

Psychological & Sociological Mechanisms Linking Low SES & Antisocial Behavior

Roberto Carlos Guerra

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Bradley A. White, Chair

Lee D. Cooper

Julie C. Dunsmore

George Clum

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ABSTRACT

Antisocial behavior, both criminal and noncriminal, is a prominent yet poorly understood public health concern. Research on antisocial behavior typically focuses on either individual or environmental risk factors, rarely integrating risks across levels of analysis. Although low objective SES is clearly associated with antisocial behavior, the reasons why are unclear. Sociological theories suggest this relationship is due to neighborhood and environmental characteristics that create social disorganization and reduce informal social controls in the community. On the other hand, psychological theories suggest that elevated levels of psychological distress and psychopathic traits may influence individual risk for antisocial behavior.

The purpose of this study was to integrate sociological and psychological models to examine how certain individual and environmental risk factors intersect in predicting antisocial behavior. In a demographically diverse adult male sample ($N = 462$), environmental (neighborhood distress) and individual (psychological distress) risk factors each mediated the SES – antisocial behavior relationship (as predicted), although findings depended on which definition of SES was used (objective versus subjective). In addition, psychopathic dimensions (specifically, meanness and disinhibition) were observed to exacerbate the effects of neighborhood and psychological distress on antisocial behavior, as hypothesized. Supplemental analyses also considered index variables comprising neighborhood disadvantage.

Overall, results of this study help inform psychological and sociological theories of antisocial behavior, and may assist in clarifying potential neighborhood- and individual-level foci for interventions to prevent and reduce antisocial behavior in the community.

GENERAL AUDIENCE ABSTRACT

Roberto Guerra

Antisocial behavior is an important public health concern. Low SES is linked to antisocial behavior, but the reasons why are unclear. Sociological theories suggest this relationship is due to a person's neighborhood and environment, while psychological theories suggest this relationship is due to individual distress and psychopathy.

The purpose of this study was to look across sociological and psychological models to examine how risk factors intersect to predict antisocial behavior. Results found environmental (neighborhood distress) and individual (psychological distress) risk factors each mediated (significantly explained) the SES – antisocial behavior relationship. In addition, psychopathy strengthened the effects of environmental and individual distress on antisocial behavior. Results of this study can be used to identify potential environmental and individual mechanisms that can be targeted to prevent and reduce antisocial behavior in the community.

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- R

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Chapter 1- Introduction

The tremendous physical, financial, and psychosocial costs of antisocial behavior make it a prominent public health concern and research priority, in the U.S. as well as abroad (e.g., Krug, Mercy, Dahlberg, & Zwi, 2002; Martinez & Blasco-Ros, 2005). Antisocial behavior refers to a broad range of acts that vary on a continuum of severity (Manvell, 2012) that interfere with the interests of social order or hurt others. These acts can range from legal yet nevertheless socially harmful behaviors (e.g., lying, verbal abuse, spreading malicious rumors) to criminal acts including nonviolent (e.g., fraud, illicit drug dealing) and physically harmful or violent acts (e.g., striking someone, sexual coercion, homicide; Skeem, Polaschek, Patrick, & Lilienfeld, 2011).

Various theoretical frameworks have been posited to explain the etiology of antisocial behavior, with research supporting factors at different levels of analysis (e.g., neurobiological, temperamental, cognitive, social) that can increase the risk of antisocial behavior (e.g., Pardini, 2016). Although the psychological and sociological literatures often converge around certain risk factors for antisociality (such as low socioeconomic status; Dodge, Petit, & Bates, 1994; Pyrooz, Fox, & Decker, 2010) psychology has traditionally emphasized individual and proximal environmental risk factors. Sociology, however, has emphasized broader socioecological influences. Commonly identified psychological risk factors include biological vulnerabilities (e.g., Raine, 2018), parenting problems (e.g., parental low warmth, abuse, neglect, inconsistency; Platt, Williams, & Ginsburg, 2016; Reingle, Jennings, & Maldonado-Molina, 2012; Widom, 1989), psychological distress (Goldman-Mellor, Margerison-Zilko, Allen, & Cerdá, 2016; Ulbrich, Warheit, & Zimmerman, 1989), impulsivity (Meier, Slutske, Arndt, & Cadoret, 2008; Vogel & Van Ham, 2017), psychopathic traits (Hare, 2003; Porter & Woodworth, 2006), and

social learning deficits (Conger, 1976; Koon-Magnin, Bowers, Langhinrichsen-Rohling, & Arata, 2016).

Conversely, risk factors of antisocial behavior emphasized in the sociological literature include ecological influences, such as social disorganization (e.g., Shaw & McKay, 1942) and environmental stress or strain (e.g., Agnew, 1985). Social disorganization theory (Shaw & McKay, 1942) states that socio-ecological characteristics in economically deprived neighborhoods (e.g., high rates of residential mobility and turnover as well as cultural heterogeneity) disrupt social systems in these neighborhoods at various levels (e.g., among family members, friends, and between individuals and local and outside institutions; Bursik & Grasmick, 1993). The social capital and sense of efficacy to collectively control undesirable behaviors in the community is also disrupted (Sampson, 1992), as is the functioning of conventional institutions of social control (e.g., families, schools, churches, community organizations) – factors that could otherwise oversee and regulate behavior of residents. This social disorganization thus contributes to greater levels of social problems, including criminality and violence (Bursik & Grasmick, 1993; Sampson, 1992).

While antisocial behavior is clearly influenced by both individual and broader environmental risk factors, investigations rarely integrate risks across individual and socio-ecological levels of analysis. Yet the sheer heterogeneity of risk factors suggests that antisocial behavior (as well as its prevention and management in communities) could be better understood via an interdisciplinary approach that simultaneously considers processes across these levels. The purpose of the current study was to integrate across psychological and sociological models, examining how environmental and individual risk factors intersect in predicting antisocial behavior. This study is among the first (c.f. Umbach, Raine, Gur, & Portnoy, 2017; Walsh &

Kosson, 2007) to investigate the interplay of individual demographic (socioeconomic status) and psychological influences (stress reactivity and personality traits) with sociological (social disorganization, informal social controls) risk factors to examine their concurrent prediction of individual vulnerability to antisocial behavior. Specifically, this investigation sought to determine whether environmental (specifically social disorganization and low social control) and individual (psychological distress) risk factors mediate the relationship between antisocial behavior and SES. An additional aim was to determine whether psychopathic traits moderate (e.g., exacerbate) effects of neighborhood and psychological distress on antisocial behavior.

1.1 Socioeconomic Status and Antisocial Behavior

Socioeconomic status (SES) reflects an individual's access to collectively desired resources, such as material goods, money, power, friendship networks, healthcare, leisure, or educational opportunity (Oakes & Andrade, 2017; Oakes & Rossi, 2003). This combined economic and sociological index of a person's position in relation to others is often based on income, education, and occupation (APA, 2017). However, the manner in which SES is conceptualized and operationalized can vary (APA, 2017; Kaufman, Cooper, & McGee, 1997; Oakes & Andrade, 2017). SES is sometimes examined in terms of, or with emphasis on, income (flow of resources), wealth (a stock of resources), educational attainment, occupational prestige (Duncan, 1961; Rossi 1974), or poverty (Oakes & Andrade, 2017).

More recently, attention has also been given to subjective social status (e.g., MacArthur Subjective Scale, Adler & Stewart, 2006), which reflects an individuals' sense of their social standing (Adler & Stewart, 2006). Subjective social status reflects the perception that one has of their place within society and has been described as indexing not only the resources that one has available to them at the moment, but also the subjective feelings involved with belonging to a

certain social stratum (Adler & Stewart, 2006; Giatta, Valle Camelo, de Castro Rodriguez, & Barreto, 2012). Subjective SES has also been described as potentially capturing current *and* past socioeconomic situation, future prospects, family resources, life opportunities, and how a person perceives themselves in relation to others – aspects of SES that income and education do not tap (Giatta et al., 2012). Subjective SES has been found to significantly correlate with measures of objective SES, with the size of their relationship described as moderate (Adler, 2000; Gong, Xu, & Takeuchi, 2012).

Importantly, most operational definitions of SES have been found to correlate with one another, with findings generally converging across variables (Gong et al., 2012; Oakes & Andrade, 2017; Ostrove, Adler, Kuppermann, & Washington, 2000). As a result, several studies use composites of variables that index different aspects of SES (APA; 2017; Oakes & Andrade, 2017; Oakes & Rossi, 2003). Importantly, two distinct definitions of SES were considered in the current study. The first, objective SES, was based on indices of self-reported income and education. The second, subjective SES, was based on subjective social status. The goal of considering both indices of SES was to permit direct comparison of how different measures of SES impact analyses.

Low SES, when defined based on objective indices, is a well-established correlate of antisocial behavior and violence (Paschall, Flewelling, & Ennett, 1998), such as delinquency, gang affiliation, rule-breaking behaviors, crime, violent behavior, and criminal recidivism (Compton, Conway, Stinson, Colliver, & Grant, 2005; Dodge et al., 1994; Frick, Bodin, & Barry, 2000; Pyrooz et al., 2010; Ringel, 1997). Low objective SES also uniquely predicts violence and recidivism, over and above other individual level risk factors such as age, race, gender, and drug use (e.g., Kubrin & Stewart, 2006). Overall, a large body of research implicates low objective

SES as a general risk factor for antisocial behavior (e.g., Pyrooz et al., 2010). However, underlying mechanisms that account for this relationship have not been adequately elucidated, and the relationship between subjective SES and antisocial behavior is a relatively neglected topic.

Several sociological theories propose socioecological explanations for the relationship between low objective SES and elevated violence. Strain theory (Merton, 1938) proposes that individuals growing up in poor neighborhoods lack the “legitimate means” to achieve their desired financial or economic goals, which leads to a higher likelihood to commit a crime. Rational choice theory (e.g., Cornish, 1993) describes low-SES youths as having a lot to gain and little to lose from offending (in terms of quality of life and future prospects), thus being more likely to commit a crime. Another model, the family stress model (Conger et al., 1992) argues the SES-violence relationship is mediated via deleterious parenting practices. Empirical studies support each of these models (e.g., Aseltine, Gore, & Gordon, 2000; Paternoster & Simpson, 1996; Scaramella, Sohr-Preston, Callahan, & Mirabile, 2008), although there are conceptual aspects of each model that overlap with one another.

Most theories that posit an ecologically based rationale for the violence-low SES relationship describe a generally distressed, disorganized, and under-resourced community or environment as a precursor for violence, consistent with social disorganization theory (e.g., Bursik, 1988; Sampson, 1992; Shaw & McKay, 1942). Empirical investigations broadly support social disorganization as a potential explanation for the relationship between low objective SES and antisocial behavior, with correlational studies finding concurrent associations between elevated levels of social disorganization in communities associating with higher indices of violence (e.g., Sampson & Groves, 1989; Slutske, Deustch, & Piasecki, 2016; Sun, Tripplett, &

Gainey, 2004; Travis, Western, & Redburn, 2014). The majority of studies that have tested social disorganization theory have been cross-sectional, reflecting the difficulty involved in compiling neighborhood-level data over an extended period. However, the importance of longitudinal studies has been recognized, with one investigation in the Netherlands (Steenbeck & Hipp, 2011) supporting that social disorganization predicts violence over time.

Notably, while earlier work emphasized larger metropolitan areas, aspects of social disorganization theory have been tested and found to generalize to rural as well as urban areas and larger metropolitan regions (Boufard & Muftic, 2006). It has been suggested (Osgood & Chambers, 2000) that higher levels of poverty in rural areas may be associated with a greater degree of residential stability and sociocultural homogeneity than in similarly impoverished urban settings. However, no literature has suggested that social disorganization is not a potential mechanism for disadvantage across these different settings (Boufard & Muftic, 2006; Osgood & Chambers, 2000). Social disorganization has been described as being developed as a general theory to explain crime in both rural and urban areas (Lee, Maume, & Ousey, 2003), although it may not work in the exact same manner and structure across settings.

1.2 Psychopathy & Antisocial Behavior

Psychopathy. Psychopathic traits are among the most widely researched individual risk factors of antisocial behaviors and violence (Hare, 2003). Psychopathy is a multifaceted construct comprising distinguishable but correlated affective (e.g., meanness, lack of remorse), interpersonal (e.g., boldness, deceitfulness, social dominance), and behavioral (e.g., disinhibition, irresponsibility, impulsivity) personality trait domains (Hare, 1996). Influential examinations of the construct of psychopathy have focused on an underlying pathological constellation of personality features that are often “masked” (particularly in non-incarcerated

populations in the community) by a seemingly well-adjusted and sometimes charming outward presentation (Cleckley, 1941). The annual aggregate cost of psychopathy to the criminal justice system has previously been estimated at approximately \$460 *billion* per year in the U.S. alone (Kiehl & Hoffman, 2011) and is tied to antisocial behavior such as non-violent and violent crime (Barry et al., 2007; Porter & Woodworth, 2006).

Measurement of psychopathy. The Psychopathy Checklist- Revised (PCL; Hare, 2003) is the most commonly used measure of psychopathy in forensic contexts (Lynam & Gudonis, 2005). This instrument allows trained assessors to use clinical judgment in rating psychopathy via an extensive clinical interview combined with corroboration of forensic records documenting previous antisocial behavior. Several limitations exist when using the PCL-R however, including the need for increased training of clinicians, increased financial costs, and time required for administration. In addition, concerns have been raised regarding the sensitivity of PCL-R ratings in assessing core psychopathy features in non-forensic populations, given that the PCL-R integrates criminal history into the assessment of psychopathy (Widiger, 2006).

In light of these concerns, self-report measures of psychopathy have been developed and validated in recent decades. These self-report psychopathy instruments address the aforementioned limitations (such as resources required), and also allow researchers to target community populations that display subclinical or moderate elevations in psychopathic traits (Lilienfeld & Fowler, 2006). While the PCL-R was initially developed to assess psychopathy as a unitary construct, at least two correlated but distinguishable factors have emerged, capturing affective and interpersonal deficits (Factor 1; e.g., shallow emotions, manipulativeness) and behavioral deficits (Factor 2; e.g., impulsivity, irresponsibility, criminal versatility; Hare & Neumann, 2008), a finding which has significantly influenced conceptual models and empirical

investigations of psychopathy. As a result, self-report instruments assess psychopathy from a multidimensional perspective, and researchers have validated these measures against dimensional models of the PCL-R (Brinkley, Schmitt, Smith, & Newman, 2001; Poythress, Edens, & Lilienfeld, 1998; Sellbom & Philips, 2013). Furthermore, some of these newer instruments ostensibly capture dimensions of psychopathy that do not directly overlap with antisocial behavior, and can be seen to even facilitate adaptive psychosocial functioning (e.g., Lilienfeld & Fowler, 2006). Importantly, much debate continues regarding distinctions between some aspects of the conceptual models and corresponding measures (e.g., Lilienfeld et al., 2012; Lynam & Miller, 2012).

Several years ago, Patrick and colleagues proposed a Triarchic model of psychopathy (Patrick, Fowles, & Krueger, 2009) that attempts to reconcile and integrate alternative historical conceptualizations of psychopathy, proposing that psychopathy comprises three distinguishable yet intersecting dimensions. These dimensions – boldness, meanness, and disinhibition – coincide with the interpersonal, affective, and behavioral deficits (respectively) of psychopathy, and are operationalized by the Triarchic Psychopathy Measure (Tri-PM; Patrick, 2010). *Boldness* reflects fearlessness, tolerance for novelty and risk, and social potency. *Meanness* is characterized by callousness, exploitative or predatory tendencies, and lack of empathy or emotional attachment, while *disinhibition* is characterized by impulsivity, low frustration tolerance, irresponsibility, oppositional tendencies, and emotional/behavioral dysregulation (Brislin, Drislane, Smith, Edens, & Patrick, 2015; Patrick et al., 2009). Patrick et al. (2009) described the construct of psychopathy as historically being understood by researchers as reflecting elevated disinhibition traits in conjunction with tendencies toward either boldness or meanness, or both (i.e. Cleckley, 1941; Karpman, 1948).

This triarchic conceptualization of psychopathy is used in the current study, given that it is explicitly based on a well-supported multidimensional conceptual model that integrates PCL-R and other psychopathy measurement models (Patrick et al., 2009). Furthermore, the Triarchic conceptualization (and thus, the TriPM) focuses on psychopathy in terms of lower-order traits on a continuum, as they exist across different contexts (community, clinical, correctional).

Psychopathy – Antisocial Behavior relationships. Psychopathy total scores are often found to be a robust predictor of various indices of antisocial behavior across a variety of populations, including adult offenders, children, adolescents, civil psychiatric inpatients, undergraduate college students, and community samples (e.g., Guerra & White, 2016; Porter & Woodworth, 2006). Indeed, those with elevated psychopathic traits commit more severe and cold-blooded acts of aggression (physical and relational), violence, sexual assault, and engage in higher rates of criminal recidivism, violent recidivism, and sexual assault (Corrado, Vincent, Hart, & Cohen, 2004; DeLisi & Piquero, 2011; Hare, 2001; Hare & Neumann, 2006; Hemphill, 2007; Leistico, Salekin, DeCoster, & Rogers, 2008; Mager, Bresin, & Verona, 2014; Porter & Woodworth, 2006; Vitacco, Neumann, & Jackson, 2005) when compared to those who are not elevated in different dimensions of psychopathic traits.

This relationship between psychopathy and antisocial behavior can be partially explained as a result of the traits captured by different triarchic dimensions of psychopathy, such as behavioral and emotional dysregulation as aspects of disinhibition, as well as callousness and a lack of empathy/remorse over hurting others as aspects of meanness. Other theories suggest that individuals with psychopathy-related affective deficits associated with boldness are more likely to engage in instrumental acts of aggression because they do not notice or are insensitive to the emotional distress of their victims and other aversive stimuli such as cues of impending

punishment (Blair, 2001; Lykken, 1957; Nestor, Kimble, Berman, & Haycock, 2002), with much evidence supporting this model (e.g., Blair, 1997; Gray et al., 2003; Igoumenou et al., 2017).

1.3 The Role of Psychopathy in the Relationship between SES & Antisocial Behavior

It is important to consider how individual risk factors may interact in predicting antisocial behavior. For example, evidence suggests that the relationship between psychopathy and antisocial behavior can vary depending on objective SES (e.g., Lahey, Loeber, Burke, & Applegate, 2005; Lynam et al., 2000). One study found that objective SES moderated the relationship between psychopathy and violence, such that this relationship was stronger among individuals lower in objective SES than among those higher SES, albeit only in Caucasian study participants (Walsh & Kosson, 2007). The authors interpreted this finding as an indication that higher objective SES protects individuals with elevations in psychopathic traits against becoming violent, conversely suggesting low objective SES individuals elevated in psychopathic traits are more likely to be violent. Other studies have found similar results that support this assertion, with Lahey and colleagues (2005) finding psychopathic traits in a youth sample to predict later adult antisocial behavior, but only among those from lower objective SES families. Furthermore, the relationship between violence and characteristics associated with some dimensions of psychopathy (e.g., low resting heart rate, impulsivity, affective deficits) is typically stronger in those from lower objective SES backgrounds (Farrington, 2005; Lynam et al., 2000).

Collectively, these results suggest that those high in psychopathic traits may be particularly vulnerable to the effect of low objective SES on antisocial behavior. Specifically, individuals presenting with increased opportunities for crime (or reduced buffers against crime) in a low objective SES setting with high neighborhood disadvantage who are *also* elevated in certain dimensions of psychopathy – in particular, disinhibition (e.g., impulsivity,

irresponsibility, behavioral dysregulation) and meanness (e.g., lack of empathy and callousness) may be even more likely to act out or take part in violence or criminality. Thus, the predictive power of objective SES in forecasting antisocial behavior may be qualitatively different for those who, due to certain elevations in psychopathic traits (disinhibition, meanness), are at an elevated individual risk to acting out in low-resourced, disorganized social settings.

The nature of one's psychopathic tendencies matters, however. In contrast to disinhibition and meanness, previous research has found that boldness is not related to antisocial outcomes (e.g., Donnelan & Burt, 2016; Gatner, Blanchard, Douglas, Lilienfeld, & Edens, 2016). Rather, boldness is often described as an adaptive phenotypic expression of an underlying fearless disposition (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Patrick et al., 2009; Patrick, Drislane, & Strickland, 2012), comprising traits such as social potency, low stress reactivity, social poise, and reduced anxiety.

Risk Multiplying Risk. Consistent with the proposition above, Raine (2002) specifically proposed that the presence of several *classes* of risk factors (e.g., sociodemographic, personality traits) has a *multiplicative* effect in prediction of violence and antisocial behavior. Raine suggested that individual-level factors might heighten an individual's susceptibility to a given risky environment, especially during one's formative years. Research supports this assertion, with adoption studies showing children at risk for crime (in this study operationalized by having a criminal biological parent) being more likely than children with non-criminal parents to commit crime *if* reared in a criminogenic environment (Bohman, 1996; Cadoret, Leve, & Devor, 1997). To the extent that individual-level risk factors (e.g., psychopathy) heighten a person's vulnerability to risky environments (e.g., disorganized neighborhoods), one would expect to observe interactions in which a person's level of psychopathic characteristics (e.g., impulsivity

or disinhibition) would be more strongly related to antisocial behavior in more disadvantaged areas (Lynam et al., 2000).

One proposed mechanism as to why individual-level risk factors (e.g., disinhibition, affective deficits) predict violence more strongly in lower (rather than higher) objective SES contexts is that socioeconomically disadvantaged neighborhoods are characterized by social disorganization (Shaw & McKay, 1942), which leads to lower levels of informal social controls that ordinarily help regulate the behavior of individuals in the community (Lynam et al., 2000; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997; Sun, Tripplett, & Gainey, 2004). Such informal social controls include monitoring of children and adolescents, willingness to intervene to prevent or interrupt acts associated with antisocial behavior (e.g., truancy, loitering), and confrontation of persons overtly exploiting or disturbing public spaces (Sampson et al., 1997). Community residents are more likely to be involved and intervene in neighborhood contexts when there is social cohesion such that rules are clear and people trust one another (Sampson et al., 1997). As discussed further below, lower levels of social controls in socially disorganized contexts could also make individual risk factors for antisocial behaviors (e.g., psychopathic traits) more important, by increasing opportunities for crime or by reducing buffers against crime (Henry, Caspi, Moffitt, & Silva, 1996).

This conceptualization suggests that children in disadvantaged communities are vulnerable to developing more aggressive trajectories (i.e. trajectories involving behaviors in line with meanness and disinhibition) earlier in life and remaining on them for longer periods of time than children from higher-SES neighborhoods in which social control is greater. The lack of informal social controls thus provides a mechanism by which social disorganization can operate,

which is arguably compatible with the aforementioned alternative explanations for an SES-antisocial behavior link (e.g., Conger et al., 1992; Cornish, 1993; Merton, 1938).

1.4 Psychological Distress & Antisocial Behavior

Psychological distress is another aspect of individual functioning that has been proposed as a potential mechanism in the objective SES – antisocial behavior relationship. Psychological distress can be defined as a state of emotional suffering characterized by symptoms of depression (e.g., lost interest; sadness; hopelessness), anxiety (e.g., restlessness; feeling tense), and a loss of control (Mirowsky & Ross 2003; Veit & Ware, 1983). Measures of psychological distress were originally developed as first-stage screeners for individuals with broadly defined emotional problems to identify those needing more in-depth clinical assessment (Kessler et al., 2010; Myers, Lindenthal, & Pepper, 1975). However, research on non-specific psychological distress has recently become more prevalent, particularly in medical and psychiatric research contexts.

