loss of potential resources that likely accompany the detection of criminal behavior; however,
informal social control does not always constrain the criminal behavior of impulsive individuals who lack
the forethought to consider the consequences of their actions.

susceptibility to a risky environment (Lynam et al., 2000). This argument presupposes that impulsive individuals are disproportionately vulnerable to criminal attractions, opportunities, and incentives. For example, Cohen and Felson (1979) argue that crime-prone individuals (motivated offenders) are more likely to engage in offending behaviors when they are exposed to a higher frequency of suitable targets in the absence of capable guardians (Cohen & Felson, 1979). This suggests that individuals with poor impulse control will be more likely to offend in areas with less youth supervision, a decreased willingness of residents to intervene in rule-violating situations, and more perceptible opportunities to offend. In these neighborhoods, where the neighborhood opportunities for crime are maximized and the perceived risks of detection/punishment are minimized, the effects on offending of a short time horizon and unplanned acting (i.e., impulsivity) will be amplified. Conversely, in low risk neighborhoods, neighborhood controls should suppress the effects of impulsivity. Under this argument, impulsivity is more strongly related to offending in high risk communities.

There are several reasons why this "vulnerability" argument is less plausible than the alternative argument. First, it presupposes that impulsive individuals will be disproportionately vulnerable to criminogenic opportunities in lower-class, disadvantaged neighborhoods. However, in these areas, most individuals possess a feeling of fatalism (Lewis, 1961) and adopt a "nothing to lose" attitude (Harris, Duncan, & Boisjoly, 2002). As a result, both impulsive and non-impulsive individuals are particularly present-oriented and act on opportunities for crime (Anderson, 1999). Essentially, non-impulsive individuals look and act like impulsive individuals in risky neighborhoods. Contrary to

the "vulnerability argument, this suggests that impulsive and non-impulsive individuals will have similar offending behaviors in risky neighborhoods.

Second, the "vulnerability" argument assumes that informal neighborhood controls should have a similarly restrictive effect on the offending behaviors of impulsive and non-impulsive individuals in low risk neighborhoods. It is true that social controls in low risk areas will likely prevent non-impulsive individuals from engaging in crime, as they are able to contemplate the punishment, social disapproval, guilt, loss of respect, and loss of potential resources that accompany the detection of criminal behavior. However, these informal controls will not prevent impulsive individuals from engaging in crime, as they lack the forethought to consider these indeterminate and deferred consequences. Thus, contrary to the "vulnerability" argument, impulsive individuals should engage in relatively higher levels of offending than non-impulsive individuals in low risk areas.

In summary, the theoretical framework argues that the effect of impulsivity on offending will be suppressed in neighborhoods with low levels of socioeconomic status (SES) and collective efficacy, and high levels of criminogenic behavior settings and pro-criminal definitions. Conversely, in low risk neighborhoods, non-impulsive individuals will be prevented from engaging in crime, while impulsive individuals will disproportionately respond to criminal opportunities and monetary incentives to offend (Wikstrom & Sampson, 2003, p. 139). Under this argument, one would expect to observe interaction effects in which the relationship between impulsivity and offending is amplified in lower risk neighborhoods but attenuated in underclass neighborhoods. Figure 1 shows causal diagrams of the proposed relationships among impulsivity, offending, and social context.

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## CHAPTER 5:  REVIEW OF LITERATURE ON PERSON-CONTEXT INTERACTIONS

Chapter 5 reviews the research base on person-context interactions. Empirical studies consistent with the trait-based approach to crime are presented, as are studies concluding that the influence of individual factors is context-dependent. The chapter concludes by presenting opposing hypotheses suggested by the extant research.

The theoretical framework advanced in this study suggests that the relationship between impulsivity and offending may be conditioned by levels of collective efficacy and the presence of criminogenic behavior settings and pro-criminal definitions in the neighborhood. No previous studies to which this author is aware have investigated if the relationship between impulsivity and offending is moderated by such explanatory contextual variables. In addition, only two recent studies have investigated the "person-context nexus" focusing specifically on the interaction between impulsivity and SES or concentrated disadvantage (Lynam et al., 2000; Vazsonyi et al., 2006).

However, several studies have compared offending rates by key individual and community factors. Consistent with the trait-based approach to crime, many of these studies have found that the relationship between individual traits and offending is invariant to neighborhood context. That is, the highest rates of offending are found for the highest-risk individuals (i.e., those psychologically/situationally disposed to offending) living in the highest-risk areas (e.g., areas with high poverty, disadvantage), while the lowest rates of offending are found for the lowest-risk individuals living in the lowest-risk areas. For example, studies comparing offending rates by individual/family SES and area/school SES (see e.g., Reiss & Rhodes, 1961; Wikstrom, 1991) have generally found

that lower SES individuals living in lower SES areas have the highest rates of offending (Wikstrom & Loeber, 2000, p. 1115).

Studies have also found that self-control is equally predictive of criminal and delinquent behaviors in different samples (see Pratt & Cullen, 2005; Vazsonyi et al., 2006, p. 4-5) and across multiple dimensions of criminal behavior, including participation, persistence, and desistence (Piquero, Moffitt, & Wright, 2007). Furthermore, researchers have consistently demonstrated that disorder and conduct problems in childhood predict offending behaviors throughout the life course, independent of an individual's environment (Farrington, 1995a; Glueck & Glueck, 1950; Robins, 1978). Finally, in a recent study, Vazsonyi et al. (2006) reported that the relationship between impulsivity and offending does not vary by level of neighborhood disadvantage. For males and females separately, Vazsonyi et al. (2006) regressed general delinquency, nonviolent delinquency, and aggression on impulsivity, neighborhood disadvantage, and their interaction. In support of the hypothesis herein, two of their six mixed regression models showed a significant negative interaction coefficient, indicating that the effect of impulsivity on offending increases as neighborhood disadvantage decreases. Still, Vazsonyi et al. (2006) concluded that there was no evidence to suggest that the effects of impulsivity on offending vary by neighborhood context.

In contrast to the studies above, there are studies suggesting that the relationship between individual risk factors and offending is modified by neighborhood context. For example, research by Sampson and Laub (1994), Furstenberg (1993), and Cleveland (2003) suggests that the level of protection afforded by the family may be more important in disadvantaged neighborhoods than in advantaged neighborhoods, where the

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community acts as a safety net for inadequate parents (see also Lindstrom, 1995). Simons, Simons, Burt, Brody, and Cutrona (2005) found that the deterrent effects of authoritative parenting (on delinquency and association with deviant peers) are enhanced when families reside in neighborhoods with higher levels of collective efficacy; Kupersmidt, Griesler, DeRosier, Patterson, and Davis (1995) showed that children living in single parent families in low SES neighborhoods are more aggressive than children living in disrupted families in higher SES neighborhoods; Peeples and Loeber (1994) found that the relationship between race and offending is only significant in underclass neighborhoods; Elliot et al. (1996) found evidence that neighborhood effects on adolescent development vary by age, sex, and family structure; and Silver (2000) demonstrated that the relationship between mental illness and violence varies by neighborhood disadvantage: psychiatric patients discharged into high disadvantage areas were significantly more likely to commit violent acts that those discharged into more affluent areas.

Finally, Lynam et al. (2000) examined the impulsivity-offending relationship across neighborhoods differentiated by census-defined SES. Using the Pittsburgh Youth Survey, Lynam et al. (2000) regressed five measures of offending (total, status, vice/drug, theft, and violence) on impulsivity, SES, and their interaction (controlling for family status, race, and family SES) for 12-13 year old boys in a cross-sectional study and 16-17 year-old boys in a longitudinal study. The cross-sectional study showed significant interactions, indicating that the effect of impulsivity increases as SES decreases. In the longitudinal study, the coefficient for impulsivity was only significant in the lowest SES

neighborhoods; however, none of the interactions were significant, indicating that the effect of impulsivity on offending was invariant to neighborhood context.

Interestingly, Wikstrom and Loeber (2000), also using the Pittsburgh Youth Survey, found opposing results. Using a risk and protective-factor approach, Wikstrom and Loeber (2000) found that neighborhood socioeconomic context had the strongest effects on rates of serious offending for the most well adjusted youths, while neighborhood context had no effect on youths with the highest risk scores.[7] In support of the theoretical framework proposed in this study, their findings suggest a person-context interaction in which the effects of individual risk characteristics on offending are increased in more affluent areas rather than in more disadvantaged areas (see also Wikstrom, 2002; Wikstrom & Sampson, 2003).[8]

Many studies focusing on victimization have also found significant interactions between community- and individual-level characteristics. For example, Miethe and McDowall (1993) found that key routine activities variables (guardianship and target attractiveness) have a significant effect on property victimization (burglary) in more affluent areas, but have little effect on burglary in socially disorganized communities (conversely, they found the relationship between individual risk and violent victimization to be invariant across social context). Similarly, Rountree, Land, and Miethe (1994) found evidence that individual-level crime opportunity variables interact with neighborhood context to influence violent victimization and burglary, and Velez (2001)

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[7] This finding was applicable for late onsets of offending, although early onset youths were unaffected by neighborhood context.

[8] Lynam et al. (2000) and Wikstrom and Loeber's (2000) divergent findings are due, in part, to conceptual differences. Wikstrom and Loeber (2000) used an aggregated measure of individual risk based on six indicators: two disposition measures (hyperactivity/impulsivity and lack of guilt) and four social situation measures (poor supervision, low school motivation, peer delinquency, and positive attitudes towards antisocial behavior).

found that public social control is more important for household and personal victimization as the level of neighborhood disadvantage increases.

Additionally, the large psychological and medical research base on person-situation interactions suggests that genetic predispositions and personality traits may be manifested differently in different types of neighborhoods (see e.g., Magnusson, 1988; Mischel, 2004; Shoda, Mischel, & Wright, 1994). For example, Caspi et al. (2002) found that the association between maltreatment and antisocial behavior is conditional on the child's genotype; Cadoret, Yates, Troughton, Woodworth, and Stewart (1995) showed that genetic-environmental interactions account for significant variation in aggressiveness and adult antisocial behaviors; and Christiansen (1977) found that the effects of genetic predispositions to crime for twin pairs from high social classes were higher than the effects of heritability for twins from lower social classes (for a general overview of the psychiatric literature on gene-environment interactions, see Moffitt, Caspi, & Rutter, 2005).

Previous research on person-context interactions has focused on the effects of different individual traits (and holistic individual risk indices). These differences, in addition to measurement discrepancies and samples of varying developmental stages, partially explain the opposing hypotheses tested in this study: (1) the invariance hypothesis, and (2) the interaction hypotheses. The invariance hypothesis, supported by the trait-based approach to crime and self-control theory, suggests that the impulsivity-offending relationship does not vary by neighborhood context. The interaction hypothesis, proposed by the theoretical framework, implies that the relationship between impulsivity and offending varies by neighborhood context, specifically that the effect of

impulsivity on offending is amplified in low risk neighborhoods. Relying on theoretical and empirical research and substantiated measurement techniques, this study uses a specific individual-level trait – impulsivity – to test the hypotheses.

## CHAPTER 6:  RESEARCH DESIGN AND METHODS

Chapter 6 begins by describing the design of the Project of Human Development in Chicago Neighborhoods (PHDCN), the sample population, and the measures used in the dissertation. Subsequently, the chapter outlines the analytical strategy. Specifically, it reviews the benefits of item response theory, presents the basic Rasch model, and annotates the three-level multivariate Rasch model used in the analysis. Finally, Chapter 6 checks the assumptions of the Rasch model.

### Sample

The dissertation examines the relationship between impulsivity and offending in different social contexts using the Project of Human Development in Chicago Neighborhoods (PHDCN). The PHDCN is a large-scale interdisciplinary study of how individual, family, school, and neighborhood factors contribute to child and juvenile development. The project collected substantial amounts of data on individuals, their families and schools, and the people, institutions, and resources in their neighborhoods. Studying individuals in their habitats was a specific focus of the project coordinators. Therefore, the dataset is hierarchical and especially suitable for studying how individual characteristics are related to social behaviors in different social environments.

Although numerous studies detail the technicalities of the PHDCN sampling procedure elsewhere (see, e.g., Bingenheimer, Brennan & Earls, 2005; Browning, 2002; Raudenbush, Johnson & Sampson, 2003; Sampson & Raudenbush, 1999; Sampson, Morenoff & Raudenbush, 2005), this section briefly describes the PHDCN design that is most relevant to the current research. The PHDCN consists of several components, including a Longitudinal Cohort Study (LCS) and Community Survey (CS). The LCS is a

series of longitudinal studies that follow over 6,000 children, adolescents, and young adults over time to study their personal characteristics, social environments, and behaviors. Specifically, the LCS, consisting of three waves of data, is a probability sample of approximately 800-900 participants in each of seven age cohorts. The Community Survey (CS) is an intensive study of neighborhoods in urban Chicago. The first CS is a probability sample of over 8,000 residents focused on assessing the social, economic, political, and cultural conditions in their communities (Earls et al., 1997).

The sampling plan as a whole was to employ a multistage sampling procedure whereby neighborhoods and individuals could be studied simultaneously. This plan was organized around neighborhood clusters (NCs) constructed from Chicago's census tracts; in the first sampling stage, all 865 census tracts within the city of Chicago were combined into 343 neighborhood clusters (NCs) based on (1) spatial contiguity according to ecological boundaries, and (2) internal homogeneity with respect to racial/ethnic mix, socioeconomic status, and family structure. Each NC, averaging approximately 8,000 people, was smaller than the 77 "community areas" in Chicago, whose average size was approximately 40,000 people. Each NC was also large enough to approximate a local "neighborhood" (Earls et al., 1997). According to the survey protocol, a "neighborhood" was defined as "… the area around where you live and around your house. It may include places you shop, religious or public institutions, or a local business district. It is the general area around your house where you might perform routine tasks, such as shopping, going to the park, or visiting with neighbors" (Earls et al., 1997). Although there is still not consensus about the definition of a neighborhood, the survey definition is grounded in the systemic theory of community (Kasarda & Janowitz, 1974) and generally consistent

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with macro-level sociological research (see Bursik & Grasmick, 1993, p. 5-12; Sampson et al., 1999, p. 638-639).

For the Longitudinal Cohort Study, a three-stage sampling procedure was used to select sample respondents. In the first stage, the 343 NCs were assigned to 21 strata in urban Chicago based on race-ethnicity (seven levels) and socioeconomic status (three levels), and 80 NCs were sampled within these strata with the purpose of producing a balanced design (see Table 1). In the next stage, residents of more than 35,000 households were enumerated from block groups randomly sampled from each of the 80 NCs. Finally, children and adolescents within six months of their birth ($0^{th}$), $3^{rd}$, $6^{th}$, $9^{th}$, $12^{th}$, $15^{th}$, and $18^{th}$ birthdays were identified for inclusion in the LCS.

The current study uses children and adolescents within six months of their $12^{th}$ and $15^{th}$ birthdays. Of the 8,347 eligible participants identified for the LCS, 1,103, and 972 individuals were within six months of their $12^{th}$ and $15^{th}$ birthdays, respectively, at Wave 1. The majority (N=1,517) agreed to participate and completed Wave 1 interviews conducted between November 1994 and June 1997, for a response rate of 73 percent. Of those Wave 1 participants, approximately 87 percent (N=1,315) were interviewed again at Wave 2, conducted between January 1997 and February 2000. The average time between interviews was 2 to 3 years (Bingenheimer et al., 2005; Earls et al., 2002d; Marz & Stamatel, 2005). Of the remaining participants, 124 were missing key variables and excluded from the analysis; the majority of these (80) were not administered the Wave 2 Self-Report of Offending Questionnaire, while 44 participants were missing valid impulsivity data. The final dataset used for this study consists of 1,191 subjects from

cohorts aged 12 (N=661) and 15 (N=530) years. See Table 2 for descriptive statistics and a differential analysis of attrition.

For the Community Survey, a three-stage sampling design was used to select city blocks within each of the 343 NCs, households within these blocks, and one adult (18 or over) resident within each household. The samples within NCs were designed to be approximately self-weighting (see Sampson et al., 1997, p. 924), and the sampling strategy ensured that the number of cases per NC would be sufficient to obtain meaningful results from aggregated individual responses (Browning, Feinberg, & Dietz, 2004).[9] For the first Community Survey, conducted between 1994 and 1995, 8,782 Chicago residents representing all of the 343 NCs were interviewed as part of the Community Survey (Earls et al., 1997), representing a final response rate of 75 percent.

The analysis for this study uses data from 78 of the 80 "sampled" NCs containing at least one of the 1,191 respondents in the sample. Nine of these NCs had less than five subjects and were collapsed by level of census SES and ethnic composition to yield a final macro-level sample size, $N$, of 70. The average micro-level sample size, $n$, within the level-three groups is 17.

The efficiency and power of multilevel tests depend on the total, $M$, macro-level, $N$, and micro-level, $n$, sample sizes. Among other things, sample size considerations depend on the magnitude of the intra-class correlation coefficient, the alpha-level, and budgetary constraints (Snijders & Bosker, 1999, p. 140-154). Taking such factors into

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[9] The target sample size for each of the 80 "sampled" NCs (i.e., those selected for the LCS) was 50. Within the blocks selected for the LCS, a systematic random sample of 65.4 (on average) dwelling units was selected with one respondent sampled per unit. Given a .90 dwelling-unit occupancy rate and a response rate of .85, one would expect an N of 50 for each sampled NC. The target sample size for each of the 263 "non-sampled" NCs was 20. Nine blocks were selected from each NC, three dwelling units were selected within each block, and one resident was selected within each unit. Given a dwelling unit occupancy rate of .90 and a response rate of .85, one would expect an N of 20 for each non-sample NC (see Earls et al., 1997).

account, there are differing views as to the optimal sample sizes to obtain unbiased results and minimize the probability of Type I errors. In a 1,000 person sample, Hox (1995) recommends a 100/10, $N/n$, rule to achieve accurate variance components, and a 50/20 rule to obtain unbiased meaningful cross-level interaction components. In addition, Kreft and De Leeuw (1998) recommend using a 30/30 rule in a 900 person sample, and Snijders and Bosker (1999) suggest using a macro-level sample size of 40 to 50 and a micro-level sample size of 15 to 20 in a total sample, $M$, of 750 to 800; they add that a micro-level sample size of nine only compromises the accuracy of the standard errors by five percent (p. 140-154). Despite these differences, there is general agreement that (1) the major consideration should be the macro-level sample size, and (2) it is better to have a large number of groups with a few people than a small number of groups with a large number of people (see, e.g., Kreft & De Leeuw, 1998, p. 199-126; Maas & Hox, 2005). In this study, a macro-level sample size, $N$, of 70, an average micro-level sample size, $n$, of 17, and a total sample size, $M$, of 1,191 meet the general guidelines presented above.

**Measures**

*Impulsivity*

Research on impulsivity has been hampered by inconsistent conceptualization and operationalization (Luengo, Carrillo-de-la-Pena, Otero, & Romero, 1994; White et al., 1994). Impulsivity is not explicitly defined in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV), nor is there one consistent definition of impulsivity in extant psychological or criminological literature. In addition, researchers have used a variety of methods to measure impulsivity, including self-report questionnaires, task-specific experiments, neuropsychological tests, and some combination of self-reports and

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tests (Moeller et al., 2001; White et al., 1994). These inconsistencies have made it difficult to compare the strength of the impulsivity-offending relationship across studies.

A review of psychiatric, psychological, and criminological literature reveals several key features in definitions of impulsivity. First, consistent with the individual-difference paradigm, impulsivity is defined as a predisposition towards a wide range of antisocial behaviors rather than to a single act (e.g., Gottfredson & Hirschi, 1990; Wilson & Herrnstein, 1985). Second, impulsivity involves rapid, unplanned actions. Third, impulsivity involves acting without forethought or the conscious deliberation of an act and its potential consequences (Moeller et al., 2001, p. 1784).

A review of the literature also reveals three main approaches to measuring impulsivity: the personality approach, the behavioral control approach, and the cognitive approach (Barratt, 1985; White et al., 1994). The personality approach involves using (1) self-report questionnaires tailored specifically to measuring impulsivity, and (2) more general questionnaires covering a broad range of personality traits. Examples of the former include the Eysenck Impulsiveness Questionnaire (Eysenck, Easting, & Pearson, 1984) and the Barratt Impulsiveness Scale (BIS) (Patton, Stanford, & Barratt, 1995). Examples of the latter, all of which have subsets of questions to measure impulsivity, include Tellegen's (1982) Multidimensional Personality Questionnaire (MPQ), the Minnesota Multiphasic Personality Inventory (MMPI), and the California Psychological Inventory (CPI) (Miller & Lynam, 2001).

According to the behavioral control approach, impulsivity is characterized by a general disinhibition that manifests in a lack of behavioral control. This lack of behavioral control, in turn, can be measured by having individuals engage in tasks that

demand control in order to avoid punishment or obtain reward. Examples include the card playing task (CPT) (Newman, Patterson, & Kosson, 1987) and the circle-tracing task (CTT) (Bachorowski & Newman, 1985).

The cognitive approach to measuring impulsivity is based on neuropsychological research linking impulsivity to (1) the improper functioning of the frontal lobes of the brain, and (2) a biologically-based rapid cognitive tempo, or "shortened time horizon" (Wilson & Herrnstein, 1985). Behavioral tests, such as the Trail Making Test (TMT) (Moffitt & Henry, 1989), have been used to test executive functioning and time perception, while neuropsychological tests have been used to record electrical brain activity while individuals are engaged in specific tasks (Moeller et al., 1994).

Although cognitive and behavioral tests have certain advantages, they do not incorporate social aspects of impulsivity, are impractical for large samples, cannot accurately distinguish between impulsivity and other mental conditions, and are unable to measure impulsivity over time. Self-report questionnaires, on the other hand, are designed specifically to measure impulsivity, have the advantage of gathering information retrospectively and on a wide variety of acts, and are practical and cost-effective for large samples and longitudinal study designs (Moeller et al., 2001; Oquendo & Mann, 2000). In addition, the relationship between impulsivity and a variety of antisocial behaviors, including offending, is consistently stronger when impulsivity is measured with self-report questionnaires than with behavioral control or cognitive experiments (Luengo et al., 1994; White et al., 1994).[10] Finally, when self-report measures are used, impulsivity appears to be relatively stable across time (Klintberg et

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[10] It is possible that impulsive individuals do not score well on questionnaires, which could compromise the validity of empirical findings.

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al., 1989). For these reasons, the most common approach to measuring impulsivity is
with questionnaires (Critchfield et al., 2004).

Based on previous research and the practical advantages of questionnaires, the
current study uses a standardized impulsivity index constructed from questions adapted
from the Achenbach Child-Behavior Checklist (Achenbach, 1993; Earls et al., 2002a).
Based on reports of the primary caregiver at the initial interview, the index was designed
to capture theoretical and practical aspects of impulsivity (American Psychiatric
Association, 1994; Wilson & Herrnstein, 1985) and measure social, behavioral and
cognitive impulsivity (Barratt, 1985; White et al., 1994). In addition, the scale was
constructed based on a large body of research linking impulsivity to crime (Earls et al.,
2002a; Farrington, 1998; Gottfredson & Hirschi, 1990; White et al., 1994). Finally, the
scale has a strong evidentiary foundation (see Sampson et al., 2005).