Importantly, individuals respond to environmental stressors in different ways, depending on different protective factors (e.g., coping skills, social supports; Binswanger et al., 2012; Dumont & Provost, 1999; Gutman, Sameroff, & Eccles, 2008) that may be present. As a result, certain individuals may experience more elevations in levels of distress when compared to others under similar environmental (e.g., socially disorganized) circumstances. Psychological distress has shown empirically to be associated with lower levels of objective SES (Ulbrich et al., 1989; Wells & Miranda, 2013). Research has also found psychological distress to mediate the link between economic hardship and certain maladaptive behaviors, particularly punitive parenting behavior (Gecas, 1979; McLoyd, 1990). Psychological distress has also been found to be associated with elevated levels of antisocial behavior (Goldman-Mellor et al., 2016; Riggs, Kilpatrick, & Resnick, 1992). This body of work suggests the importance of considering the role

of individual psychological distress in the relationship between stress and behavioral outcomes (Cohen, Kamarck, & Mermelstein, 1983).

The current study considers psychological distress as a potential mediator between SES and antisocial behavior, and also considers the potential role of psychopathy in moderating the link between psychological distress and antisocial behavior. While the potential interaction between psychological distress and dimensions of psychopathy has not been examined in published research, variables closely related with psychological distress (namely, depression) has been found to interact with psychopathy in predicting maladaptive outcome. Specifically, maladaptive trait dimensions of psychopathy, such as meanness and disinhibition, have been found to interact with depression in predicting negative outcomes such as anger, aggression, substance use, and even suicidality (Pennington, Cramer, Miller, & Anastasi, 2014; Price, Salekin, Klinger, & Barker, 2013) in adolescent and adult forensic samples. While these variables are not operationalizations of psychological distress per se, they do tap aspects of overall distress. As a result, in keeping with Raine's (2002) recommendation of considering multiplicative classes of risk factors, one may expect individual psychopathic dimensions (specifically meanness and disinhibition) to exacerbate the relationship between psychological distress and antisocial behavior.

1.5 Current Study

The current study represents one of the first investigations of risk factors in predicting antisocial behavior that integrates across psychological and sociological models by examining the interplay of demographic (socioeconomic disparities), psychological (stress reactivity and personality traits) and socioecological risk factors (social disorganization, informal social controls) in predicting individual vulnerability to antisocial behavior. Specifically, this

investigation examined whether environmental (social disorganization and low social control) and individual (psychological distress) risk factors mediate the relationship between antisocial behavior and SES, and whether psychopathic traits exacerbate effects of neighborhood and psychological distress on antisocial behavior.

1.6 Hypotheses

Hypothesis 1. Given that the influence of low objective SES on antisocial behavior has been described as a result of social disorganization, as well as a lack of informal social control (e.g., neighborhood monitoring) in one's immediate environment (per social disorganization theory, e.g., Bursik & Grasmick, 1993; Sampson et al., 1997), it was hypothesized that social disorganization and informal social control would mediate the relationship between SES and antisocial behavior, controlling for any influences of race and psychological distress. In order to assess neighborhood disadvantage more comprehensively, social disorganization and informal social control were combined to operationalize a single Neighborhood Disadvantage composite, described below. While such mediation has not been formally empirically tested in prior research, research does support links between SES and social disorganization (Bruinsma, Pauwels, Weerman, & Bernasco, 2013; Kaylen & Pridemore, 2013; Sampson & Groves, 1989), as well as between social disorganization and elevations in antisocial behavior in different populations, including adolescents, children, and adults in the community (Sampson & Groves, 1989; Slutske, Deustch, & Piasecki, 2016; Travis, Western, & Redburn, 2014). This hypothesized model is illustrated in Figure 1. This mediation analysis was conducted both on the relationship between antisocial behavior and objective SES, as well as on the relationship between antisocial behavior and subjective SES.

Hypothesis 2a and 2b. Specific psychopathy dimensions (specifically, meanness and disinhibition) and SES were hypothesized to interact in uniquely predicting antisocial behavior, in line with previous research (e.g., Donnelan & Burt, 2016; Patrick et al., 2009). Given that individual-level factors such as psychopathic traits are believed to heighten an individual's susceptibility to a given maladaptive or risky environment (e.g., Raine, 2002), dimensions of psychopathy were proposed to moderate the SES-antisocial behavior relationship. Specifically, meanness and disinhibition were each predicted to exacerbate the effect of low SES on antisocial behavior, as per previous research (Lahey et al., 2005; Lynam, et al., 2000; Walsh & Kosson, 2007). While this prior work focused on the disinhibition dimension of psychopathy, it is predicted that this interaction with SES would also be found for meanness, given that this trait dimension reflects callous exploitative tendencies. This hypothesized model (2a) is illustrated in Figure 2. Analyses included an examination of the interaction of psychopathy facets with both objective SES and subjective SES. Similarly, meanness and disinhibition dimensions of psychopathy were hypothesized to interact with neighborhood disadvantage in predicting antisocial behavior. This hypothesized model (2b) is illustrated in Figure 3.

An important limitation of prior work is that the reason for this moderating effect of psychopathy on the link between objective SES and antisocial behavior remains unclear. However, the literature on neighborhood disadvantage offers a viable, though previously untested, explanation. By increasing opportunities for crime, or reducing buffers against crime, neighborhood disadvantage and lower SES may interact with individual-level risk factors such as psychopathic traits in predicting criminal behavior (Henry, Caspi, Moffitt, & Silva, 1996; Raine, 2002; Sampson et al., 1997). In such a situation, individuals who have increased

characterological risk factors for antisocial behavior (elevated meanness and disinhibition traits) will be particularly vulnerable to acting out or taking part in violence or criminality.

Notably, boldness (the third dimension of psychopathy in the Triarchic Model of Psychopathy) is not predicted to be uniquely related to antisocial behavior, based on research finding that boldness may actually protect against maladaptive outcomes (Gatner et al., 2016; Guelker, 2012; Lilienfeld, Watts, & Smith, 2015). Thus, the unique role of boldness traits was also explored.

Hypothesis 3a and 3b Given the role that psychological distress may have as a potential mechanism involved in the relationship between low objective SES and antisocial behavior (Pennington et al., 2014; Price et al., 2013), it was hypothesized that psychological distress mediates this relationship, even after controlling for potential influences of race and neighborhood disadvantage. This hypothesized model (3a) is illustrated in Figure 4. In addition, psychological distress was also hypothesized to interact with psychopathy facets in uniquely predicting antisocial behavior. Specifically, meanness and disinhibition were predicted to exacerbate the effect of psychological distress on antisocial behavior, with individuals who are experiencing more psychological difficulties and distress being more likely to commit antisocial behavior to the extent that their maladaptive psychopathic tendencies (meanness, disinhibition) are elevated. This hypothesized model (3b) is illustrated in Figure 5.

In such a study, it is important to consider and potentially control for effects of potential confounds. In addition to considering race and age, the current study attempted to control for socially desirable responding. Research has found social desirability scores to inversely relate with violence and recidivism in an offender sample, such that lower scores were associated with a higher likelihood to re-offend (Mills, Loza, & Kroner, 2003). Mills et al. suggested that

impression management may be an issue with individuals more likely to offend and aggress (in their case, offenders, but also possibly individuals high in psychopathic traits). Research has shown scores on self-report measures of psychopathy to be associated with PCL-R scores (Benning et al., 2005; Brislin et al., 2015). In light of such findings, social desirability was also assessed in order to examine the potential influence of socially desirable responding in reporting on unsavory behaviors, such as antisocial behavior.

Chapter 2- Methods

2.1 Inclusion Criteria

Inclusion criteria for this study regarded gender, age, and location characteristics. Only men were recruited, in order to directly compare results to previous studies (e.g., Sullivan, Abramowitz, Lopez, & Kosson, 2006; Walsh & Kosson, 2007) conducted on male populations, and to eliminate gender as a potential confound in this preliminary investigation of the proposed relationships. Similarly, age range for participants was constrained from ages 18 to 45, based on evidence that antisocial behavior peaks within this range (Monahan, Steinberg, & Cauffman, 2009). In addition, recruitment took place in the United States (described below), and participants recruited for this study were individuals who reported living in the U.S. during the survey period. Furthermore, once objective SES quotas (described below) were filled, additional individuals in those quotas were excluded from participation in the study.

Sampling. The current study used a convenience sample that was not representative of adult males across the U.S. but did target a variety of geographic regions and setting types (urban, suburban, rural). The primary sampling goal for the current study was to obtain an SES-diverse sample, given the primary research questions involving the nature of the SES-antisocial behavior relationship. In order to achieve this, a quota-based sampling approach was used as the primary sampling structure of this study. Quota sampling is a non-probabilistic participant selection method, whereby target quotas are identified in advance and sampled in a convenience (vs. random) fashion (Acharya, Prakash, Saxena, & Nigam, 2013). Quota-based approaches allow typically underrepresented sociodemographic subgroups, (in this case, low-SES individuals) to be strategically oversampled. The use of quota sampling during this study allowed

for equal participant representation from predefined low, medium, and high objective SES groups, in order to ensure sufficient SES heterogeneity.

In order to obtain sufficient variation across the objective SES construct, a one-third grouping was targeted (i.e. 33% of the sample in low SES grouping, 33% mid-SES, 33% high SES), with a minimum 25% threshold required (i.e., each SES group must be represented by at least 1/4th of the overall sample). Specific objective SES quota data are presented in Table 2. A priori cut point scores on a participants' measure of objective SES were identified prior to data collection. Specifically, given that income and education level are two of the primary indicators across several measures of SES (e.g., APA, 2017; Braveman, 2005; Oakes & Andrade, 2017; Oakes & Rossi, 2003), survey logic was created in order to categorize participants into quotas based on their response to income and education level questions presented at the start of the survey. Survey logic was based on a point scale where participants were categorized into low, medium, or high objective SES based on specific responses to the questions: a) "Which [choice] best describes your educational attainment?", and b) "Which [choice] best describes your current personal income?" Categorization into low, medium and high objective SES groups was based on census data (U.S. Census Bureau, 2015).

While a universally accepted operational definition for what is considered a "low SES" cut point does not exist in the literature (APA, 2017; Oakes & Andrade, 2017), specific data that was used for building of this pre-survey categorization includes research finding nearly 30% of males ages 18 to 40 in the US made less than 25,000 a year, and more than 32% of males ages 18 to 40 in the US made between 25,000 and 50,000 (U.S. Census Bureau, 2015). In addition, the U.S Census (2015) poverty guidelines defined low-income earners as individuals who earn "at or no more than 199% of the poverty level," which was \$22,865.10 in 2013. Other data used

included those with an income below 67% of the overall median income (\$24,173) being defined as low objective SES (via a pew research poll), and those with an income below 67% to 200% of the overall median income (\$24,173 to \$72,521) being defined as mid objective SES (Pew Research Poll, 2015; U.S. Census Bureau, 2015). Regarding education level, 79% of males in the US reported having graduated from high school, while 26% have received at least a bachelor's degree (U.S. Census Bureau, 2000). Importantly, the defining of low-, mid-, and high-objective SES categories based on observed rates of income rates and education level in the US was entirely for quota sampling reasons.

2.2 Participants

The sample for the current study ($N = 462$) was primarily Caucasian (79.2%), followed by 10% African American, 6.7% Hispanic, 1.1% Asian-American, and 3% multiracial or from other racial/ethnic groups. The average participant age was 30.09 ($SD = 5.08$; range = 18- 45). All sample characteristics are presented in Tables 1a and 1b.

2.3 Procedure

The current study was approved by the University Institutional Review Board (IRB). After participants consented, online self-report data were collected via a confidential online survey system (Qualtrics) that was used to systematically target a large and stratified population. Qualtrics allowed for predefined quotas to exist prior to data collection beginning (based on a priori cut point scores), enabling an experimenter to automatically close the survey off to individuals who fall into a given cell once the survey reached a certain ratio of qualified responses (desired N per cell). The use of the Qualtrics online systems allowed for the collection of national data from participants via an online method which yields reliable and valid data, collecting data from participants who are similar to the general population that uses the internet,

and significantly more diverse than college samples (e.g., Buhrmester, Kwang, & Gosling, 2011; Casler, Bickel, & Hackett, 2013). Of note, this system allowed for screening of participant data, in order to ensure no duplicate responders were included in analyses. Specifically, email addresses were manually input by participants, and data from participants who already filled out the survey (i.e., those with duplicate email addresses) were removed ($N = 39$). In addition, GPS coordinates and IP addresses were automatically recorded in Qualtrics. To help ensure no duplicate cases, only the first completed survey was accepted from any individual IP address or set of GPS coordinates. Duplicate data/survey responses from previously recorded IP addresses or GPS coordinates were removed prior to statistical analyses ($N = 132$).

Participant recruitment took place primarily via flyers and online forums. In order to allow for recruitment materials to reach a sociodemographically diverse group of U.S. adult males, welfare offices, temporary employment agencies, Head Start centers, and parole agencies were targeted for in-person recruitment, with a link to the survey contained in the flyer. This flyer was also digitally posted in online forums and online advertisement websites (e.g., craigslist). Of note, while resource restrictions prohibited obtaining a nationally representative sample, the aim of this study was to include a diverse sample across several geographical regions of the U.S. In order to achieve this goal, a focus of online (e.g., craigslist) recruitment was to target counties and regions in U.S. states that met one or more of the following criteria: a) shared a border with the state of Virginia, b) that research assistants or graduate students were able to directly access, and c) whose median household income was low relative to the rest of the country. Specifically, sampling was conducted in 15 states (VA, WV, PA, FL, CA, CO, TN, KY, NC, SC, OH, MD, LA, GA, and AK) as well as in Washington DC. Once participants completed survey measures, they were compensated \$5.00 for their time via online Amazon gift cards.

2.4 Measures

Demographic Questionnaire (Appendix C). At the beginning of the online survey, participants completed a demographic questionnaire. Specific data that was obtained with this questionnaire included income level, age, education, and self-identified racial/ethnic group (“Which racial and/or ethnic group do you identify with?”), as well as employment status, English fluency, and urban/suburban/rural neighborhood identification. Because most participants identified as non-Hispanic White, a dichotomous Racial Group variable (0 = Caucasian/Majority Status, 1 = Non-Caucasian/Minority Status) was created to maximize statistical power when examining influence of race and ethnicity.

SES (Appendix D and E). For the current study, an objective measure of SES (Appendix D) was obtained using a composite of individual’s income and education, as per previous research (e.g., Oakes & Rossi, 2003). Higher scores on the composite indicate higher levels of SES. In addition, Subjective Social Status was also obtained using participants’ response on the second “ladder” in of the MacArthur Subjective Social Status Scale (Appendix E) to capture each individual’s sense of their social standing (Adler & Stewart, 2006) and to permit direct comparison of how SES operationalization (subjective vs. objective) affected results. On this scale, participants are asked to indicate a rung of the ladder (of 10 rungs from lowest to highest) that represents their standing relative to others in the United States with respect to how much money and education they have and how respected their jobs are. This perceived level on the SES ladder is then converted to a numerical score, with higher numbers indicating higher subjective SES.

Although historically popular measures of objective SES (e.g., Hollingshead Index; Hollingshead, 1975) also include occupation in their operationalizations of this construct,

occupation was not included in the index of objective SES in the current study. This decision was based on the fact that no consensus exists as to how occupations should be rated with regard to their bearing on SES relative to one another, and the possibility of dozens or even hundreds of distinguishable occupations existing in some occupational categories, complicating self-report (Hauser & Warren 1997; Oakes & Andrade, 2017). As a result, some research has suggested shifting the focus on measurements of SES away from occupational categories (e.g., Duncan & Magnusen, 2001). Indeed, Hauser and Warren (1997) concluded that while “measures of occupational status may have heuristic uses, the global concept... is scientifically obsolete.” In light of these concerns, occupation was not included in the current operational definition of objective SES.

Neighborhood Disadvantage Composite. A composite score of neighborhood disadvantage was computed using averages of standardized scores on Informal Social Control and Social Disorganization measures. Cronbach’s α for the composite was .51. The measures of Neighborhood Disadvantage used in the current study include:

Informal Social Control (Appendix F). Informal social control was examined via a five-item Likert self-report measure. This informal social control measure (Sampson et al., 1997) assessed the likelihood of whether a participant’s neighbors could be counted on to intervene in social situations (e.g., if children were skipping school, spray-painting graffiti on a local building, or children were showing disrespect to an adult). This measure has been used in several studies to examine informal social control throughout different neighborhoods (e.g., Sampson et al., 1997; Steptoe & Feldman, 2001). Notably, all items on this scale were coded in order for interpretation of scores to line up with other disadvantage variables (i.e. items were coded such

that higher scores indicate less informal social control present). Cronbach's α for Informal Social Control was .92 for the current study.

Social Disorganization (Appendix G). Social disorganization was examined via a 5-item Likert self-report measure, with higher scores indicating higher levels of social disorganization. This measure assessed neighborhood support, perception of prosocial and negative behaviors, and indicators of violence in a participants' neighborhood. This measure has been used in studies to examine aspects of social disorganization throughout different neighborhoods (e.g., Bowen, Bowen, & Ware, 2002). Cronbach's α for Social Disorganization was .87 for the current study.

Psychopathy Dimensions (Appendix H). The Triarchic Psychopathy Measure (Tri-PM; Patrick, 2010) is a 58-item self-report measure that evaluates psychopathy personality traits (namely boldness, meanness, and disinhibition) on a 4-point Likert scale (4 = "true," 3 = "somewhat true," 2 = "somewhat false," 1 = "false"). Validity and reliability of the Tri-PM has been supported in undergraduate and community samples (e.g., Gaughan, Miller, & Pryor, 2009; Sellbom & Phillips, 2013). In the current study, Cronbach's α for Boldness was .89, for Meanness was .89, and for Disinhibition was .93.

Psychological Distress (Appendix I). The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1994) is a 19-item self-report measure that evaluates a measure of the degree to which situations in one's life are appraised as stressful on a 5-point Likert scale (0 = "never," 1 = "almost never," 2 = "sometime," 3 = "fairly often," 4 = "often"). Higher scores indicate higher reported levels of distress. Validity and reliability of the PSS has been supported in undergraduate and community samples (e.g., Andreou et al, 2011; Siqueria-Reis, Hino, & Añez, 2013). In the current study, Cronbach's α was .67.

Antisocial Behavior Composite. A composite score of antisocial behavior was derived from different measures indexing aspects of antisociality, including physical aggression (self-report and behavioral measures) and antisocial behavior. A composite score of Antisocial Behavior was computed using averages of standardized scores on several different types of antisocial behavior, including reactive and proactive forms of physical aggression, and non-aggressive violations of social norms or rules. Previous research has used composite variables to index several aspects of violence and antisocial behavior (e.g., Banyard & Cross, 2008; Farrington & Ttofi, 2011). Cronbach's α for the Antisocial Behavior Composite was .97. The measures of antisocial behavior used in the current study include:

Self-reported Antisocial Behavior (Appendix J). The self-report antisocial behavior scale (Elliott, Ageton, & Huizinga, 1985) is a 22-item self-report measure used to assess levels of antisocial behavior, with higher scores indicating higher levels of self-reported antisocial acts. Examples of behavior assessed in this measure includes being drunk publicly, driving recklessly, stealing, cheating, using someone else's credit cards without permission, setting fires, and breaking and entering, as well other antisocial acts. This measure has been used for several large-scale studies on antisocial behavior in the U.S. and New Zealand (Elliot et al., 1985; Huizinga, Esbensen, & Weiher, 1991; Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996; Thornberry, Krohn, Lizotte, & Chard-Wierschem, 1993). Cronbach's α on this measure was .95 for the current study.

Self-reported Aggression (Appendix K). The Reactive-Proactive Questionnaire (RPQ; Raine et al., 2006) is a 23-item measure indexing levels of Proactive (PA) and Reactive (RA) on a 3-point Likert scale (0 = "never," 1 = "sometimes," 2 = "often"). 12 items of the RPQ index PA (e.g., "Threatened and bullied someone"), while 11 items index RA (e.g., "Reacted angrily

when provoked by others”). Higher scores indicate higher levels of self-reported aggression. Proactive and reactive scales have been found to be moderately associated with one another but to have distinct correlates (Card & Little, 2006; White, Jarrett, & Ollendick, 2013). The RPQ has been validated in college and community samples (e.g., Gao & Tang, 2013; Raine et al., 2006). Cronbach’s α for PA was .94, while α for RA was .80 for the current study.

Social Desirability (Appendix L). The short form of the Marlowe-Crowne Social Desirability Scale (MC-SDS; Crowne & Marlowe, 1960) was included to control for potential response characteristics that may be differentially associated with the primary variables of interest. This 13-item self-report measure (Reynolds, 1982) involves participants answering true or false questions that measure a person’s tendency to want to be perceived positively, with higher scores indicating higher levels of socially desirable responding. Cronbach’s α for Social Desirability was unusually low (.47) in the current study compared to other studies (Beretvas, Meyers, & Leite, 2002; Reynolds, 1982; Sârbescu, Costea, & Rusu, 2012). Although deletion of 6 items on this scale would increase Cronbach’s α to .74, the original 13 item scale was retained in the currently reported analyses because such adjustment would substantially shorten the scale, and there have been criticisms of the literature on the use and interpretation of shortened version of the MC-SDS (Barger, 2002).

2.5 Data Screening and Analytic Procedure

Only data from participants who completed all relevant instruments and tasks were retained for analyses. Careless responders were eliminated prior to analyses based on invalid responses to two or more randomly dispersed instructed-response items, following Meade and Craig (2012). Specifically, four special items were randomly dispersed throughout the survey which instructed participants to provide a directed response (e.g., “For this item, please select

‘Very Likely’”). Careless responding was defined a priori as two or more incorrect responses that indicated random or inattentive responding. A total of 21 participants were classified as careless responders, and their data were excluded prior to conducting analyses on the final, reported sample ($N= 462$).

Data were screened to test assumptions of normality, linearity, and homoscedasticity following recommendations of Tabachnick and Fidell (2013). Means, standard deviations, and ranges were computed, and zero-order Pearson product-moment correlations were examined between variables. Racial Group and Age were considered as potential confounding demographic variables in instances where they correlated significantly with both predictor and outcome variables. In such instances, analyses were also evaluated with potential confounds controlled statistically as covariates in regression models.

Next, hierarchical regression analyses were conducted to test each proposed model. Continuous predictors were mean-centered prior to regression analyses that examined tests of interactions, where doing so could aid interpretation. When testing associations with aggression, non-focal psychopathy factors were included to examine unique effects of antisocial behavior. Other variables (e.g., Racial Group, Age, Social Desirability) were also included as covariates in certain regression models.

To probe significant interactions observed during regression analyses, post-hoc tests of simple slopes plotted at 1 SD above and below moderator value means were considered, in line with Aiken, West, & Reno (1991). While this conventional “pick-a-point” approach (Bauer & Curran, 2005) is convenient for preliminary inspection and plotting of interactions, the selection of probed levels of the moderator is notably arbitrary and limited in range (Hayes, 2013). We thus also tested more comprehensively for regions of significance across the range of the

observed data using the Johnson-Neyman (J-N) technique (1936). These probed values were obtained using PROCESS (Hayes, 2013).

To test for significant effects during mediation analyses, hierarchical regression analyses of total and direct effects of SES and bootstrapped 95% confidence intervals of the indirect effect through the hypothesized mechanism (neighborhood disadvantage, psychological distress) were computed using the PROCESS macro in SPSS (Hayes, 2013) with 5000 bootstrapped samples. A significant indirect effect, consistent with mediation, is supported when confidence intervals do not contain 0.

Chapter 3 - Results

Sample descriptive statistics and zero-order correlations are presented in Tables 1 and 3, respectively. Age was correlated in the positive direction with objective SES ($r = .26; p < .001$), Income ($r = .27; p < .001$), Education ($r = .23; p < .001$), and Boldness ($r = .24; p < .001$), while inversely correlating with Social Disorganization ($r = -.26; p < .001$), Disinhibition ($r = -.10; p = .04$), Meanness ($r = -.17; p < .001$), both functions of Aggression (RA: $r = -.20; p < .001$; PA: $r = -.13; p = .004$), and both composite variables (Neighborhood Disadvantage [$r = -.13; p = .01$] and Antisocial Behavior [$r = -.13; p = .01$]). Racial Group was significantly correlated with Social Disorganization ($r = .13; p = .004$) and with Psychological Distress ($r = .12; p = .01$), and inversely correlating with Boldness ($r = -.15; p = .002$), Income ($r = -.15; p = .001$), Education ($r = -.19; p < .001$), and objective SES ($r = -.18; p < .001$). Racial Group was not correlated with either composite variable, however. Based on correlational findings, Age was considered as a possible covariate in subsequent regression analyses. Racial Group membership was controlled for in analyses where SES was hypothesized to predict a variable specifically over and above Racial Group (described in further detail below), but not in other analyses.

Social desirability was inversely correlated with Racial Group ($r = -.11; p = .024$), Social Disorganization ($r = -.23; p < .001$), Disinhibition ($r = -.22; p < .001$), Meanness ($r = -.25; p < .001$), both functions of Aggression ($r_s = -.28$ [PA] & $-.39$ [RA]; $p_s < .001$), Antisociality ($r = -.16; p = .001$), and the Antisocial Behavior composite ($r = -.29; p < .001$). It was also positively correlated with Age ($r = .21; p < .001$), Informal Social Control ($r = .17; p < .001$), and Boldness ($r = .42; p < .001$). Social desirability as a potential confound and covariate in analyses are discussed within each hypothesis section.

Of note, Subjective SES was significantly correlated with the Objective SES composite variable ($r = .48; p < .001$). Objective and Subjective SES were each significantly associated in the positive direction with Income and Education (r s between .44 and .48; $p < .001$ for each correlation), and inversely associated with Racial Group ($r = -.10; p = .03$). Interestingly, only the composite Objective SES variable (but not Subjective SES) was associated with Age ($r = .26; p < .001$), Boldness ($r = .15; p = .001$), and RA ($r = -.11; p = .02$). Conversely, only Subjective SES (but not the composite Objective SES variable) was associated with Social Control ($r = .31; p < .001$), Antisociality ($r = .19; p < .001$), PA ($r = .24; p < .001$), and the Antisocial Behavior composite variable ($r = .19; p < .001$). Four variables were significantly associated with each SES index, but in opposite directions. Specifically, Subjective SES was positively associated with Social Disorganization ($r = .28; p < .001$), the Neighborhood Disadvantage Composite ($r = .34; p < .001$), Meanness ($r = .25; p < .001$), and Disinhibition ($r = .27; p < .001$). However, the Objective SES composite variable was inversely associated with Social Disorganization ($r = -.09; p = .04$), the Neighborhood Disadvantage Composite ($r = -.09; p = .04$), Meanness ($r = -.12; p = .01$), and Disinhibition ($r = -.09; p = .04$). Contrary to expectations, subjective SES was positively associated with antisocial behavior and psychopathy variables.

3.1 Hypothesis 1

Regression models were run to test hypothesis 1, observing relationships among SES and Antisocial Behavior, as well as bootstrapped CIs of indirect effects that were computed to test for mediation by Neighborhood Disadvantage. The first model tested the total effect of SES on Antisocial Behavior, controlling for Racial Group and Psychological Distress. While Age and Social Desirability were correlated with study variables, they were not included as covariates in

the reported model.¹ Predictors in the model explained 35.3% variance in Antisocial Behavior, $F(3, 458) = 83.22, p < .001, R^2 = .35$. A second model tested the association between the same predictors and Neighborhood Disadvantage (path a , illustrated in Figure 6a), explaining 26.3% of the variance in Neighborhood Disadvantage, $F(3, 458) = 54.37, p < .001, R^2 = .26$. The third model tested the direct effect of SES and covariates, as well as Neighborhood Disadvantage as potential mediator of the link between SES and Antisocial Behavior. This model explained 43.3% variance in Antisocial Behavior, $F(4, 457) = 87.08, p < .001, R^2 = .43$.

After controlling for Racial Group and Psychological Distress, Neighborhood Disadvantage was uniquely and positively related to Antisocial Behavior ($B = .51, p < .001$), but did not account for the inverse relationship between SES and Antisocial Behavior ($B = .002, \text{Boot SE} = .01, \text{CI}_{95\%} = -.01 - .02$). Therefore, these analyses did not support Neighborhood Disadvantage as a mediator between SES and Antisocial Behavior. This model is depicted in Figure 6a.

A test was also conducted on whether Neighborhood Disadvantage mediated the relationship between *Subjective* SES and Antisocial Behavior. This model tested the total effect of Subjective SES on Antisocial Behavior, controlling for Racial Group and Psychological Distress. In keeping with the mediation analysis presented in Figure 6a, Age and Social Desirability were not included in the model. Predictors in the model explained 36.8% variance in Antisocial Behavior, $F(3, 457) = 88.50, p < .001, R^2 = .37$. A second model tested the association between the same predictors and Neighborhood Disadvantage (path a , illustrated in Figure 6b), explaining 34.2% of the variance in Neighborhood Disadvantage, $F(3, 457) = 79.25, p < .001, R^2$

¹ Adding Age or Social Desirability into any model for Hypothesis 1 did not impact the pattern of the results with regard to statistical significance. For sake of parsimony, analyses are described without these variables included as covariates.

= .34. The third model tested the direct effect of Subjective SES and covariates, as well as Neighborhood Disadvantage as potential mediator of the link between Subjective SES and Antisocial Behavior. This model explained 43.3% variance in Antisocial Behavior, $F(4, 456) = 86.90, p < .001, R^2 = .43$.

After controlling for Racial Group and Psychological Distress, Neighborhood Disadvantage was uniquely and positively related to Antisocial Behavior ($B = .49, p < .001$). In addition, there was a significant indirect effect of Neighborhood Disadvantage on the inverse relationship between *Subjective* SES and Antisocial Behavior ($B = .11, \text{Boot SE} = .02, \text{CI}_{95\%} = .08 \text{ to } .16$), which is consistent with mediation. These relationships are depicted in Figure 6b.

3.2 Hypothesis 2a

The next set of hierarchical regression models tested the prediction of Antisocial Behavior by psychopathy factors, as well as SES and their interactions. Racial Group was added into the model as a covariate in order to examine unique effects of SES.^{2,3} Thus, Boldness, Meanness, Disinhibition, SES, and Racial Group were entered at step 1 of the model. Step 2 included two-way interactions between SES and each factor of psychopathy. The full model accounted for 61.5% of variance in Antisocial Behavior. As shown in Table 4a, Antisocial Behavior was uniquely and positively associated with Meanness ($\beta = .35, p < .001$), and Disinhibition ($\beta = .39, p < .001$). It was also uniquely negatively associated with Boldness ($\beta = -.11, p = .002$). The unique relationship between Disinhibition and Antisocial Behavior was

² Adding Age into this model did not impact significance levels of results. For sake of parsimony, analyses are described with Age not included in the model as a covariate

³ Adding Social Desirability reduced the intensity of the SES x Disinhibition interaction (reducing the effect from [$\beta = -.15; p = .04$] to [$\beta = -.13; p = .08$]). Although the interaction was no longer significant, the pattern of simple slope results remained the same regardless of whether Social Desirability was included. Therefore, analyses are described with Social Desirability excluded (see Supplementary Analyses).

subsumed by a higher-order interaction between Disinhibition and SES ($\beta = -.15, p = .04$) in predicting Antisocial Behavior. This interaction was explored via post-hoc probing using conventional tests of simple slopes, as well as Johnson-Neyman tests of significance.

Probing of the Disinhibition by SES interaction using simple slope tests at 1 SD above and below the mean level of Disinhibition revealed a non-significant trend ($B = .09, p = .0501$) in the relationship between SES and Antisocial Behavior in participants reporting low Disinhibition and among participants high in Disinhibition ($B = -.08, p = .08$). This was in contrast to no SES – Antisocial Behavior relationship among those reporting mean levels of Disinhibition ($B = .01, p = .72$). These relationships are illustrated in Figure 7a. Clarifying the picture, the J-N approach revealed a significant relationship between Antisocial Behavior and SES among those reporting slightly greater than one SD below average Disinhibition levels ($B = .09; p = .05$), as well as among those reporting about 2.5 standard deviations above average Disinhibition ($B = -.19; p = .05$).

The above set of regression models were replicated, this time testing the prediction of Antisocial Behavior by psychopathy factors, as well as *Subjective* SES and their interactions (with Racial Group once again added into the model as a covariate).⁴ Thus, Boldness, Meanness, Disinhibition, Subjective SES, and Racial Group were entered at step 1 of the model. Step 2 included two-way interactions between Subjective SES and each factor of psychopathy. The full model accounted for 62.4% of variance in Antisocial Behavior. As shown in Table 4b, Antisocial Behavior was uniquely and positively associated with Meanness ($\beta = .35, p < .001$), and Disinhibition ($\beta = .39, p < .001$). It was also uniquely negatively associated with Boldness ($\beta = -$

⁴ Adding Age or Social Desirability into this model did not impact the pattern of the results. For sake of parsimony, analyses are described without social desirability as a covariate.

.11, $p = .002$). The unique positive relationships that were present were each subsumed by higher order interactions. Specifically, a higher-order interaction emerged between Disinhibition and Subjective SES ($\beta = -.35, p < .001$). A separate higher-order interaction was also observed between Meanness and Subjective SES ($\beta = .29, p < .001$). Both of these interactions were explored via post-hoc probing using conventional tests of simple slopes, as well as Johnson-Neyman tests of significance.

Probing of the Meanness by Subjective SES interaction using simple slope tests at 1 SD above and below the mean level of meanness revealed that Antisocial Behavior was inversely related to Subjective SES in participants who reported relatively low Meanness ($B = -.30, p < .001$). Conversely, Antisocial Behavior was positively related to Subjective SES in participants high in Meanness ($B = .33, p < .001$). Participants with average Meanness scores did not evidence any relationship between Subjective SES and Antisocial Behavior ($B = .02, p = .70$). These relationships are illustrated in Figure 7b. Johnson-Neyman analyses clarified that, for individuals with Meanness scores from approximately .3 SDs below the mean to approximately .2 SDs above the mean, no relationship between Antisocial Behavior and Subjective SES exists.

The Disinhibition x Subjective SES interaction was similarly probed using simple slope tests at 1 SD above and below the mean level of Disinhibition. Antisocial Behavior was inversely related to Subjective SES in participants high in Disinhibition ($B = -.35, p < .001$). Conversely, Antisocial Behavior was significantly and positively related to Subjective SES in participants low in Disinhibition ($B = .38, p < .001$). Participants with average Disinhibition scores did not evidence any relationship between Subjective SES and Antisocial Behavior ($B = .01, p = .73$). These relationships are illustrated in Figure 7c. The J-N technique clarified that, for individuals with Disinhibition scores ranging from about -.2 SD below to .3 SD above the mean, no

relationship between Antisocial Behavior and Subjective SES was present. Interestingly, the relationship changes directionality when scores reach mean levels of Disinhibition.

3.3 Hypothesis 2b

The next set of hierarchical regression models tested the prediction of Antisocial Behavior by psychopathy factors, as well as Neighborhood Disadvantage and their interactions (controlling for Racial Group).⁵ Thus, Boldness, Meanness, Disinhibition, Neighborhood Disadvantage, and Racial Group were entered at step 1 of the model. Step 2 included two-way interactions between Neighborhood Disadvantage and each factor of psychopathy. The full model accounted for 67.3% of variance in Antisocial Behavior. As shown in Table 5, Antisocial Behavior was uniquely and positively associated with Meanness ($\beta = .31, p < .001$), and Disinhibition ($\beta = .37, p < .001$), as well as Neighborhood Disadvantage ($\beta = .08, p = .03$). It was also uniquely negatively associated with Boldness ($\beta = -.11, p = .001$). The unique relationships between Antisocial Behavior and both Meanness and Neighborhood Disadvantage were subsumed by a higher-order interaction between Meanness and Neighborhood Disadvantage ($\beta = .19, p = .001$) in predicting Antisocial Behavior. This interaction was explored via post-hoc probing using conventional tests of simple slopes, as well as Johnson-Neyman tests of significance.

Probing of the Meanness x Neighborhood Disadvantage interaction using simple slope tests at 1 SD above and below the mean level of Meanness revealed that Antisocial Behavior was significantly and positively related to Neighborhood Disadvantage in participants high in Meanness ($B = .63, p < .001$), as well as participants with average Meanness scores ($B = .25, p <$

⁵ Adding Age or Social Desirability into the model did not impact the pattern of results for this hypothesis. For sake of parsimony, analyses are described without social desirability as a covariate.

.001). Participants low in Meanness did not evidence any relationship between Neighborhood Disadvantage and Antisocial Behavior ($B = -.12, p = .30$). These relationships are illustrated in Figure 8. When observing the regions of significance, J-N analyses revealed a significant positive relationship between Antisocial Behavior and Neighborhood Disadvantage to emerge among those reporting slightly below-average levels of Meanness (about .3 SDs below the average raw score Meanness levels; $B = .13; p = .05$).

3.4 Hypothesis 3a

Regression models were then run to test hypothesis 3a, observing relationships among bootstrapped CIs of indirect effects that were computed to test for mediation of SES and Antisocial Behavior by Psychological Distress. The first model tested the total effect of SES on Antisocial Behavior, controlling for Racial Group and Neighborhood Disadvantage.⁶ These predictors together explained 30.1% variance in Antisocial Behavior, $F(3, 458) = 65.67, p < .001, R^2 = .30$. A second model tested the association between the same predictors and Psychological Distress (path a , illustrated in Figure 9a), explaining 29.3% of the variance in neighborhood disadvantage, $F(3, 458) = 63.21, p < .001, R^2 = .29$. The third model tested the direct effect of SES and covariates, as well as Psychological Distress as potential mediator of the link between SES and Antisocial Behavior. This model explained 43.3% variance in Antisocial Behavior, $F(4, 457) = 87.08, p = .48, R^2 = .43$.

After controlling for Racial Group and Neighborhood Disadvantage, Psychological Distress was uniquely and positively related to Antisocial Behavior ($B = .30, p < .001$). In addition, there was a significant indirect effect of Psychological Distress on the inverse

⁶ Adding Age or Social Desirability into the model did not impact the pattern of results. For sake of parsimony, analyses are described with this variable not included in the model as a covariate.

relationship between SES and Antisocial Behavior ($B = -.04$, Boot SE = .01, $CI_{95\%} = -.06$ to $-.02$), which is consistent with mediation. These relationships are depicted in Figure 9a.

Psychological Distress as a potential mediator of the relationship between *Subjective* SES and Antisocial Behavior was considered next. The first model tested the total effect of Subjective SES on Antisocial Behavior, controlling for Racial Group and Neighborhood Disadvantage, with Age and Social Desirability excluded. Predictors in the model explained 29.9% variance in Antisocial Behavior, $F(3, 457) = 64.97$, $p < .001$, $R^2 = .30$. A second model tested the association between the same predictors and Psychological Distress (path *a*, illustrated in Figure 6b), explaining 27.5% of the variance in Psychological Distress, $F(3, 457) = 57.86$, $p < .001$, $R^2 = .28$. The third model tested the direct effect of Subjective SES and covariates, as well as Psychological Distress as potential mediator of the link between Subjective SES and Antisocial Behavior. This model explained 43.3% variance in Antisocial Behavior, $F(4, 456) = 86.91$, $p < .001$, $R^2 = .43$.

After controlling for Racial Group and Neighborhood Disadvantage, Psychological Distress, was uniquely and positively related to Antisocial Behavior ($B = .30$, $p < .001$), but did not account for the inverse relationship between Subjective SES and Antisocial Behavior ($B = -.03$, Boot SE = .03, $CI_{95\%} = -.09$ to $.03$). Therefore, these analyses did not support Psychological Distress as a mediator between *Subjective* SES and Antisocial Behavior. This model is depicted in Figure 9b.

3.5 Hypothesis 3b

The final set of hierarchical regression models tested the prediction of Antisocial Behavior by psychopathy factors, as well as Psychological Distress and their interactions

(controlling for Racial Group).^{7, 8} Thus, Boldness, Meanness, Disinhibition, Psychological Distress, and Racial Group were entered at step 1 of the model. Step 2 included two-way interactions between Psychological Distress and each factor of psychopathy. The full model accounted for 64.8% of variance in Antisocial Behavior. As shown in Table 6, Antisocial Behavior was uniquely and positively associated with Meanness ($\beta = .35, p < .001$), and Disinhibition ($\beta = .34, p < .001$), as well as Psychological Distress ($\beta = .10, p = .02$). It was also uniquely negatively associated with Boldness ($\beta = -.08, p = .02$). The unique relationships between Antisocial Behavior and Boldness, Meanness, and Psychological Distress were subsumed by higher-order interactions between Meanness and Psychological Distress ($\beta = .22, p < .001$), as well as Boldness and Psychological Distress ($\beta = .08, p = .02$), in predicting Antisocial Behavior. This interaction was explored via post-hoc probing using conventional tests of simple slopes, as well as Johnson-Neyman tests of significance.

Probing of the Psychological Distress by Meanness interaction using simple slope tests at 1 SD above and below the mean level of Meanness revealed that Antisocial Behavior was significantly and positively related to Psychological Distress in participants high in Meanness ($B = .21, p < .001$), as well as participants with average Psychological Distress scores ($B = .06, p = .04$) and low Psychological Distress scores ($B = -.09, p = .03$). However, it is important to note the relationship between Psychological Distress and Antisocial Behavior was strongest when participants evidenced high (+1 SD) Meanness scores. These relationships are illustrated in

⁷ Adding Age into this model did not impact the pattern of results. For sake of parsimony, analyses are described with Age not included in the model as a covariate

⁸ Adding Social Desirability reduced the magnitude of the SES x Disinhibition interaction to a n.s. trend (reducing the effect from [$\beta = .08; p = .02$] to [$\beta = .07; p = .06$]). Although the interaction was no longer significant, the pattern of results remained the same (e.g., significance levels during post-hoc probing of this interaction remained the same regardless of whether Social Desirability was included). Therefore, analyses are described with this variable excluded (see Supplementary analyses for details).

Figure 10. When observing the regions of significance technique, analyses revealed a significant positive relationship between Antisocial Behavior and Psychological Distress to emerge among those reporting slightly below-average levels of Meanness (about .03 SDs below the average raw score meanness levels; $B = .06$; $p = .05$).

Probing of the Psychological Distress by Boldness interaction using simple slope tests at 1 SD above and below the mean level of Psychological Distress revealed that Antisocial Behavior was significantly and negatively related to Psychological Distress in participants high in Boldness ($B = .10$, $p = .001$). No significant relationships were present between Antisocial Behavior and Psychological Distress in participants with average ($B = .06$, $p = .35$) or low ($B = .02$, $p = .54$) Boldness scores. These relationships are illustrated in Figure 11. When observing the regions of significance technique, analyses revealed a significant positive relationship between Antisocial Behavior and Psychological Distress to emerge among those reporting slightly below-average levels of Boldness (.1 SDs below the mean raw score boldness levels; $B = .06$; $p = .05$).

Chapter 4 – Discussion

The main objective of this study was to examine how individual and environmental risk factors intersect in predicting antisocial behavior. A key aspect was the integration across both sociological and psychological models in observing potential moderating and mediating roles of psychopathy, neighborhood disadvantage, and psychological distress in the relationship between SES and antisocial behavior. Our sample reported comparable mean levels of psychopathy (e.g., van Dongen, et al., 2017), social disorganization (Sampson & Grove, 1989), informal social control (Sampson & Grove, 1989) and aggression (Perenc & Radochonski, 2014) to similar community samples. Study variables were generally associated with one another in the expected directions based on the literature, with some exceptions. Namely, neighborhood disadvantage was associated with dimensions of psychopathy, as well as antisocial behavior (both the composite variable, and all index scores that went into the composite). It was also inversely related to objective SES, as expected. Psychological distress, while acting as a mediator between objective SES and antisocial behavior (described further below), was not associated at the bivariate level with objective SES. Psychological distress was associated with antisocial behavior (both the composite variable, and all index scores that went into the composite), as well as psychopathy dimensions.

Prior to considering the mediation and moderation models tested in the current study, several observations are noteworthy with regard to performance of the SES variables in relation to one another and in relation to antisocial outcome variables. Objective and subjective SES are often described as indexing partly overlapping aspects of the construct of social class. Consistent with this notion, objective and subjective SES shared substantial covariance in the current study, at levels slightly higher than prior studies (Adler et al., 2000; Gong et al., 2012; Ostrove et al.,

2000). However, subjective and objective SES have been found to diverge in important ways. Subjective SES has been found to more strongly predict lower negative affect and pessimism (Demakakos, Nazroo, Breeze, & Marmot, 2008; Kraus, Adler, & Chen, 2013), as well as better cognitive functioning, empathy, and behavior (Kraus, Côté, & Keltner, 2010; Kraus, Piff, & Keltner, 2011), when compared to objective SES. The feelings of security and hope derived from perceptions of higher social status, as opposed to objective indicators of ones' actual educational or financial situation, have been described as potentially providing psychological buffers against stressors by acting through immunological mediating pathways (Adler et al., 2000; Segerstrom, Taylor, Kemeny, & Fahey, 1998). However, there is some recent evidence that high subjective SES may be associated with certain undesirable traits (Piff, 2014; Greitemeyer & Sagioglou, 2016). In the current study, whereas objective SES was inversely related to social disorganization, meanness, disinhibition, and reactive aggression, subjective SES was positively correlated with neighborhood disadvantage variables, as well as to meanness, disinhibition, and proactive aggression. Although some recent research has supported the notion that low subjective SES may be a unique risk factor for aggression (Greitemeyer & Sagioglou, 2016), other studies have found that those with high subjective SES are more entitled and narcissistic, and engage in more antisocial behavior (Piff, 2014), in keeping with findings of the current study.

In addition to the objective/subjective distinction, the two SES indices in the current study also diverged with regard to consideration of occupation, in that the MacArthur Subjective scale asks participants to also consider how respected their jobs are, whereas the objective SES variable used considered only income and education. The impact of perceived respect or prestige of one's occupation may differ in important ways from externally determined rankings of

occupation that have been incorporated into some objective SES measures. Such considerations, as well as the divergent results across objective and subjective SES in the current study, highlight just how complex the construct of social class is, and how diverging definitions of SES can dramatically impact findings.

4.1 Neighborhood Disadvantage as a Mediator

Mediation of the relationship between SES and antisocial behavior by neighborhood disadvantage and psychological distress depended upon the SES index under consideration. Contrary to Hypothesis 1, Neighborhood Disadvantage did not appear to mediate the relationship between objective SES and antisocial behavior, after controlling for Racial Group and psychological distress. However, neighborhood disadvantage was found to mediate the relationship between *subjective* SES and antisocial behavior, controlling for Racial Group and psychological distress.