Subjects were asked to indicate on a 3-point scale from "Not True" to "Very
True" how accurately the following ten items described the respondent: has trouble
concentrating or paying attention; cannot get mind off certain thoughts; has trouble sitting
still, restless, or hyperactive; feels confused or in a fog; demands a lot of attention;
accidentally gets hurt a lot or accident-prone; acts without stopping to think; is nervous,
high-strung, or tense; has nervous movements or body twitches; and repeats certain
actions over and over. These items were summed to create a scale with a reliability
(Cronbach's alpha) of $\propto = 0.80$.

### Neighborhood-level Characteristics

#### Census-defined Contextual Variables

Based on previous research with the PHDCN, this study examines ten variables constructed from the 1990 decennial census (Morenoff & Sampson, 1997; Sampson et al., 1997; Sampson et al., 1999). The 1990 census was independent of and collected five years earlier than the PHDCN Community Survey, thereby preserving the temporal order of structural and social process neighborhood variables. According to procedures described elsewhere (see Morenoff & Sampson, 1997; Sampson et al., 1997; Wikstrom & Loeber, 2000), these ten variables were combined into three indices of neighborhood structural differentiation based on oblique rotated factor analysis.

*Socioeconomic Status (SES)*, the first component extracted from the factor analysis, is defined by the percent of families below the poverty line, percent of households receiving public assistance, percent of non-intact families with children, percent of the population that is unemployed, median household income in 1989, and percent of population that is Non-White (Wikstrom & Loeber, 2000).[11] These variables loaded on a single factor and were combined using a weighted factor regression score (see Table 3); the scale was formed such that high levels reflect high SES. The resulting scale reflects three underlying dimensions: poverty/affluence, family structure, and race/ethnicity. This is a well-established scale that has been validated in the city of Chicago (e.g., Sampson et al., 1999).

Including census SES in the interaction analysis as a continuous variable would assume that there is a monotonically increasing or decreasing pattern between impulsivity

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[11] SES is the conceptual equivalent to concentrated disadvantage, scored as its inverse so that high levels of SES correspond to low levels of concentrated disadvantage, and vice versa.

and SES (as related to offending). In addition, the interpretation of interactions with continuous variables is not as intuitive as interactions between a continuous focal variable and a categorical moderator variable, where the moderator is divided into specific "types" (Aiken & West, 1991). Therefore, neighborhoods were classified as "high", "middle", or "low" SES. Neighborhoods in the upper quartile (i.e., those with the 25 percent highest factor scores) were classified as high SES neighborhoods, those in the lower quartile were classified as low SES neighborhoods, and the remaining 50 percent of neighborhoods were classified as middle SES neighborhoods. This classification has been validated by previous research (Lynam et al., 2000; Wikstrom & Loeber, 2000).

*Immigration concentration* is defined by two census variables: percent Latino and percent foreign-born. Immigrant concentration captures heterogeneity within a neighborhood and is linked to crime through a general lack of resident cohesion (Sampson & Groves, 1989).

*Residential instability*, the third scale created from census variables, is defined as the percentage of neighborhood residents (aged five years and older) living in the same house as five years earlier, and the percentage of owner-occupied homes. Residential instability captures transiency, or neighborhood turnover, and is consistent with previous research linking exogenous neighborhood factors to crime (see, e.g., Kasarda & Janowitz, 1974). Residential instability and concentrated immigration are used as neighborhood-level control variables in the analysis.

## Social Process Variables

Previous studies examining the person-context nexus have used structural neighborhood characteristics such as SES and concentrated disadvantage to differentiate

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neighborhood context (see Lynam et al., 2000; Vazsonyi et al., 2006; Wikstrom & Loeber, 2000). However, it is widely accepted that social process variables mediate much of the explanatory power of structural neighborhood factors (Kubrin & Weitzer, 2003; Sampson et al., 2002). Therefore, without investigating if specific neighborhood social processes condition the impulsivity-offending relationship, the mechanisms behind an impulsivity-SES interaction remain unexplained. This study follows the suggestions of Lynam et al. (2000) by using three more proximate social process variables to differentiate neighborhood context: collective efficacy, criminogenic behavior settings, and pro-criminal definitions. All social process variables were constructed by aggregating individuals' responses to the Community Survey.

*Collective efficacy.* This study replicates a validated measure of collective efficacy by combining social cohesion/trust with shared expectations for social control (Earls et al., 1997; Sampson et al., 1997). Social cohesion/trust was measured by combining the responses to five questions. Respondents were asked on a five-point scale how strongly they agreed that "this is a close-knit neighborhood", "people are willing to help their neighbors", "people in the neighborhood can be trusted", "people don't get along", and "people in the neighborhood do not share the same values" (the last two items were reverse-coded). Shared expectations for social control were measured by combining respondents' responses on a five-point scale to the likelihood that their neighbors would "do something about kids skipping school", "do something about kids defacing a building", "scold a child for not showing respect", "break up a fight in front of their house", and "organize to keep a local fire station" (Earls et al., 1997; Sampson et al., 1997). The social cohesion and informal social control scales were strongly related across

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neighborhood clusters ($r = 0.80$). According to previous research (Sampson et al., 1997), the scales were combined into a summary measure of collective efficacy as follows: first, "don't know" responses were recoded into the middle category of "neither agree nor disagree" or "neither likely nor unlikely". Then, for respondents answering all ten questions, the responses to those questions were averaged. For respondents who answered at least one but not all of the questions, a linear item-response model was used to account for the number and difficulty of the items to which the respondent responded (for a more detailed explanation of the construction of collective efficacy, see Sampson et al., 1997).

Collective efficacy scales were created for the 7,729 respondents in the first Community Survey with sufficient data. The "ecometric" or aggregate-level reliability of collective efficacy was 0.85, meaning that the analysis can reliably tap the variance in collective efficacy at the neighborhood level. The conceptual equivalent of Cronbach's alpha, neighborhood-level reliability represents the power to detect between neighborhood differences; it measures the precision (of the estimate) of collective efficacy, averaged across neighborhoods, as a function of each neighborhood's sample size and the proportion of total variance that is between groups relative to the within-group variance (see Raudenbush and Sampson, 1999). Following the procedures above, neighborhoods were divided into "high", "middle", and "low" collective efficacy neighborhoods, with high collective efficacy serving as a protective neighborhood factor and low collective efficacy as a risk factor.

***Criminogenic behavior settings***. Behavior settings are standing patterns of social behavior to which individuals are routinely exposed. "Criminogenic" behavior settings

are those that create situations conducive to criminal behavior. According to Wikstrom and Sampson (2003), criminogenic behavior settings produce "temptations" (i.e., opportunities for criminal behavior) and "provocations" (i.e., attacks on one's person, property, reputation, friends, or family) that generate illegal retaliatory acts or preemptive actions. In addition, much like social disorder (see, e.g., Kelling & Coles, 1996), criminogenic behavior settings provide "highly visible cues to which neighborhood observers respond" (Sampson & Raudenbush, 1999, p. 637). That is, potential offenders respond to the lack of social control or "weak deterrence" that allows these behavior settings to exist (see Wikstrom & Sampson, 2003, p. 125-126).

Criminogenic behavior settings were measured by combining the responses to three questions addressing the extent to which the neighborhood presents opportunities and pressures to engage in crime. On a three-point scale, respondents were asked to report how much of a problem each of the following is in their community: "drinking in public", "people selling or using drugs", and "groups of teenagers or adults hanging out in the neighborhood and causing trouble". As with collective efficacy, the scale was constructed as the simple mean of the items for individuals providing answers to all three questions. For individuals missing one or more responses but providing an answer to at least one of the questions, a linear item-response model was used to account for the number and difficulty of the items to which each respondent responded (see Earls et al., 1997; Sampson & Raudenbush, 1999). Additionally, as with the other neighborhood variables, neighborhoods were characterized as "high", "middle", and "low", with high representing the presence of more criminogenic behavior settings.

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***Pro-criminal definitions.*** Sutherland (1947), Sykes and Matza (1957), and Akers (1998), among others, have examined the nature of definitions favorable to crime and delinquency. Although the research suggests that the majority of individuals do not hold values that unconditionally approve of crime, there is evidence that some individuals approve of, justify, or rationalize crime in specific situations (for an overview of the empirical research, see Akers & Jensen, 2006, p. 42-54). Furthermore, the greater the extent to which an individual has learned definitions that approve of, justify, or rationalize crime, the greater the chances are that one will engage in that behavior (Akers, 1998; Akers & Jensen, 2006). Therefore, it is the "ratio" of these pro-criminal definitions (to pro-social definitions) that determines whether someone will engage in or refrain from criminal behavior in a certain situation (Lilly, Cullen, & Ball, 2007, p. 42). Consistent with this general usage, pro-criminal definitions were measured using five questions. Respondents were asked on a five-point scale how strongly they agreed with each of five statements: "Laws were made to be broken"; "It's okay to do anything you want as long as you don't hurt anyone"; "To make money, there are no right and wrong ways anymore, only easy ways and hard ways"; "Fighting between friends or within families is nobody else's business"; and "Nowadays a person has to live pretty much for today and let tomorrow take care of itself". These questions reflect a willingness to accept, approve of, or justify criminal or delinquent behaviors under certain conditions.[12] The scale was constructed using the same procedures as above (Earls et al., 1997.

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[12] Some of these items might also be conceptualized as indicators of anomie, or the willingness to pursue goals without regard for normative guidelines (Agnew, 1992; Merton, 1938; Messner & Rosenfeld, 1994).

### *Self-Reports of Offending*

Based on previous research (see Raudenbush et al., 2003), the analysis attempts to explain individual variation in offending using a two-dimensional conceptualization of crime (self-reported violent and property crime). Accordingly, all LCS respondents were administered a Self-Report of Offending questionnaire, adapted from previous studies (Earls et al., 2002e; National Institute on Drug Abuse, 1991), to determine participation in a series of violent and property crimes. Self-reports of offending were used because they are independent of the biases of the criminal justice system and capture a broader range of delinquent behaviors than official measures of crime (Thornberry & Krohn, 2002). In addition, research supports the reliability and validity of self-reports of offending across racial groups, particularly important because of the racial/ethnic diversity of the PHDCN (Farrington, Loeber, Stouthamer-Loeber, Kammen & Schmidt, 1996; Sampson et al., 2005).

All LCS respondents from cohorts aged 12 and 15 years of age were asked to report if they had engaged in a battery of violent and property crimes in the year preceding the Wave 2 interview (Earls et al., 2002e). Nine items indicating physical aggression were considered forms of violent crime: hitting someone with whom you lived with the idea of hurting them; hitting someone with whom you did not live with the idea of hurting them; hitting or attacking someone (you did not live with) with a weapon; throwing objects, such as rocks or bottles, at people; carrying a hidden weapon; purposely setting fire to a house, building, car, or vacant lot; snatching someone's purse

or wallet or picking someone's pocket;[13] using a weapon or force to get money or things

from people; and being involved in a gang fight in which someone was hurt or threatened

with harm. Six property crimes include: purposely damaging or destroying property that

did not belong to you; entering or breaking into a building to steal something; stealing

something from a household member; stealing something from a store; taking something

that did not belong to you from a car; and knowingly buying or selling stolen goods.

Like Raudenbush et al. (2003) and Sampson et al. (2005), the current analysis

focuses on whether or not the respondent reported involvement in each item during the

past year;[14] Table 4 displays the dichotomous (1 = yes; 0 = no) item responses for violent

and property crimes. The procedure for constructing the crime outcome measures is

described in detail below (see Analytic Strategy).

### *Background Variables*

The analysis includes age, sex, race/ethnicity, family socioeconomic status,

family structure, and the number of years at the current residence as person-level control

variables. Inclusion of these controls is based on previous research investigating the

impulsivity-offending relationship (Lynam et al., 2000; Vazsonyi et al., 2006) and using

the PHDCN (e.g., Sampson et al., 2005). All background variables were measured at the

initial interview (Earls et al., 2002b, 2002c, 2002d; Sampson et al., 2005).

The mean age of respondents across cohorts was approximately 13.5 years, and

just over half of sample members were female. Forty-six percent of respondents were of

Hispanic origin, 35 percent were Black, and 15 percent were White; the remaining three

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[13] This item is considered an act of robbery, and therefore physical aggression, since it is the act of seizing
property by means of force or fear. It can be considered a task-specific version of "using a weapon or force
to get money or things from people".
[14] Previous research indicates that the number of different offenses committed may be more informative for
crime and delinquency than the frequency of committing the acts (see Hindelang, Hirschi, & Weis, 1981).

percent of respondents reported being Asian, Pacific Islander, American Indian, or Other and were collapsed into one "Other" category. Racial/ethnic distinctions were made based on primary caregiver (PC) interviews. First, the respondent was categorized as either Latino or non-Latino. For non-Latinos, race was then coded as White, Black, Asian, Pacific Islander, American Indian, or Other. In all cases, mother's race was used as the default; that is, for subjects who had parents of different races, the subject's race was set equal to the mother's race. To investigate the accuracy of racial/ethnic classifications, primary caregivers were asked to identify their race/ethnicity at each interview. Approximately 90 percent of subjects were identified with consistent classifications across waves; of the remaining 10 percent, the majority reported mixed race/ethnicity at a subsequent wave (see Earls et al., 2002d; Sampson et al., 2005). Family socioeconomic status was constructed as a standardized scale of parent's income, education, and occupational status; and family structure was created with the following classification scheme: (1) two parents, both biological; (2) two parents, one/both non-biological; (3) one parent, biological; and (4) one parent, non-biological (see Earls et al., 2002b).

The analysis also includes neighborhood activism as a neighborhood-level control variable. Neighborhood activism was constructed through an item-response model (refer to the neighborhood indicators discussed above) based on the responses to five items: "spoke to a politician about a problem", "talked to a person or group causing problems", "attended a meeting about a problem", "talked to a minister about a problem", and "gotten together for action about a problem". Neighborhood activism serves as a proxy for the detection of offending behaviors. Although offending is measured by a self-report,

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including an approximation of "detection" in the model minimizes the chances that the report of offending behaviors depends on the perception or notification of an objective entity.

Two additional neighborhood-level variables are used in the analysis: physical disorder and the lack of job opportunities. Physical disorder is a three-item scale measuring the problematic nature of graffiti, litter, and vacant areas in one's neighborhood. The lack of neighborhood job opportunities is composed of two related items from the Community Survey: (1) if a friend said that they were planning on moving to Chicago, what would you tell them is the worst thing about living in this city? Few job opportunities was one potential answer to this question; and (2) is helping someone get a job a reason you (or your family) might want to move from this neighborhood? An average of 23 percent of individuals across the 70 NCs reported having problems with job opportunities. A neighborhood with a severe lack of job opportunities is defined as the 90th percentile, or those neighborhoods having 36 percent or more of individuals reporting having a lack of job opportunities. A neighborhood with no lack of job opportunities is defined as the 10th percentile, or those neighborhoods having 11 percent or less of individuals reporting having a lack of job opportunities.

## Analytical Strategy

### *Item Response Theory*

Perhaps the simplest and most common method for combining multiple item responses is to sum or average the items (Osgood, McMorris, & Potenza, 2002). However, combining item responses additively presupposes a given dimensionality of crime; that is, it assumes that the number of types of crime is known *a priori*. Additive

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scales also assume equal intervals of measurement across items; therefore, less serious offenses are often over-emphasized and more serious forms of offending are under-emphasized. For example, in an additive scale, hitting a classmate and attacking someone with a weapon are assumed to contribute equally to the resulting scale. However, since hitting a classmate is a less serious, albeit more common crime, it will contribute to the resulting scale more than attacking someone with a weapon, which is a less frequent but more serious form of crime. Furthermore, since the modal response for normative violating behavior is inevitably zero, summative scales (1) are often considerably skewed, (2) have heterogeneous error variances, and (3) have decreased precision of measurement as scale scores increase. For example, in the PHDCN data, approximately 63 and 71 percent of the respondents reported not committing any violent and property crime acts, respectively, in the past 12 months (see Figure 2); therefore, the distributions of the summative violent and property crime scales are discrete, limited, and skewed. Finally, item-level missing data problems are compounded when combining multiple items additively; that is, unless one imputes the missing data, any respondent with a missing response for any one of the scale items is excluded from analysis. This can result in the loss of vast amounts of data (Osgood et al., 2002; Raudenbush et al., 2003).

To address these problems, the analysis uses item response theory (IRT) to scale self-reports of offending in order to (1) appropriately reflect the varying seriousness and frequency of offending behavior; (2) reduce the skewness that commonly occurs when combining specific offending behaviors from self-reports; and (3) utilize data from all respondents, assuming missing data is missing at random (MAR) (Osgood et al., 2002; Raudenbush et al., 2003). According to IRT, responses to survey items depend on latent

traits (i.e., unmeasurable respondent characteristics) and item characteristics. When these responses are dichotomous, the Rasch model is the simplest, most interpretable, and best known model for applying IRT (Hardouin, 2007; Raudenbush et al., 2003; De Boeck & Wilson, 2004).

Like Raudenbush et al. (2003) and Sampson et al. (2005), the current analysis focuses on whether or not the respondent reported involvement in each offending item during the past year. According to the Rasch model, the log-odds of person $j = 1,\ldots, J$ responding "yes" to any of the multiple binary items $m = 1,\ldots, M$ (for each crime type) depends on the criminal propensities $\pi_j$ of the respondents and the severities $\psi_m$ of the acts in question:

$$\eta_{mj} = \pi_j - \psi_m \tag{1}$$

where

$\eta_{mj} = \log[\mu_{mj}/(1 - \mu_{mj})]$, the natural log-odds of person $j$ responding "yes" to item $m$;

$\mu_{mj} = \mathrm{Prob}(Y_{mj} = 1 \setminus \psi_m, \pi_j)$, the probability that person $j$ will respond "yes" to item $m$, given that person's criminal propensity and the severity of the act in question; and

$Y_{mj} = 1$ if person $j$ responds "yes" to item $m$, 0 otherwise.

Two major assumptions of the model are: (1) additivity; that is, item severities and person propensities contribute additively to the log-odds of a positive item response; and (2) local independence; that is, conditional on item severity and person propensity, item responses are independent Bernoulli random variables.[15] These assumptions imply

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[15] When item responses depend on affirmative responses to previous "filter" items, the usual conditional independence assumption fails (see Reardon & Raudenbush, 2006). For example, respondents may be asked "How many times did you steal last year?" only if they respond affirmatively to the filter question: "Have you stolen in the past year?" If two individuals stole on day 364 of the preceding year, they may respond differently to the filter question. Thus, the prevalence question will be asked for one of these individuals, while the prevalence question will be skipped for the other individual. In this case, using filter

unidimensionality; that is, each set of item responses taps a single interval-scale construct, in this case, "the propensity to commit (violent and property) crime" (Raudenbush et al., 2003, p. 177). If these assumptions are valid, the Rasch model provides (1) an ordering of the items, in terms of act severity, and (2) a score for each individual on the latent trait; these scores lie on the same scale and can be compared across individuals.

If the additivity assumption is valid, and thus a one-parameter Rasch model is applicable, one can assume that less frequently occurring acts of the given crime type are more severe. In other words, (1) persons of all propensities are (relatively) more likely to respond affirmatively to a less severe crime (e.g., pushing a peer) than to a more severe crime (e.g., murder), and (2) only the most serious offenders are likely to respond affirmatively to the most severe (but least common) acts. This leads to the interpretation of $\psi_m$ as item severity (Raudenbush et al., 2003, p. 176-180).

When the additivity assumption fails, the IRT model becomes a two-parameter model, where each item is characterized by a discrimination parameter, $\lambda_m$:

$$\eta_{mj} = \lambda_m(\pi_j - \psi_m)$$

Thus, under the two-parameter model, an item's severity depends on a person's propensity to offend, a classic interaction. Figure 3 illustrates the point by showing item characteristic curves (ICCs) for three fictitious binary items for the one-parameter Rasch model and the two-parameter model. The ICCs display the probability of an affirmative response to each item, $Y_{mj} = 1$, as a function of criminal propensity, $\pi_j$. Item severity, $\psi_m$, is interpreted as the point on the x-axis for which the probability of an affirmative

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questions can cause time-frame distortions to inflate measurement error when combining the items. For the Wave 2 self-report of offending questions used in this study, there are no filter questions.

response is 0.5, and the discrimination parameter, $\lambda_m$, is interpreted as the slope of the curve at that same point. For example, in Figure 3(a), the item severities for items 1, 2, and 3 in the Rasch model are 3.25, 3.75, and 4.75, respectively. In addition, the discrimination parameters, or "slopes", are equal in the Rasch model; thus, the Rasch model is a special case of the two-parameter model in which $\lambda_1 = \lambda_2 = \ldots = \lambda_m$. In Figure 3(b), the ICCs are not proportional. Individuals with high criminal propensities are more likely to respond affirmatively to item 3 than item 1, while individuals with low criminal propensities are more likely to respond affirmatively item 1 than to item 3. This situation represents an interaction, where item location and person propensity enter into the model multiplicatively, and the probability of an affirmative response to an item therefore depends on a person's criminal propensity. The implication is that item locations cannot be interpreted as item severity in the two-parameter model.

The local independence assumption can also be tested. One can estimate the hierarchical model with and without extra-binomial dispersion to see if the within-participant variance is greater than expected (overdispersion) or less than expected (underdispersion) under the measurement model.

### *The Statistical Model*

The analysis uses hierarchical linear models (HLM) to nest individuals within their respective neighborhoods (Raudenbush & Bryk, 1992). Using HLM, one can allow offending to vary across neighborhoods, assess the percentage of variation in the data that is due to clustering, examine the effects of the study variables on offending, and examine the cross-level interactions between impulsivity and the neighborhood moderators.

Generalized hierarchical linear models can be viewed as having a two-level structure with persons nested within neighborhoods (or some other higher-level context such as schools). Extended to accommodate item response data, these models become multivariate, multilevel Rasch models, three-level structures with items nested within persons nested within neighborhoods (Raudenbush et al., 2003); thus, the models represent item variation within persons, person variation within neighborhoods, and variation between neighborhoods. Essentially, these models combine item response models and hierarchical linear models, simultaneously estimating measurement and regression models. This type of statistical model improves upon previous studies by taking into account clustering and applying IRT to the dependent variable in a random-effects setting, thereby utilizing data from all of the respondents.