Although neighborhood disadvantage was uniquely related to antisocial behavior as expected, the unique relationship between neighborhood disadvantage and objective SES was not significant, contrary to prior research (Bruinsma et al., 2013; Kaylen & Pridemore, 2013; Sampson & Groves, 1989; Slutske, Deustch, & Piasecki, 2016; Travis, Western, & Redburn, 2014). This null finding was considered to potentially occur as a result of the measures used. One possibility which was explored further is that the composite measure of Neighborhood Disadvantage, which comprised both informal social control *and* social disorganization, had low internal consistency reliability ($\alpha = .51$). However, the index variables of social control and disorganization were strongly correlated with one another, and both demonstrated similar relationships to objective SES and to the antisocial behavior composite. Furthermore, neither informal social control *nor* social disorganization mediated the relationship between objective

SES and antisocial behavior when tested individually, outside of the Disadvantage composite (see Supplementary Analyses). It may be possible that some of the covariates included in the model are accounting for a sizeable amount of the variance in this relationship, and thus a mediation finding is not found. It may also be possible that in the studies that observed these relationships, the difference in measures used of social disorganization and psychological distress, the sample being examined, or the specific SES index used was responsible for the discrepancies between findings. In any case, this is a relationship that warrants further investigation.

Another unique aspect to consider when observing the differences in results between subjective and objective SES is the nature of the mechanisms that may drive associations with antisocial behavior. With regard to Hypothesis 1, it is intriguing that psychological distress mediated the objective SES – antisocial behavior relationship but not the subjective SES – antisocial behavior relationship, considering that psychological distress, like subjective SES, is based upon an individuals' perceptions of how they are doing.

This study is one of the first to empirically test neighborhood disadvantage as a direct mechanism (mediator) for the relationship between SES and antisocial behavior, with results showing that mediation was present, but only between the subjective SES – antisocial behavior relationship. Theoretical descriptions and empirical findings examining neighborhood disadvantage have described it as a catalyst for negative outcomes such as antisocial behavior in low objective SES populations. However, in this sample, neighborhood disadvantage did not act as a mechanism in the relationship between antisocial behavior and objective SES such as income and education. It may be that key aspects of neighborhood disadvantage that are not directly examined with this measure (i.e. unemployment, neighborhood crime levels, perceived

neighborhood safety, social support; Clark et al., 2013; Kim, 2010; Ross & Mirowsky, 2001) may be potentially responsible for this relationship. Alternatively, as seen in this sample, the manner in which low SES is considered (subjective impressions of one's own standing vs. one's objective income and educational level) may influence the manner in which neighborhood disadvantage can be considered a mechanism in explaining the SES-antisocial behavior link. The potential manner in which variables were composited during this study may also have impacted results. However, it important to note that results were consistently not significant (i.e. no mediation was observed) whether examining social disorganization, informal social control, or a composite variable of these two variables as a mediator for the objective SES-antisocial behavior relationship (see Supplementary Analyses).

4.2 Psychopathy Moderating Disadvantage – Antisocial Behavior Relationship

In accordance with hypothesis 2a, dimensions of psychopathy and SES did interact in uniquely predicting antisocial behavior. Specifically, disinhibition was a moderator of the relationship between SES and antisocial behavior, exacerbating the effect of low SES on antisocial behavior, as predicted. This relationship is in line with previous research (Lahey et al., 2005; Lynam, et al., 2000; Walsh & Kosson, 2007). Indeed, these studies examined the disinhibited dimension of psychopathy and found it to interact with low objective SES in predicting violence. In addition to supporting these studies, results also support the work of Raine (2002), which found that the presence of various *classes* of risk factors (e.g., sociodemographic, personality traits) have a multiplicative effect in prediction of violence and antisocial behavior. Accordingly, results of this study support the notion that interactions in which a person's level of psychopathic characteristics (e.g., disinhibition) are more strongly related to antisocial behavior in individuals who are lower in SES (Lynam et al., 2000; Raine,

2002). Furthermore, this interaction was present regardless of how SES was operationalized (objective vs. subjective), although the effect was stronger when subjective SES was examined.

Interestingly, for hypotheses 2a and 2b, the interaction between psychopathy and “disadvantage” variables (neighborhood disadvantage, low SES) was expected to be observed for both “maladaptive” dimensions of psychopathy in the same manner according to the triarchic model (meanness and disinhibition). However, this was not the case. Specifically, Disinhibition interacted with low SES (but not neighborhood disadvantage) in predicting antisocial behavior. These results support the findings of Lynam et al. (2000) and Lahey et al. (2005). However, this pattern did not generalize to the other maladaptive dimension of psychopathy (meanness) as predicted, when examining objective SES. Of note, the interaction between psychopathic disinhibition and SES was consistent across both objective and subjective SES. In both instances, the relationship between antisocial behavior and lower SES was strongest in high disinhibition individuals.

Conversely, meanness interacted with higher neighborhood disadvantage in predicting antisocial behavior. That disinhibition, but not meanness, interacted with objective SES may speak to the manner in which aspects of disinhibition and meanness are understood in the psychology literature. Disinhibition traits of psychopathy reflect “Factor 2” behavioral disturbances, which manifest as elevated antisocial behavior and emotional reactivity. Meanness, in contrast, reflects callousness, characterized by a lack of empathy, emotional coldness, lack of close attachments, and empowerment through cruelty or destructiveness (Patrick et al., 2009). It could be that different aspects of inequality (e.g., low income vs. neighborhood disadvantage) differentially relate to these two dimensions of psychopathy. Importantly, these dimensions are described as having different etiological factors, with behavioral/regulatory deficits more

environmentally learned/determined, while affective deficits are considered more heritable/genetically determined (Karpman, 1948; Skeem, Johansson, Andershed, Kerr, & Louden, 2007). Future research should investigate these differences more closely.

The interaction between meanness and subjective SES was difficult to understand in relation to the other findings in the current investigation. Meanness interacted with subjective but not objective SES to predict antisocial behavior. However, the pattern of results was contrary to predictions, and in contrast to the disinhibition interaction with subjective SES. Individuals who had elevated levels of meanness did endorse significantly more antisocial behavior than those low in meanness, as one would predict. This was true across levels of SES. However, the highest level of antisocial behavior was observed in individuals endorsing meanness along with high subjective SES individuals, as opposed to those endorsing low subjective SES. That meanness and disinhibition would interact with subjective SES in predicting antisocial behavior in opposite directions is not suggested in any literature. It is possible, however, that effects observed in the successful psychopathy literature can potentially explain these results. Specifically, relative elevations in interpersonal/affective deficits have been observed in individuals with higher levels of income, education, and occupation, when compared to those lower in SES (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Hall, Benning, & Patrick, 2004). Interestingly, workplace aggression and white-collar crime have been associated with “successful” psychopathic traits among individuals with higher-income occupations although this association is more often attributed to the boldness/fearless-dominance dimension of psychopathy, rather than meanness (Smith & Lilienfeld, 2013; Smith, Lilienfeld, Coffey, & Dabbs, 2013).

Psychopathic traits also interacted with neighborhood disadvantage in uniquely predicting antisocial behavior, as predicted (Hypothesis 2b). Specifically, meanness (and not

disinhibition) was a moderator for the relationship between neighborhood disadvantage and antisocial behavior, exacerbating the effect of high neighborhood disadvantage on antisocial behavior, as predicted (and as per previous research; Lahey et al., 2005; Lynam, et al., 2000; Raine, 2002; Walsh & Kosson, 2007). The rationale for this relationship was the same as in Hypothesis 2a, with the presence of multiple *classes* of risk factors expected to have a multiplicative effect in prediction of violence and antisocial behavior.

4.3 Psychological Distress as a Mediator

In accordance with hypothesis 3a, psychological distress was found to mediate the relationship between objective SES and antisocial behavior, over and above race and neighborhood disadvantage. While there is some previous research implicating psychological distress as a potential mechanism in the relationship between SES and antisocial behavior (Pennington et al., 2014; Price et al., 2013), this study is the first to empirically support the role of psychological distress as a mediator for the relationship between objective SES and antisocial behavior. Interestingly, this pattern did not extend when examining the relationship between antisocial behavior and *subjective* SES. This suggests that an individual's psychological distress plays a critical role in explaining the relationship between low SES and antisocial behavior, primarily when considering antisocial behavior in relation with objective status (e.g., income, education), as opposed to subjective social standing and how one experiences their own status.

This finding adds to the literature on environmental factors that may help explain the relationship between low objective SES and antisocial behavior. Specifically, results suggest that individual, psychological factors are critical to consider in the relationship between low objective SES and antisocial behavior/violence. Psychological distress accounts for an unpleasant subjective state, can be reflective of depression, anxiety, or life stressors, as well as other

possible individual factors (e.g., Mirowsky & Ross, 2003). Having a better understanding and consideration of the *psychological* distress that is occurring in low objective SES households and environments may be critical in curbing antisocial behavior in these environments.

4.4 Psychopathy Moderating Psychological Distress – Antisocial Behavior Relationship

Psychological distress and dimensions of psychopathy also interacted in uniquely predicting antisocial behavior. Specifically, meanness was found to be a moderator for the relationship between psychological distress and antisocial behavior, exacerbating the effect of high psychological distress on antisocial behavior, as predicted. The rationale for this prediction once again stemmed from Raine's 2002 work that highlighted the presence of multiple *classes* of risk factors having a multiplicative effect in prediction of antisocial behavior. This rationale was extended however, beyond environmental (i.e., neighborhood distress) into more a psychopathological/individual domain (i.e. distress that is felt in some way from one's individual experience). These results indicate that in individuals who are suffering from psychological distress, the likelihood of that person committing some sort of antisocial act or behavior is elevated to the extent that person has characterological elevations in meanness (e.g., lack of empathy or remorse).

4.5 Secondary Analyses Examining Boldness as a Protective Factor

Secondary analyses were also conducted to examine the potential effect of boldness as a protective factor, in accordance with previous research finding that boldness may protect against maladaptive outcomes such as violence and antisocial behavior, with adaptive aspects of this trait (stress-immunity, fearless, social potency) potentially buffering against the influence of such risk factors (Gatner et al., 2016; Guelker, 2012; Lilienfeld, Watts, & Smith, 2015). Bivariate correlations indicated a positive association between boldness and objective SES, in keeping

with previous research (e.g., Benning et al., 2003; Hall, Benning, & Patrick, 2004). Interestingly, boldness did not correlate with subjective SES. Although no extant literature has examined the relationship between subjective SES and boldness, this lack of association may be a result of the SES-boldness relationship being reliant specifically on tangible aspects of SES (e.g., boldness being associated with objective measurements such as income and education, rather than subjective status). Furthermore, inverse relationships were found between boldness and antisocial behavior, as well as neighborhood disadvantage, in keeping with previous research (e.g., Hall, Benning, & Patrick, 2004). In addition, individuals who reported elevated levels of boldness scores (1 SD above the mean) endorsed below average antisocial behavior scores, regardless of psychological distress.

Boldness did not interact with environmental risk factors of neighborhood disadvantage or SES (either objective or subjective), but it did moderate the relationship between psychological distress and antisocial behavior. However, boldness did not act as a buffer against antisocial behavior with regard to its influence on effects of psychological distress. Rather, the relationship between antisocial behavior and psychological distress was actually stronger in individuals who scored high in boldness. Although no formal predictions were made involving boldness as a protective factor, the observed relationship where boldness seemed to exacerbate/worsen the relationship between antisocial behavior and psychological distress was unexpected, and difficult to reconcile given the literature suggesting boldness as being a protective factor buffering against maladaptive outcomes (e.g., Gatner et al., 2016; Guelker, 2012; Lilienfeld, Watts, & Smith, 2015). The dimension in Hare's (2003) psychopathy model that is most closely aligned with the boldness construct (Factor 1; Hare, 2003) has been conceptually described as possibly moderating the relationship between Factor 2 psychopathy

and violent recidivism, such that individuals with elevations on both factors are particularly prone to engage in violence (e.g., Hare & Neumann, 2008; Walsh & Kosson, 2008). However, no literature has focused on boldness specifically as a risk factor for, or moderator of, other variables in predicting antisocial behavior. Importantly, although boldness was not seen as a buffer against antisocial behavior (e.g., via moderation), it did seem to act as a protective factor at the main effect level. Specifically, individuals who had elevated levels of boldness committed significantly less antisocial behavior than those who were low in boldness. This was true at low, medium, and high levels of psychological distress. So, although there was no protective effect via moderation, those high in boldness were observed to commit less acts of antisocial behavior overall.

4.6 Strengths

The present investigation has several noteworthy strengths. The primary piece that this study adds to the literature includes the integration of psychological and sociological models in order to examine relationships. Models investigating the relationship between low SES environments and antisocial behavior thru a psychological or sociological lens have been present for several decades. Rarely, however, are individual (psychological) *and* environmental (sociological) models considered simultaneously, especially in predicting antisocial behavior. Future studies should devote more energy in understanding potential causal or maintaining factors from different etiological lenses.

Another specific strength of this study is the utilization of a socioeconomically and geographically diverse sample as a result of quota-based sampling. The quota sampling used in this study allowed for an SES-diverse sample, which ensured the variance necessary for statistical analyses on models focusing on SES. The sampling strategy used allowed for low

objective SES participants to be strategically oversampled, ensuring sufficient objective SES heterogeneity. In addition, this study's statistical rigor is important to highlight, both in terms of highlighting unique effects of variables, as well as considering the nuanced consideration of certain variables, namely psychopathy dimensions. Statistical models that tested SES in this study also considered race as a covariate, which too often is not considered as a confound in any study examining the effect of SES. This study also used a large sample that had sufficient power, and eliminated careless responders in order to emphasize valid response data. Furthermore, the identification of specific regions of significance in our tests of moderation also allowed for statistical conclusions to be drawn in a more nuanced manner.

Consideration of both objective and subjective measures of SES is another strength of this study. The extant literature focusing on SES as a construct has evolved beyond focusing solely on one aspect of SES (i.e., income). However, few studies directly examine how different definitions of SES (e.g., subjective social status, objective SES) directly impact the nature of results in a given study. Recent work has begun to focus on the value that subjective social status has in predicting variables over and above income or education (e.g., Adler et al., 2000; Hu, Adler, Goldman, Weinstein, & Seeman, 2005; Singh-Manoux, Adler, & Marmot, 2003). However, the consideration of how and why certain relationships (i.e. neighborhood disadvantage mediating the low SES – antisocial behavior link) change based on definitions of SES are important to examine, and thus a notable strength of this study.

A final strength of this study involves statistical control of potential confounding variables. Specifically, age, racial group, non-focal psychopathy dimensions, and social desirability were examined as potential confounds in different analyses described above. Although age and racial group correlated with study variables, they did not impact the main

pattern of findings. Social desirability correlated strongly with psychopathy and aggression scores. However, while its inclusion as a covariate in analyses reduced the statistical reliability of two interactions to non-significant trend levels, it did not impact the pattern of simple slopes. In addition, analyses in this study also examined the unique effects of individual psychopathy dimensions, controlling for non-focal dimensions.

4.7 Limitations, Future Directions, and Implications

This study also includes important limitations. First, it relied upon self-report survey measures. While these measures have been supported in prior research, the use of other methods, such as behavioral indices, would help reduce the potential influence of shared method variance. Second, the design was cross-sectional, limiting causal inference. While there has been some longitudinal research on psychopathy and antisocial behavior (e.g., Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Piatigorsky & Hinshaw, 2004) future studies should consider incorporating prospective or experimental designs that may help confirm whether the observed patterns also fit our hypotheses in terms of causal directionality.

This study also attempted to control for the potential influence of race and ethnicity on SES groupings by statistically controlling for race/ethnicity. However, given that the sample in this study was somewhat homogenous (80% Caucasian), generalizability of our findings may be impacted. Furthermore, potential effects of racial and ethnic differences may be present that help explain the SES x psychopathy interactions in predicting antisocial behavior. These cultural differences that intersect with SES may include differences in parenting, family structure, and impacts of discrimination (e.g., Brooks-Gunn, Klebanov, & Liaw, 1995; Cardona, Nicholson, & Fox, 2000; Vines & Baird, 2009). Future studies should consider potential sampling criteria that

include a sizeable number of minority participants, in order to properly examine how race is present in this relationship.

A further limitation regarding generalizability of findings involved geographic regions observed. While this study did not focus on whether rural versus urban settings affected findings, it would be interesting to examine whether type of setting influences the results. Future studies should also investigate whether or not findings generalize across geographical regions within the U.S., and to other cultural contexts across the globe. Impacts of low SES and poverty may manifest in a different manner across Western versus non-Western cultures (The World Bank, 2008).

In addition, the focus of this study was on men only, thus questions of generalizability also extend to gender. Biological sex differences and gender role socialization can influence expression of antisocial behavior (e.g., Hamburger, Lilienfeld, & Hogben, 1996), and evidence exists that environmental factors such as low SES are differentially experienced across genders (e.g., Sjoren & Kristenson, 2006).

Furthermore, the manner in which SES was operationalized influenced results in this study. While income and education have been described as two critical aspects of SES (APA; 2017; Braveman, 2005; Oakes & Andrade, 2017), other definitions are popular in the literature (Adler & Stewart, 2006; Duncan, 1961; Hollingshead, 1975; Kaufman, Cooper, & McGee, 1997; Oakes & Andrade, 2017). As was evident in this study, the definition of SES that is used can impact results. Future studies should thus examine the role of other aspects of SES (e.g., subjective social status, prestige, occupation) in relation to dimensions of psychopathy, neighborhood disadvantage, psychological distress, and antisocial behavior.

While often treated as a static variable, SES may change substantially over the course of one's life, and parental and individual SES can thus vary and have different influences over time. SES by definition can be considered as a dynamic variable that can change over time. For example, the notion of subjective SES is almost inherently informed by one's own childhood experience. While an individual's income and/or education may objectively be considered "average," that same person may subjectively rate themselves as having above average subjective SES if they have come a long way from poverty in youth. Although the "snapshot" approach used in this study to examine SES is an approach often used in research, future studies should consider the dynamic nature of SES, particularly across the lifespan via a developmental lens, starting in youth (i.e. Rekker et al., 2015).

Additionally, the analytic approach in the current study has certain limitations. Although the current study focused on unique effects of individual psychopathy dimensions and their interaction with other risk factors, future studies should also consider moderation among psychopathy dimensions (e.g., meanness x disinhibition), to examine how these dimensions interact in predicting other variables (e.g., Guerra & White, 2016). Other possible limitations include the examination of only linear relationships among variables in this study, as well as the compositing of certain variables. This compositing (e.g., of antisocial behavior) likely limited the ability to detect unique associations between predictors and subtypes of antisocial behavior (e.g., proactive aggression).

Although necessarily tentative, these findings add to the literature on sociological and psychological risk factors for antisocial behavior, as well as potential mechanisms that are significant in explaining the relationship between low SES and antisocial behavior. Results of the current study have potential practical implications for identifying and intervening with

individuals who may be at elevated risk for antisocial behavior in low SES environments.

Targeting psychological distress in these low SES areas, potentially through family interventions or parenting tools, may help reduce antisocial behavior in these areas. Targeting potential neighborhood disadvantage on a macro/environmental level, particularly in communities where individual's subjective view of their social status is quite low, may help reduce antisocial behavior in these areas. Results of this study show the importance of considering both sociological and psychological difficulties in the context of relationships between antisocial behavior and SES.

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Table 1a*Sample Descriptive Statistics.*

Variable	Mean	SD	Skew	Kurtosis	Min	Max
Age	30.09	5.08	.17	.50	18	45
Education Level	3.87	1.90	-.35	-1.15	1	9
Income	4.63	2.45	-.04	-1.26	1	8
Race (Minority Status)	.21	.41	--	--	--	--
Social Control	16.38	5.58	-.21	-1.43	5	25
Social Disorganization	10.81	4.25	.26	-.56	5	23
Psychological Distress	21.61	2.61	.39	3.14	14	34
Boldness	44.50	4.79	.20	1.22	31	58
Meanness	57.48	10.91	-.41	-1.12	25	76
Disinhibition	60.85	12.27	-.74	-.58	26	79
Proactive Aggression	16.84	5.88	.97	-.44	12	34
Reactive Aggression	19.23	4.01	.63	.59	11	31
Antisociality	36.39	15.45	1.49	1.42	21	82
Social Desirability	19.05	2.10	.14	1.61	14	25

Table 1b

Sample Descriptive Statistics (continued).

Variable	# of participants	% of sample
Racial Minority	96	20.8
Racial Majority (Caucasian)	366	79.2
Rural Background	89	19.3
Urban Background	279	60.4
Suburban Background	94	20.3
% of sample that has been arrested	51	11
% of sample that has been arrested for violent crime	22	4.8

Table 2

SES Descriptive Statistics.

Variable	# of Participants	Percent of Sample	Mean Income	Mean Edu	Mean SSS
High SES group	138	29.9	6.64	7.43	6.51
Mid SES group	151	32.7	5.59	5.19	5.71
Low SES group	173	37.4	2.03	1.9	4.01

Note. SSS = Subjective Social Status.

Note. Mean Income and Education levels are described in Appendix D

Table 3. Zero-order Pearson Correlations among Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Age	1																	
2. Racial Group	-.03	1																
3. Income	.27**	-.15**	1															
4. Education	.23**	-.19**	.83**	1														
5. Objective SES Comp.	.26**	-.18**	.96**	.95**	1													
6. Subjective SES	.09	-.10*	.48**	.44**	.48**	1												
7. Social Disorganization	-.26**	.13**	-.07	-.12*	-.09*	.28**	1											
8. Informal Soc. Control	.04	-.03	-.03	-.11*	-.07	.31**	.52**	1										
9. Neighborhood Disadvantage	-.13**	.06	-.05	-.13**	-.09*	.34**	.87**	.87**	1									
10. Psychological Distress	.05	.12**	-.10*	-.06	-.09	-.05	.14**	.06	.11*	1								
11. Boldness	.24**	-.15**	.15**	.15**	.15**	.05	-.39**	-.18**	-.32**	-.07	1							
12. Meanness	-.17**	.07	-.06	-.17**	-.12*	.25**	.61**	.51**	.64**	.06	-.49**	1						
13. Disinhibition	-.10*	.08	-.06	-.13**	-.09*	.27**	.58**	.48**	.61**	.17**	-.50**	.87**	1					
14. Antisociality	.00	-.02	-.02	-.08	-.05	.19**	.38**	.34**	.41**	.14**	-.34**	.62**	.67**	1				
15. Proactive Aggression	-.13**	.07	-.03	-.15**	-.09	.24**	.55**	.52**	.62**	.12*	-.48**	.79**	.76**	.76**	1			
16. Reactive Aggression	-.20**	.09	-.08	-.13**	-.11*	.09	.48**	.30**	.45**	.35**	-.47**	.60**	.59**	.63**	.75**	1		
17. ASB Composite	-.13**	.06	-.05	-.13**	-.09	.19**	.52**	.43**	.55**	.23**	-.48**	.74**	.75**	.89**	.93**	.88**	1	
18. Social Desirability	.21**	-.11*	.05	.05	.06	.07	-.23**	.17**	-.04	-.09	.42**	-.25**	-.22**	-.16**	-.23**	-.39**	-.29**	1

Note. * $p < .05$, ** $p < .01$.

Table 4a. *Effects of Psychopathy, SES, and Race on Antisocial Behavior.*

Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.60	139.13**
	SES	.00	.02	-.01	-.18		
	Boldness	-.07	.02	-.11	-3.15**		
	Meanness	.09	.02	.35	5.87**		
	Disinhibition	.09	.01	.39	6.56**		
	Race	-.11	.20	-.02	-.54		
	Step 2					.01	90.27**
	SES x Boldness	.00	.01	-.02	-.50		
	SES x Meanness	.00	.00	.04	.56		
	SES x Disinhibition	-.01	.00	-.15	-2.05*		

Note. SES = Socioeconomic Status; * $p < .05$, ** $p < .01$. Coefficients and *t*-values are reported at the step in which the variable was entered. All variables in Step 1 of the model (with the exception of Race) were mean-centered prior to regression analyses.

Table 4b. *Effects of Psychopathy, Subjective SES, and Race on Antisocial Behavior*

Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.60	138.60**
	Subjective SES	.00	.04	.00	.02		
	Boldness	-.07	.02	-.11	-3.12**		
	Meanness	.09	.02	.35	5.87**		
	Disinhibition	.09	.01	.39	6.47**		
	Race	-.10	.20	-.02	-.51		
	Step 2					.02	93.95**
	SES x Boldness	-.01	.01	-.06	-1.42		
	SES x Meanness	.03	.01	.29	4.14**		
	SES x Disinhibition	-.03	.01	-.35	-4.99**		

Note. Subjective SES = Subjective Socioeconomic Status; * $p < .05$, ** $p < .01$. Coefficients and *t*-values are reported at the step in which the variable was entered. All variables in Step 1 of the model (with the exception of Race) were mean-centered prior to regression analyses.

Table 5. *Effects of Psychopathy, Neighborhood Disadvantage, and Race on Antisocial Behavior.*

Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.61	141.45**
	Neighborhood Disadvantage	.13	.06	.08	2.15*		
	Boldness	-.07	.02	-.11	-3.23**		
	Meanness	.08	.02	.31	5.05**		
	Disinhibition	.08	.01	.37	6.23**		
	Race	-.11	.20	-.02	-.55		
	Step 2					.07	116.63**
	ND x Boldness	-.01	.02	-.03	-.60		
	ND x Meanness	.04	.01	.20	3.36**		
	ND x Disinhibition	.01	.01	.08	1.41		

Note. ND = Neighborhood Disadvantage; **p* < .05, ***p* < .01. Coefficients and *t*- values are reported at the step in which the variable was entered. All variables in Step 1 of the model (with the exception of Race) were mean-centered prior to regression analyses.

Table 6. *Effects of Psychopathy, Psychological Distress, and Race on Antisocial Behavior.*

Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.61	142.10**
	Psychological Distress	.07	.03	.10	2.43*		
	Boldness	-.05	.02	-.08	-2.31*		
	Meanness	.09	.02	.35	5.86**		
	Disinhibition	.07	.01	.34	5.32**		
	Race	-.14	.20	-.02	-.69		
	Step 2					.04	104.41**
	PD x Boldness	.01	.00	.08	2.38*		
	PD x Meanness	.01	.00	.22	4.87**		
	PD x Disinhibition	.00	.00	.00	.07		

Note. PD = Psychological Distress; * $p < .05$, ** $p < .01$. Coefficients and *t*- values are reported at the step in which the variable was entered. All variables in Step 1 of the model (with the exception of Race) were mean-centered prior to regression analyses.

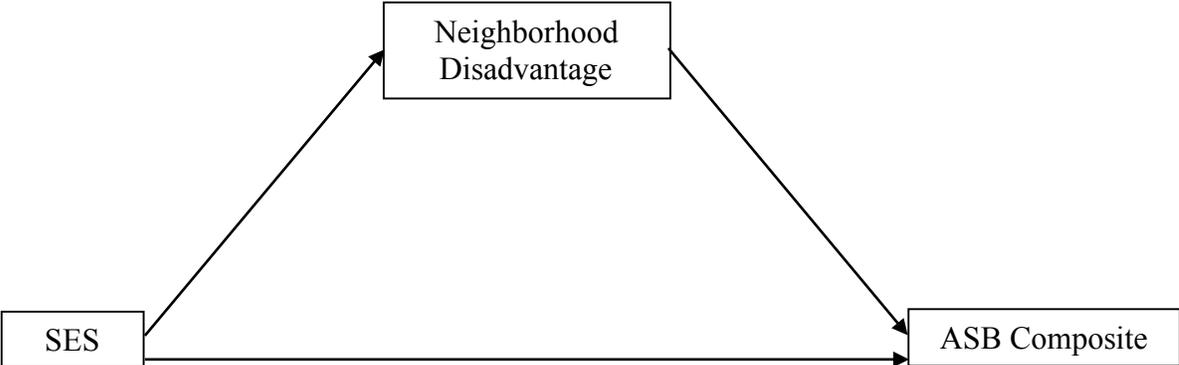


Figure 1 – Hypothesized model for Hypothesis 1

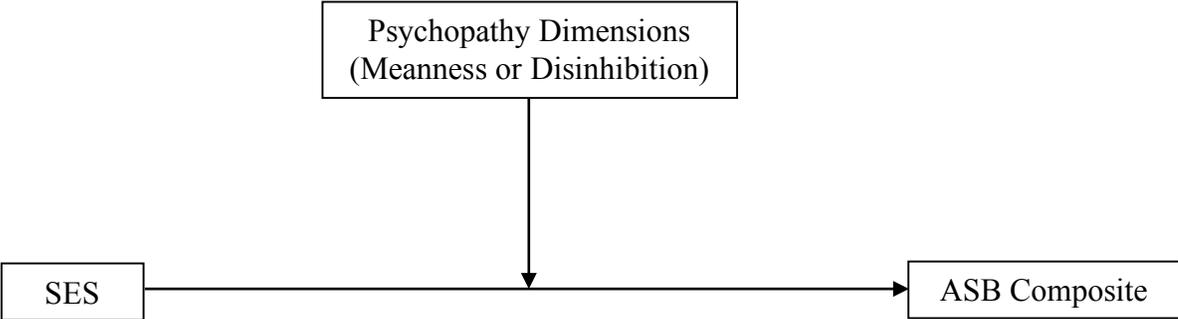


Figure 2 – Hypothesized model for Hypothesis 2a

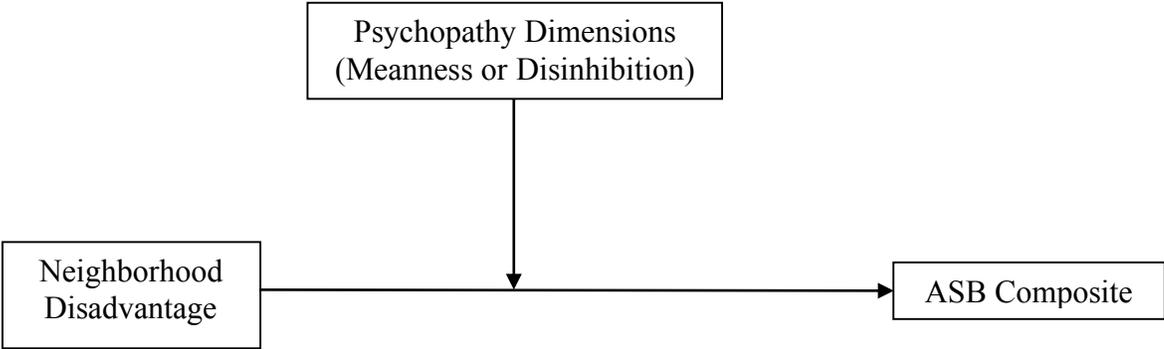


Figure 3 – Hypothesized model for Hypothesis 2b

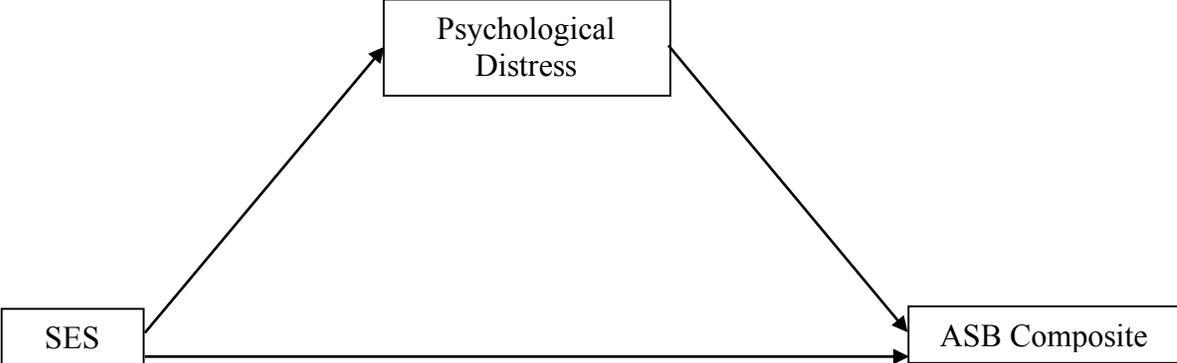


Figure 4 – Hypothesized model for Hypothesis 3a

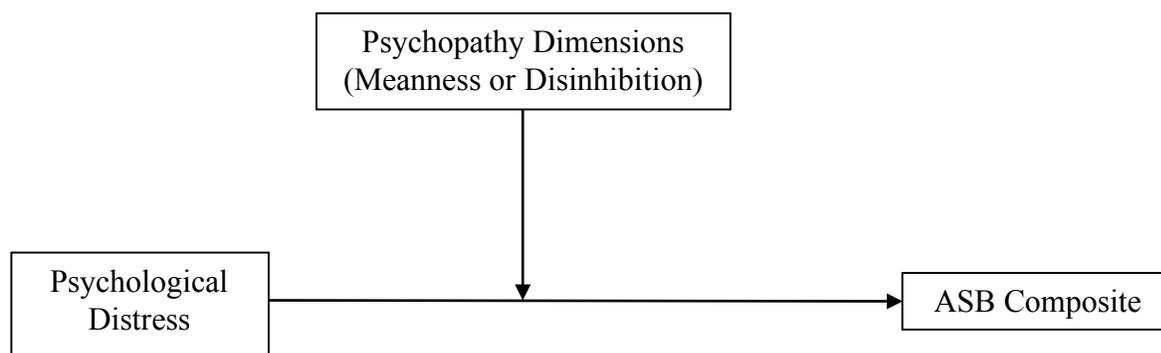
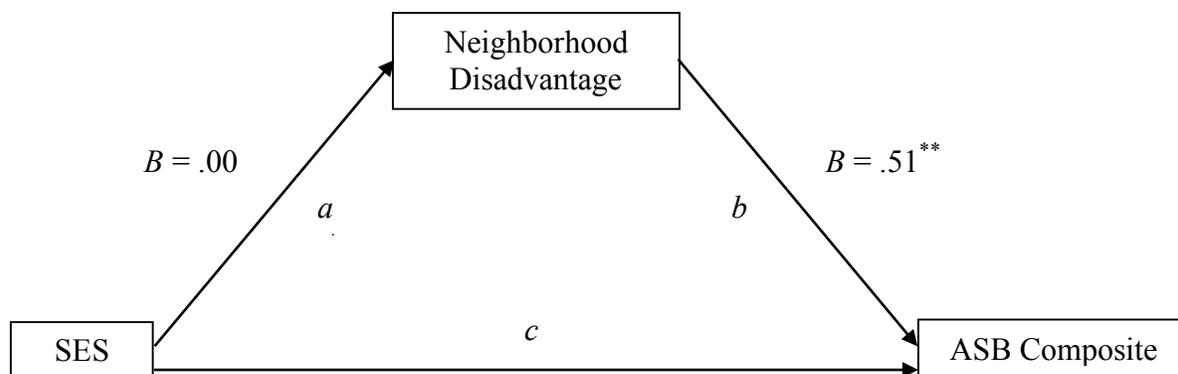


Figure 5 – Hypothesized model for Hypothesis 3b



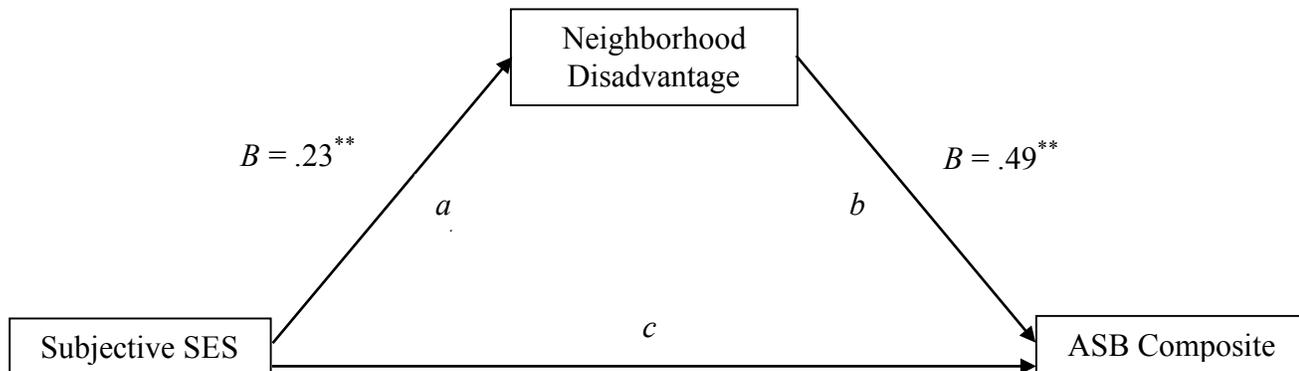
Covariates: Race, Psychological Distress

Total effect (c): $B = .02$, $SE = .02$, $p = .45$

Direct effect (c'): $B = .02$, $SE = .02$, $p = .48$

Indirect effect (ab): $B = .00$, $Boot SE = .01$, $CI_{95\%} = -.01$ to $.02$

Figure 6a. Mediation of SES and ASB by Neighborhood Disadvantage.



Covariates: Race, Psychological Distress

Total effect (c): $B = .16$, $SE = .05$, $p = .00$

Direct effect (c'): $B = .05$, $SE = .05$, $p = .33$

Indirect effect (ab): $B = .11$, $Boot SE = .02$, $CI_{95\%} = .08$ to $.16$

Figure 6b. Mediation of Subjective SES and ASB by Neighborhood Disadvantage.

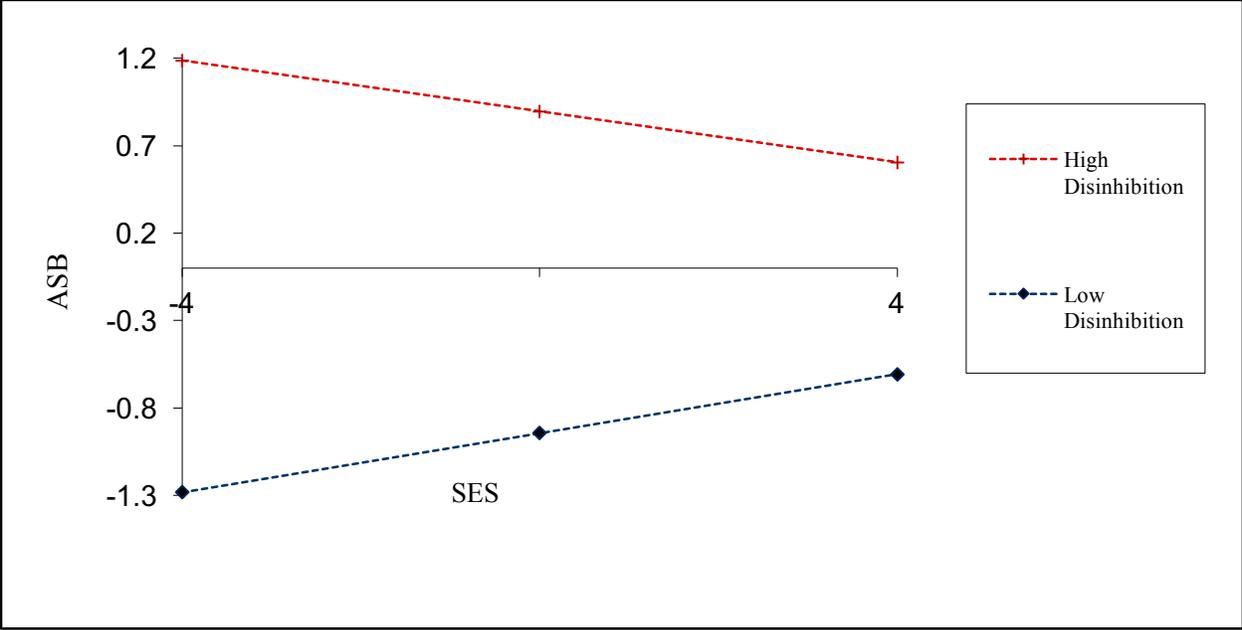


Figure 7a. Interaction between SES and Disinhibition on Antisocial Behavior

Note: All variables above were mean-centered prior to analyses

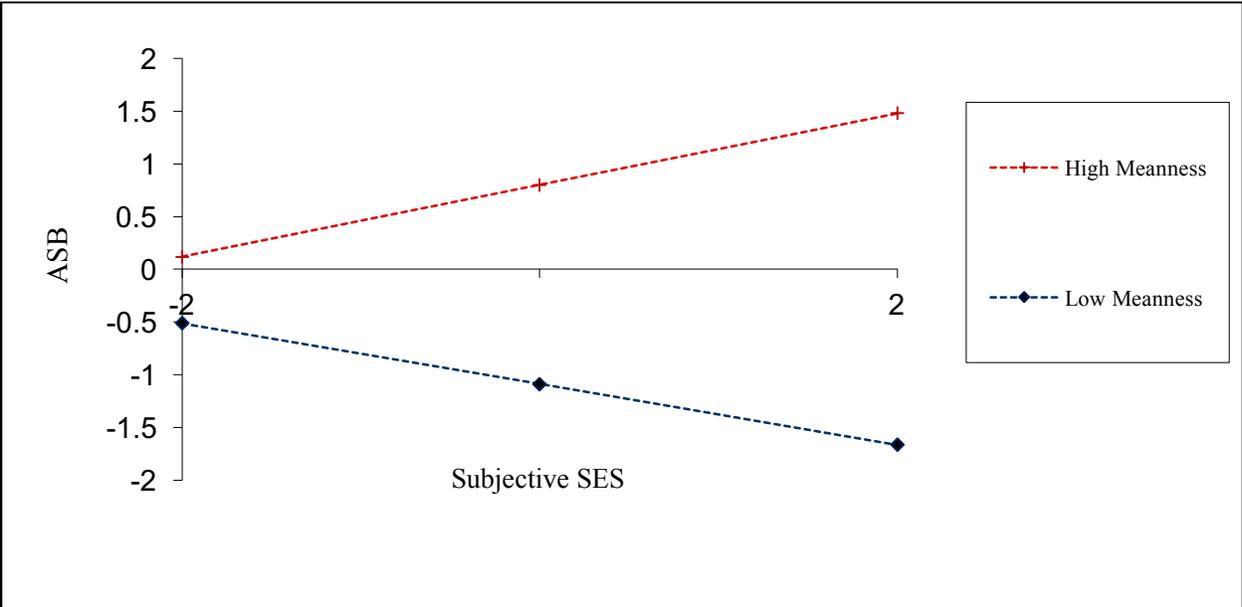


Figure 7b. Interaction between Subjective SES and Meanness on Antisocial Behavior

Note: All variables above were mean-centered prior to analyses

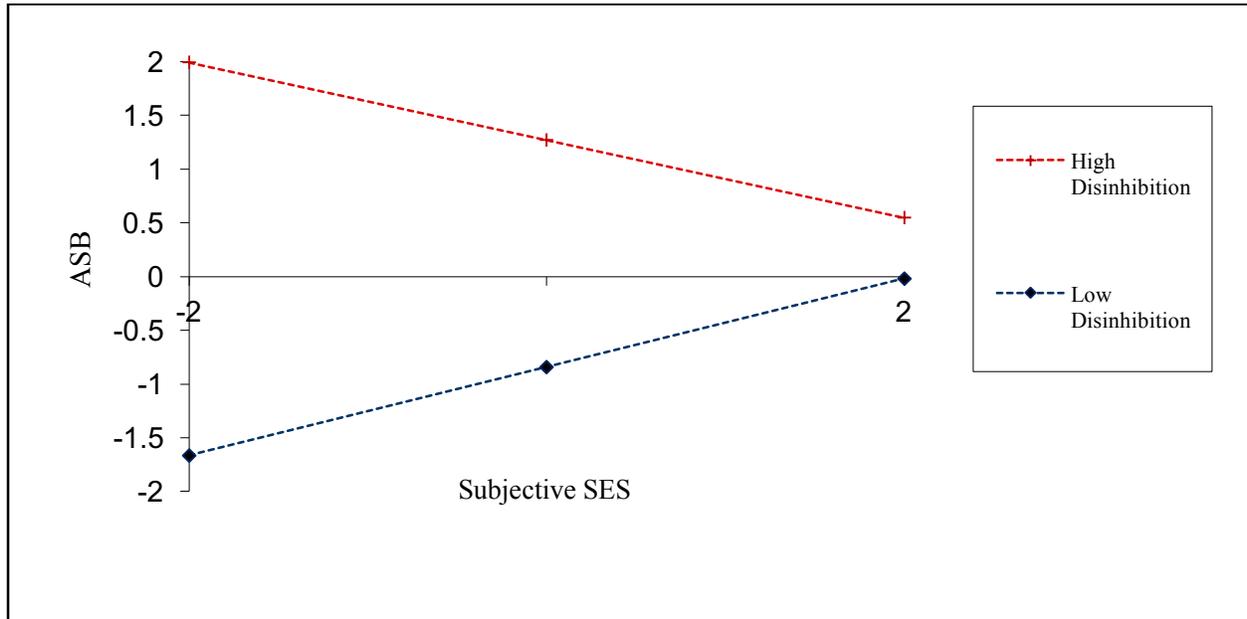


Figure 7c. Interaction between Subjective SES and Disinhibition on Antisocial Behavior