Building on model (1) above, the level-one model allows the responses to each dichotomous item to vary as a function of item indicators:

$$\eta_{ijk} = \pi_{jk} + {}_{m=1}\Sigma^{M-1} \, \psi_{mjk} \, a_{mijk} \tag{2}$$

where

$\eta_{ijk} = \log[\mu_{ijk}/(1 - \mu_{ijk})]$, the log-odds of person $j$ in neighborhood $k$ responding "yes", to the $i^{\text{th}}$ item;

$\pi_{jk}$ is the log-odds of person $j$ in neighborhood $k$ responding "yes" to an "average" item in the offending scales. This is the true score for respondents' criminal propensities;

$\psi_{mjk}$ represents the severity of crime item $m$ in the offending scale; and

$a_{mijk}$ is an indicator variable taking on the value of 1 if the $i^{\text{th}}$ item is the $m^{\text{th}}$ item in the offending scale, 0 otherwise.

Note that one item is excluded from the analysis and serves as the reference item. This is similar to how multiple regression handles categorical variables with dummy variables.

The level-two model (between persons) holds item responses constant across persons but allows person propensities to vary within neighborhoods (NCs):

$$\pi_{jk} = \beta_k + \mu_{jk} \tag{3}$$

where

$\beta_k$ is the mean person propensity within neighborhood $k$; and

$\mu_{jk}$ is a normally distributed random person effect.

The level-two model is then expanded to incorporate person-level covariates, $X_{1k}, \ldots, X_{nk}$:

$$\pi_{jk} = \beta_{0k} + {}_{n=1}\Sigma^{N} \beta_{nk} X_{nk} + \mu_{jk} \tag{4}$$

The full level-2 model can be written:

$$\pi_{jk} = \beta_{0k} + \beta_{1k}*(AGE)_{1k} + \beta_{2k}*(MALE)_{2k} + \beta_{3k}*(WHITE)_{3k} +$$

$$\beta_{4k}*(BLACK)_{4k} + \beta_{5k}*(OTHER)_{5k} + \beta_{6k}*(FAMILY\ SES)_{6k} +$$

$$\beta_{7k}*(2\ PAR.,\ NON\text{-}BIO)_{7k} + \beta_{8k}*(1\ PAR.,\ BIO)_{8k} +$$

$$\beta_{9k}*(1\ PAR.,\ NON\text{-}BIO)_{9k} + \beta_{10k}*(YRS.\ AT\ RES.)_{10k} +$$

$$\beta_{11k}*(IMPULSIVITY)_{11k} + \mu_{jk}; \tag{5}$$

For illustrative purposes, "Hispanic", "Female", and "2 parents, both biological" are the excluded, reference categories.

The level-three model allows neighborhood mean propensities to vary randomly across neighborhoods:

$$\beta_{0k} = \gamma + \upsilon_k \tag{6}$$

where

$\gamma$ is the grand mean propensity of offending; and

$v_k$ is a random neighborhood effect.

The level-three model can be further accommodated to include neighborhood-level predictors, for example socioeconomic status (SES):

$$\beta_{0k} = \gamma_{00} + \gamma_{01}*(\text{"LOW" SES})_k + \gamma_{02}*(\text{"MID" SES})_k + v_k \qquad (7)$$

Since SES was classified into categories, two of the three categories representing all of the information in SES are included in the model, with high SES serving as the reference group.

Finally, the level-three model can be expanded to address the substantive question addressed in this study: does the effect of impulsivity on offending vary as a function of neighborhood context? This is accomplished by modeling the slope of impulsivity ($\beta_{11k}$) as a function of the neighborhood-level factors, for example neighborhood SES:

$$\beta_{11k} = \gamma_{110} + \gamma_{111}*(\text{"LOW" SES})_k + \gamma_{112}*(\text{"MID" SES})_k \qquad (8)$$

The full model incorporating the cross-level interaction is:

$$\eta_{ijk} = \gamma_{00} + \gamma_{01}*(\text{"LOW" SES})_k + \gamma_{01}*(\text{"MID" SES})_k + \beta_{1k}*(AGE)_{1k} +$$

$$\beta_{2k}*(MALE)_{2k} + \beta_{3k}*(WHITE)_{3k} + \beta_{4k}*(BLACK)_{4k} + \beta_{5k}*(OTHER)_{5k} +$$

$$\beta_{6k}*(FAMILY\ SES)_{6k} + \beta_{7k}*(2\ PAR,\ ONE/BTH\ NON\text{-}BIO)_{7k} +$$

$$\beta_{8k}*(1\ PAR,\ BIO)_{8k} + \beta_{9k}*(1\ PAR,\ NON\text{-}BIO)_{9k} + \beta_{10k}*(YRS\ AT\ RES) +$$

$$\gamma_{110}*(IMP)_{12k} + \gamma_{121}*(IMP)*(\text{"LOW" SES})_k + \gamma_{121}*(IMP)*(\text{"MID" SES})_k +$$

$$v_k + \mu_{jk} + {}_{m=1}\Sigma^{M\text{-}1}\ \alpha_{mjk}\ \alpha_{mijk} \qquad (9)$$

This unconditional random effects model will be used to examine if socioeconomic status and the hypothesized social process variables modify the relationship between impulsivity and offending. Using this multivariate, multilevel Rasch model, extended to allow for cross-level interactions, this study moves beyond existing research on the

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person context nexus by examining if, and why, the impulsivity-offending relationship depends on neighborhood context.

## Checking Rasch Model Assumptions

### *Additivity*

Using GLLAMM procedures in Stata, one can check the additivity assumption by comparing results based on one-parameter (i.e., Rasch) and two-parameter models. This is where one of the benefits of the Rasch model is apparent: the items are tested to make sure that they measure the same construct, and inconsistent items are removed before continuing with the analysis.

### *Violent Crime*

Figure 4 shows the item characteristic curves (ICCs) describing the relationships between criminal propensity and the likelihood of a positive endorsement to each of the nine violent crime items. The values of criminal propensity, $\pi_j$, where the curves cross the 0.5 probability line are the estimated item difficulties, $\psi_m$. For example, the severity of Item 1 in the one-parameter Rasch model (a) is approximately 2.25, while the severity of Item 2 is approximately 5. Note that all of the ICCs are proportional in the one-parameter Rasch model, where the slopes are constrained to equality. In the two-parameter model, where the slopes are allowed to vary across items, the ICCs are nearly proportional except for Item 9 (hitting someone you live with); the ICC for Item 9 cuts across the other ICCs and has a visibly lower "slope" than the other ICCs. In addition, the items in the two-parameter model have similar discrimination parameters except for Item 9 (not shown); the discrimination parameters for items 1 through 8 vary randomly around 1.07 while the discrimination parameter for Item 9 is 0.47. Finally, a likelihood ratio test ($\chi^2 =$

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55.91, $p < 0.001$) indicates that the two-parameter model fits the data better than the one parameter Rasch model.

These results are consistent with those by Raudenbush et al. (2003), who suggest that Item 9, the only item indicating violent crime inside of the home, may represent a different construct than violence outside of the home. As a result, the one- and two-parameter models were re-estimated without Item 9 (Figure 5). Graphs of the ICCs for these models look proportional, the discrimination parameters are similar, and a likelihood ratio test indicates that the two-parameter model does not fit better than the one-parameter Rasch model ($\chi^2 = 9.11$, $p = 0.245$). As a result, the outcome data for the analysis includes respondents' responses to eight violent crime items.

### Property Crime

Figure 6 shows the item characteristic curves (ICCs) describing the relationships between criminal propensity and the likelihood of a positive endorsement to each of the six property crime items. The ICCs are proportional in the one-parameter Rasch model (a). In the two-parameter model (b), where the slopes are allowed to vary across items, the ICCs are nearly proportional except for Item 6 (stealing from your house); the ICC for Item 6 cuts across the other ICCs and has a visibly lower "slope" than the other ICCs. In addition, the items in the two-parameter model have similar discrimination parameters except for Item 6; the discrimination parameters for items 1 through 5 vary randomly around 0.96 while the discrimination parameter for Item 6 is 0.40 (not shown). Finally, a likelihood ratio test ($\chi^2 = 34.62$, $p < 0.001$) indicates that the two-parameter model fits the data better than the one parameter Rasch model.

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Again, Item 6 is the only item indicating property crime inside of the home. Therefore, the one- and two-parameter models were re-estimated for all property crime acts outside of the home (Figure 7). Graphs for these models look proportional, the discrimination parameters are similar, and a likelihood ratio test indicates that the two-parameter model does not fit better than the one-parameter Rasch model ($\chi^2 = 7.60$, $p = 0.108$). As a result, the outcome data for the analysis includes respondents' responses to five property crime items.

### Local Independence

The Rasch models for violent and property crime were re-estimated with extra-binomial dispersion to see if the within-participant variance was not equal to that expected under the assumption of local independence. Since the variance of the item responses appeared to be lower than expected (violent crime: $\chi^2 = 530.42$, $p < 0.001$; property crime: $\chi^2 = 23.29$, $p < 0.001$), the models were adjusted to allow for underdispersion.

This chapter discussed the design of the PHDCN, the sample, and the measures used in the study. The key individual-level variables are impulsivity and violent/property crime, and the key neighborhood-level variables are SES, collective efficacy, criminogenic behavior settings, and pro-criminal definitions. The chapter also enumerated and checked the assumptions of the Rasch model. After checking the additivity assumption, two items tapping household offending were removed from the scales. After checking the local independence assumption, the violent and property crime models were adjusted to allow for underdispersion.

## CHAPTER 7: RESULTS

This chapter proceeds in four stages. First, correlations among the study variables are computed. Second, the baseline Rasch model is analyzed. Third, person-level covariates are added to the model. Fourth, the models are used to examine if the effects of impulsivity on offending are amplified in lower risk neighborhoods. In this last stage of analysis, impulsivity is interacted with SES and each of the social process variables in separate models. Then, a social process composite is created and modeled on the slope of impulsivity with SES to test a standard intervening effects model. Finally, a total risk composite, comprised of SES and the social process variables, is created and interacted with impulsivity.[16]

### Zero-Order Correlations

Table 5 presents the zero-order correlations among impulsivity, the neighborhood measures, offending, and the demographic/control variables. As one can see, impulsivity is positively and significantly correlated with both violent and property crime. This is consistent with a breadth of prior research on impulsivity (White et al., 1994). In addition, the correlation between socioeconomic status and violent crime is negative and significant, although none of the other correlations between offending and context are significant. This is consistent with the majority of previous research that has found weak correlations between neighborhood-level factors and individual variations in offending (Lizotte et al., 1994).

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[16] Sensitivity analyses were run to confirm that the findings were not due to the operationalization of the dependent variable or the model used. In one set of analyses, the violent and property crime items were combined additively and 2-level models were estimated. I a second set of analyses, individuals were coded with a one if they responded affirmatively to any one of the violent and property crime items, respectively, and zero otherwise. Then, multilevel logistic models were estimated. The results of both sets of analyses were consistent with those presented below.

Most of the control variables are significantly related to impulsivity and the neighborhood measures, underscoring the need to include these variables in the analysis. As expected, Hispanics and African Americans are more likely to reside in neighborhoods with lower levels of collective efficacy, and higher levels of criminogenic settings and pro-criminal definitions, while Whites are more likely to live in neighborhoods with higher levels of SES and collective efficacy, and lower levels of criminogenic settings and pro-criminal definitions. Furthermore, males are more likely to be impulsive than females, and family structure is significantly related to impulsivity; that is, living with two biological parents is associated with lower rates of youth impulsivity, while living with one non-biological parent is associated with higher rates of impulsivity. These findings are consistent with previous research on race and neighborhood factors (see Sampson et al., 2005), gender and crime (see Glueck & Glueck, 1950), and family structure and offending (Hirschi, 1969). Finally, impulsivity is negatively and significantly related to SES, and positively and significantly related to criminogenic behavior settings and pro-criminal definitions, indicating that impulsive youth tend to live in higher risk neighborhoods.

## Baseline Model

In the next stage of analysis, baseline hierarchical linear models are estimated. These three-level Rasch models without covariates generate item severities, unobserved heterogeneity among neighborhoods, and between-person and between-neighborhood reliabilities.

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### *Item Severities*

Table 6 displays the item severities. The reference items, to which each of the items in the table is compared, are "hit someone you did not live with" and "stolen from a store. As one can see from the table, arson, robbery, and armed robbery are the most severe violent crimes (they are also the least frequently occurring acts); the least severe violent crimes are hitting someone you did not live with (reference item) and throwing objects (these are the most frequently occurring acts). For property crime, breaking and entering and stealing from a car are the most severe crimes, while stealing from a store (reference item) and damaging/destroying property are the most common and therefore least severe crimes.

### *Baseline Model Properties*

For the violent crime model, approximately 4.4 percent [$\tau_{\beta 00} / (\tau_{\beta 00} + \tau_\pi) = 0.22 / (0.22 + 4.74)$] of the reliable variation in violent crime lies between neighborhoods, where $\tau_{\beta 00}$ is the neighborhood-level variance and $\tau_\pi$ is the between-person variance. Thus, there is significant unobserved heterogeneity across neighborhoods ($\chi^2 = 109.83$, d.f. $= 69$, $p < 0.01$). Conversely, there is no between-neighborhood variation in property crime ($\chi^2 = 74.39$, d.f. $= 69$, $p = 0.31$); less than 1 percent of the reliable variation in property crime lies between neighborhoods [$0.04 / (0.04 + 4.88)$].

The baseline models also estimate (1) the between-person reliability, or the ratio of the variance of the true person propensity scores to the variance of the observed person propensity scores: $\tau_{\beta 00} / (\tau_{\beta 00} + \sigma^2/n_i)$, where $\sigma^2/n_i$ is the measurement error for the level-2 variance; and (2) the between-neighborhood reliability, or the ratio of the variance of the true neighborhood person propensity score means to the variance of the estimated

neighborhood person means: $\tau_{\beta000} / (\tau_{\beta000} + \tau_\pi/n_{jk} + \sigma^2/n_i)$. In essence, the reliabilities measure the precision of the least square estimated coefficients. The between-person reliabilities for the violent and property crime models, respectively, are 0.65 and 0.54. The between-neighborhood reliabilities are 0.32 and 0.08, respectively. Not surprisingly, the between-neighborhood reliability for property crime is close to zero (Raudenbush et al., 2003, p. 197-198; Raudenbush & Bryk, 2002, p. 46-66).

### Incorporating Person-Level Covariates

The baseline model can be expanded to incorporate person-level covariates. The only difference from model (5) is that all covariates have been adjusted to make the results more interpretable; that is, the independent variables have been grand-mean centered so that the results can be interpreted for an average person in the sample. Centering also reduces collinearity in the model, which is instrumental when models contain cross-level interactions (see Raudenbush & Bryk, 2002, p. 31-35).

The results are displayed in Table 7. For an average person in the sample, the probability of engaging in violent crime is approximately 22 percent $[e^{-1.289} / (1+e^{-1.289})]$, while the probability of engaging in property crime is approximately 11 percent $[e^{-2.093} / (1+e^{-2.093})]$.[17] In addition, age is significantly related to violent ($p < 0.001$) and property crime ($p = 0.070$), with older individuals engaging in more criminal behavior. A

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[17] Not only are these rates of offending high, but it seems to be an anomaly that violent crime is more pervasive than property crime. Several points justify these findings. First, this study takes place in the city of Chicago and does not include surrounding areas or suburbs; therefore, the rates of offending in this sample should be higher than national crime rates. Second, one can see in Table 4 that the two most prevalent offenses in this sample are violent in nature: (1) hitting someone with whom you did not live, and (2) throwing objects at people (note that hitting someone with whom you lived and stolen from a household member were excluded from the analysis). Approximately 24 percent of the sample respondents reported hitting someone with whom they did not live, and 11 percent reported throwing objects at people; participation in the remaining offenses range from 0.5 percent to 10 percent. Third, hitting someone with whom you did not live and throwing objects at people likely include minor incidents that arguably occur more frequently than breaking and entering.

one year increase of age increases the odds of engaging in violent and property crime by approximately 15 percent $[(e^{\wedge 0.140} – 1) * 100\%]$ and 8 percent $[(e^{\wedge 0.081} – 1) * 100\%]$, respectively, controlling for the other covariates in the model.[18] Furthermore, the odds of engaging in violent crime are 52 percent $[(e^{\wedge -0.728} – 1) * 100\%]$ lower for females than for males, and the odds of engaging in property crime are 40 percent $[(e^{\wedge -0.500} – 1) * 100\%]$ lower for females than for males. Finally, and most importantly for this analysis, impulsivity is significantly related to both violent and property crime. A one standard deviation increase in impulsivity increases the odds of engaging in violent and property crime by approximately 15 percent $[(e^{\wedge (0.038*3.76)} – 1) * 100]$ and 12 percent $[(e^{\wedge (0.031*3.76)} – 1) * 100]$, respectively; note that 3.76 is the standard deviation of impulsivity.

Looking at the intra- and inter-neighborhood variances in Table 7, one can also see that less than 1 percent of the reliable variation in each crime type lies between neighborhoods $[(0.01 / (0.01 + 4.49)); (0.04 / (0.04 + 4.83))]$. Thus, after accounting for the person-level covariates, there is no longer significant unobserved heterogeneity in violent crime across neighborhoods ($\chi^2 = 71.55$, d.f. = 69, $p = 0.393$).

### Person-Context Interactions

The next stage of analysis examines if the relationship between impulsivity and offending is conditioned by neighborhood context. Like previous research (e.g., Lynam et al., 2000; Vazsonyi et al., 2006; Wikstrom & Loeber, 2000), this analysis begins by examining if there is an interaction between impulsivity and socioeconomic status (SES).

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[18] Consistent with the findings for age, individuals from cohort 15 are significantly more likely to engage in violent ($p < 0.001$) and property ($p = 0.064$) crime than individuals from cohort 12 [cohort was excluded from the models due to high collinearity with age ($r = 0.978$)]. The odds of engaging in violent crime are 35 percent higher for individuals from cohort 15 than for individuals from cohort 12; similarly, the odds of engaging in property crime are 22 percent higher for individuals from cohort 15 than for individuals from cohort 12.

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The analysis then moves beyond extant research by testing if the impulsivity-offending relationship is conditioned by collective efficacy, criminogenic behavior settings, and pro-criminal definitions.

### *The Moderating Effects of Socioeconomic Status*

A two-step approach is used to examine if the relationship between impulsivity and offending is conditioned by SES. In the first step, SES is added to the model as a neighborhood-level predictor of offending. In the second step, SES is included as a moderator of the relationship between impulsivity and crime; this is accomplished by modeling the slope of impulsivity as a function of SES. This stepwise approach allows one to assess the model fit with and without the interaction. An alternative approach would be to first test the significance of a random slope variance on impulsivity, and subsequently think of neighborhood-level variables that could explain the random slope (Snijders & Bosker, 1999, p. 74). However, basing the cross-level interactions on *a priori* substantive arguments is preferable. The power of the statistical tests of the cross-level interaction fixed effects is considerably higher than the power of tests based on the random slopes. In addition, one can test these interactions irrespective of whether a random slope on impulsivity is found (see Snijders & Bosker, 1999, p. 74-75, 95-96).

During this stage of analysis, three other neighborhood-level variables are included in the model as control variables: concentrated immigration, residential instability, and neighborhood activism. The former two variables are common exogenous

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variables in neighborhood-level research, while the latter serves as a proxy for the detection of offending behaviors.[19]

Since SES is a categorical variable representing high, middle, and low SES neighborhoods, three (0/1) dummy variables represent the different neighborhood types. Therefore, three multilevel regression models are estimated, with each model excluding one of the dummy variables. These models produce simple slope coefficients for each neighborhood type, interaction coefficients, and statistical tests of these coefficients (Aiken & West, 1991). In addition, since we have two dummy variables representing all of the information in the three neighborhood type variables, a second test of significance of the interaction effect is the hierarchical test of the restricted main-effects-only model versus the full model with the interactions (Jaccard, Turrisi, & Wan, 1990, p. 44). The test is the difference in the deviance statistics (-2 * log-likelihood) across models, distributed $\chi^2$ with two degrees of freedom.

The simple slopes and model improvement $\chi^2$ tests for the interactions are presented in Table 8. As one can see, impulsivity significantly predicts offending only in the highest SES neighborhoods. This is true for both violent and property crime. In addition, the interaction coefficients show that the effect of impulsivity on offending is significantly greater in high SES neighborhoods than in low or middle SES neighborhoods.

According to the results, a one standard deviation (S.D.) increase in impulsivity increases the odds of engaging in property crime by approximately 51 percent $[(e^{(0.11*3.76)} - 1) * 100\%]$ for individuals living in high SES neighborhoods, while a one

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[19] Arguably, these neighborhood-level controls partial out some of the neighborhood-level riskiness that is captured by SES in the impulsivity-SES interaction. However, it is important to control for other neighborhood-level factors that may affect offending behaviors directly.

S.D. increase in impulsivity only increases the odds of engaging in property crime by 16 percent $[(e^{\wedge(0.04*3.76)} - 1) * 100\%]$ for individuals in low SES neighborhoods, a difference of 35 percent. This difference can also be calculated using the interaction coefficient: $[(e^{\wedge(-0.073*3.76)} - 1) * 100\% = 35\%]$. For violent crime, the interaction coefficients are such that a one S.D. in impulsivity increases the odds of engaging in violent crime approximately 64 percent more for individuals living in high SES neighborhoods than for individuals living in middle SES neighborhoods $[(e^{\wedge(-0.132*3.76)} - 1) * 100\%]$. Similarly, a one S.D. increase in impulsivity increases the odds of violence 62 percent more for individuals living in high SES neighborhoods than for individuals living in low SES neighborhoods $[(e^{\wedge(-0.128*3.76)} - 1) * 100\%]$.

In addition, not only is the effect of impulsivity indistinguishable from zero in low and middle SES neighborhoods, but the slope of impulsivity is indistinguishable between low and middle SES neighborhoods (analysis not shown). Finally, the model improvement $\chi^2$ tests reveal that the models with the interactions explain significantly more variation in violent and property crime than the models without the interactions.

Figure 8 presents a graphical representation of the interactions. As one can see, the slope of impulsivity is nearly horizontal in low and middle SES neighborhoods, indicating that there is no effect of impulsivity on offending in these neighborhood types. On the other hand, impulsivity has a robust effect on violent and property crime in high SES neighborhoods.

### The Moderating Effects of Neighborhood Social Process Variables

The next step is to test the mechanisms hypothesized to account for the impulsivity-SES interaction. If the proposed theoretical mechanisms are at work, one

would expect impulsivity to have a stronger (positive) relationship with offending in areas with less criminogenic behavior settings and pro-criminal definitions, and higher levels of collective efficacy. The moderating effects of these variables are examined in separate models, controlling for socioeconomic status, concentrated immigration, residential instability, and neighborhood activism.

Table 9 displays the simple slopes of impulsivity in low, middle, and high risk neighborhoods. As one can see, impulsivity significantly predicts violent and property offending in all types of low risk neighborhoods (i.e., in neighborhoods with low levels of criminogenic settings and pro-criminal definitions, and high levels of collective efficacy), but generally does not predict violent offending in middle or high risk neighborhoods. In addition, the slope of impulsivity is indistinguishable between middle and high risk neighborhoods (not shown). Moreover, the model fit $\chi^2$ statistics show that the effect of impulsivity on violent offending is significantly greater in low risk than in middle or high risk neighborhoods.

For property crime, only criminogenic behavior settings moderate the effect of impulsivity. The relationship between impulsivity and property crime is invariant to neighborhood levels of collective efficacy and pro-criminal definitions, even though impulsivity significantly predicts property offending only in neighborhoods with high levels of collective efficacy and low levels of pro-criminal definitions. Perhaps other neighborhood factors condition the relationship between impulsivity and property offending. For example, it is possible that cultural aspects of criminogenic neighborhoods (e.g., "respect", lack of social control, and social unrest) disproportionately affect violent offending (Anderson, 1999), while property offending is affected primarily by physical

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aspects of neighborhoods and the lack of job opportunities in underclass areas (Wilson, 1987). Accordingly, Figure 9 shows the relationship between property offending and physical disorder. As one can see, impulsivity has a positive and significant effect on property offending in neighborhoods with low levels of physical disorder; conversely, the effect of impulsivity is not significantly different from zero in neighborhoods with middle or high levels of physical disorder. In addition, the effect of impulsivity is significantly greater in low physical disorder neighborhoods than in neighborhoods with middle or high levels of disorder.

Figure 10 shows the relationship between property offending and the lack of job opportunities. As one can see, (1) impulsivity has a positive and significant effect on property offending in neighborhoods without a lack of job opportunities, (2) the effect of impulsivity is indistinguishable from zero in neighborhoods with a severe lack of job opportunities, and (3) the effect of impulsivity is significantly greater in neighborhoods with adequate job opportunities than in neighborhoods with a severe lack of jobs. Consistent with the pattern of findings, the effect of impulsivity is amplified in low risk neighborhoods.

### *The Mediating Effects of Neighborhood Social Process Variables*

The preceding analysis demonstrated that impulsivity interacts with the social process variables as expected. Still, it did not demonstrate that the impulsivity-SES interaction is statistically interpreted by those interactions. In other words, it did not use the hypothesized social process variables to explain why the effect of impulsivity varies as a function of SES. If the theoretical claims are accurate, the effects of SES on the slope of impulsivity should become insignificant, or at least be reduced, in models that also

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include the interactions between impulsivity and the more proximate mediators. Although this seems conceptually complex, it is just a standard intervening effects model (X $\rightarrow$ Z $\rightarrow$ Y) predicting the slope of impulsivity instead of predicting another outcome like crime. Unfortunately, it would be quite cumbersome to include all of these interactions in the same model; in addition, the meaning of the coefficients would be compromised. Therefore, a social process risk composite was constructed to test the standard intervening effects model. To create a social process risk composite, the three social process variables were standardized and summed (with collective efficacy reverse-coded), and the resulting composite scale was trichotomized.

Table 10 shows the interaction coefficients when impulsivity is interacted with SES alone, and when impulsivity is interacted with both SES and the social process risk composite. The model improvement $\chi^2$ indicates that the full model explains significantly more variability in violent offending than the restricted model. In addition, the interaction between impulsivity and the social process composite is highly significant in the full model. Finally, when the social process composite is included in the model, the impulsivity-SES interaction coefficients decrease approximately 23 percent (from -0.132 to -0.101) and 39 percent (from -0.128 to -0.078). This suggests that the hypothesized social process variables explain, at least in part, why the relationship between impulsivity and violent crime varies as a function of SES. This lends some credence to the standard intervening effects model, but also suggests that other mechanisms may explain the impulsivity-SES interaction, since it remains significant in the full model.

Because the full model accounts for three neighborhood types based on SES and three neighborhood types based on the social process composite, the model ultimately

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accounts for nine (3 x 3) different types of neighborhoods. These neighborhood types are shown in Table 11, along with the impulsivity simple slope in each neighborhood type. As one can see, there is a clear relationship between impulsivity and the social process composite after accounting for SES. That is, for each level of SES, the slope of impulsivity decreases as the level of social process risk increases. This relationship is clear in Figure 11. Again, the relationship between impulsivity and offending is significant in neighborhoods with low social process risk and generally insignificant otherwise.

Finally, it is interesting to look at three types of neighborhoods based on the combination of neighborhood SES and social process risk. One can see in Figure 12 that the slope of impulsivity decreases as the neighborhood type becomes more risky. Again, it is clear that the impulsivity-offending relationship is strongest in more affluent areas.

### *Composite Neighborhood Risk*

Because both interactions were significant when included in the same model, a logical final step in this analysis was to create one overall neighborhood risk score. To accomplish this, all four neighborhood variables were standardized, the resulting z-scores were summed (with collective efficacy reverse-coded), and the scale was trichotomized.[20] Figure 13 shows the regression lines for an average individual in low, middle, and high risk neighborhoods. As one can see, the slope of impulsivity is nearly horizontal in middle and high risk neighborhoods, indicating that impulsivity does not influence offending in these neighborhood types. Conversely, impulsivity clearly has a positive and significant relationship with offending in low risk neighborhoods. Referring to Table 12, one can see that impulsivity significant predicts both violent and property crime in low

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[20] Alternate categorizations based on the trichotomous variables produced nearly identical results.

risk neighborhoods. In addition, the slope of impulsivity is indistinguishable from zero in middle and high risk neighborhoods, and indistinguishable between middle and high risk neighborhoods (not shown). Finally, the slope of impulsivity is significantly higher in low risk than in middle or high risk neighborhoods ($p < 0.001$; not shown).

Throughout the analysis, the effect of impulsivity on offending has been indistinguishable from zero in middle and high risk neighborhoods, and indistinguishable between middle and high risk neighborhoods. As a result, the composite risk models were re-run after collapsing these two neighborhood types. Figure 14 displays the results. As one can see, impulsivity significantly predicts both violent and property crime in low risk neighborhoods, while the slope is flat and indistinguishable from zero in middle/high risk neighborhoods. In addition, the effect of impulsivity is significantly greater in low risk than in middle/high risk neighborhoods ($p < 0.001$). Figure 14 substantiates the predominant finding in this dissertation: the effect of impulsivity on offending is amplified in lower risk neighborhoods.

## CHAPTER 8: DISCUSSION

The final chapter restates the purpose of the study, summarizes the findings, and discusses possibilities for future research, given the results. The discussion concludes by discussing the implications of the findings for designing effective policy interventions.

The purpose of this study was to test two competing hypotheses: (1) the invariance hypothesis, supported by the trait-based approach to crime and self-control theory, and suggesting that the impulsivity-offending relationship is invariant to neighborhood context; and (2) the interaction hypothesis, proposed by the theoretical framework, and implying that the relationship between impulsivity and offending differs as a function of social context. Specifically, the interaction hypothesis purported that the effect of impulsivity on offending is amplified in low risk (e.g., high SES) neighborhoods. The theoretical framework then proposed three neighborhood-level social process variables to explain why impulsivity varies as a function of neighborhood context: collective efficacy, criminogenic neighborhood settings, and pro-criminal definitions.

In support of the interaction hypothesis, the analysis found that collective efficacy, criminogenic behavior settings, and pro-criminal definitions, in addition to socioeconomic status, moderated the impulsivity-offending relationship. The findings were such that the risk of offending was heightened for impulsive individuals living in the lowest risk neighborhoods, while impulsivity had no effect on offending in Chicago's more risk-laden neighborhoods. In addition, the findings indicated that the relationship between impulsivity and offending was indistinguishable between middle and high risk neighborhoods. Furthermore, a social process risk composite was created to investigate if

the social process variables statistically accounted for the impulsivity-SES interaction. When included in the same model, the social process risk composite reduced the effects of SES on the slope of impulsivity, lending some credence to a standard intervening effects model. Finally, an overall neighborhood risk composite was created to substantiate the findings. Again, the effect of impulsivity on offending was significant only in the lowest risk neighborhoods, while the slope of impulsivity was (1) indistinguishable from zero in middle and high risk neighborhoods, and (2) indistinguishable between middle and high risk neighborhoods. Several conclusions seem justified by the findings.

First, the study used appropriate and rigorous statistical methods to test the theoretical frameworks. Results are often inconsistent across and within studies, partially as a result of unreliable measurement techniques, the exclusion of cases due to missing data, the inability to detect important differences between items in scales, and the failure to account for unobserved heterogeneity. This study used multivariate, multilevel item response models to (1) nest item responses within individuals and individuals within their respective neighborhoods, thereby accounting for unobserved heterogeneity; (2) test for and remove items exhibiting a lack of fit with other scale items; (3) account for missing data on the dependent variable; and (4) appropriately reflect the varying seriousness and frequency of offending behavior. These Rasch models simultaneously utilized the benefits of both measurement models and multilevel regression models.

Second, the findings add to the strong theoretical and empirical research base linking impulsivity to criminal behavior (Eysenck, 1977; Lynam et al., 2000; Moffitt, 1993; White et al., 1994). Overall, impulsivity significantly predicted both violent and

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property crime. This finding ultimately supports the trait-based perspective that links persistent individual-difference factors to offending (e.g., Gottfredson & Hirschi, 1990; Wilson & Herrnstein, 1985).

Third, the study failed to find significant direct effects of contextual variables on violent and property crime. This is consistent with the majority of previous research that has found weak correlations between neighborhood-level factors and individual variations in offending (Gottfredson, McNeil, & Gottfredson, 1991; Lizotte et al., 1994). Perhaps more attention needs to be paid to specific mechanisms linking community processes and individual behaviors (e.g., Coleman, 1990).

Fourth, this is the first study (to the author's knowledge) that has tested which specific aspects of the neighborhood moderate the effect of impulsivity on offending. After finding that impulsivity predicted offending in the highest SES neighborhoods, but had no influence on offending in lower SES areas, this study followed the suggestion of Lynam et al. (2000) by exploring the mechanisms behind the impulsivity-SES interaction. The findings indicated that collective efficacy, criminogenic behavior settings, and pro-criminal definitions conditioned the impulsivity-offending relationship. Analysis using composite risk scores underscored the findings by demonstrating that the risk of offending was heightened for impulsive individuals living in the lowest risk neighborhoods, while impulsivity had no effect on offending in Chicago's higher risk neighborhoods. Taken together, these findings provide support for ethnographic research on underclass areas (Anderson, 1990, 1997, 1999; Wilson, 1987, 1996) and psycho-physiological research (Mischel, 1977; Raine, 1988) suggesting that individual-difference traits are suppressed in environments with strong pushes and pulls towards crime, but

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encouraged in areas with less behavior-dictating factors. In addition, the effect of impulsivity on offending may be masked in high risk areas since all individuals in these areas are to some degree present-oriented (Anderson, 1997).

There are several limitations to this study. First, the moderating effect of SES on the impulsivity-property crime relationship was not fully explained by the proposed theoretical framework. Although physical disorder and the lack of job opportunities conditioned the effect of impulsivity on property crime, perhaps there are other neighborhood-level factors that moderate the relationship. In addition, there appear to be neighborhood factors not explored in this study that moderate the relationship between impulsivity and violent crime, as both SES and the social process risk composite predicted impulsivity when included in the same model. Future research should examine how different neighborhood factors affect the relationships between individual-difference traits and specific types of offending.

Second, the study did not find significant direct effects of contextual variables on offending, despite a theoretical framework suggesting that behavior-dictating contextual factors suppress the influence of impulsivity on crime in higher risk neighborhoods. Therefore, future research should examine which factors in high risk neighborhoods directly affect individual variations in offending behavior. Perhaps individuals' perceptions of the neighborhood, or more proximate factors such as peer influence, are more influential in predicting criminal behavior than residents' aggregated perceptions.

Third, this study used sample respondents from cohorts aged 12 and 15 years. Yet the impulsivity-context interactions observed in this study may be limited to adolescents. That is, the moderating effects of neighborhood context may depend on an individual's

developmental stage. For example, Moffitt (1993) and Sampson and Laub (1990) recognize that criminal behavior may be the product of different factors at different points in the life course. Future studies should examine if the impulsivity-social context interaction varies by age. That is, there may be a three-way interaction between impulsivity, age, and social context.

Fourth, this study is sensitive to the spatial distribution of offending. That is, neighborhood-level variables were attached to each individual according to where he or she lived. However, the dependent variable in the study was self-reported criminal behavior, which had a limited time frame (i.e., in the 12 months before Wave 2) but no limit in space. Thus, a sample respondent could have lived in one neighborhood but offended in another. This would affect the findings if (1) the respondent offended outside of his (or her) neighborhood, and (2) a respondent's perception of the neighborhood in which he (or she) offended was noticeably different than the respondent's perception of his own neighborhood. The majority of global offending, journey to crime, Geographic Information Systems (GIS), and crime displacement research suggests that most offenses take place close to home (see, e.g., Brantingham & Brantingham, 1993; Chainey & Ratcliffe, 2005; Rengert & Wasilchick, 1985). That is, most "offending occurs along the normal, *noncriminal* travel patterns of offenders" (Ratcliffe, 1996, p. 264). In addition, research suggests that perceptions are relatively stable over time and space (see, e.g., Klintberg et al., 1989). That is, individuals' perceptions go with them. Nonetheless, future research should take into account where an individual offends and individuals' perceptions of the different neighborhoods in which they offend.

Lastly, this study examined individuals in the city of Chicago and "did not go beyond its official boundaries into a wider region" (Sampson et al., 1997, p. 923). As a result, one may ask, how bad were the bad, and how good were the good neighborhoods in this study? Because the PHDCN data did not extend beyond the city of Chicago, there were no suburban or rural neighborhoods in this study, and the average neighborhood was more criminogenic than the average U. S. neighborhood. However, the 1990 decennial poverty and income rates in Chicago were comparable to those in other U. S. cities. In addition, Chicago was chosen because of its racial, ethnic, and economic diversity (Sampson et al., 1997). Still, one should be careful in generalizing the results of the study.

Despite these limitations, the findings have important implications for theory, research, and policy. They underscore that research accounting for either individual- or community-level processes may be inconclusive, at best (Farrington, 1993). For this study found that impulsivity predicts offending only in the lowest risk neighborhoods. In more risky neighborhoods, impulsivity had no relationship with either violent or property crime. Therefore, a full understanding of crime ultimately requires the consideration of both individual and environmental differences, perhaps most importantly because they may interact to produce offending behavior (Tonry et al., 1991; Wikstrom & Loeber, 2000).

The findings also emphasize that neighborhood-level factors do not need to affect individuals' offending behaviors directly to be influential. Rather, they may moderate the relationships between individual-difference factors and offending. That is, the effects of individual-difference factors may depend on the larger environmental context in which

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they are embedded. As a result, future research should explore the interactions between other individual- and community-level factors. For example, some research has already examined the interactions between parental and neighborhood efficacy (Simons et al., 2005). Moreover, more proximate contextual influences, such as the school, may condition the impulsivity-offending relationship, and neighborhood factors may condition the effects of school-level factors on offending. Interactions between different variables and different contexts may be fruitful areas for future research.

It is also likely that aspects of the neighborhood influence the development of impulsivity and other individual-difference traits during infancy and childhood. This underdeveloped area of research will be important in disentangling the effects of individual- and neighborhood-level factors on criminal behavior.

Furthermore, if neighborhood factors are as important as the results suggest, researchers should pay closer attention to developing reliable neighborhood-level measures. Such measures are crucial in understanding how individuals' environments influence their developmental patterns and offending behaviors. This study was able to examine the causal mechanisms behind the impulsivity-SES interaction using neighborhood-level social process variables constructed in the Project of Human Development in Chicago Neighborhoods (PHDCN), but future studies should focus on developing reliable neighborhood-level measures.

Finally, this study has important policy implications. The results suggest that social prevention programs aimed at reducing individual propensity to crime may have a higher potential for success in low risk neighborhoods, where the impulsivity-offending relationship is robust. Conversely, social prevention programs may have limited success

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in high risk neighborhoods where there is no relationship between impulsivity and offending. The results also suggest that situational prevention strategies, such as target-hardening techniques, may have a higher potential for success in neighborhoods with less impulsive youth, where crime displacement is not an issue. Conversely, situational preventions may not be as effective in neighborhoods with higher percentages of impulsive youth, where displacement is a concern. Still, one should be cautious in interpreting these statements, as it is vital to investigate under what specific neighborhood conditions the effect of impulsivity becomes insignificant.

## References

Achenbach, T. M. (1993). *The Young Adult Self-Report-Revised and the Young Adult Behavior Checklist*. Burlington, VT: University of Vermont, Department of Psychiatry.

Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology*, 30, 47-88.

Aiken, L. S., & West, S. G. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage Publications.

Akers, R. L. (1977). *Deviant behavior: A Social Learning Approach, 2nd Edition*. Belmont, CA: Wadsworth.

Akers, R. L. (1996). Is differential association/social learning cultural deviance theory? *Criminology*, 34, 229-247.

Akers, R. L. (1998). *Social Learning and Social Structure: A General Theory of Crime and Deviance*. Boston: Northeastern University Press.

Akers, R. L., & Jensen, G. F. (2006). The empirical status of social learning theory of crime and deviance. In F. T. Cullen, J. P Wright, and K. R. Blevins (Eds.), *Taking Stock: The Status of Criminological Theory, Advances in Criminological Theory, Volume 15* (pp. 37-76). New Brunswick, NJ: Transaction Publishing.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders*, 4th Edition. Washington, DC.

Anderson, E. (1990). *Streetwise: Race, Class, and Change in an Urban Community*. Chicago: University of Chicago Press.

Anderson, E. (1997). Violence and the inner-city street code. In J. McCord (Eds.),

*Violence and Children in the Inner City* (pp. 1-30). New York: Cambridge University
Press.

Anderson, E. (1999). *Code of the Streets: Decency, Violence, and the Moral Life of the
Inner City*. New York: W. W. Norton and Company.

Bachorowski, J., & Newman, J. P. (1985). Impulsivity in adults: Motor inhibition and
time-interval estimation. *Personality and Individual Differences*, 6, 133-136.

Barker, R. G. (1968). *Ecological Psychology: Concepts and Methods for Studying the
Environment of Human Behavior*. Stanford: Stanford University Press.

Barratt, E. S. (1985). Impulsiveness subtraits: Arousal and information processing. In J.
T. Spence and C. E. Izard (Eds.), *Motivation, Emotion, and Personality* (pp. 137-146).
Amsterdam: Elsevier Science.

Baumer, E., Horney, J., Felson, R., & Lauritsen, J. L. (2003). Neighborhood disadvantage
and the nature of violence. *Criminology*, 41, 39-71.

Becker, G. S. (1968). Crime and punishment: An economic approach. *The Journal of
Political Economy,* 76, 169-217.

Bellair, P. E. (1997). Social interaction and community crime: Examining the importance
of neighbor networks. *Criminology*, 35, 677-703.

Bentham, J. (1948). *An Introduction to the Principles of Morals and Legislation*.
New York, New York: Hafner. (Original work published 1789).

Bingenheimer, J. B., Brennan, R. T., & Earls, F. J. (2005). Firearm violence exposure and
serious violent behavior. Supporting Online Material. *Science* manuscript 1110096.

Brantingham, P., & Brantingham, P. (1993). Nodes, paths, and edges: Considerations on
the complexity of crime and the physical environment. *Environmental Psychology*, 13,

3-28.

Brooks-Gunn, J., Duncan, G. J., Aber, J. L. (1997a). *Neighborhood Poverty: Volume I: Context and Consequences for Children*. New York: Russell Sage Foundation.

Brooks-Gunn, J., Duncan, G. J., Aber, J. L. (1997b). *Neighborhood Poverty: Volume II: Policy Implications in Studying Neighborhoods*. New York: Russell Sage Foundation.

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

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

Burgess, R. L., & Akers, R. L. (1966). A differential association-reinforcement theory of criminal behavior, *Social Problems*, 14, 128-147.

Bursik, R. J. (1988). Social disorganization and theories of crime and delinquency: Problems and prospects. *Criminology*, 26, 519-551.

Bursik, R. J., & Grasmick, H. G. (1993). *Neighborhoods and Crime*. New York: Lexington Books.

Cadoret, R. J., Yates, W. R., Troughton, E., Woodworth, G., & Stewart, M. A. (1995). Genetic-environmental interaction in the genesis of aggressivity and conduct disorders. *Archives of General Psychiatry*, 52, 916-924.

Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., Taylor, A., & Poulton, R. (2002). Role of genotype in the cycle of violence in maltreated children. *Science*, 297, 851-854.

Chainey, S., & Ratcliffe, J. H. (2005). *GIS and Crime Mapping*. London: Wiley.

Christiansen, K. O. (1977). A preliminary study of criminality among twins. In S. A.

Mednick and K. O. Christiansen (Eds.), *Biosocial Bases of Criminal Behaviour* (pp.

89-108). New York: Gardner Press.

Clarke, R. V. (2003). *Situational Crime Prevention*. Retrieved December 4, 2004, from

the Center for Problem-Oriented Policing Web site:

http://popcenter.org/about-situational.htm.

Cleckley, H. (1964). *The Mask of Sanity*, 4th Edition. St Louis: Mosby.

Cleveland, H. H. (2003). Disadvantaged neighborhoods and adolescent aggression:

Behavioral genetic evidence of contextual effects. *Journal of Research on*

*Adolescence*, 13, 211-238.

Cloward, R., & Ohlin, L. (1960). *Delinquency and Opportunity*. Glencoe, Illinois: Free

Press.

Cohen, A. K. (1955). *Delinquent Boys*. Glencoe, Illinois: Free Press.

Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A

routine activity approach. *American Sociological Review*, 44(4), 588-608.

Coleman, J. (1990). *Foundations of Social Theory*. Cambridge: Harvard University Press.

Critchfield, K. L., Levy, K. N., & Clarkin, J. F. (2004). The relationship between

impulsivity, aggression, and impulsive-aggression in Borderline Personality Disorder:

An empirical analysis of self-report measures. *Journal of Personality Disorders*, 18,

555-570.

Cullen, F. T., & Agnew, R. (2003). *Criminological Theory: Past to Present, Second*

*Edition*. Los Angeles: Roxbury Publishing Company.

De Boeck, P., & Wilson, M. (2004). *Exploratory Item Response Models: A Generalized*

90

*Linear and Nonlinear Approach*. New York: Springer.

Durkheim, E. (1951). *Suicide: A Study in Sociology*. Free Press.

Earls, Felton J., Jeanne Brooks-Gunn, Stephen W. Raudenbush, and Robert J. Sampson.
PROJECT ON HUMAN DEVELOPMENT IN CHICAGO NEIGHBORHOODS:
COMMUNITY SURVEY, 1994-1995 [Computer File]. ICPSR02766-v2. Boston,
MA: Harvard Medical School [producer], 1997. Ann Arbor, MI: Inter-university
Consortium for Political and Social Research [distributor], 2006-09-08.