Note: All variables above were mean-centered prior to analyses

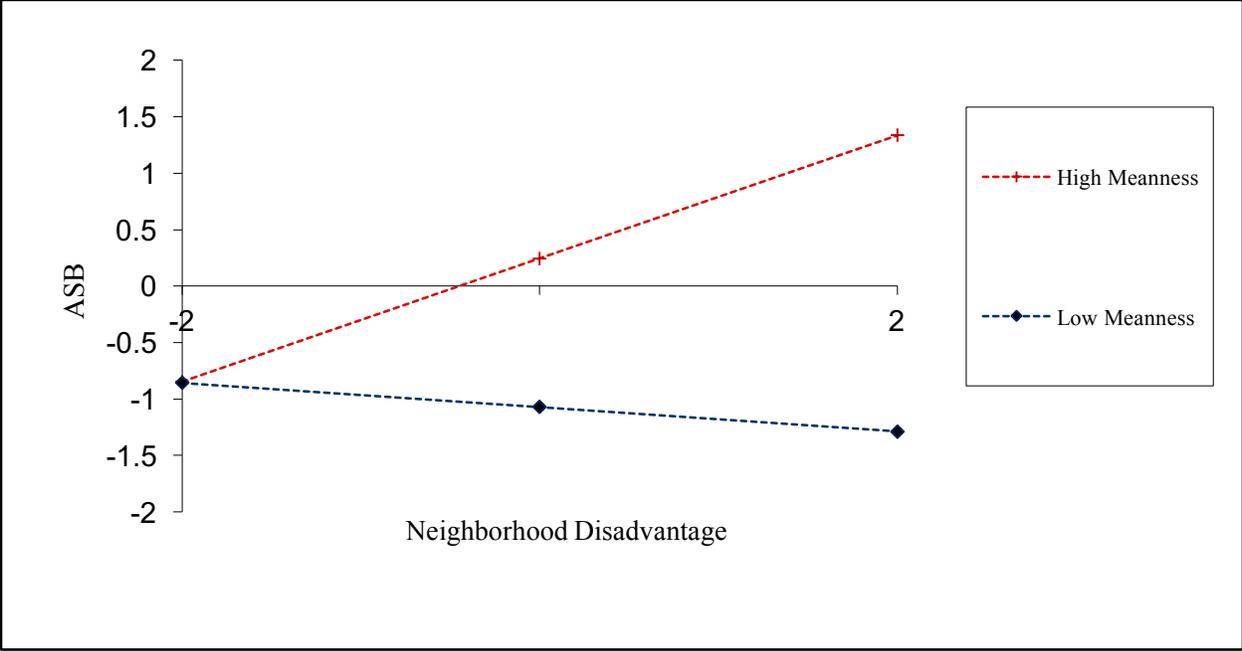
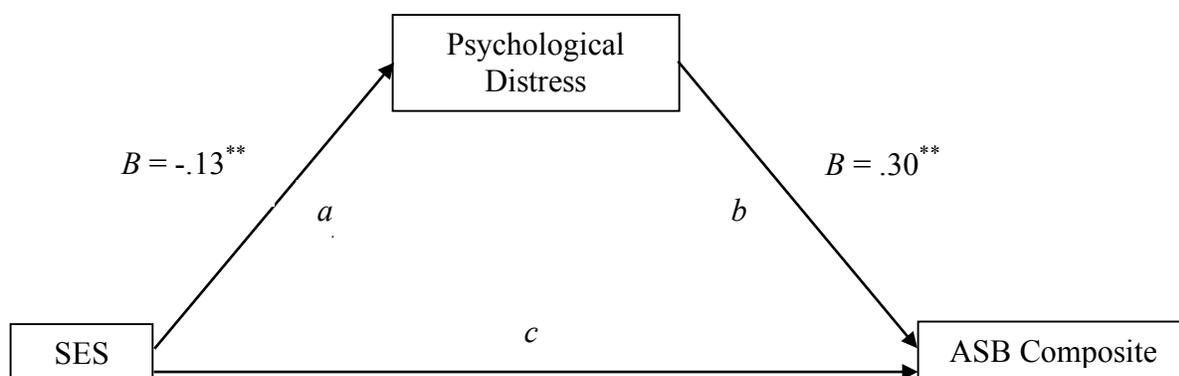


Figure 8 – Interaction between Neighborhood Disadvantage and Meanness on Antisocial Behavior

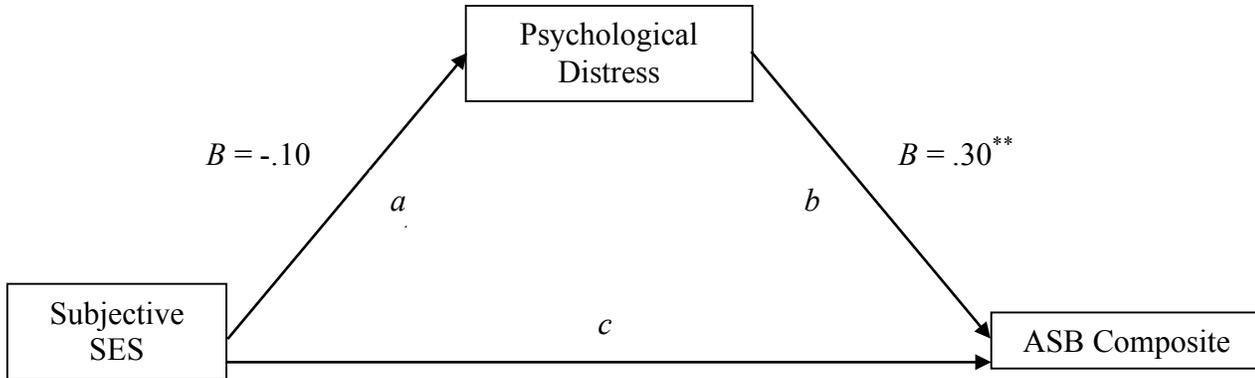
Note: All variables above were mean-centered prior to analyses



Covariates: Race, Neighborhood Disadvantage

Total effect (c): $B = -.02$, $SE = .02$, $p = .35$
Direct effect (c'): $B = .02$, $SE = .02$, $p = .48$
Indirect effect (ab): $B = -.04$, $Boot SE = .01$, $CI_{95\%} = -.06$ to $-.02$

Figure 9a – Mediation of SES and ASB by Psychological Distress



Covariates: Race, Neighborhood Disadvantage

Total effect (*c*): $B = .02$, $SE = .05$, $p = .76$

Direct effect (*c'*): $B = .05$, $SE = .05$, $p = .33$

Indirect effect (*ab*): $B = -.03$, $Boot SE = .03$, $CI_{95\%} = -.09$ to $.03$

Figure 9b – Mediation of Subjective SES and ASB by Psychological Distress

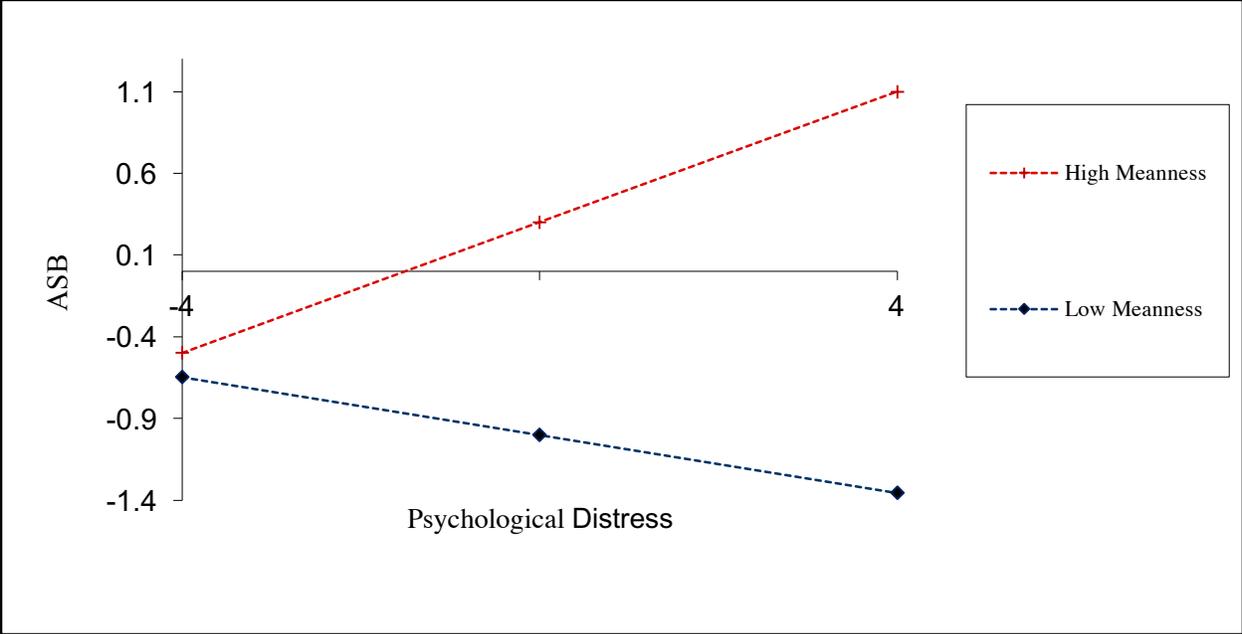


Figure 10 – Interaction between Psychological Distress and Meanness on Antisocial Behavior

Note: All variables above were mean-centered prior to analyses

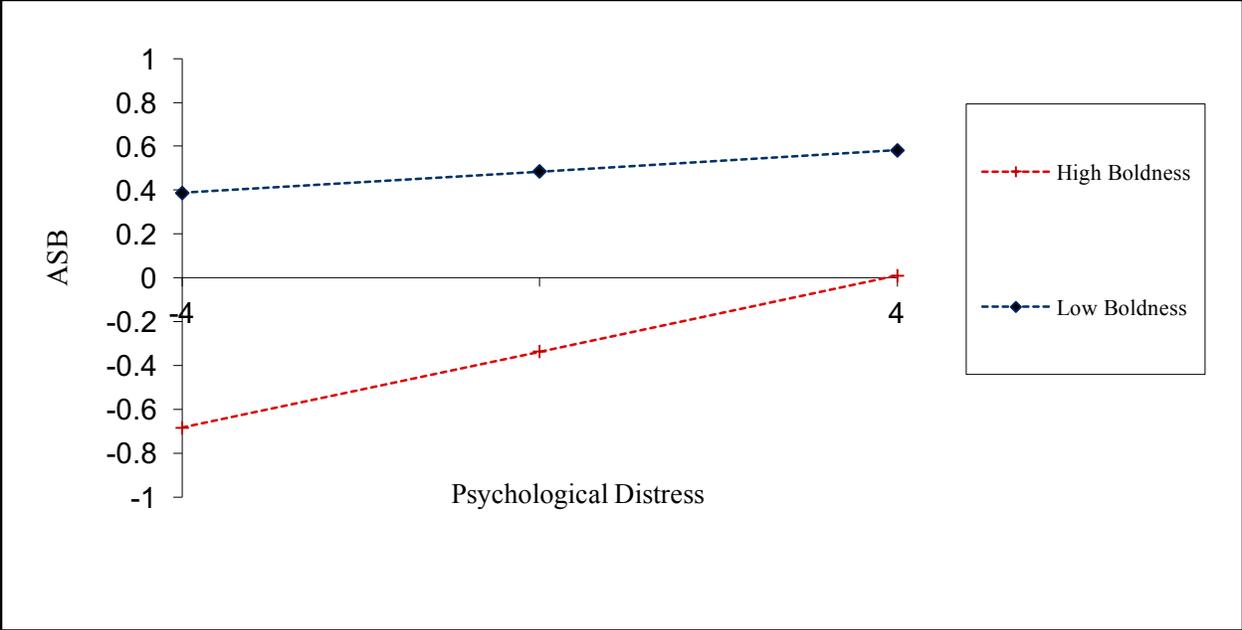


Figure 11 – Interaction between Psychological Distress and Boldness on Antisocial Behavior

Note: All variables above were mean-centered prior to analyses

Appendix B

Information Sheet

COMMUNITY SURVEY STUDY

Purpose

The purpose of this study is to assess relationships between a variety of emotions, experiences, and ways of responding in adults. Based on the results of this study, we hope to contribute to basic knowledge in the field of psychology that might also lead to a better understanding of certain difficulties commonly experienced by individuals. Note: This study is for research purposes only. Your responses will be combined with those of other individuals to help answer important questions in the field of psychology. The potential risks and benefits to you as a participant are explained further below.

Procedures

This study involves an online survey that is open to anyone ages 18 to 40. The survey takes approximately 20 to 40 minutes. Compensation is described below. After reading this information page, if you wish to continue with the survey, you will enter your initials on the next page. After the survey is completed, you will be provided a link, where you will enter your name and email, which will be used to provide compensation (see below).

Eligibility

In order to take part in this study, participants must be male, and be between 18 and 40 years of age. Aside from these criteria, sampling will also take place where a (roughly) equal number of participants will need to be sampled from high, medium, and low socioeconomic status (SES) strata. As a result, you may sign up for the study, and – after answering the first question (re: SES), be told the survey is capped. A screen will appear at this point informing you that you are not eligible to complete the remainder of this study. Participants who are not eligible due to capped SES groups will be given instructions for compensation on a separate screen (see compensation below).

Risks and Benefits

The first risk is that this survey takes time and attention that you could put toward other activities. A second risk regards the types of questions asked in the survey. All items have been very carefully selected, yet you may find some of them to seem boring or repetitive, and some may seem sensitive or quite personal. They could lead you to feel uncomfortable or bring up unpleasant memories. Please remember that you are free to withdraw from the study at any time. If you do withdraw, you may contact vtcommunitystudy@gmail.com and we will provide instructions regarding compensation. If you agree to participate, we ask that you do so at a time that you can work by yourself and focus on the survey, reading all instructions and items carefully, and responding in a totally honest manner. Beyond the compensation described below, there is likely no direct benefit to you for completing this survey. However, we hope that results of this study can ultimately improve the knowledge base and literature for a variety of difficulties that adults sometimes face.

Compensation

Participants who complete the survey will be asked to input their name and email upon completion. This email address will be used to send a \$5.00 digital Amazon gift card to participants upon completion of the study within 1-5 days.

Two individuals from the same physical location or residence cannot complete the survey, and the survey cannot be completed twice on the same computer. Anyone completing the survey from the same computer, residence, or physical location will not receive payment for participation. If you have any questions as a result, please email us at vtcommunitystudy@gmail.com. Furthermore, potentially duplicate/fraudulent responses will be investigated, and additional information will be required before compensation is provided.

For participants who begin the study and are found to not be eligible based on SES sampling criteria, a separate screen will appear informing participants that responses from individuals' who match that participants' SES strata are no longer needed. If this is the case, this screen will inform you that you are still entitled to some compensation due to time spent on the survey (the two SES questions). This compensation is the option to sign up for a raffle, in which participants have a 1-in-30 chance of getting a \$5.00 Amazon gift card. The separate screen participants are forwarded to will contain a link, where participants not eligible based on SES sampling criteria can provide their name and email in order to sign up for the raffle.

Confidentiality

The only personally identifying information we request is your email address. All of your answers will be kept strictly confidential. Your individual responses and email address will not be released to anyone outside of the investigator's lab. The only case in which it would be shared is with your permission or as required by U.S. or State law. You are welcome to contact the investigator at any time with any questions or concerns. My contact information is listed below.

You do not have to participate in this survey. If you choose to do so, you can stop participating in this study at any time. Credit (compensation) will be prorated for the parts undertaken, with completion of less than 50% being entered in a raffle in which participants have a 1-in-10 chance of getting a \$5.00 Amazon gift card. If you choose to participate, keep in mind that there are no "right" or "wrong" answers. Please just read the instructions and questions carefully and answer every question honestly.

Questions/Contact Information

If you would like to speak with the investigator or other member of the research team, please call Dr. White at the Cognition Emotion and Self-Regulation (CEaSR) Lab at (540) 231-1382 or email us at: vtcommunitystudy@gmail.com. It is advised that you copy this email down in order to contact the research team if you have any questions.

If you have any questions about the protection of human research participants regarding this study, you may contact Dr. David Moore, Chair, Virginia Tech Institutional Review Board for the Protection of Human Subjects, telephone: (540) 231-4991; email: moored@vt.edu.

You may also contact David W. Harrison, Ph.D., Chair, Human Subjects Committee, Psychology Department, telephone: (540) 231-4433; email: dwh@vt.edu; address: Department of Psychology, Virginia Tech, 109 Williams Hall (0436), Blacksburg, VA 24061.

Entering your email on the next page will indicate that you consent to participate in this study.

We appreciate your input and thank you for your time and assistance!

Appendix C

Demographics Questionnaire

Instructions. Please respond to each item below. Remember, your responses are CONFIDENTIAL, so please respond honestly to every question.

1. Please select your gender

- Male
- Female
- Other

2. What is your Age in years?

3. What is your current level of education?

- Less than high school
- High school or GED (no college yet)
- Some college
- 2-year degree
- 4-year degree
- Professional degree
- Master's degree
- Doctorate

4. Which of these best describes your race and/or ethnicity?

- White/Caucasian, non-Hispanic, non-Arab
- Black/African American, non-Hispanic
- Hispanic/Latino
- American Indian/Alaskan Native
- Arab/Middle Eastern or Arab American
- Asian/Asian-American
- Pacific Islander
- Biracial or Multiracial

5. Do you consider yourself Biracial or Multiracial

- Yes
- No

6. What is your current relationship status?

- Single, not currently in a relationship
- Single, in a relationship
- Married or in a domestic partnership
- Divorced
- Widowed

7. What is your employment status? (Include paid self-employment.)

- Not employed
- Employed part-time
- Employed full-time

8. Do you consider yourself a fluent English speaker

- Yes
- No
- Might or might not
- Probably not
- Definitely not

9. Does your family speak mostly English at home?

- Yes
- No

10. Have you ever been arrested for any criminal activity?

- Yes
- No

11. Have you ever been arrested as a result of a violent crime?

- Yes
- No

12. Which of these best describes where you currently reside (live)

- Rural
- Urban
- Suburban

13. How would you rate yourself in regard to English-speaking fluency on a 1-10 scale?

Appendix D – Objective SES Items

1) Which of these best describes your educational attainment?

1. 8th grade or less
2. Completed junior high school (9th grade)
3. High school graduate
4. Partial college
5. Associates degree/Technical degree/Vocational program
6. Bachelor's degree
7. Graduate professional training or certificate
8. Master's Degree
9. Doctoral Degree

2) Which of these best describes your current personal income? (How much you make per year)

1. Less than 10,000
2. 10,000 to 14,999
3. 15,000 to 24,999
4. 25,000 to 34,999
5. 35,000 to 49,999
6. 50,000 to 74,999
7. 75,000 to 99,999
8. 100,000 to 149,000
9. 150,000 to 199,000
10. 200,000 +

Appendix E- MacArthur Subjective Social Status Scale (Adler & Stewart, 2006)

1

Think of this ladder as representing where people stand in their communities.

People define community in different ways; please define it in whatever way is most meaningful to you. At the **top** of the ladder are the people who have the highest standing in their community. At the **bottom** are the people who have the lowest standing in their community.

Where would you place yourself on this ladder?

Please place a large "X" on the rung where you think you stand at this time in your life, relative to other people in your community.



2.

Think of this ladder as representing where people stand in the United States.

At the **top** of the ladder are the people who are the best off – those who have the most money, the most education and the most respected jobs. At the **bottom** are the people who are the worst off – who have the least money, least education, and the least respected jobs or no job. The higher up you are on this ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom.

Where would you place yourself on this ladder?

Please place a large "X" on the rung where you think you stand at this time in your life, relative to other people in the United States.



3. What is the highest grade (or year) of regular school you have completed?

4. What is the highest degree you earned?

- High school diploma or equivalency (GED)
- Associate degree (junior college)
- Bachelor's degree
- Master's degree
- Doctorate
- Professional (MD, JD, DDS, etc.)
- Other specify
- None of the above (less than high school)

5. Which of the following best describes your current main daily activities and/or responsibilities?

- Working full time
- Working part-time
- Unemployed or laid off
- Looking for work
- Keeping house or raising children full-time
- Retired

6. With regard to your current or most recent job activity:
a. In what kind of business or industry do (did) you work?

(For example: hospital, newspaper publishing, mail order house, auto engine manufacturing, breakfast cereal manufacturing.)

b. What kind of work do (did) you do? (Job Title)

(For example: registered nurse, personnel manager, supervisor of order department, gasoline engine assembler, grinder operator.)

c. How much did you earn, before taxes and other deductions, during the past 12 months?

- Less than \$5,000
- \$5,000 through \$11,999
- \$12,000 through \$15,999
- \$16,000 through \$24,999
- \$25,000 through \$34,999
- \$35,000 through \$49,999
- \$50,000 through \$74,999
- \$75,000 through \$99,999
- \$100,000 and greater
- Don't know
- No response

Mechanisms, Low SES, Antisocial Behavior

7. How many people are currently living in your household, including yourself?

- Number of people
- Of these people, how many are children?
- Of these people, how many are adults?
- Of the adults, how many bring income into the household?

8. Is the home where you live:

- Owned or being bought by you (or someone in the household)?
- Rented for money?
- Occupied without payment of money or rent?
- Other (specify) _____

9. Which of these categories best describes your total combined family income for the past 12 months? This should include income (before taxes) from all sources, wages, rent from properties, social security, disability and/or veteran's benefits, unemployment benefits, workman's compensation, help from relatives (including child payments and alimony), and so on.

- Less than \$5,000
- \$5,000 through \$11,999
- \$12,000 through \$15,999
- \$16,000 through \$24,999
- \$25,000 through \$34,999
- \$35,000 through \$49,999
- \$50,000 through \$74,999
- \$75,000 through \$99,999
- \$100,000 and greater
- Don't know
- No response

10. If you lost all your current source(s) of household income (your paycheck, public assistance, or other forms of income), how long could you continue to live at your current address and standard of living?

- Less than 1 month
- 1 to 2 months
- 3 to 6 months
- 7 to 12 months
- More than 1 year

11a. Suppose you needed money quickly, and you cashed in all of your (and your spouse's) checking and savings accounts, and any stocks and bonds. If you added up what you would get, about how much would this amount to?

- Less than \$500
- \$500 to \$4,999
- \$5,000 to \$9,999
- \$10,000 to \$19,999
- \$20,000 to \$49,999
- \$50,000 to \$99,999

Mechanisms, Low SES, Antisocial Behavior

- \$100,000 to \$199,999
- \$200,000 to \$499,999
- \$500,000 and greater
- Don't know
- No response

11b. If you now subtracted out any debt that you have (credit card debt, unpaid loans including car loans, home mortgage), about how much would you have left?

- Less than \$500
- \$500 to \$4,999
- \$5,000 to \$9,999
- \$10,000 to \$19,999
- \$20,000 to \$49,999
- \$50,000 to \$99,999
- \$100,000 to \$199,999
- \$200,000 to \$499,999
- \$500,000 and greater
- Don't know
- No response

Appendix F

Informal Social Control

How likely would it be that neighbors in your *current* neighborhood could be counted on to intervene in these specific ways:

- If children were skipping school and hanging out in a street corner
 1. Very Likely
 2. Likely
 3. Neither Likely nor Unlikely
 4. Unlikely
 5. Very Unlikely
- If children were spray painting graffiti on a local building
 1. Very Likely
 2. Likely
 3. Neither Likely nor Unlikely
 4. Unlikely
 5. Very Unlikely
- If children were showing disrespect to an adult
 1. Very Likely
 2. Likely
 3. Neither Likely nor Unlikely
 4. Unlikely
 5. Very Unlikely
- If a fight broke out in front of your house
 1. Very Likely
 2. Likely
 3. Neither Likely nor Unlikely
 4. Unlikely
 5. Very Unlikely
- If the fire station closest to their home was threatened with budget cuts
 1. Very Likely
 2. Likely
 3. Neither Likely nor Unlikely
 4. Unlikely
 5. Very Unlikely

Appendix G

Social Disorganization

How strongly do you agree that:

- People around me are willing to help their neighbors
 1. Strongly Agree
 2. Agree
 3. Neither Agree nor Disagree
 4. Disagree
 5. Strongly Disagree

- The neighborhood in which I live is a close-knit neighborhood
 1. Strongly Agree
 2. Agree
 3. Neither Agree nor Disagree
 4. Disagree
 5. Strongly Disagree

- People in my neighborhood can be trusted
 1. Strongly Agree
 2. Agree
 3. Neither Agree nor Disagree
 4. Disagree
 5. Strongly Disagree

- People in my neighborhood generally don't get along with each other
 1. Strongly Agree
 2. Agree
 3. Neither Agree nor Disagree
 4. Disagree
 5. Strongly Disagree

- People in my neighborhood do not share the same values
 1. Strongly Agree
 2. Agree
 3. Neither Agree nor Disagree
 4. Disagree
 5. Strongly Disagree

Appendix H

Psychopathy (Triarchic Psychopathy Measure; Patrick et al., 1999)

This questionnaire contains statements that different people might use to describe themselves. Each statement is followed by four options. For each statement, select the option that describes you best. There are no right or wrong answers; just choose the option that best describes you.