Earls, Felton, J., Jeanne Brooks-Gunn, Stephen W. Raudenbush, and Robert J. Sampson.
PROJECT ON HUMAN DEVELOPMENT IN CHICAGO NEIGHBORHOODS
(PHDCN): EMOTIONALITY, ACTIVITY, SOCIABILITY, IMPULSIVITY
TEMPERAMENT SURVEY, WAVE 1, 1994-1995 [Computer file]. ICPSR13586-v1.
Boston, MA: Harvard Medical School [producer], 2002a. Ann Arbor, MI:
Inter-university Consortium for Political and Social Research [distributor],
2005-07-08.

Earls, Felton, J., Jeanne Brooks-Gunn, Stephen W. Raudenbush, and Robert J. Sampson.
PROJECT ON HUMAN DEVELOPMENT IN CHICAGO NEIGHBORHOODS
(PHDCN): FAMILY ENVIRONMENT SCALE, WAVE 1, 1994-1995 [Computer
file]. ICPSR13590-v1. Boston, MA: Harvard Medical School [producer], 2002b. Ann
Arbor, MI: Inter-university Consortium for Political and Social Research [distributor],
2005-07-18.

Earls, Felton J., Jeanne Brooks-Gunn, Stephen W. Raudenbush, and Robert J. Sampson.
PROJECT ON HUMAN DEVELOPMENT IN CHICAGO NEIGHBORHOODS
(PHDCN): HOME OBSERVATION FOR MEASUREMENT OF THE

ENVIRONMENT, WAVE 1, 1994-1995 [Computer file]. ICPSR13594-v1. Boston,

MA: Harvard Medical School [producer], 2002c. Ann Arbor, MI: Inter-university

Consortium for Political and Social Research [distributor], 2005-07-18.

Earls, Felton J., Jeanne Brooks-Gunn, Stephen W. Raudenbush, and Robert J. Sampson.

PROJECT ON HUMAN DEVELOPMENT IN CHICAGO NEIGHBORHOODS

(PHDCN): MASTER FILE, WAVE 1, 1994-1997 [Computer file]. ICPSR13580-v3.

Boston, MA: Harvard Medical School [producer], 2002d. Ann Arbor, MI:

Inter-university Consortium for Political and Social Research [distributor],

2005-12-06.

Earls, Felton J., Jeanne Brooks-Gunn, Stephen W. Raudenbush, and Robert J. Sampson.

PROJECT ON HUMAN DEVELOPMENT IN CHICAGO NEIGHBORHOODS

(PHDCN): SELF REPORT OF OFFENDING, WAVE 1, 1994-1997 [Computer file].

ICPSR13601-v1. Boston, MA: Harvard Medical School [producer], 2002e. Ann

Arbor, MI: Inter-university Consortium for Political and Social Research [distributor],

2005-07-22.

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, 389-426.

Ellis, L. (1987). Relationships of criminality and psychopathy with eight other apparent

behavioral manifestations of sub-optimal arousal. *Personality and Individual

Differences*, 8, 905-925.

Ellis, L., & Walsh, A. (1999). Criminologists' opinions about the causes and theories of

crime and delinquency. *The Criminologist*, 24, 1-4.

Ellison, C. G. (1991). *An eye for an eye? A note on the Southern Subculture of Violence thesis*. Social Forces, 69, 1223-1239.

Eysenck, H. J. (1977). *Crime and Personality*. London: Routledge & Kegan Paul.

Eysenck, S. B. G., Easting, G., & Pearson, P. R. (1984). Age norms for impulsiveness, venturesomeness and empathy in children. *Personality and Individual Differences*, 5, 315-321.

Farrington, D. P. (1993). Have any individual, family, or neighborhood influences on offending been demonstrated conclusively" In D. P. Farrington, R. J. Sampson, & P-O H. Wikstrom (Eds.), *Integrating individual and ecological aspects of crime* (BRA Report). Stockholm: Allmanna Forlaget.

Farrington, D. P. (1994). *Psychological Explanations of Crime*. Brookfield, VT: Dartmouth.

Farrington, D. P. (1995a). The development of offending and antisocial behavior from childhood: Key findings from the Cambridge Study in Delinquent Development. *Journal of Child Psychology and Psychiatry*, 36, 2-36.

Farrington, D. P. (1995b). Key issues in the integration of motivational and opportunity reducing crime prevention strategies. In P-O Wikstrom, R. V. Clarke, & J. McCord (Eds.), *Integrating Crime Prevention Strategies: Propensity and Opportunity* (pp. 333-357). Sweden: National Council for Crime Prevention.

Farrington, D. P. (1998). Individual differences and offending. In Tonry, M. (Ed.), *The Handbook of Crime and Punishment* (pp. 241-268). NY: Oxford University Press.\

Farrington, D. P., Loeber, R., Stouthamer-Loeber, M., Kammen, W. B. V., & Schmidt, L. (1996). Self-reported delinquency and a combined delinquency seriousness scale

based on boys, mothers, and teachers: Concurrent and predictive validity for

African-Americans and Caucasians. *Criminology*, 34, 493-518.

Farrington, D. P., Loeber, R., & Van Kammen, W. B. (1990). Long-term criminal

outcomes of hyperactivity-impulsivity-attention deficit and conduct problems. In L.

Robins & M. Rutter (Eds.), *Straight and devious pathways from childhood to

adulthood*, pp. 62-81. Cambridge: Cambridge University Press.

Fossati, A., Barratt, E. S., Carretta, I. Leonardi, B., Grazioli, & Maffei, C. (2004).

Predicting borderline and antisocial personality disorder features in nonclinical

subjects using measures of impulsivity and aggressiveness. *Psychiatry Research*, 125,

161-170.

Furstenberg, F. F. (1993). How families manage risk and opportunity in dangerous

neighborhoods. In W. J. Wilson (Ed)., *Sociology and the public agenda* (pp. 231-258).

Newbury park, CA: Sage Publications.

Glueck, S., & Glueck, E. (1950). *Unraveling juvenile delinquency*. New York:

Commonwealth Fund.

Goddard, H. H. (1912). *The Kallikak Family: A Study in the Heredity of

Feeblemindedness*. New York: Macmillan.

Gorenstein, E. E., & Newman, J. P. (1980). Disinhibitory psychopathology.

*Psychological Review*, 87, 301-315.

Gottfredson, D. C., & Hirschi, T. (1990). *A General Theory of Crime*. Stanford, CA:

Stanford University Press.

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, 197-226.

Gray, J. A. (1987). Perspectives on anxiety and impulsivity: A commentary. *Journal of Research in Personality*, 21, 493-509.

Hampton, K., & Wellman, B. (2003). Neighboring in Netville: How the internet supports community and social capital in a wired suburb. *City and Community*, 2, 277-311.

Hardouin, J.-B. (2007). Rasch analysis: Estimation and tests with raschtest. *Stata Journal*, 7, 22-44.

Harris, K. M., Duncan, G. J., & Boisjoly, J. (2002). Evaluating the role of "nothing to lose" attitudes on risky behavior in adolescence. Social Forces, 80, 1005-1039.

Herrnstein, R., & Murray, C. (1994). *The Bell Curve: Intelligence and Class Structure in American Life.* New York: Free Press.

Hindelang, M. J., Hirschi, T., & Weis, J. G. (1981). *Measuring Delinquency*. Beverly Hills: Sage.

Hirschi, T. (1969). *Causes of Delinquency*. Berkeley, CA: University of California Press.

Hirschi, T., & Hindelang, M. (1977). Intelligence and delinquency: A revisionist review. *American Sociological Review*, 42, 471-586.

Hoffman, J. P. (2002). A contextual analysis of differential association, social control, and strain theories of delinquency. *Social Forces*, 81, 753-785.

Hooton, E. A. (1939). *Crime and the Man*. Cambridge: Harvard University Press.

Hox, J. J. (1995). *Applied Multi-Level Analysis, 2$^{nd}$ Edition*. Amsterdam: T. T. Publications.

Hunter, A. J. (1985). Private, parochial, and public school orders: The problem of crime and incivility in urban communities. In G. D. Suttles and M. N. Zald (Eds.), *The

*Challenge of Social Control: Citizenship and Institution Building in Modern Society* (pp. 230-242). Norwood, NJ: Ablex Publishing.

Jaccard, J., Turrisi, R., & Wan, C. K. (1990). *Interaction Effects in Multiple Regression*. Newbury Park, CA: Sage.

Kasarda, J. D., & Janowitz, M. (1974). Community attachment in mass society. *American Sociological Review*, 39, 328-399.

Klintberg, B., Magnusson, D., & Schalling, D. (1989). Hyperactive behavior in childhood and adult impulsivity: A longitudinal study of male subjects. *Personality and Individual Differences*, 10, 43-50.

Kobrin, S. (1959). The Chicago Area Project: A 25-year assessment. *The Annals of the American Academy of Political and Social Science*, 322, 19-29.

Kornhauser, R. R. (1978). *Social Sources of Delinquency*. Chicago: University of Chicago Press.

Kreft, I., & De Leeuw, J. (1998). *Introducing Multi-Level Modeling*. Thousand Oaks, CA: Sage Publications.

Krivo, L. J., & Peterson, R. D. (1996). Extremely disadvantaged neighborhoods and urban crime. *Social Forces*, 75, 619-650.

Kubrin, C. E., & Weitzer, R. (2003). New directions in social disorganization theory. *Journal of Research in Crime and Delinquency*, 40, 374-402.

Kupersmidt, J. B., Griesler, P. C., DeRosier, M. E., Patterson, C. J., & Davis, P. W. (1995). Childhood aggression and peer relations in the context of family and neighborhood factors. *Child Development*, 66, 360-375.

Lewis, O. (1961). *The children of Sanchez: autobiography of a Mexican family*. New

York: Random House.

Lilly, J. R., Cullen, F. T., & Ball, R. A. (2007). *Criminological Theory: Context and Consequences, 4th Edition*. Thousand Oaks, CA: Sage.

Lindstrom, P. (1995). *School Context and Delinquency. Project Metropolitan*. Research Report No. 41. Department of Sociology, University of Stockholm.

Lizotte, A. J., Thornberry, T. P., Krohn, M. D., Chard-Wierschem, D. C., & McDowall, D. (1994). Neighborhood context and delinquency: A longitudinal analysis. In Weitekamp, E. M. G., & H-J Kerner (Eds.), *Cross-National Longitudinal Research on Human Development and Criminal Behavior*. Kluwer Academic Publishers: Netherlands.

Luengo, M. A., Carrillo-de-la-Pena, M. T., Otero, J. M., & Romero, E. (1994). *Journal of Personality and Social Psychology*, 66, 542-548.

Lundman, R. J. (2001). *Prevention and Control of Juvenile Delinquency*. New York: Oxford University Press.

Lykken, D. T. (1995). *The Antisocial personalities*. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Lynam, D. R., Wikstrom, P. H. Caspi, A., Moffitt, T. E., Loeber, R., & Novak, S. (2000). The interaction between impulsivity and neighborhood context on offending: The effects of impulsivity are stronger in poorer neighborhoods. *Journal of Abnormal Psychology*, 109, 563-574.

Maas, C. J., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology*, 1, 86-92.

Magnusson, D. (1988). *Individual Development from an Interactional Perspective: A*

*Longitudinal Study*. Hillsdale, NJ: Erlbaum.

Marz, K., & Stamatel, J. (2005). Project on Human Development in Chicago

Neighborhoods (PHDCN) data now available. *ICPSR Bulletin*, 26, 13-17.

Massey, D. S., & Denton, N. A. (1993). *American Apartheid: Segregation and the

Making of the Underclass*. Cambridge: Harvard University Press.

Matsueda, R. L., Kreager, D. A., & Huizinga, D. (2006). Deterring delinquents: A

rational choice model of theft and violence. *American Sociological Review*, 71,

95-122.

Merton, R. K. (1938). Social structure and anomie. *American Sociological Review*, 3,

672-682.

Merton, R. K. (1968). *Social Theory and Social Structure.* Free Press.

Messner, S. F. (1988). Research on criminal and socioeconomic factors in criminal

violence. *The Psychiatric Clinics of North America*, 11, 511-525.

Messner, S. F., & Rosenfeld, R. (1994). *Crime and the American Dream*. Belmont, CA:

Wadsworth.

Miethe, T. D., & McDowall, D. (1993). Contextual effects in models of criminal

victimization. *Social Forces*, 3, 741-759.

Miller, W. B. (1958). Lower class culture as a generating milieu of gang delinquency.

*Journal of Social Issues*, 14, 5-19.

Miller, J., & Lynam, D. (2001). Personality and antisocial behavior. *Criminology*, 39,

765-799.

Mischel, W. (1968). *Personality and Assessment*. New York: John Wiley & Sons.

Mischel, W. (1977). The interaction of person and situation. In D. Magnusson and N. S.

Endler (Eds.), *Personality at the Crossroads: Current Issues in Interactional Psychology* (pp. 333-352). Hillsdale, NJ: Erlbaum.

Mischel, W. (2004). Toward an integrative science of the person. *Annual Review of Psychology*, 55, 1-22.

Moeller, F. G., Barratt, E. S., Dougherty, D. M., Schmitz, J. M., & Swann, A. C. (2001). Psychiatric aspects of impulsivity. *American Journal of Psychiatry*, 158, 1783-1793.

Moffitt, T. E. (1993). Adolescence-limited and life-course persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 674-701.

Moffitt, T. E., Caspi, A., & Rutter, M. (2005). Strategy for investigating interactions between measured genes and measured environments. *Archives of General Psychiatry*, 62, 473-481.

Moffitt, T. E., & Henry, B. (1989). Neuropsychological assessment of executive functions in self-reported delinquents. *Development and Psychopathology*, 1, 105-118.

Morenoff, J. D. (2003). Neighborhood mechanisms and the spatial dynamics of birth weight. *American Journal of Sociology*, 108, 976-1017.

Morenoff, J. D., & Sampson, R. J. (1997). Violent crime and the spatial dynamics of neighborhood transition: Chicago, 1970-1990. *Social Forces*, 76, 31-64.

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

Moss, R. H. (1976). *The Human Context: Environmental Determinants of Behavior*. New York: Wiley.

Nagin, D. (1998). Criminal deterrence at the outset of the twenty-first Century. In M. Tonry (Eds.), *Crime and Justice: A Review of Research,* Volume 23 (pp. 1-42).

Chicago: University of Chicago Press.

Nagin, D. S., & Farrington, D. P. (1992). The onset and persistence of offending. *Criminology, 30*(4), 501-523.

Nagin, D. S., & Paternoster, R. (1993). Enduring individuals differences and rational choice theories of crime. *Law & Society Review, 27*(3), 467-496.

Nagin, D. S., & Pogarsky, G. (2001). Integrating celerity, impulsivity, and extralegal sanction threats into a model of general deterrence: Theory and evidence. *Criminology*, 39, 865-891.

National Institute on Drug Abuse. (1991). *National Household Survey on Drug Abuse: Population Estimates*. Rockville, MD: Government Printing Office.

Newman, J. P. (1987). Reaction to punishment in extraverts and psychopaths: Implications for the impulsive behavior of disinhibited individuals. *Journal of Research in Personality*, 21, 464-480.

Newman, J. P., Patterson, C. M., & Kosson, D. (1987). Response perseveration in psychopaths. *Journal of Abnormal Psychology*, 96, 145-148.

Nisbett, R. E., & Cohen, D. (1996). *Culture of Honor: The Psychology of Violence in the South*. Boulder, CO: Westview.

Nye, F. I. (1958). *Family Relationships and Delinquent Behavior*. New York: Wiley.

Oquendo, M. A., & Mann, J. J. (2000). The biology of impulsivity and suicidality. *Psychiatric Clinics of North America*, 23, 11-25.

Osgood, D. W., McMorris, B. J., & Potenza, M. T. (2002). Analyzing multiple-item measures of crime and deviance 1: Item response theory scaling. *Journal of Quantitative Criminology*, 18, 267-296.

Park, R. E. (1916). Suggestions for the investigations of human behavior in the urban environment. *American Journal of Sociology*, 20, 577-612.

Park, R. E., & Burgess, E. W. (1924). The urban community as a special pattern and a moral order. In E. W. Burgess (Eds.), *The Urban Community* (pp. 3-18). Chicago: University of Chicago Press.

Patterson, G. R. (1982). *A social learning approach: Volume 3. Coercive family process*. Eugene, OR: Castalia.

Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *Antisocial boys*. Eugene, OR: Castalia.

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

Pattillo, M. E. (1999). *Black Picket Fences: Privilege and Peril Among the Black Middle Class*. Chicago: University of Chicago Press.

Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology*, 51, 768-774.

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

Pinel, P. (1806). *A Treatise on Insanity*. Published by W. Todd, Sheffield. Translated by D. D. Davis.

Piquero, A. R., Moffitt, T. E., & Wright, B. E. (2007). Self-control and criminal career dimensions. *Journal of Contemporary Criminal Justice*, 23, 72-89.

Pogarsky, G., A. R. Piquero, and R. Paternoster. (2004). Modeling Change in Perceptions

About Sanctions Threats: The Neglected Linkage in Deterrence Theory. *Journal of Quantitative Criminology*, 20, 343-370.

Pratt, T., & Cullen, F. (2005). Assessing the relative effects of macro-level predictors of crime: A meta-analysis. In M. Tonry (Eds.), *Crime and Justice: A Review of Research* (pp. 373-450). Chicago: University of Chicago Press.

Raine, A. (1988). Antisocial behaviour and social psychophysiology. In H. L. Wagner (Eds.), *Social Psychophysiology and Emotion: Theory and Clinical Applications* (pp. 231-250). New York: Wiley.

Ratcliffe, J. H. (2006). A temporal constraint theory to explain opportunity-based spatial offending patterns. *Journal of Research in Crime and Delinquency*, 43, 261-291.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical Linear Models: Applications and Data Analysis Methods, Second Edition*. London: Sage.

Raudenbush, S. W., Johnson, C., & Sampson, R. J. (2003). A multivariate, multilevel Rasch model with application to self-reported criminal behavior. *Sociological Methodology*, 33, 169 - 211.

Raudenbush, S. W., & Sampson, R. J. (1999). Ecometrics: Toward a science of assessing ecological settings, with application to the systematic social observation of neighborhoods. *Sociological Methodology*, 29, 1-41.

Reardon, S. F., & Raudenbush, S. W. (2006). A partial independence item response model for surveys with filter questions. *Sociological Methodology*, 36, 257-300.

Reiss, A. J., & Rhodes, A. L. (1961). The distribution of juvenile delinquency in the social class structure. *American Sociological Review*, 26, 720-732.

Rengert, G. F., & Wasilchick, J. (1985). *Suburban Burglary: A Time and Place for*

*Everything*. Springfield, IL: C.C. Thomas.

Robins, L. N. (1978). Sturdy childhood predictors of adult antisocial behavior: Replications from longitudinal studies. *Psychological Medicine*, 8, 611-622.

Robins, L. N. (1993). Vietnam veteran's rapid recovery from heroin addiction: A fluke or normal expectation? *Addiction*, 88, 1041-1054.

Rosenfeld, R., Messner, S. F., & Baumer, E. P. (2001). Social capital and homicide. *Social Forces*, 80, 283-309.

Ross, R. R., & Ross, B. D. (1988). Delinquency prevention through cognitive training. *New Education*, 10, 70-75.

Rountree, P. W., Land, K. C., & Miethe, T. D. (1994). Macro-micro integration in the study of victimization: A hierarchical logistic model analysis across Seattle neighborhoods. *Criminology*, 32, 387-414.

Sampson, R. J. (1989). The promises and pitfalls of macro-level research. *The Criminologist*, 14, 1-ff.

Sampson, R. J. (2003). The neighborhood context of well being. *Perspectives in Biology and Medicine*, 46, S53-S73.

Sampson, R. J. (2006). Collective efficacy theory: Lessons learned and directions for future inquiry. In F. T. Cullen, J. P. Wright, and K. R. Blevins (Eds.), *Taking Stock: The Status of Criminological Theory. Advances in Criminological Theory, Volume 15* (pp. 149-167). New Brunswick, NJ: Transaction.

Sampson, R. J., & Groves, W. B. (1989). Community structure and crime: Testing social disorganization theory. *American Journal of Sociology*, 94, 774-802.

Sampson, R. J., & Laub, J. H. (1994). Urban poverty and family context of delinquency:

A new look at structure and process in a classic study. *Child Development*, 65, 523-540.

Sampson, R. J., Morenoff, J. D., & Earls, F. (1999). Beyond social capital: spatial dynamics of collective efficacy for children. *American Sociological Review*, 64, 633-660.

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

Sampson, R. J., Morenoff, J. D., & Raudenbush, S. (2005). Social anatomy of racial and ethnic disparities in violence. *American Journal of Public Health*, 95, 224-232.

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, 918-924.

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

Sarason, I. G. (1977). The growth of interactional psychology. In D. Magnusson and N. S. Endler (Eds.), *Personality at the Crossroads: Current Issues in Interactional Psychology* (pp. 261-272). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Schalling, D. (1978). Psychopathy-related personality variables and the psychophysiology of socialization. In R. D. Hare & D. Schalling (Eds.), *Psychopathic*

*Behavior: Approaches to Research*, pp. 85-106. Chichester, England: Wiley.

Shaw, C., & McKay, H. D. (1942). *Juvenile Delinquency and Urban Areas*. Chicago:
University of Chicago Press.

Shoda, Y., Mischel, W., & Wright, J. C. (1994). Intraindividual stability in the
organization and patterning of behavior: Incorporating psychological situations into
the idiographic analysis of personality. *Journal of Personality and Social Psychology*,
67, 674-687.

Silver, E. (2000). Extending social disorganization theory: A multilevel approach to the
study of violence among persons with mental illnesses. *Criminology*, 38, 1043-1073.

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

Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel Analysis: An Introduction to Basic
and Advanced Multilevel Modeling*. London: Sage Publications.

Stark, R. (1987). Deviant places: A theory of the ecology of crime. *Criminology*, 25,
893-909.

Sutherland, E. (1931). Mental deficiency and crime. In K. Young (Eds.), *Social Attitudes*,
chap. 15. New York, Henry Holt.

Sutherland, E. (1947). *Principles of Criminology, 4ᵗʰ Edition*. Philadelphia: J. B.
Lippincott.

Sykes, G., & Matza, D. (1957). Techniques of neutralization: A theory of delinquency.
*American Sociological Review*, 22, 664-673.

Tellegen, A. (1982). *Multidimensional Personality Questionnaire Manual*. Minneapolis:

University of Minnesota Press.

Thornberry, T. P., & Krohn, M. D. (2002). Comparison of self-report and official data for
measuring crime. In J. V. Pepper and C. V. Petrie (Eds.), *Measurement Problems in
Criminal Justice Research: Workshop Summary* (pp. 43-94). Washington, DC:
National Academics Press.

Tonry, M., Ohlin, L. E., & Farrington, D. P. (1991). *Human Development and Criminal
Behavior*. New York: Springer-Verlag.