1. I'm optimistic more often than not.
2. How other people feel is important to me.
3. I often act on immediate needs.
4. I have no strong desire to parachute out of an airplane.
5. I've often missed things I promised to attend.
6. I would enjoy being in a high-speed chase.
7. I am well-equipped to deal with stress.
8. I don't mind if someone I dislike gets hurt.
9. My impulsive decisions have caused problems with loved ones.
10. I get scared easily.
11. I sympathize with others' problems.
12. I have missed work without bothering to call in.
13. I'm a born leader.
14. I enjoy a good physical fight.
15. I jump into things without thinking.
16. I have a hard time making things turn out the way I want.
17. I return insults.
18. I've gotten in trouble because I missed too much school.
19. I have a knack for influencing people.
20. It doesn't bother me to see someone else in pain.
21. I have good control over myself.
22. I function well in new situations, even when unprepared.
23. I enjoy pushing people around sometimes.
24. I have taken money from someone's purse or wallet without asking.
25. I don't think of myself as talented.
26. I taunt people just to stir things up.
27. People often abuse my trust.
28. I'm afraid of far fewer things than most people.
29. I don't see any point in worrying if what I do hurts someone else.
30. I keep appointments I make.
31. I often get bored quickly and lose interest.
32. I can get over things that would traumatize others.
33. I am sensitive to the feelings of others.
34. I have conned people to get money from them.
35. It worries me to go into an unfamiliar situation without knowing all the details.
36. I don't have much sympathy for people.
37. I get in trouble for not considering the consequences of my actions.
38. I can convince people to do what I want.

39. For me, honesty really is the best policy.
40. I've injured people to see them in pain.
41. I don't like to take the lead in groups.
42. I sometimes insult people on purpose to get a reaction from them.
43. I have taken items from a store without paying for them.
44. It's easy to embarrass me.
45. Things are more fun if a little danger is involved.
46. I have a hard time waiting patiently for things I want.
47. I stay away from physical danger as much as I can.
48. I don't care much if what I do hurts others.
49. I have lost a friend because of irresponsible things I've done.
50. I don't stack up well against most others.
51. Others have told me they are concerned about my lack of self-control.
52. It's easy for me to relate to other people's emotions.
53. I have robbed someone.
54. I never worry about making a fool of myself with others.
55. It doesn't bother me when people around me are hurting.
56. I have had problems at work because I was irresponsible.
57. I'm not very good at influencing people.
58. I have stolen something out of a vehicle.

Appendix I

Perceived Stress Scale (Cohen et al., 1988)

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

0. Never
1. Almost never
2. Sometimes
3. Fairly often
4. Very often

1. In the last 12 months, how often have you been upset because of something that happened unexpectedly?
2. In the last 12 months, how often have you felt that you were unable to control the important things in your life?
3. In the last 12 months, how often have you felt nervous and "stressed"?
4. In the last month, how often have you dealt successfully with irritating life hassles?
5. In the last 12 months, how often have you felt that you were effectively coping with important changes that were occurring in your life?
6. In the last 12 months, how often have you felt confident about your ability to handle your personal problems?
7. In the last 12 months, how often have you felt that things were going your way?
8. In the last 12 months, how often have you found that you could not cope with all the things that you had to do?
9. In the last 12 months, how often have you been able to control irritations in your life?
10. In the last 12 months, how often have you felt that you were on top of things?
In the last 12 months, how often have you been angered because of things that happened that have been outside of your control?
11. In the last 12 months, how often have you found yourself thinking about things that you have to accomplish?
12. In the last 12 months, how often have you been able to control the way you spend your time?
13. In the last 12 months, how often have you felt difficulties were piling up so high that you could not overcome them?

Appendix J

Antisocial Behavior Scale (Eliot et al., 1985)

During the past 12 months, how often have you:

1. Stayed away from school, work, or other responsibilities without permission
2. Taken a car or other vehicle without the owner's permission, just to drive around
3. Snatched someone's purse or wallet without hurting them
4. Been drunk in a public place
5. Broke in or tried to break into a building just for fun or to look around
6. Broke in or tried to break into a building to steal or damage something
7. Thrown objects such as rocks or bottles at people to hurt or scare them
8. Set fire to a building or field or something like that just for fun
9. Sneaked into a movie, sporting event or something like that without paying
10. Steal money or take something that did not belong to you
11. Beat up on someone or fought someone physically because they made you angry
12. Purposely damaged or destroyed property that did not belong to you
13. Attack someone with a weapon trying to seriously hurt them
14. Sold illegal drugs such as pot, grass, LSD, cocaine, or another drug
15. Used a weapon, force or strong-arm methods to get money or things from someone
16. Drive a car recklessly
17. Cheat in some manner
18. Tell lies to people
19. Sell stolen goods
20. Write bad checks
21. Use someone else's credit card without permission

Appendix K

Aggression (Reactive-Proactive Questionnaire; Raine et al., 2006)

0=never 1= sometimes 2 =often

How often have you...

- | | |
|---|-------|
| 1. Yelled at others when they have annoyed you | 0 1 2 |
| 2. Had fights with others to show who was on top | 0 1 2 |
| 3. Reacted angrily when provoked by others | 0 1 2 |
| 4. Taken things from other students | 0 1 2 |
| 5. Gotten angry when frustrated | 0 1 2 |
| 6. Vandalized something for fun | 0 1 2 |
| 7. Had temper tantrums | 0 1 2 |
| 8. Damaged things because you felt mad | 0 1 2 |
| 9. Had a gang fight to be cool | 0 1 2 |
| 10. Hurt others to win a game | 0 1 2 |
| 11. Become angry or mad when you don't get your way | 0 1 2 |
| 12. Used physical force to get others to do what you want | 0 1 2 |
| 13. Gotten angry or mad when you lost a game | 0 1 2 |
| 14. Gotten angry when others threatened you | 0 1 2 |
| 15. Used force to obtain money or things from others | 0 1 2 |
| 16. Felt better after hitting or yelling at someone | 0 1 2 |
| 17. Threatened and bullied someone | 0 1 2 |
| 18. Made obscene phone calls for fun | 0 1 2 |
| 19. Hit others to defend yourself | 0 1 2 |
| 20. Gotten others to gang up on someone else | 0 1 2 |
| 21. Carried a weapon to use in a fight | 0 1 2 |
| 22. Gotten angry or mad or hit others when teased | 0 1 2 |
| 23. Yelled at others so they would do things for you | 0 1 2 |

Appendix L

Social Desirability (Marlowe-Crown Social Desirability Scale; Crowne & Marlowe, 1960)

Please indicate whether each statement below is mostly true for you (True) or mostly false for you (False).

1. It is sometimes hard for me to go on with my work if I am not encouraged.
 True False
2. I sometimes feel resentful when I don't get my way.
 True False
3. On a few occasions, I have given up doing something because I thought too little of my ability.
 True False
4. There have been times when I felt like rebelling against people in authority even though I knew they were right.
 True False
5. No matter who I'm talking to, I'm always a good listener.
 True False
6. There have been occasions when I took advantage of someone.
 True False
7. I'm always willing to admit it when I make a mistake.
 True False
8. I sometimes try to get even rather than forgive and forget.
 True False
9. I am always courteous, even to people who are disagreeable.
 True False
10. I have never been irked when people expressed ideas very different from my own.
 True False
11. There have been times when I was quite jealous of the good fortune of others.
 True False
12. I am sometimes irritated by people who ask favors of me.
 True False
13. I have never deliberately said something that hurt someone's feelings.
 True False

Supplementary Analyses – Social Desirability Included in Models**Table A.** *Effects of Psychopathy, Social Desirability, SES, and Race on Antisocial Behavior.*

Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.61	118.60**
	SES	.00	.02	-.01	-.24		
	Boldness	-.05	.02	-.08	-2.07*		
	Meanness	.08	.02	.34	5.68**		
	Disinhibition	.09	.01	.40	6.74**		
	Race	-.14	.20	-.02	-.68		
	Social Desirability	-.11	.042	-.09	-2.63*		
	Step 2					.01	81.75**
	SES x Boldness	.00	.01	-.01	-.32		
	SES x Meanness	.00	.00	.02	.34		
	<i>SES x Disinhibition</i>	-.01	.00	-.13	-1.74		

Note. SES = Socioeconomic Status; **p* < .05, ***p* < .01. Coefficients and *t*-values are reported at the step in which the variable was entered.

Table B. *Effects of Psychopathy, Social Desirability, Subjective SES, and Race on Antisocial Behavior*

Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.61	118.15**
	Subjective SES	.01	.04	.01	.20		
	Boldness	-.05	.02	-.08	-2.11*		
	Meanness	.08	.02	.34	5.67**		
	Disinhibition	.08	.01	.40	6.63**		
	Race	-.13	.20	-.02	-.63		
	Social Desirability	-.11	.04	-.09	-2.63*		
	Step 2					.02	84.88**
	SES x Boldness	-.01	.01	-.06	-1.46		
	SES x Meanness	.03	.01	.26	3.71**		
	SES x Disinhibition	-.03	.01	-.34	-4.77**		

Note. Subjective SES = Subjective Socioeconomic Status; **p* < .05, ***p* < .01. Coefficients and *t*-values are reported at the step in which the variable was entered.

Table C. *Effects of Psychopathy, Social Desirability, Neighborhood Disadvantage, and Race on Antisocial Behavior.*

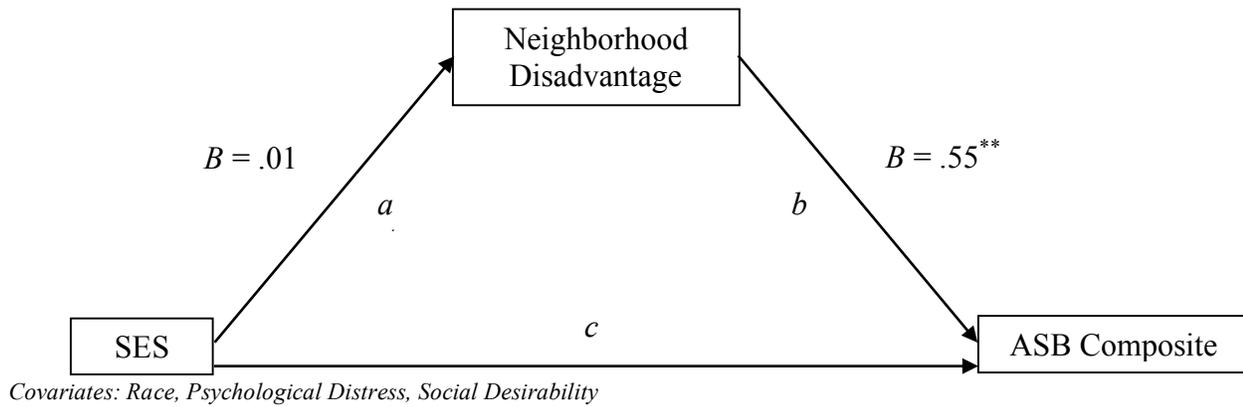
Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.611	121.65**
	Neighborhood Disadvantage	.16	.06	.10	2.68*		
	Boldness	-.04	.02	-.07	-1.98*		
	Meanness	.07	.02	.29	4.66**		
	Disinhibition	.08	.01	.38	6.38**		
	Race	-.14	.20	-.02	-.72		
	Social Desirability	-.13	.04	-.10	-3.08*		
	Step 2					.058	104.51**
	ND x Boldness	-.02	.02	-.04	-.74		
	ND x Meanness	.03	.01	.19	3.18*		
ND x Disinhibition	.01	.01	.08	1.40			

Note. ND = Neighborhood Disadvantage; **p* < .05, ***p* < .01. Coefficients and *t*- values are reported at the step in which the variable was entered.

Table D. *Effects of Psychopathy, Social Desirability, Psychological Distress, and Race on Antisocial Behavior.*

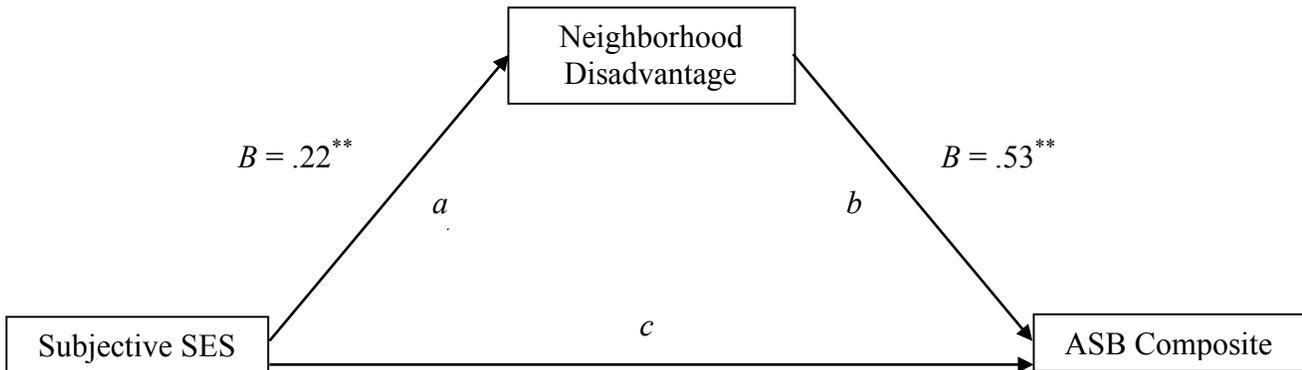
Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.61	120.49**
	Psychological Distress	.06	.03	.09	2.12*		
	<i>Boldness</i>	-.03	.02	-.06	-1.52		
	Meanness	.08	.02	.34	5.70**		
	Disinhibition	.08	.01	.35	5.55**		
	Race	-.16	.20	-.02	-.79		
	Social Desirability	-.10	.04	-.08	-2.34*		
	Step 2					.04	93.68**
	<i>PD x Boldness</i>	.01	.00	.07	1.9		
	PD x Meanness	.01	.00	.22	4.78**		
PD x Disinhibition	.00	.00	.00	.05			

Note. PD = Psychological Distress; * $p < .05$, ** $p < .01$. Coefficients and *t*- values are reported at the step in which the variable was entered.



Total effect (c): $B = .02$, $SE = .02$, $p = .48$
Direct effect (c'): $B = .01$, $SE = .02$, $p = .54$
Indirect effect (ab): $B = .00$, Boot $SE = .01$, $CI_{95\%} = -.01$ to $.02$

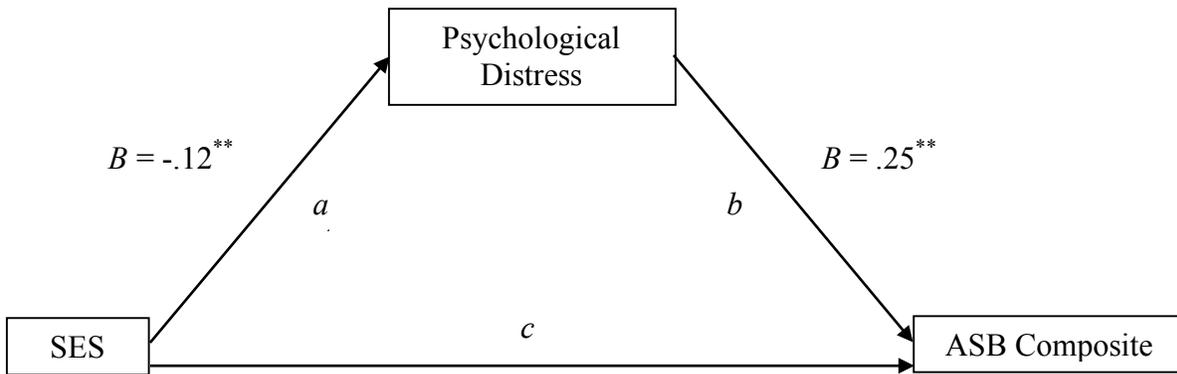
Figure A. Mediation of SES and ASB by Neighborhood Disadvantage.



Covariates: Race, Psychological Distress, Social Desirability

Total effect (c): $B = .17$, $SE = .05$, $p < .001$
Direct effect (c'): $B = .06$, $SE = .05$, $p = .21$
Indirect effect (ab): $B = .11$, Boot $SE = .02$, $CI_{95\%} = .08$ to $.16$

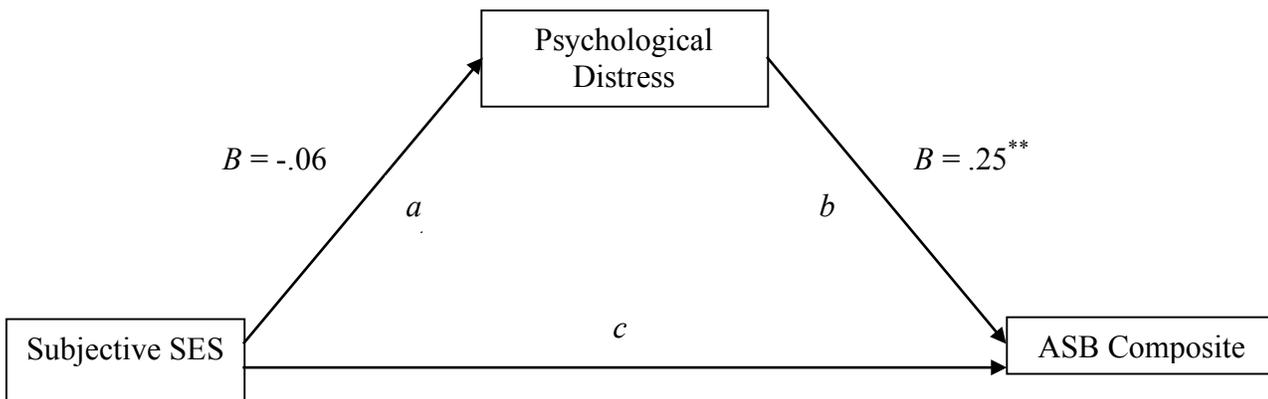
Figure B. Mediation of Subjective SES and ASB by Neighborhood Disadvantage.



Covariates: Race, Neighborhood Disadvantage, Social Desirability

Total effect (*c*): $B = -.02$, $SE = .02$, $p = .46$
 Direct effect (c'): $B = .01$, $SE = .02$, $p = .54$
 Indirect effect (ab): $B = -.03$, $Boot SE = .01$, $CI_{95\%} = -.05$ to $-.01$

Figure C – Mediation of SES and ASB by Psychological Distress



Covariates: Race, Neighborhood Disadvantage, Social Desirability

Total effect (*c*): $B = .04$, $SE = .05$, $p = .38$
 Direct effect (c'): $B = .06$, $SE = .05$, $p = .21$
 Indirect effect (ab): $B = -.02$, $Boot SE = .02$, $CI_{95\%} = -.06$ to $.02$

Figure D – Mediation of Subjective SES and ASB by Psychological Distress

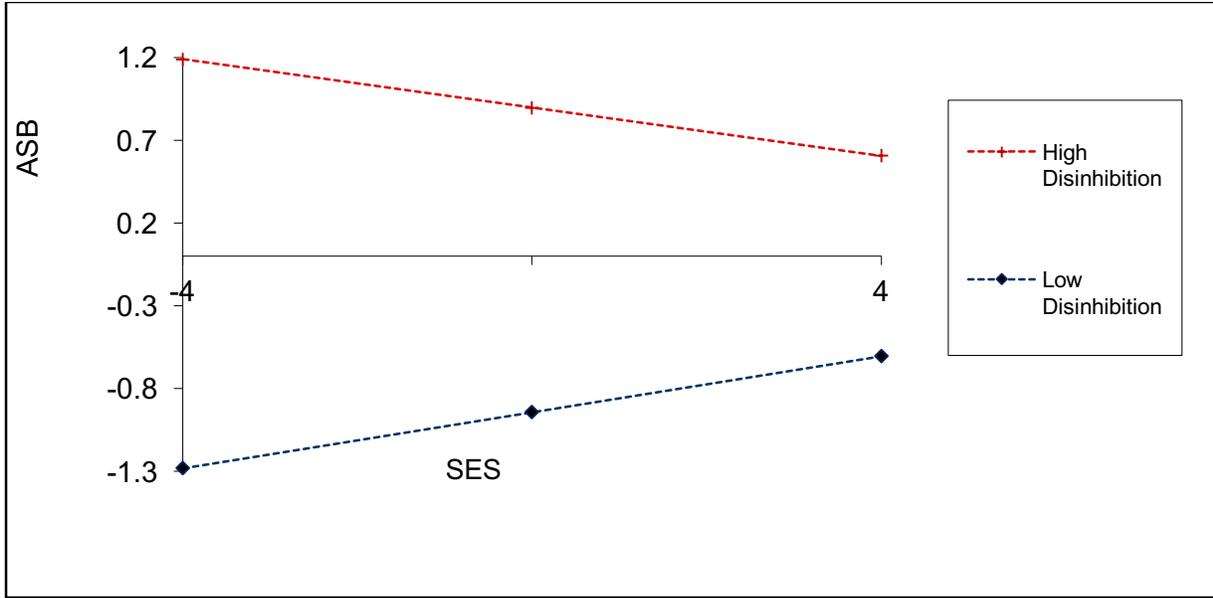


Figure E – Interaction between SES and Disinhibition on Antisocial Behavior (with Social Desirability covaried)

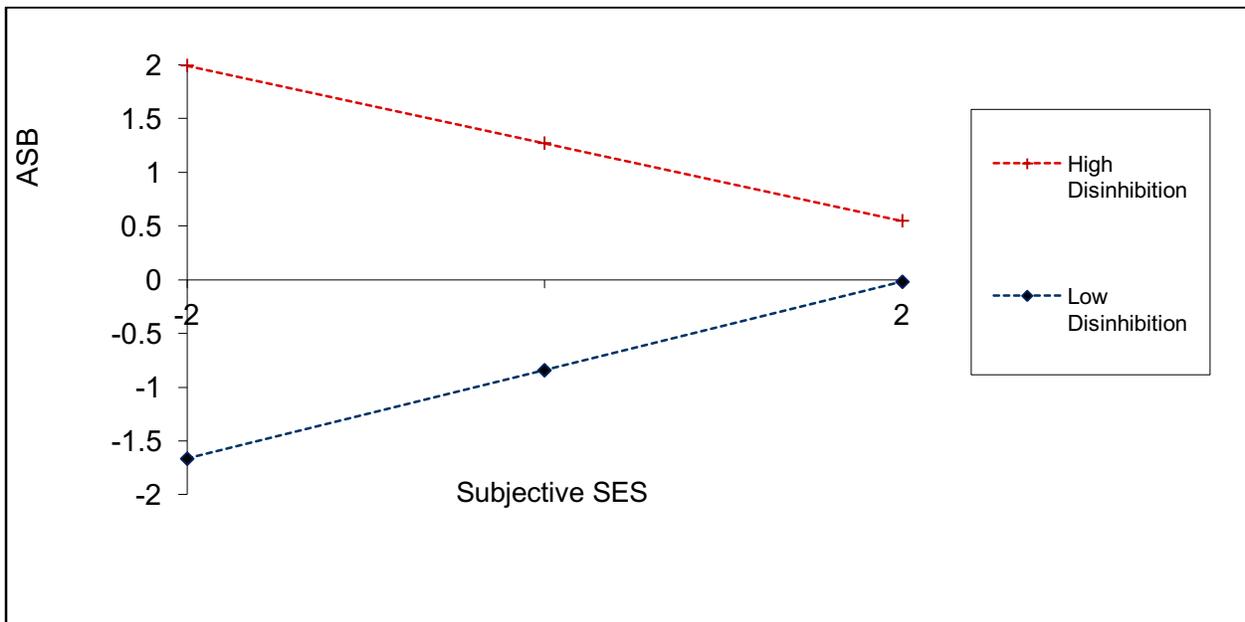


Figure F – Interaction between Subjective SES and Disinhibition on Antisocial Behavior (with Social Desirability covaried)