Tremblay, R. E., Pihl, R. O., Vitaro, F., & Dobkin, P. L. (1994). Predicting early onset of
male antisocial behavior from preschool behavior. *Archives of General Psychiatry*, 51,
732-739.

Vazsonyi, A. T., Cleveland, H. H., & Wiebe, R. P. (2006). Does the effect of impulsivity
on delinquency vary by level of neighborhood disadvantage? *Criminal Justice and
Behavior*, 33, 511-541.

Velez, M. (2001). The role of public social control in urban neighborhoods. *Criminology*,
39, 837-863.

Vigil-Colet, A., & Codorniu-Raga, M. J. (2004). Aggression and inhibition deficits, the
role of functional and dysfunctional impulsivity. *Personality and Individual
Differences*, 37, 1431-1440.

Warner, B. D. (2003). The role of attenuated culture in Social Disorganization Theory.
*Criminology*, 41, 73-97.

Warner, B. D. (2007). Directly intervene or call the authorities? A study of forms of
neighborhood social control within a social disorganization framework. *Criminology*,
45, 99-130.

Warner, B. D., & Rountree, P. (1997). Examining informal social ties in a community
and crime model: Questioning the systemic nature of informal social control. *Social
Problems*, 44, 520-536.

White, J. L., Moffitt, T. E., Caspi, A., Bartusch, D, J., Needles, D. J., & Stouthamer-
Loeber, M. (1994). Measuring impulsivity and examining its relationship to
delinquency. *Journal of Abnormal Psychology*, 103, 192-205.

Wikstrom, P-O H. (1991). Housing tenure, social class and offending. *Criminal Behavior
and Mental Health*, 1, 69-89.

Wikstrom, P-O H. (2002). *Adolescent Crime in Context*. University of Cambridge:
Cambridge.

Wikstrom, P-O H. (2004). Crime as alternative: Towards a cross-level situational action
theory of crime causation. In J. McCord, (Eds.), *Beyond Empiricism* (pp. 1-38). New
Brunswick, NJ: Transaction Publishers.

Wikstrom, P-O H., & Loeber, R. (2000). Do disadvantaged neighborhoods cause well-
adjusted children to become adolescent delinquents? A study of male juvenile serious
offending, individual risk and protective factors, and neighborhood context.
*Criminology*, 38, 1109-1142.

Wikstrom, P-O H., & Sampson, R. J. (2003). Social mechanisms of community
influences on crime and pathways in criminality. In B. B. Lahey, T. E. Moffitt, and A.
Caspi (Eds.), *Causes of Conduct Disorder and Juvenile Delinquency* (pp. 118-152).
New York: The Guildford Press.

Wilson, J. Q., & Herrnstein, R. J. (1985). *Crime and Human Nature*. New York:
Touchstone Book.

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

Wilson, W. J. (1996). *When Work Disappears: The World of the New Urban Poor*. New York: Alfred A. Knopf.

Wilson, J. Q., & Kelling, G. (1982). The police and neighborhood safety: Broken windows. *Atlantic*, 127, 29-38.

Wolfgang, M. E. (1958). *Patterns in Criminal Homicide*. Philadelphia: University of Pennsylvania Press.

Wolfgang, M. E., & Ferracuti, F. (1982). *The Subculture of Violence*. Beverly Hills: Sage.

TABLE 1

Number of Census Tracts (N = 196) and Sampled Neighborhood Clusters (N = 80) by Socioeconomic Status (SES) and Racial/Ethnic Composition

| | SES | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Racial/Ethnic Strata | Low | | Medium | | High | | Total | |
| ≥ 75% Black | 31 | (9) | 10 | (4) | 9 | (4) | 50 | (17) |
| ≥ 75% White | 0 | (0) | 7 | (4) | 19 | (8) | 25 | (12) |
| ≥ 75% Latino | 12 | (4) | 12 | (4) | 0 | (0) | 24 | (8) |
| ≥ 20% Latino and ≥ 20% White | 11 | (4) | 14 | (5) | 10 | (4) | 35 | (13) |
| ≥ 20% Hispanic and ≥ 20% Black | 7 | (4) | 7 | (4) | 0 | (0) | 14 | (8) |
| ≥ 20% Black and ≥ 20% White | 3 | (2) | 4 | (4) | 10 | (4) | 17 | (10) |
| NCs Not Classified Above | 8 | (4) | 14 | (4) | 9 | (4) | 31 | (12) |
| TOTAL | 72 | (27) | 68 | (29) | 56 | (24) | 196 | (80) |

Note: The NCs are shown in parentheses.

SES was defined by an additive scale of the following standardized neighborhood measures based on the 1990 decennial census: median income; percent college educated; percent with a household income over $50,000; percent of families below the poverty line; percent of families on public assistance; and percent of families with a household income less than $50,000.

TABLE 2
Descriptive Statistics for Original Sample and Analysis of Attrition

| Variable | Original Sample (N=1,517) | Sample not Lost to Attrition Across Waves (N=1,315) | Sample with Valid Outcome Data at Wave 2 (N=1,235) | Final Sample with Valid Impulsivity Data (N=1,191) |
|---|---|---|---|---|
| Sex (% Female) | 50.9 | 50.5 | 51.4* | 51.3 |
| Race/Ethnicity (%) | | | | |
| Hispanic | 44.8 | 45.9* | 46.1 | 46.3 |
| African American | 36.7 | 35.4* | 35.6 | 35.3 |
| White | 14.3 | 15.1* | 14.9 | 15.1 |
| Other | 4.2 | 3.6* | 3.4 | 3.3 |
| Family Structure (%) | | | | |
| Two Bio | 43.4 | 45.1* | 45.4 | 45.8 |
| Two Non-Bio | 21.4 | 20.5* | 20.4 | 20.7 |
| One Bio | 30.0 | 29.2 | 29.0 | 29.0 |
| One Non-Bio | 4.3 | 4.5 | 4.5 | 4.6 |
| Age | 13.53 (1.54) | 13.51 (1.53) | 13.50 (1.52) | 13.49 (1.52) |
| Family SES | -0.14 (1.40) | -0.12 (1.41) | -0.12 (1.42) | -0.11 (1.42) |
| Years at Residence | 6.66 (7.29) | 6.96 (7.46)* | 6.96 (7.46) | 6.94 (7.47) |
| Impulsivity | 3.96 (3.79) | 3.95 (3.78) | 3.93 (3.76) | 3.92 (3.76) |

*$p < 0.05$

*Neighborhood Level Data*

| | |
|---|---|
| Socioeconomic Status (SES) | 0.05 (0.76) |
| Concentrated Immigration | 0.40 (1.06) |
| Residential Instability | -0.09 (0.97) |
| Neighborhood Activism | -2.01 (0.69) |
| Collective Efficacy | 3.44 (0.29) |
| Pro-Criminal Definitions | 2.38 (0.16) |
| Criminogenic Behavior Settings | 1.86 (0.38) |

All individual-level data were obtained at Wave 1. Distributions of binary (sex) and nominal (race/ethnicity and family structure) variables were compared using likelihood ratio $\chi^2$ test statistics. For continuous variables (reported with standard deviations in parentheses), two-sample, equal variance *t*-tests were used to compare subjects who were lost to follow-up or missing data to subjects who were included in the analysis.

TABLE 3

Oblique Rotated Factor Pattern for Chicago Neighborhoods from 1990
Decennial Census

| Variable | Factor Loading |
|---|---|
| *Socioeconomic Status* | |
| Percent of Families Below the Poverty Line | 0.94 |
| Percent of Households Receiving Public Assistance | 0.96 |
| Percent of Non-Intact Families with Children | 0.96 |
| Median Household Income in 1989 | -0.85 |
| Percent of Population that is Unemployed | 0.88 |
| Percent of Population that in Non-White | 0.83 |
| | |
| *Concentrated Immigration* | |
| Percent of Population that is Hispanic | 0.91 |
| Percent of Population that is Foreign-Born | 0.91 |
| | |
| *Residential Instability* | |
| Percent of Occupied Housing Units that are Owner-Occupied | 0.89 |
| Percent of Population Who Lived in the Same House Five Years Ago | 0.89 |

TABLE 4
Item Responses for Crime at Wave 2

| Variable | Category | Frequency | Percent |
|---|---|---|---|
| *Violent Crime* | | | |
| Hit someone with whom you lived with in the past 12 months with the idea of hurting them | 0 = No<br>1 = Yes | 1,069<br>120 | 10.1% |
| Hit someone with whom you did not live with in the past 12 months with the idea of hurting them | 0 = No<br>1 = Yes | 908<br>283 | 23.8% |
| Hit or attacked someone you did not live with in the past 12 months with a weapon | 0 = No<br>1 = Yes | 1,143<br>48 | 4.0% |
| Thrown objects, such as rocks or bottles, at people in the past 12 months | 0 = No<br>1 = Yes | 1,055<br>135 | 11.3% |
| Carried a hidden weapon in the last 12 months | 0 = No<br>1 = Yes | 1,078<br>113 | 9.5% |
| Purposely set fire to a house, building, car, or vacant lot in the past 12 months | 0 = No<br>1 = Yes | 1,185<br>5 | 0.4% |
| Snatched someone's purse or wallet or picked someone's pocket in the past 12 months | 0 = No<br>1 = Yes | 1,182<br>7 | 0.6% |
| Used a weapon or force to get money or things from people in the past 12 months | 0 = No<br>1 = Yes | 1,185<br>6 | 0.5% |
| Been involved in a gang fight in which someone was hurt or threatened in the past 12 months | 0 = No<br>1 = Yes | 1,116<br>69 | 5.8% |
| *Property Crime* | | | |
| Purposely damaged or destroyed property that did not belong to you in the past 12 months | 0 = No<br>1 = Yes | 1,072<br>118 | 9.9% |
| Entered or broke into a building to steal something in the past 12 months | 0 = No<br>1 = Yes | 1,180<br>10 | 0.8% |
| Stolen something from a household member in the past 12 months | 0 = No<br>1 = Yes | 1,028<br>161 | 13.5% |
| Stolen something from a store in the past 12 months | 0 = No<br>1 = Yes | 1,066<br>125 | 10.5% |
| Taken something that did not belong to you from a car in the past 12 months | 0 = No<br>1 = Yes | 1,168<br>21 | 1.8% |
| Knowingly bought or sold stolen goods in the past 12 months | 0 = No<br>1 = Yes | 1,130<br>58 | 4.9% |

TABLE 5

Zero-Order Correlations Among Impulsivity, Neighborhood Measures, Offending, and Control Variables

| Variable | Impulsivity | SES | Criminogenic Settings | Pro-Criminal Definitions | Collective Efficacy |
|---|---|---|---|---|---|
| Age | 0.04 | 0.06* | -0.07* | 0.00 | 0.05 |
| Sex (Female) | 0.06* | -0.01 | -0.01 | 0.00 | 0.01 |
| *Race/Ethnicity* | | | | | |
| Hispanic | -0.09** | 0.11*** | 0.11** | 0.03 | -0.18*** |
| African American | 0.14*** | -0.46**** | 0.21** | 0.15*** | -0.09** |
| White | -0.06 | 0.42**** | -0.39*** | -0.23*** | 0.33*** |
| Other | -0.02 | 0.08** | -0.09** | -0.02 | 0.07* |
| *Family Structure* | | | | | |
| Two Parents Bio | -0.14*** | 0.25*** | -0.17*** | -0.09** | 0.12** |
| Two Parents Non-Bio | 0.06 | 0.03 | 0.04 | 0.05 | -0.05 |
| One Parent Bio | 0.04 | -0.16**** | 0.10*** | 0.02 | -0.05 |
| One Parent Non-Bio | 0.13*** | -0.19**** | 0.11*** | 0.07* | -0.07* |
| Family SES | -0.06* | 0.32*** | -0.41*** | -0.23*** | 0.35*** |
| Years at Residence | -0.04 | -0.06 | -0.03 | 0.03 | 0.14*** |
| Impulsivity | | -0.12*** | 0.06* | 0.09** | -0.04 |
| Violent Crime | 0.11*** | -0.10*** | 0.03 | 0.05 | -0.01 |
| Property Crime | 0.05* | -0.01 | -0.03 | 0.02 | 0.01 |

Note: The full sample of N = 1,191 was used for correlations involving all demographic variables. For violent and property crime, sample sizes ranged from N = 1,180 to N = 1,185, respectively, due to missing data on one or more of the scale items.

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

TABLE 6
Item Severities

| Item | Coefficient Estimate | Standard Error |
|---|---|---|
| *Violent Crime*[1] | | |
| Intercept | -1.17 | 0.09 |
| Hit or attacked someone you did not live with in the past 12 months with a weapon | -1.99 | 0.13 |
| Thrown objects, such as rocks or bottles, at people in the past 12 months | -0.89 | 0.09 |
| Carried a hidden weapon in the last 12 months | -1.09 | 0.10 |
| Purposely set fire to a house, building, car, or vacant lot in the past 12 months | -4.08 | 0.21 |
| Snatched someone's purse or wallet or picked someone's pocket in the past 12 months | -3.80 | 0.20 |
| Used a weapon or force to get money or things from people in the past 12 months | -3.93 | 0.23 |
| Been involved in a gang fight in which someone was hurt or threatened with harm in the past 12 months | -1.61 | 0.13 |
| *Property Crime*[2] | | |
| Intercept | -2.14 | 0.10 |
| Purposely damaged or destroyed property that did not belong to you in the past 12 months | -0.06 | 0.13 |
| Entered or broke into a building to steal something in the past 12 months | -2.50 | 0.21 |
| Taken something that did not belong to you from a car in the past 12 months | -1.81 | 0.17 |
| Knowingly bought or sold stolen goods in the past 12 months | -0.82 | 0.14 |

[1]The reference item is "Hit someone with whom you did not live with in the past 12 months with the idea of hurting them."

[2]The reference item is "Stolen something from a store in the past 12 months."

TABLE 7
Baseline HLM Results for Person-Level Covariates

| Predictor | Violent Offending | | | Property Offending | | |
|---|---|---|---|---|---|---|
| | Log-Odds Coefficient | S.E. | t-ratio | Log-Odds Coefficient | S.E. | t-ratio |
| Intercept | -1.289 | 0.136 | -9.485 | -2.093 | 0.173 | -12.084 |
| Age | 0.140 | 0.031 | 4.455 | 0.081 | 0.045 | 1.812 |
| Female | -0.728 | 0.119 | -6.127 | -0.500 | 0.137 | -3.659 |
| Race/Ethnicity | | | | | | |
| African-American | 0.604 | 0.174 | 3.467 | 0.262 | 0.198 | 1.323 |
| White | 0.033 | 0.202 | 0.164 | 0.215 | 0.209 | 1.026 |
| Other | 0.046 | 0.241 | 0.189 | 0.099 | 0.336 | 0.296 |
| Family Structure | | | | | | |
| Two Non-Bio | 0.459 | 0.161 | 2.847 | 0.056 | 0.166 | 0.338 |
| One Bio | 0.258 | 0.286 | 0.902 | -0.312 | 0.297 | -1.049 |
| One Non-Bio | 0.289 | 0.159 | 1.815 | 0.099 | 0.164 | 0.603 |
| SES Comp. | -0.049 | 0.047 | -1.057 | 0.023 | 0.047 | 0.486 |
| Years at Res. | -0.012 | 0.007 | -1.884 | -0.024 | 0.011 | -2.189 |
| Impulsivity | 0.038 | 0.015 | 2.566 | 0.031 | 0.014 | 2.293 |
| Inter-Person Variance | 4.49 | | | 4.83 | | |
| Inter-Neighborhood Variance | 0.01 | | | 0.04 | | |

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TABLE 8

Simple Slope and Interaction Analysis for the Effect of Impulsivity on
Offending by Level of Socioeconomic Status (SES)

| Level of SES | Violent Crime | | Property Crime | |
|---|---|---|---|---|
| | Impulsivity Simple Slope | Interaction Coefficient | Impulsivity Simple Slope | Interaction Coefficient |
| High | 0.14*** | | 0.11*** | |
| Middle | 0.01 | -0.13** | 0.00 | -0.11** |
| Low | 0.01 | -0.13*** | 0.04 | -0.07* |
| Model Improvement $\chi^2$ | 111.24*** | | 65.27*** | |

*p < 0.05, **p < 0.01, ***p < 0.001

TABLE 9

Simple Slope and Interaction Analysis for the Effect of Impulsivity on Offending by Level of Neighborhood Social Process Risk

| Level of Risk | Criminogenic Behavior Settings | | Pro-Criminal Definitions | | Collective Efficacy | |
|---|---|---|---|---|---|---|
| | Violent Crime | Property Crime | Violent Crime | Property Crime | Violent Crime | Property Crime |
| Low | 0.12*** | 0.10*** | 0.11*** | 0.08* | 0.07** | 0.06* |
| Middle | 0.01 | 0.00 | 0.04** | 0.03 | 0.03 | 0.03 |
| High | 0.00 | 0.03 | -0.02 | 0.02 | 0.01 | 0.01 |
| Model Improvement $\chi^2$ | 54.62*** | 6.00* | 73.76*** | 4.67$^+$ | 28.78*** | 0.00 |

Note: All coefficients are in log-odds. The model improvement $\chi^2$ is the difference between the deviance statistic of the full and restricted models (d.f. = 2).

$*p < 0.05$; $**p < 0.01$; $***p < 0.001$ ($^+p < 0.10$)

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TABLE 10

The Mediating Effects of Neighborhood Social Processes:

SES → Social Processes → Impulsivity Slope

| Variable | Log-Odds Interaction Coefficient | t-ratio | p-value |
|---|---|---|---|
| *SES → Impulsivity Slope* | | | |
| Middle SES | -0.132 | -4.539 | < 0.001 |
| Low SES | -0.128 | -3.414 | 0.001 |
| Deviance Statistic = 23,097.34 | | | |
| *SES → Social Process Risk → Impulsivity Slope* | | | |
| Middle SES | -0.101 | -3.482 | 0.001 |
| Low SES | -0.078 | -2.091 | 0.036 |
| Middle Social Process Risk | -0.160 | -2.467 | 0.014 |
| High Social Process Risk | -0.230 | -2.620 | 0.009 |
| Deviance Statistic = 23,027.67 | | | |
| Model Improvement: $\chi^2 = 69.66$, $p < 0.001$ | | | |

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TABLE 11

Simple Slope Analysis for the Effect of Impulsivity on Violent Crime by Level
of Neighborhood SES and Social Process Risk

| Level of Neighborhood SES | Level of Social Process Risk | Intercept | Impulsivity Simple Slope |
|---|---|---|---|
| High | Low | -1.22 | 0.27*** |
| High | Middle | -1.14 | 0.11*** |
| High | High | -0.78 | 0.04 |
| Middle | Low | -1.10 | 0.17* |
| Middle | Middle | -1.02 | 0.01 |
| Middle | High | -0.66 | -0.06 |
| Low | Low | -1.37 | 0.19** |
| Low | Middle | -1.29 | 0.03 |
| Low | High | -0.93 | -0.04 |

Note: All coefficients are in log-odds. The intercept was calculated for the
average person in the sample.

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

TABLE 12

Simple Slope Analysis for the Effect of Impulsivity on Offending by Composite Neighborhood Risk

| | Violent Crime | | Property Crime | |
|---|---|---|---|---|
| Level of Risk | Intercept | Impulsivity Simple Slope | Intercept | Impulsivity Simple Slope |
| Low | -1.15 | 0.12* | -2.05 | 0.10* |
| Middle | -1.06 | 0.01 | -2.18 | 0.00 |
| High | -1.16 | 0.00 | -2.28 | 0.02 |

Note: All coefficients are in log-odds. The intercept was calculated for the average person in the sample.

*$p < 0.001$

**FIGURE 1**
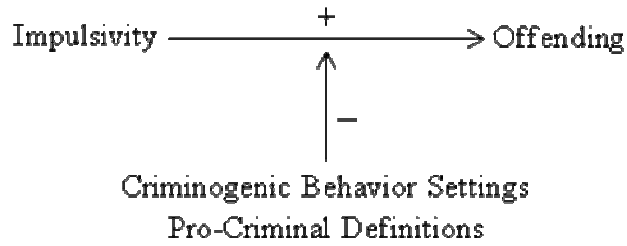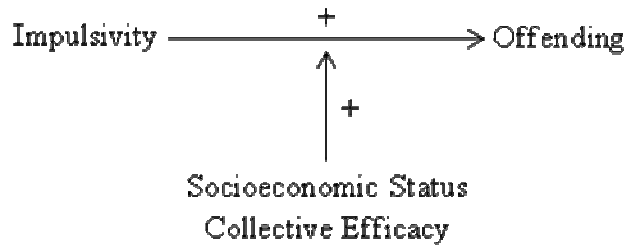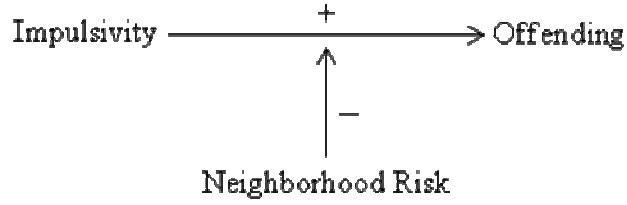
**FIGURE 2**
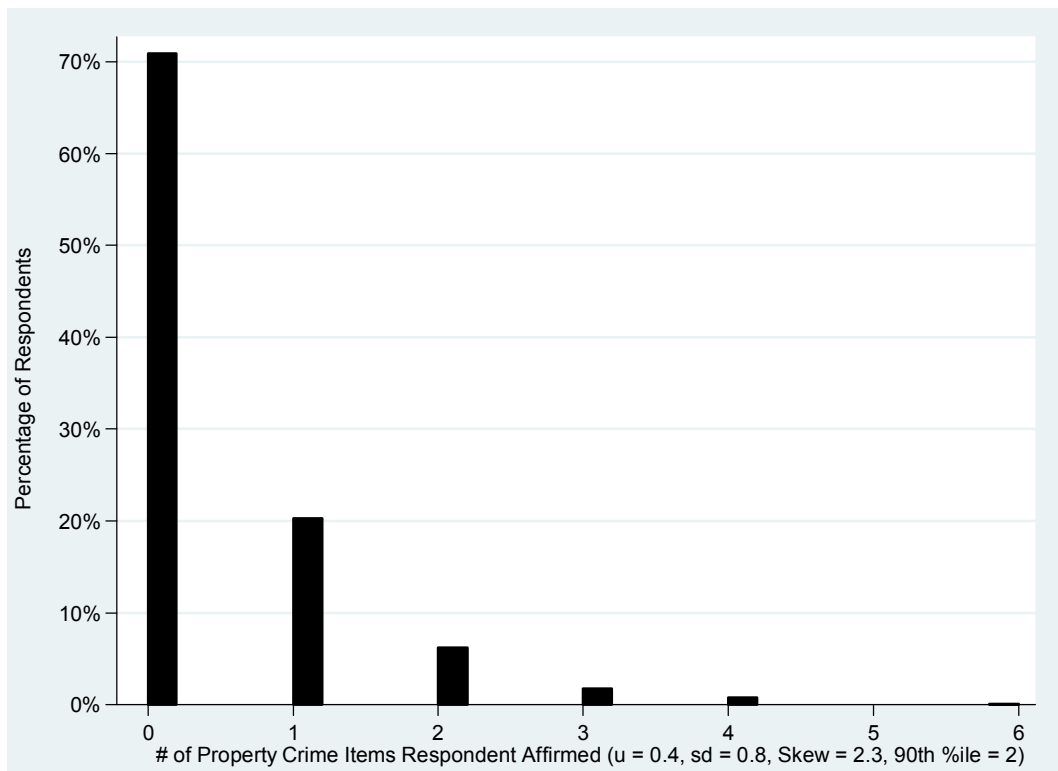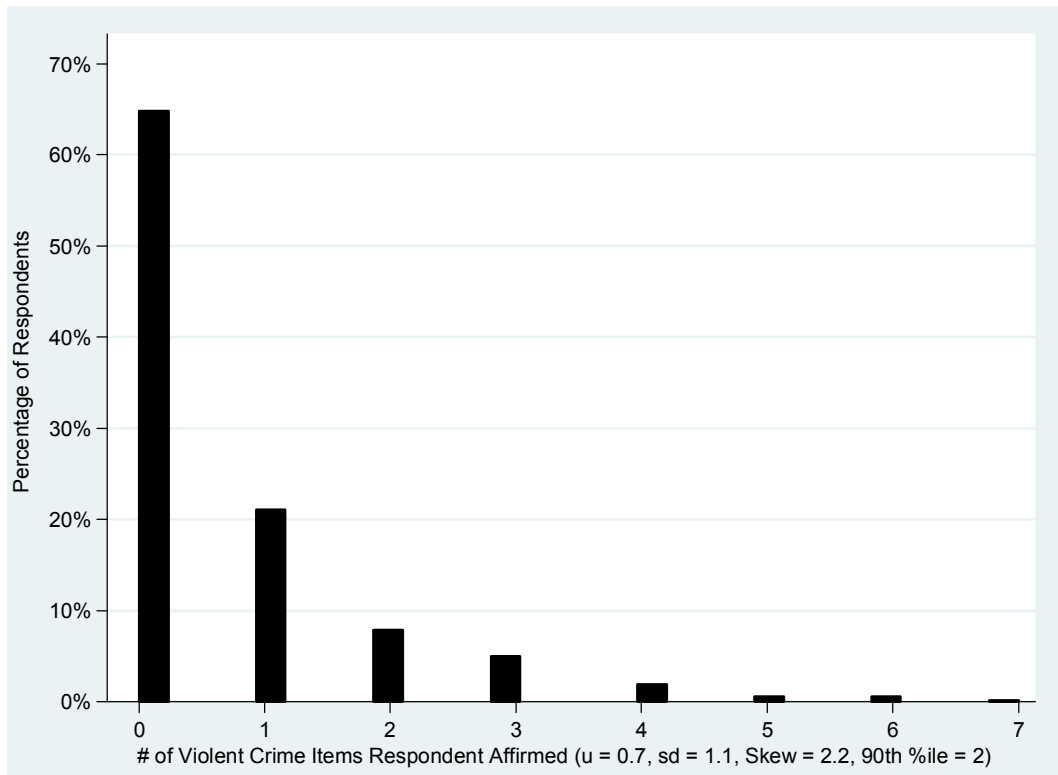
**FIGURE 3**

(a)
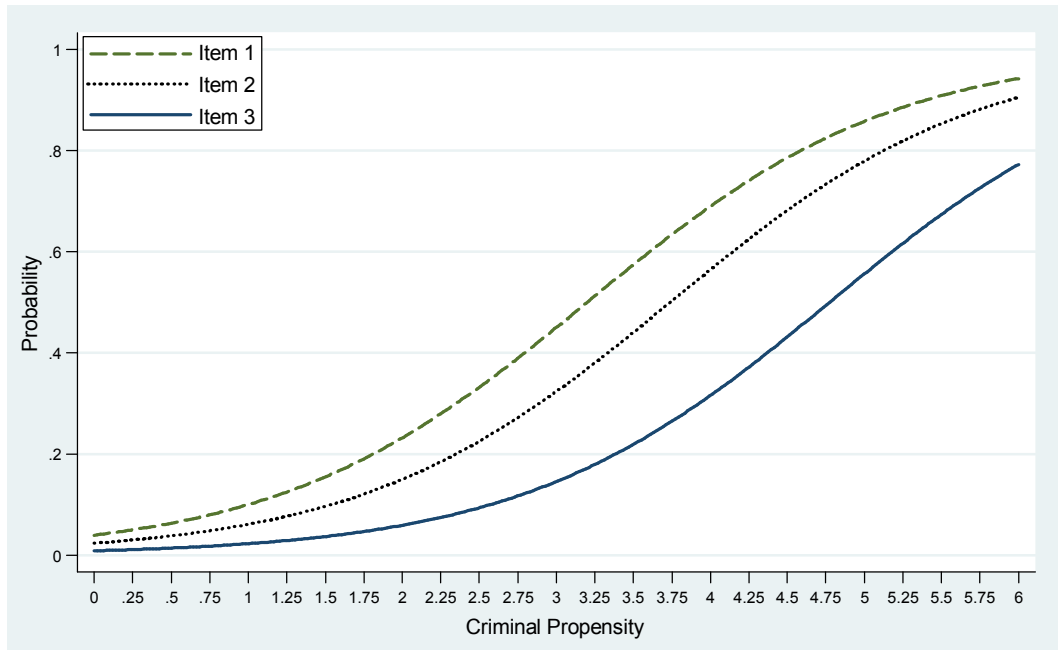


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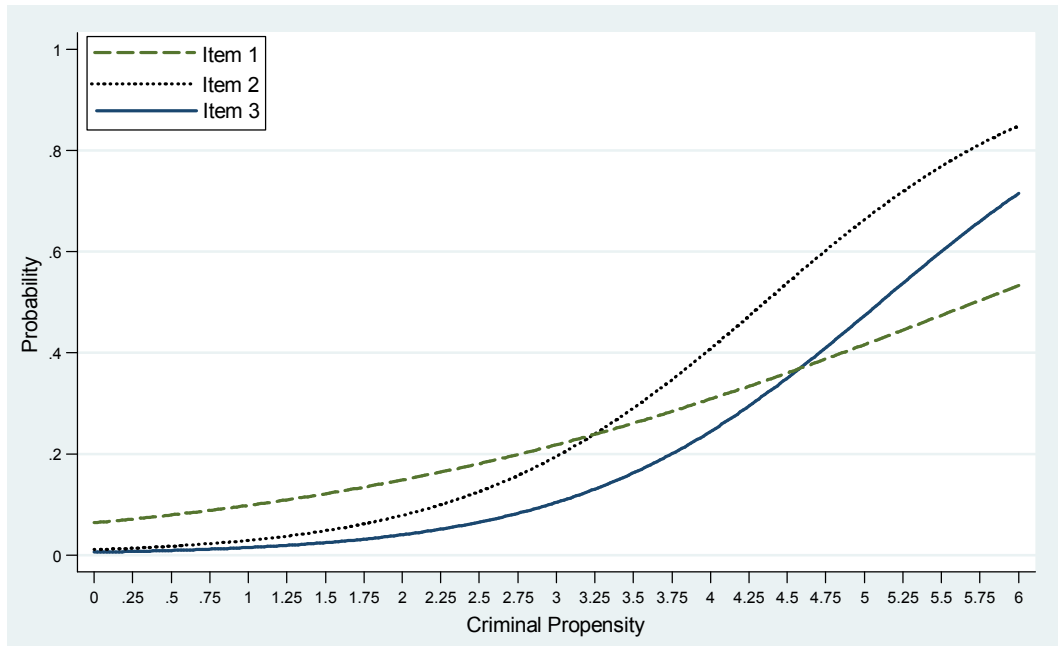
**FIGURE 4**

(a)
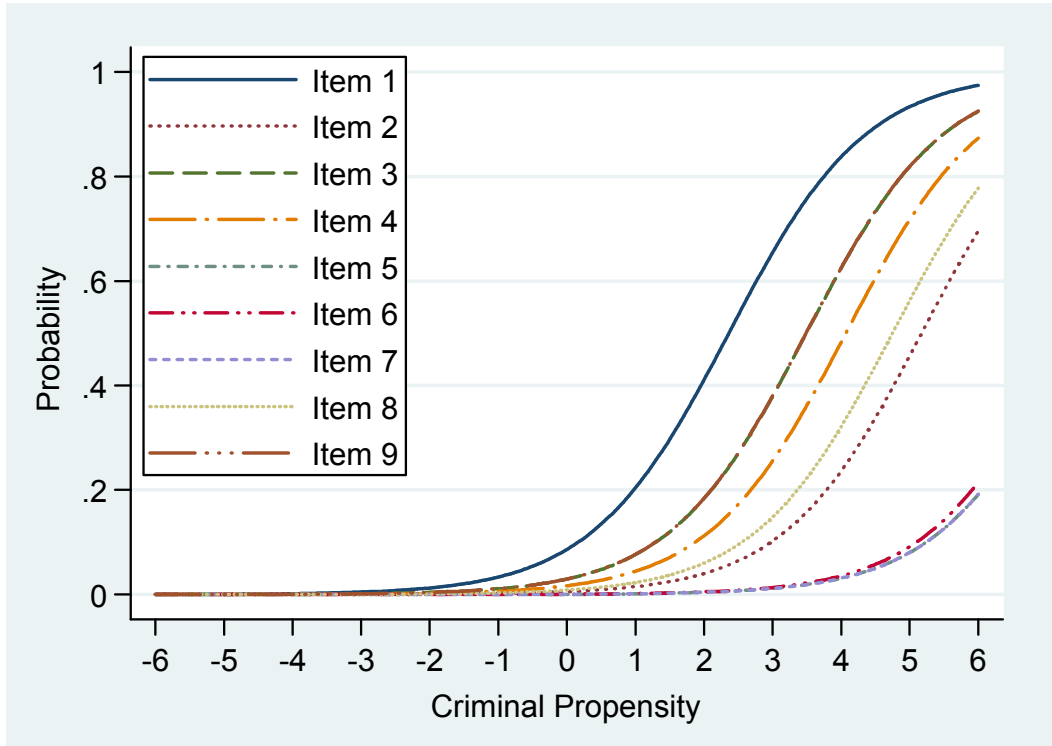


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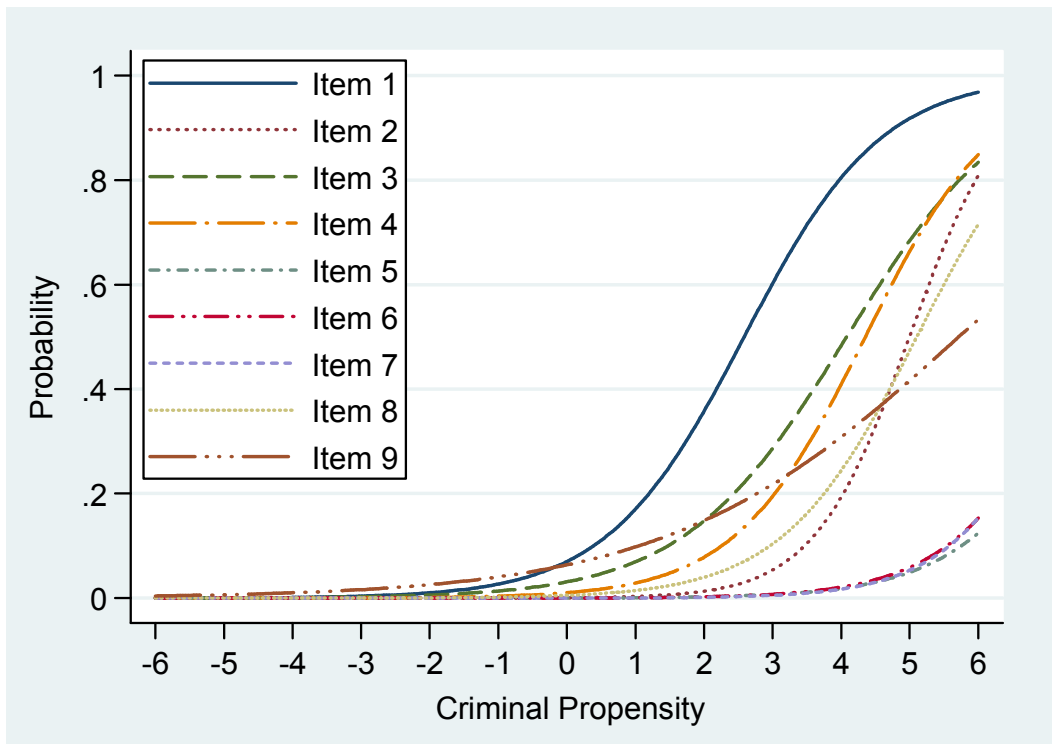
**FIGURE 5**

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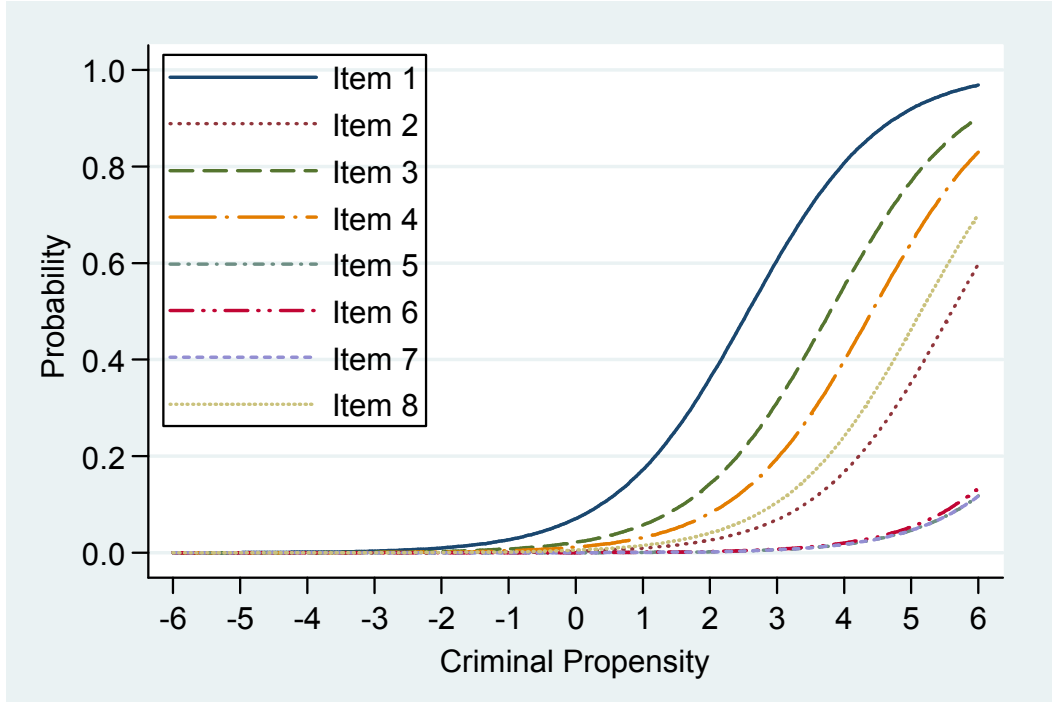


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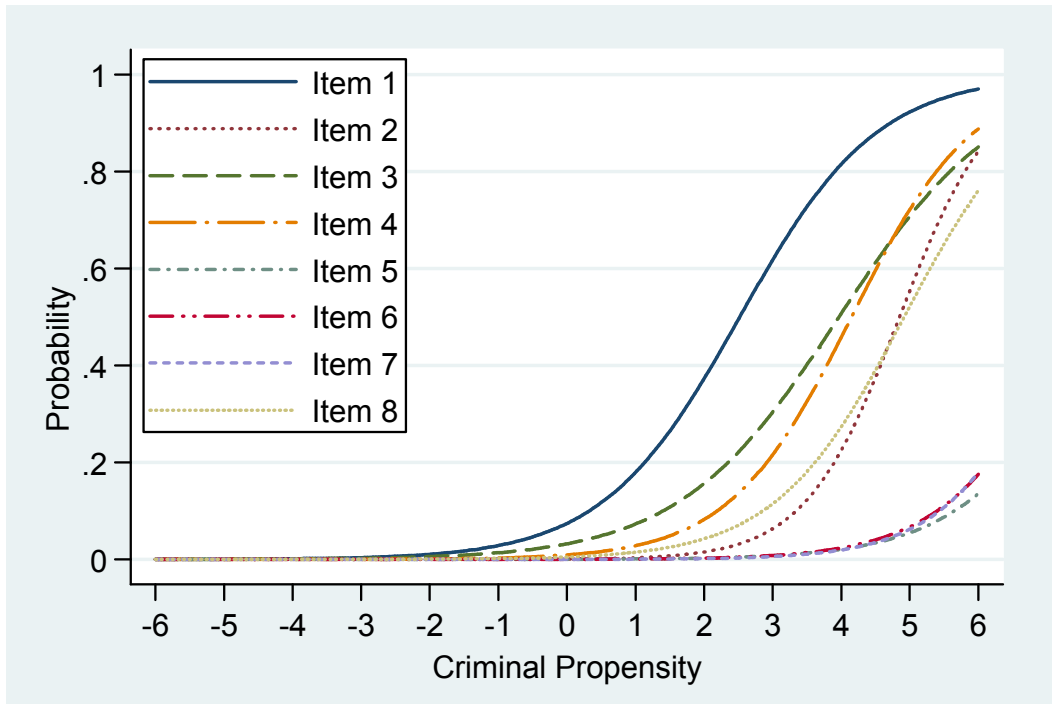
**FIGURE 6**