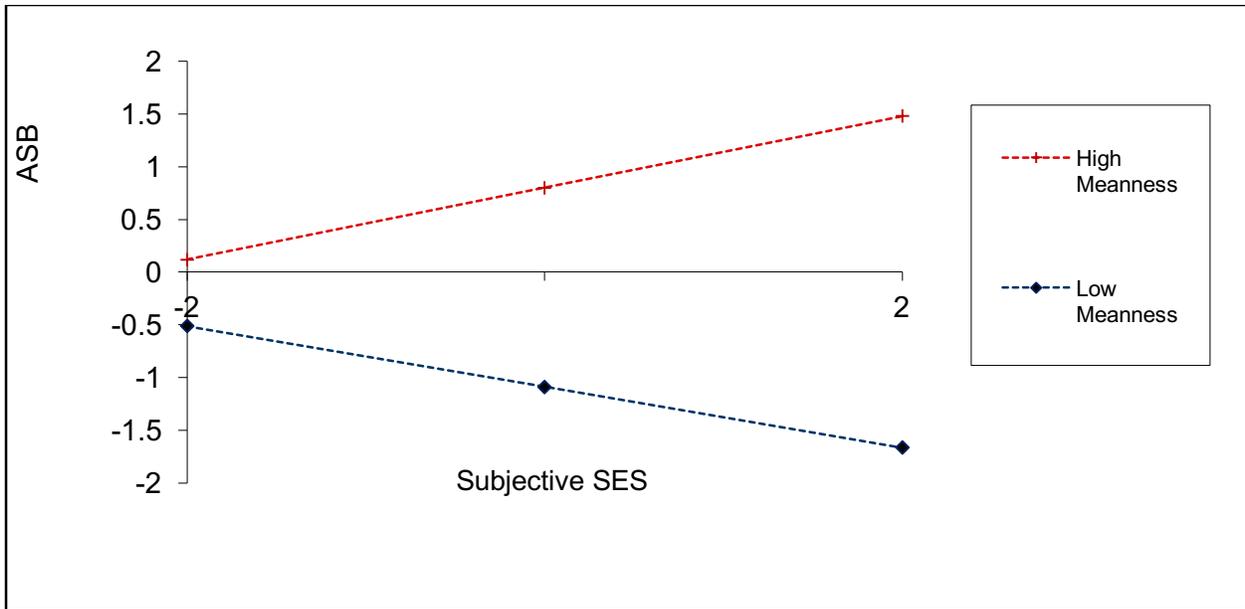


Figure G – Interaction between Subjective SES and Meanness on Antisocial Behavior (with Social Desirability covaried)

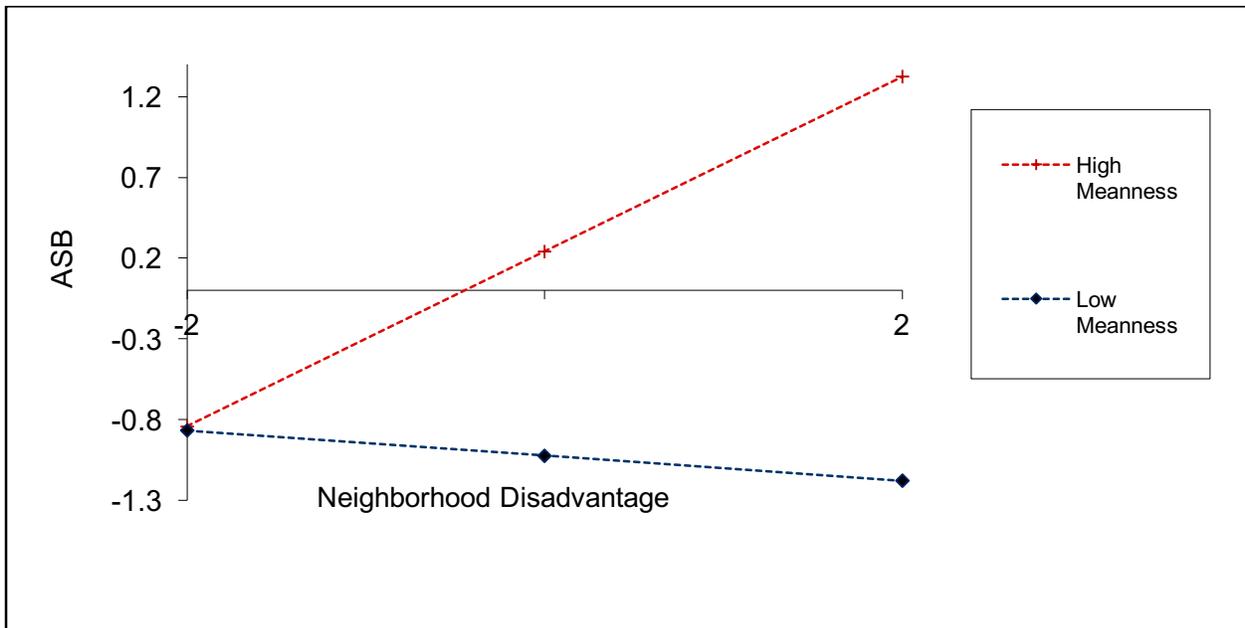


Figure H – Interaction between Neighborhood Disadvantage and Meanness on Antisocial Behavior (with Social Desirability covaried)

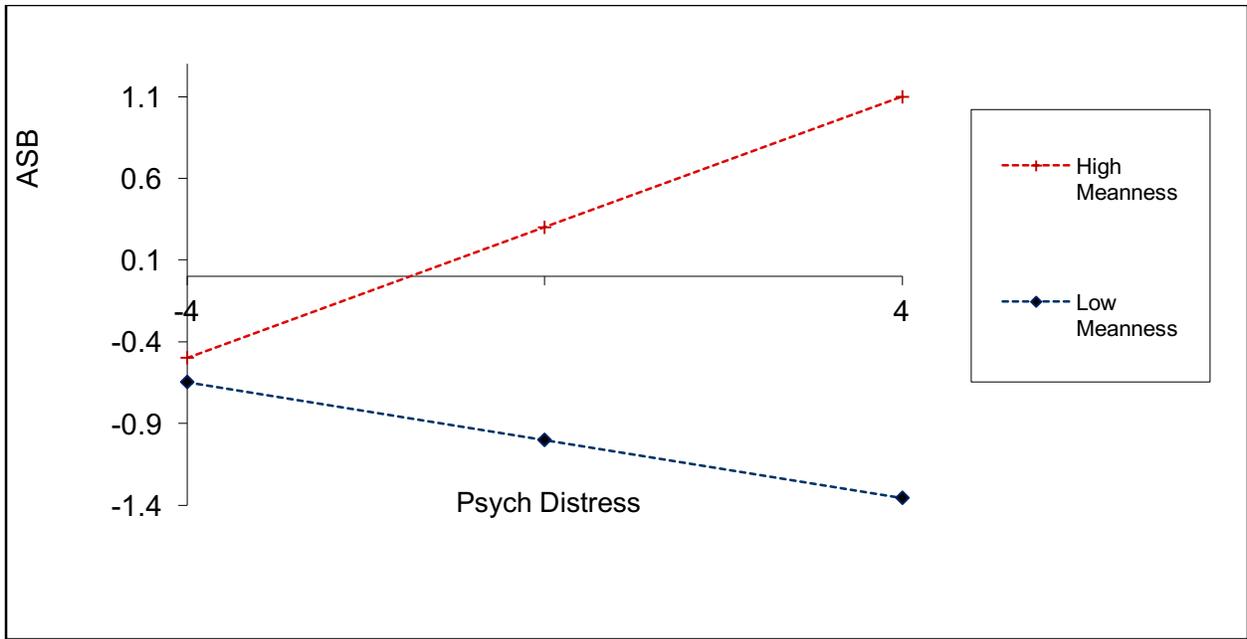


Figure I – Interaction between Psychological Distress and Meanness on Antisocial Behavior (with Social Desirability covaried)

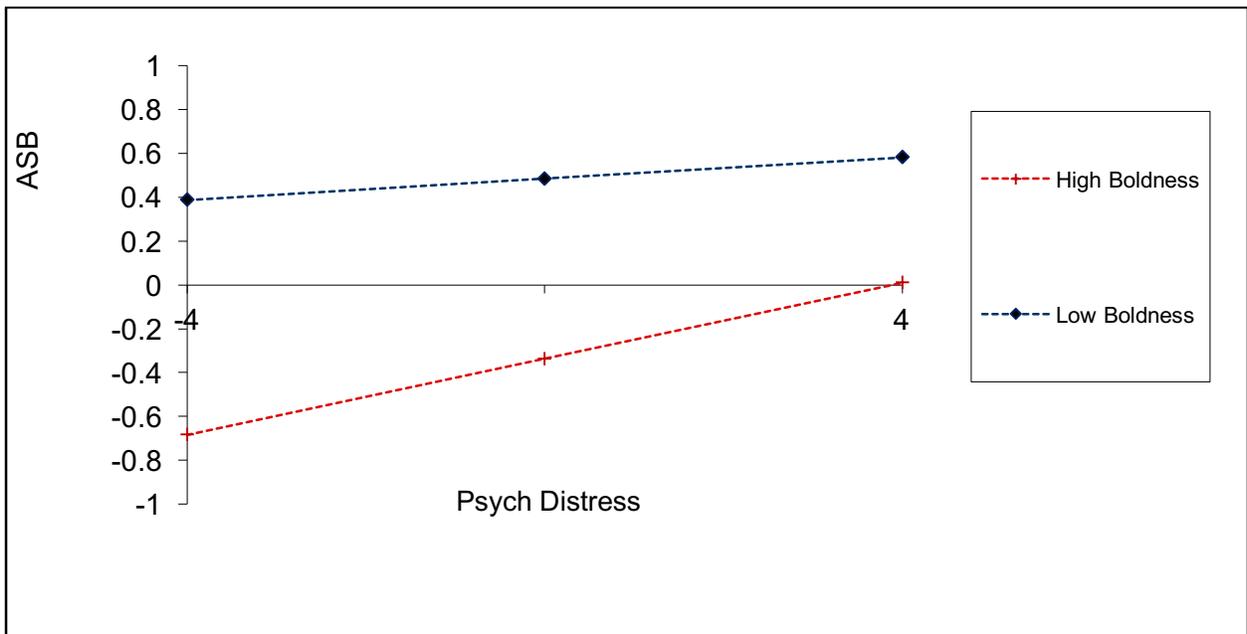


Figure J – Interaction between Psychological Distress and Boldness on Antisocial Behavior (with Social Desirability covaried)

Supplementary Analyses – Neighborhood Disadvantage Split up into Individual Variables**Table E.** *Effects of Psychopathy, Informal Social Control, and Race on Antisocial Behavior.*

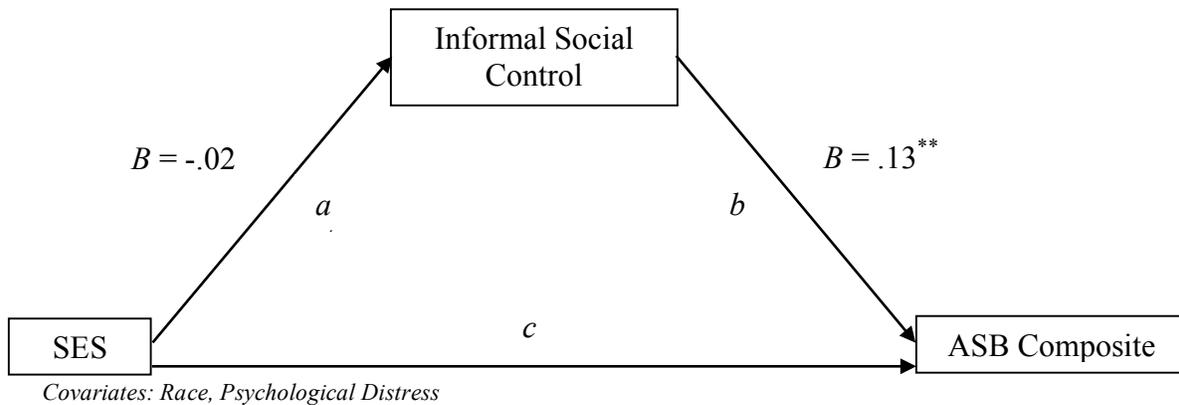
Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.60	140.88**
	Informal Social Control	.03	.02	.07	1.87		
	Boldness	-.07	.02	-.12	-3.38*		
	Meanness	.08	.02	.33	5.37**		
	Disinhibition	.08	.01	.38	6.30**		
	Race	-.08	.20	-.01	-.39		
	Step 2					.06	114.76**
	Soc. Control x Boldness	.01	.00	.06	1.53		
	Soc. Control x Meanness	.00	.00	.04	.59		
	Soc. Control x Disinhibition	.00	.00	.27	4.20**		

Note. * $p < .05$, ** $p < .01$. Coefficients and *t*-values are reported at the step in which the variable was entered.

Table F. *Effects of Psychopathy, Social Disorganization, and Race on Antisocial Behavior*

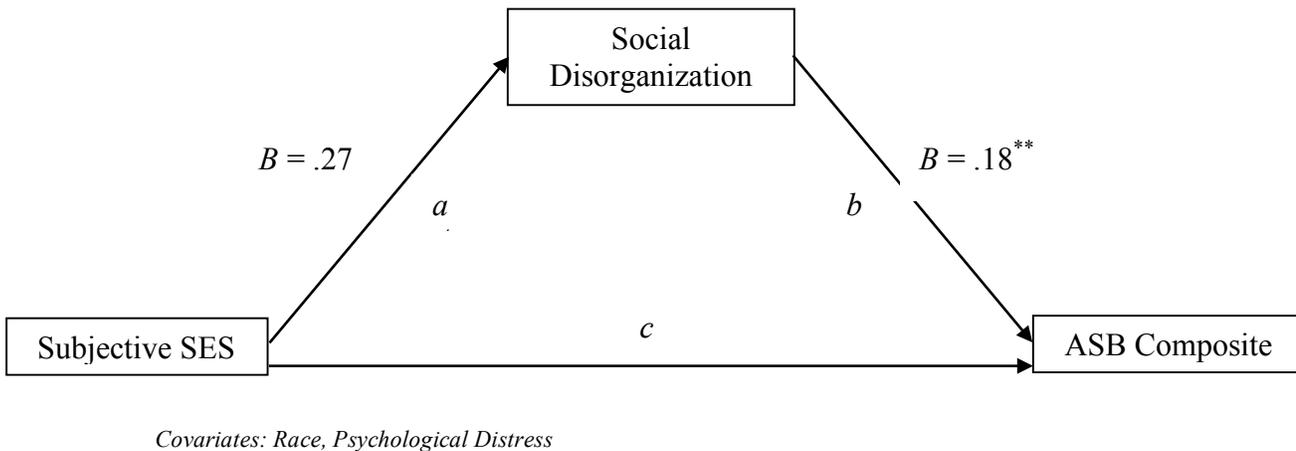
Dep. Variable	Predictors	B	SE B	Beta	<i>t</i>	<i>R</i> ² change	<i>F</i> change
ASB Composite	Step 1					.60	140.42**
	Social Disorganization	.04	.02	.06	1.61		
	Boldness	-.06	.02	-.11	-3.03*		
	Meanness	.08	.02	.32	5.29**		
	Disinhibition	.08	.01	.38	6.37**		
	Race	-.13	.20	-.02	-.68		
	Step 2					.02	96.06**
	Soc. Disorg x Boldness	.00	.00	.02	.49		
	Soc. Disorg x Meanness	.01	.00	.16	3.71**		
	Soc. Disorg x Disinhibition	.00	.00	.00	-.04		

Note. * $p < .05$, ** $p < .01$. Coefficients and *t*-values are reported at the step in which the variable was entered.



Total effect (c): $B = .02$, $SE = .02$, $p = .45$
 Direct effect (c'): $B = .02$, $SE = .02$, $p = .40$
 Indirect effect (ab): $B = .00$, $Boot SE = .01$, $CI_{95\%} = -.02$ to $.01$

Figure K. Mediation of SES and ASB by Informal Social Control.



Total effect (c): $B = .02$, $SE = .02$, $p = .45$
 Direct effect (c'): $B = .01$, $SE = .02$, $p = .57$
 Indirect effect (ab): $B = .01$, $Boot SE = .01$, $CI_{95\%} = .01$ to $.02$

Figure L. Mediation of Subjective SES and ASB by Social Disorganization.

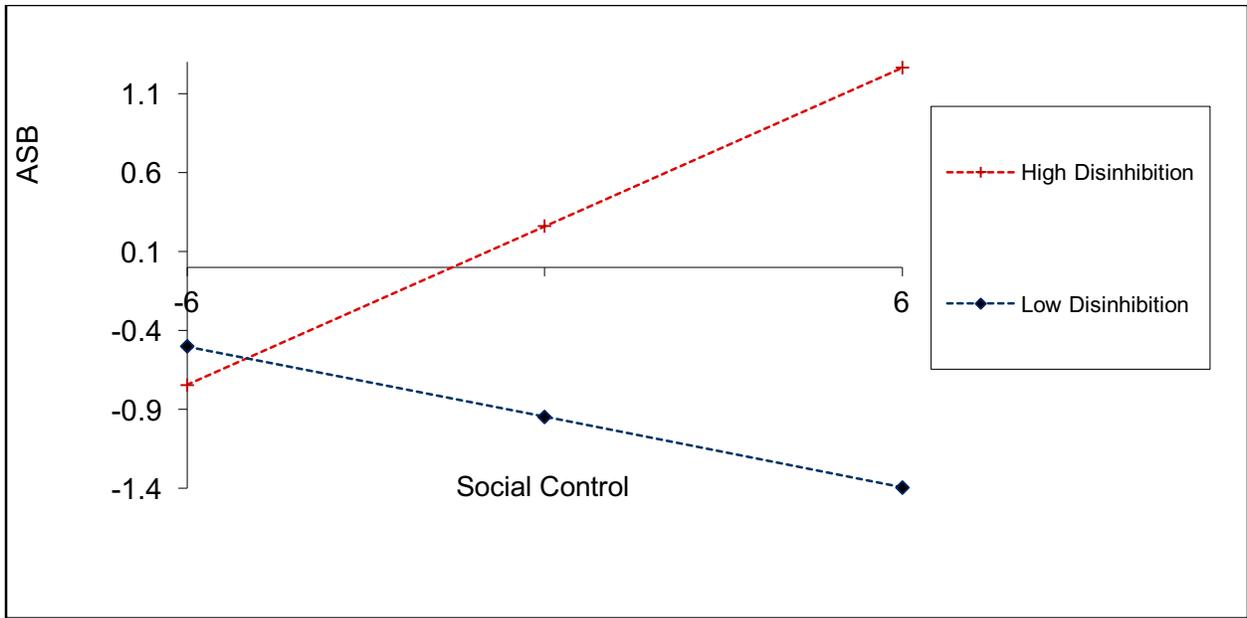


Figure M – Interaction between Social Control and Disinhibition on Antisocial Behavior

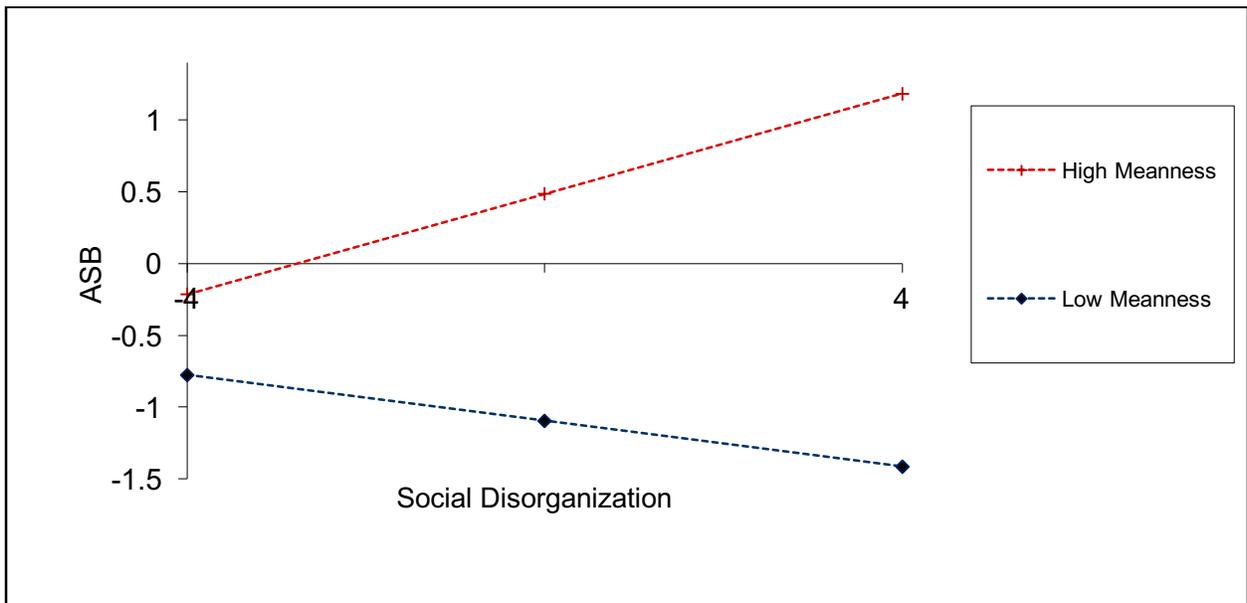


Figure N – Interaction between Social Disorganization and Meanness on Antisocial Behavior

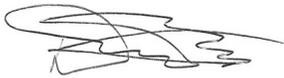
Supplementary Analyses – Regional Participant Information

Table G

Participant Regional Location.

Region	Number of Participants	Percent of Sample
Rural	89	19.3
Urban	279	60.4
Suburban	94	20.3

MEMORANDUM

DATE: March 30, 2017 

TO: Bradley A White, Roberto Carlos Guerra

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires January 29, 2021)

PROTOCOL TITLE: Examining the relationship between SES and antisocial behaviors: Individual and Environmental mechanisms

IRB NUMBER: 17-347

Effective March 30, 2017, the Virginia Tech Institutional Review Board (IRB) Chair, David M Moore, approved the New Application request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Expedited, under 45 CFR 46.110 category(ies) 7**
Protocol Approval Date: **March 30, 2017**
Protocol Expiration Date: **March 29, 2018**
Continuing Review Due Date*: **March 15, 2018**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

MEMORANDUM

DATE: March 14, 2018
TO: Bradley A White, Roberto Carlos Guerra
FROM: Virginia Tech Institutional Review Board (FWA00000572, expires January 29, 2021)
PROTOCOL TITLE: Examining the relationship between SES and antisocial behaviors: Individual and Environmental mechanisms
IRB NUMBER: 17-347

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