(a)
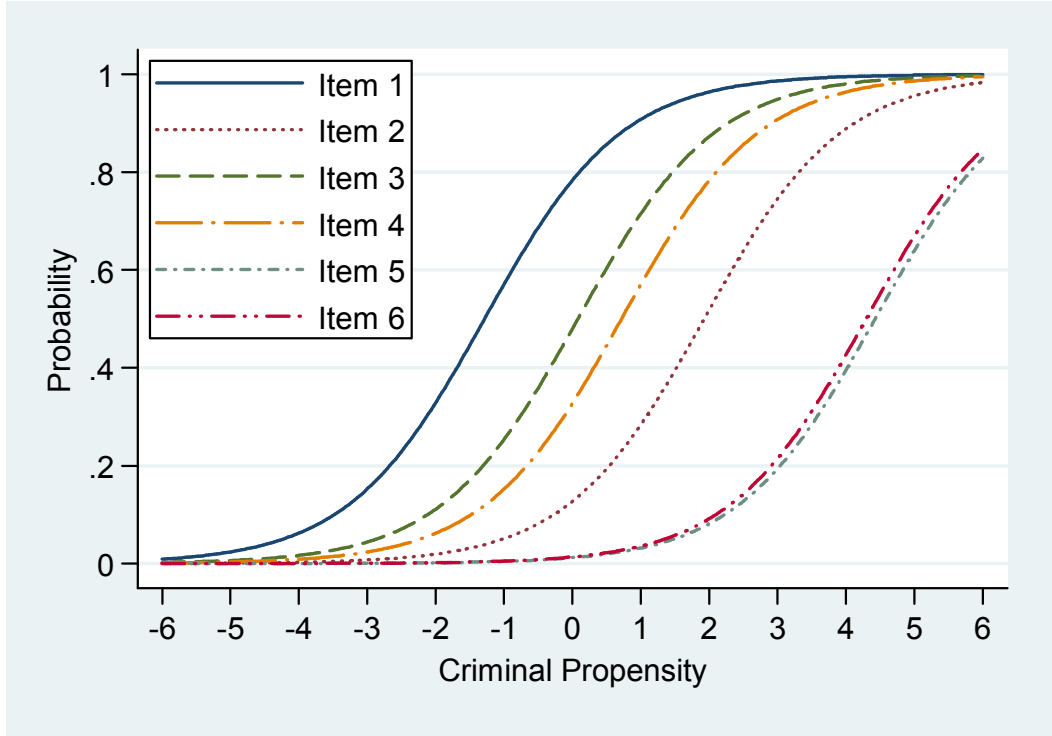


(b)
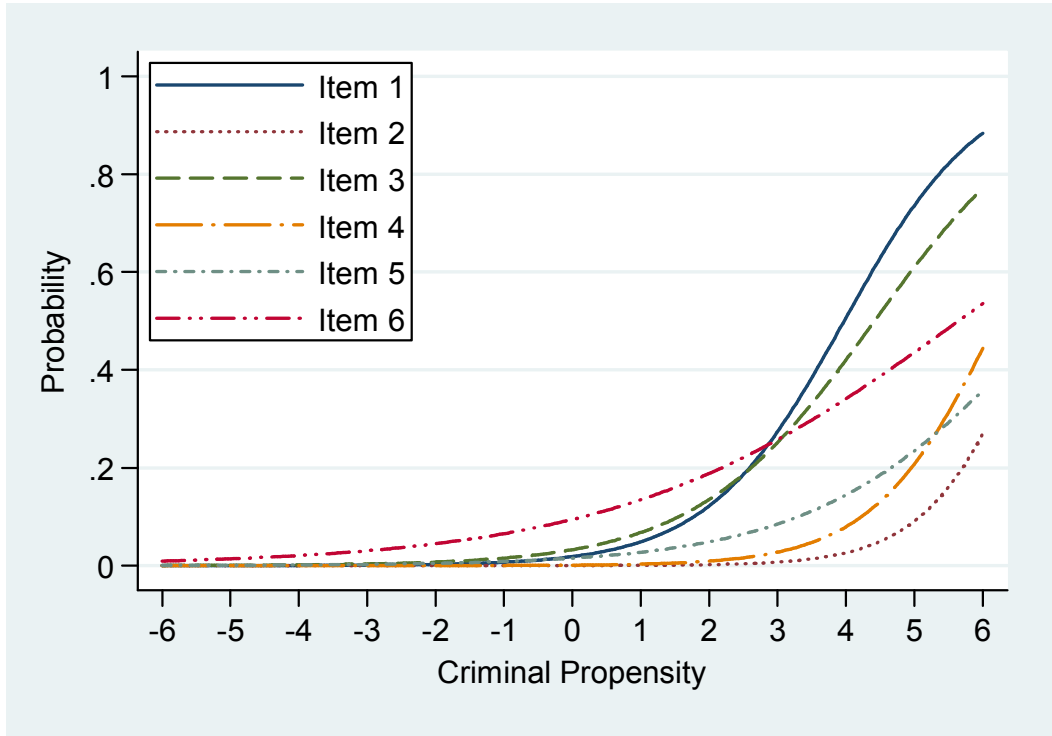
**FIGURE 7**

(a)
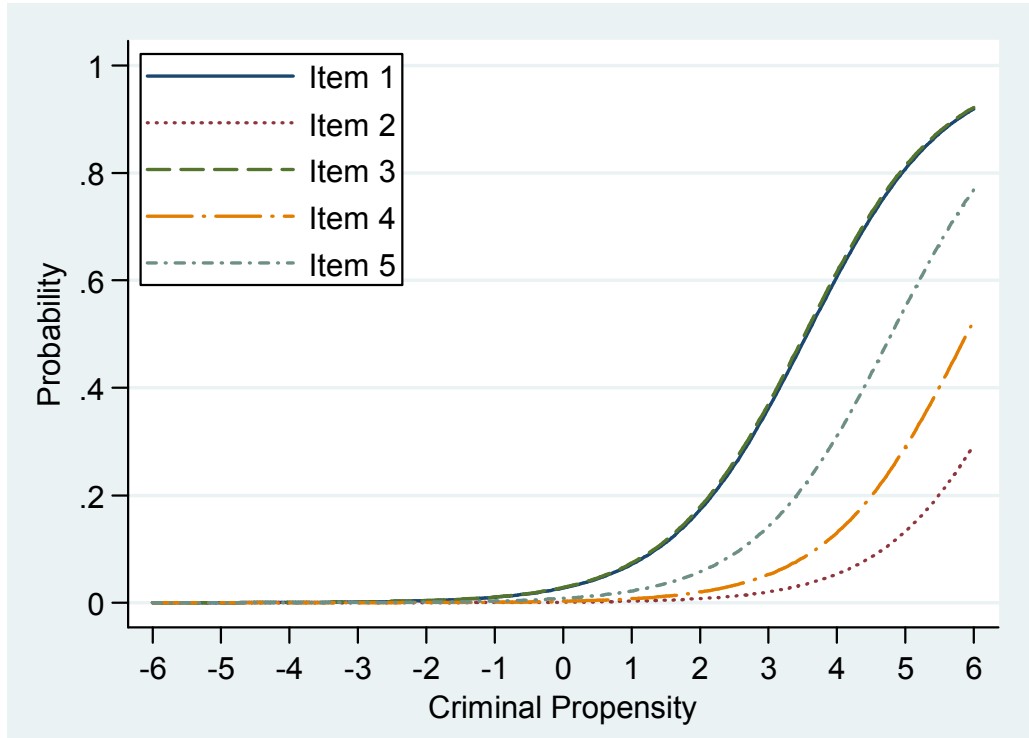


(b)
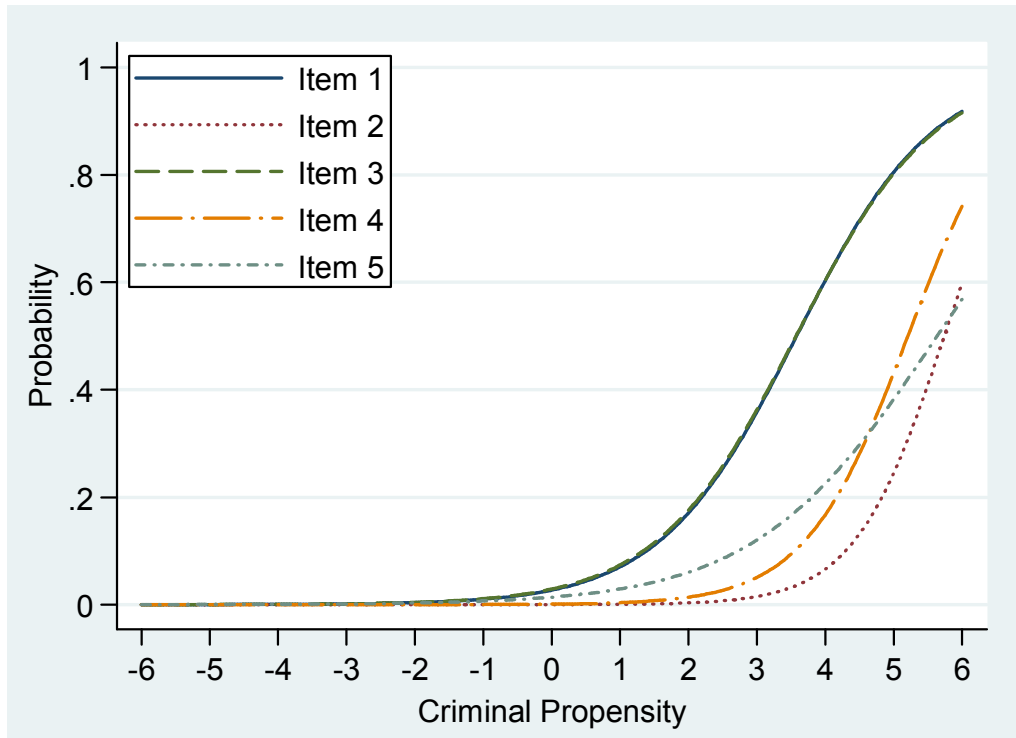
**FIGURE 8**
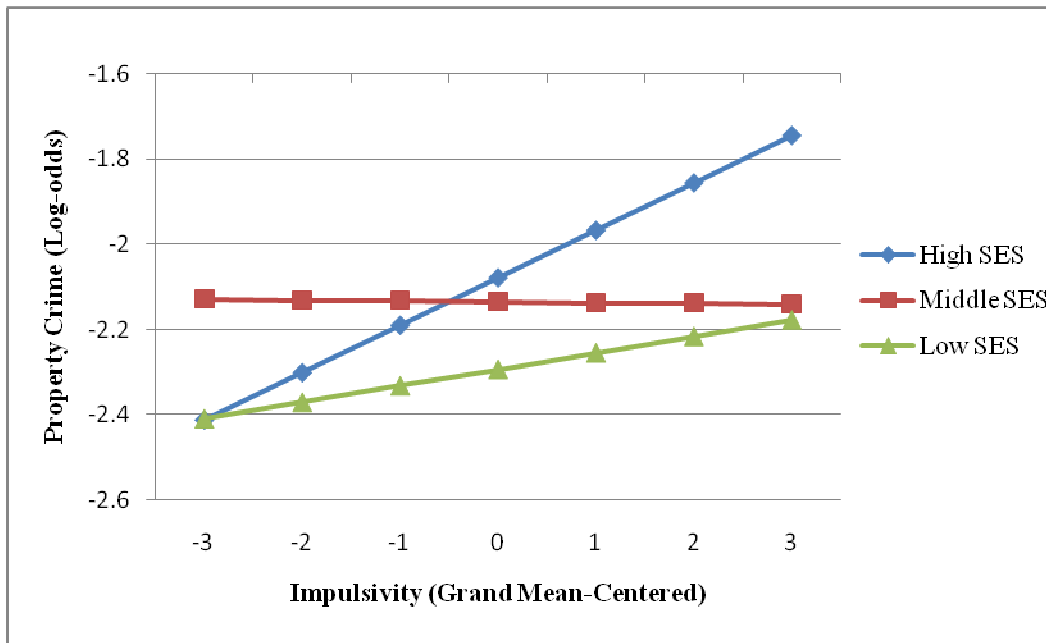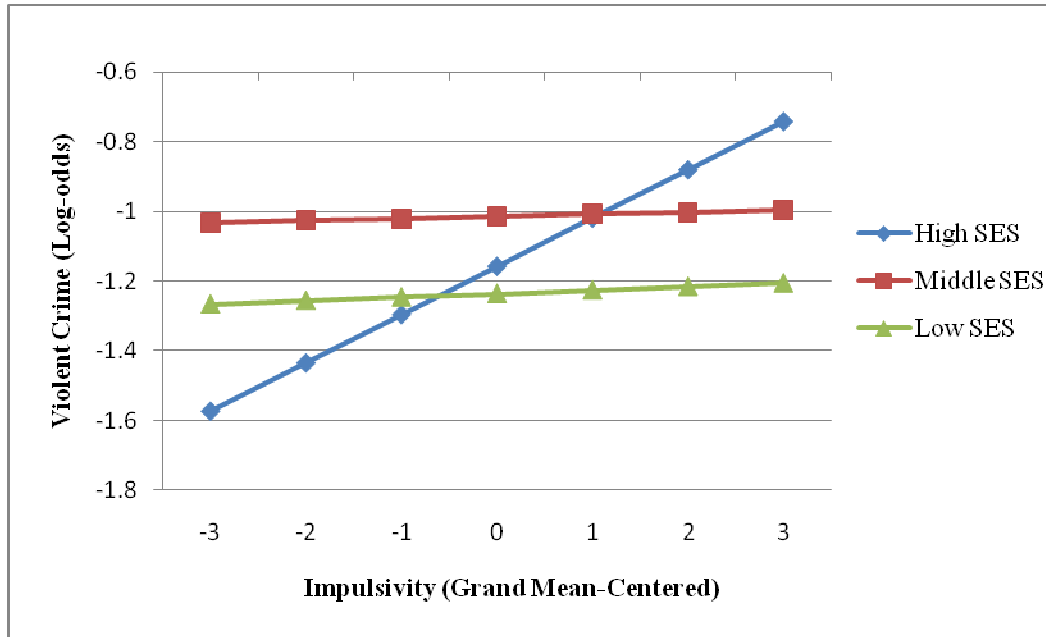
**FIGURE 9**
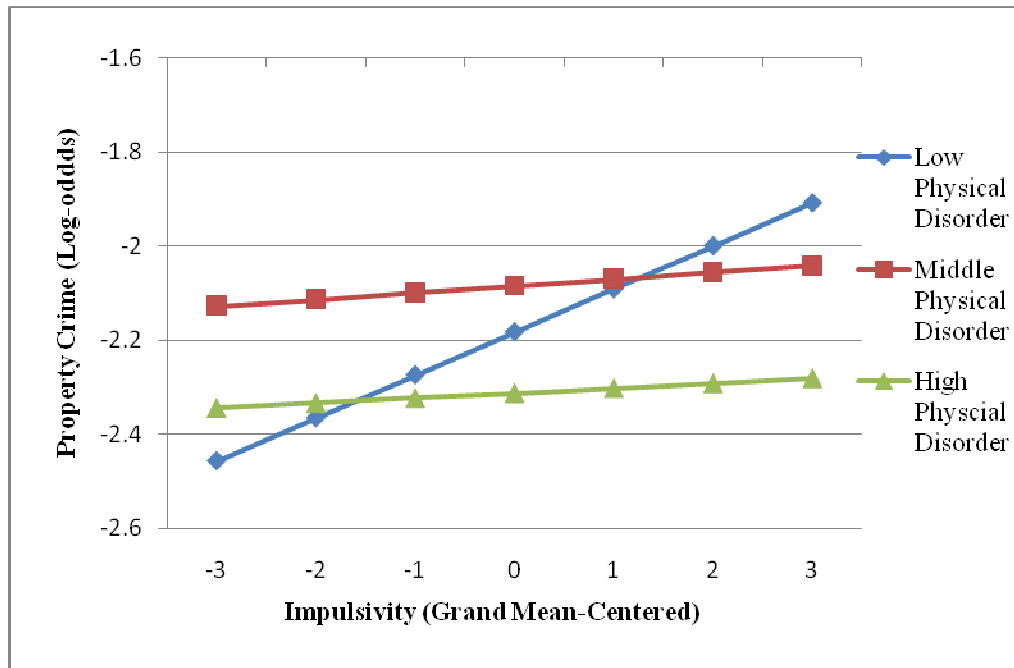


Impulsivity significantly predicts property offending only in neighborhoods with low levels of physical disorder ($p < 0.01$). In addition, the effect of impulsivity is significantly greater in neighborhoods with low levels of physical disorder than in neighborhoods with middle ($p < 0.05$) and high ($p < 0.05$) levels of physical disorder. The simple slopes are indistinguishable between neighborhoods with middle and high levels of physical disorder.

**FIGURE 10**
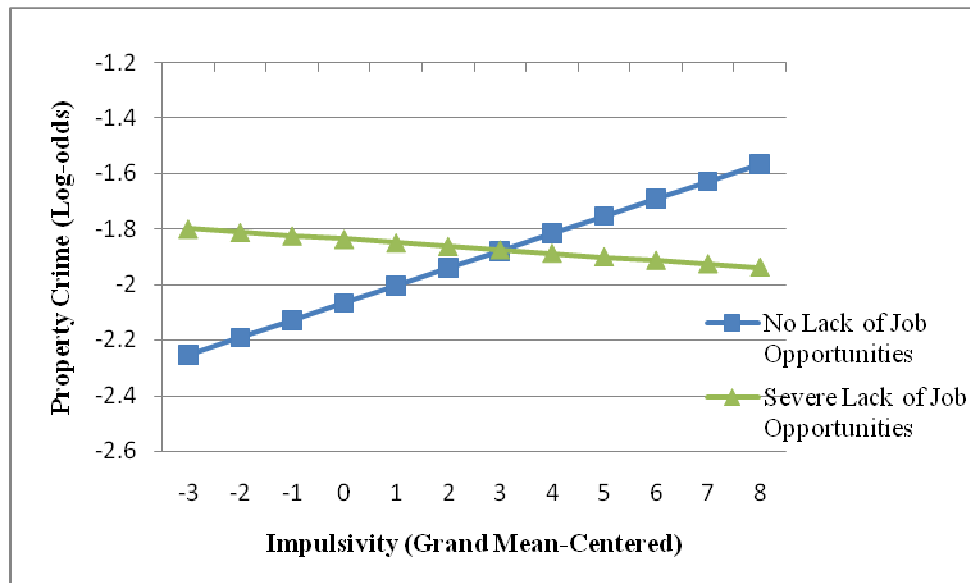


Impulsivity significantly predicts property offending in neighborhoods that do not have a
lack of job opportunities ($p < 0.05$), but not in neighborhoods with a severe lack of job
opportunities ($p > 0.50$). In addition, the effect of impulsivity is significantly higher in
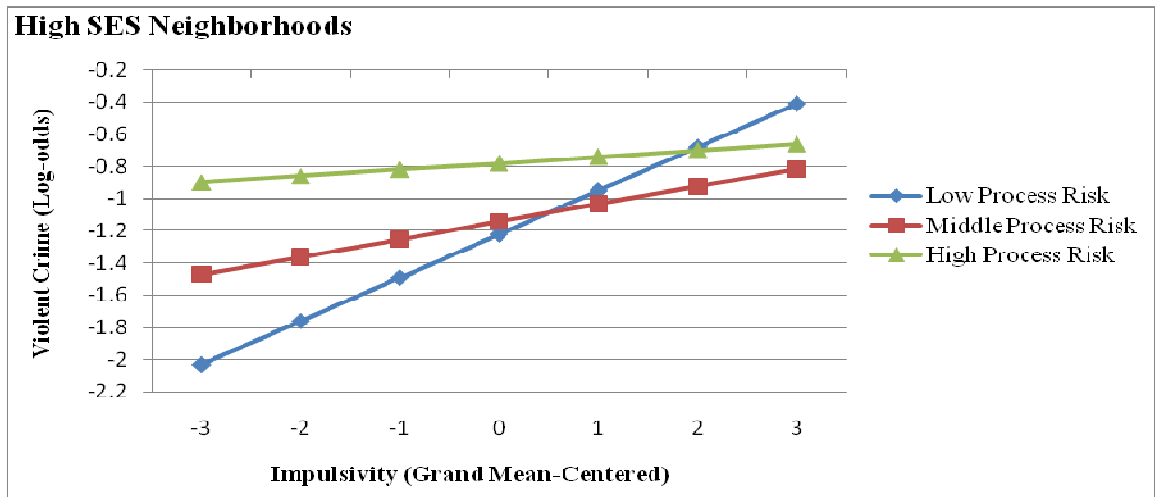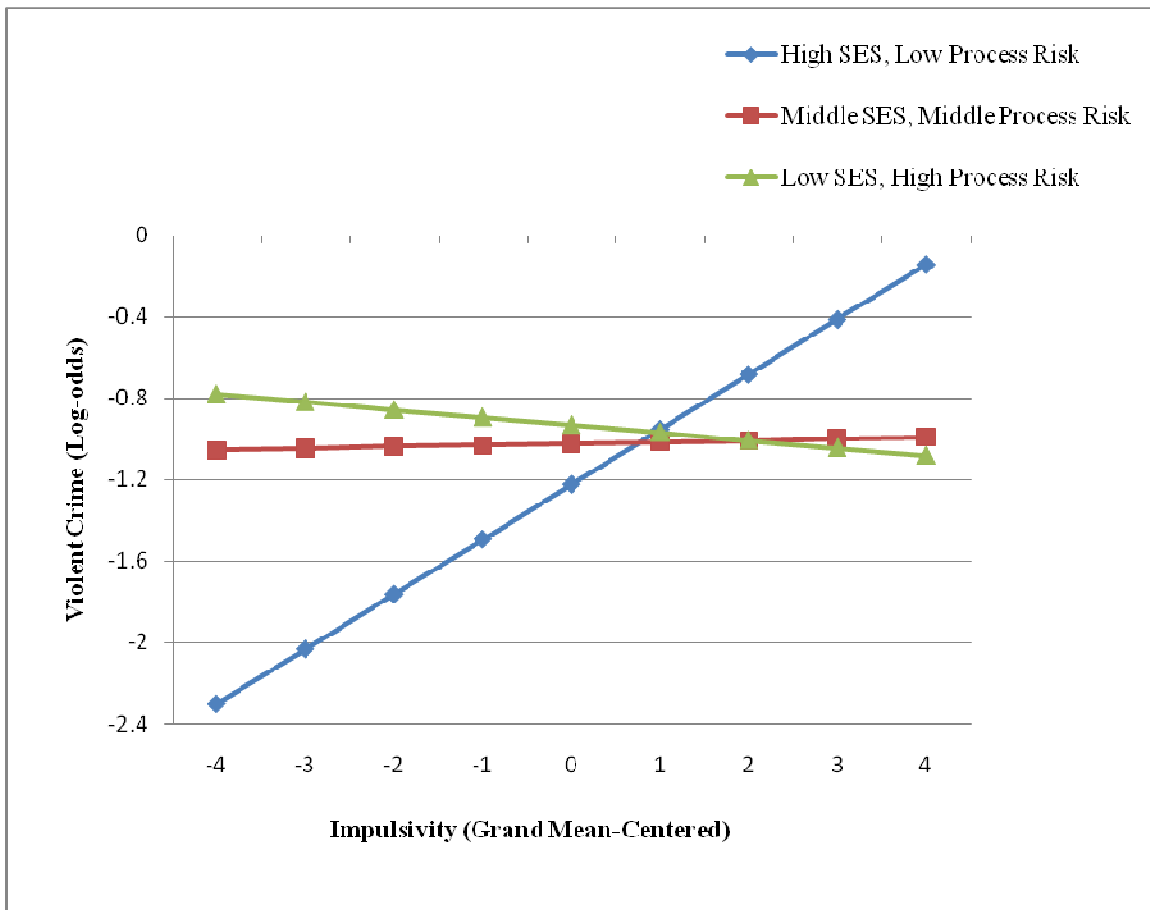neighborhoods that do not have a lack of jobs ($p < 0.05$).

**FIGURE 11**
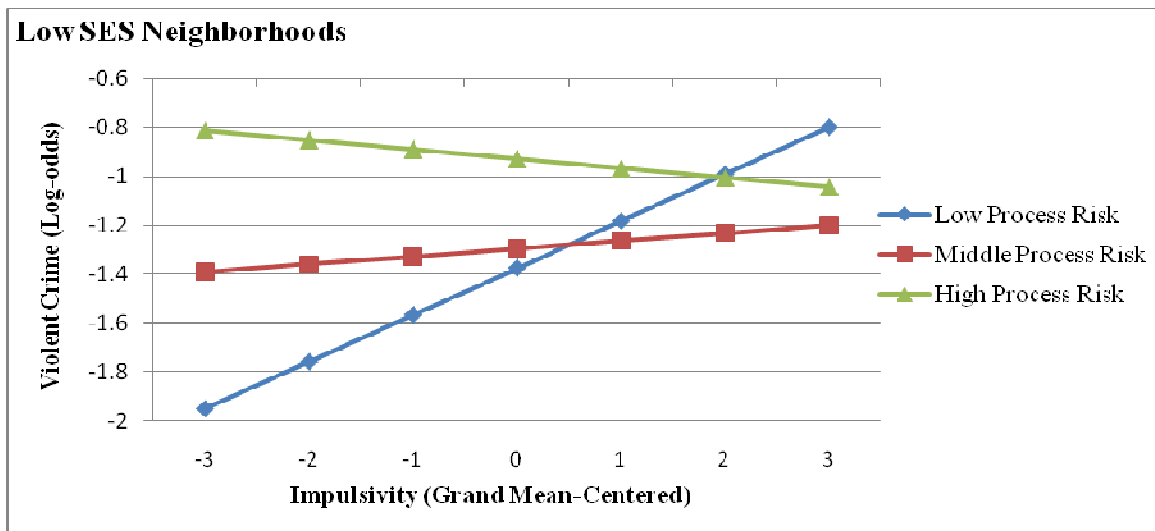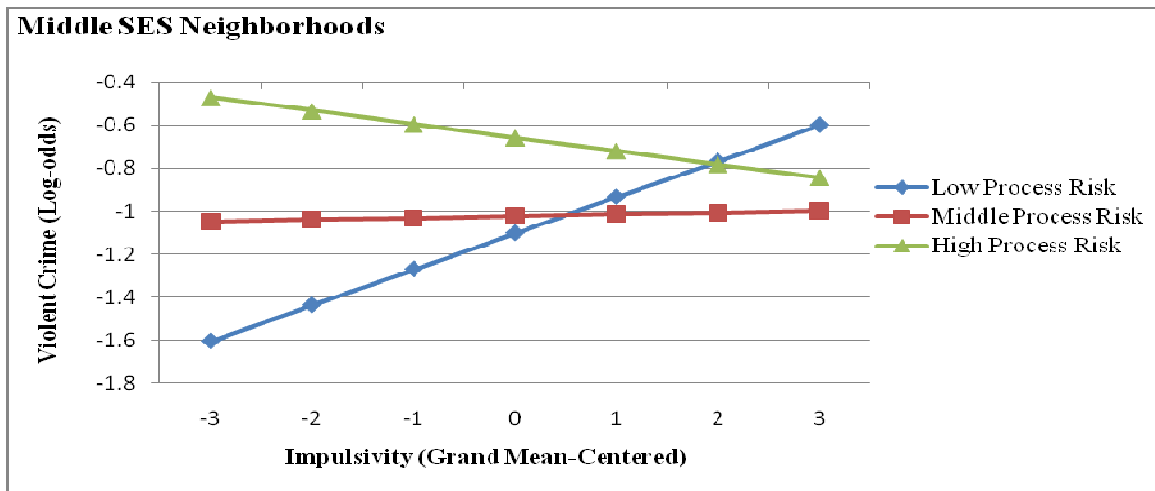
**FIGURE 12**

**FIGURE 13**

**FIGURE 14**