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# Violent victimization, confluence of risks and the nature of criminal behavior: Testing main and interactive effects from Agnew's extension of General Strain Theory

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ABSTRACT

*Purpose:* Important facets of the association between violent crime victimization and criminal offending remain unsettled. Drawing on key aspects of General Strain Theory, this study examined whether violent crime victimization affects overall offending proclivity as well as the character—violent vs. nonviolent—of criminal behavior. Additionally, it tested a recent theory extension positing that larger effects of violent victimization will be found among individuals with a greater confluence of criminogenic risk factors.
*Methods:* Multi-level latent variable item-response models are used to examine data from a sample of nearly 3,000 tenth-grade students from thirty Kentucky counties.
*Results:* Quantitative analyses indicated that greater violent victimization was associated with both higher scores on a latent index of overall offending and with an elevated propensity for *violent* criminality in particular. Contrary to expectations, effects of violent victimization on overall offending and the propensity for violence were not higher for individuals with higher scores on a multidimensional risk index.
*Conclusion:* In support of General Strain Theory, violent victimization elevates the overall amount of criminal offending and increases odds that crimes involve violent rather than nonviolent behaviors. However, variations in the preceding effects across levels of criminogenic risk are not consistent with the theory.


## Introduction

A question of tremendous importance among criminologists centers on whether individuals who are victims of violent crime are themselves more likely to engage in crime. One major criminological theory that offers an affirmative response is Agnew's General Strain Theory (hereafter, GST). This theory contends that because violent crime victimization is a severe and unjust strain, it increases motivation for criminal behavior, which often serves as a coping strategy. Support for this core GST hypothesis has been strong with numerous studies reporting that violent victimization is positively associated with a person's involvement in various forms of criminal offending (Agnew, 2002; Baron, 2009; Hay & Evans, 2006; Jang & Johnson, 2003; Kort-Butler, 2010; Moon, Morash, McCluskey & Hwang, 2009; Piquero & Sealock, 2000, 2004; Turanovic & Pratt, 2013).

Yet other GST-inspired hypotheses regarding the relationship between violent victimization and criminal offending are less settled, primarily because empirical evidence is scarce or inconsistent. Accordingly, this paper focuses specifically on two heretofore unresolved issues. The first is whether violent victimization has general or crime-type specific effects on offending. In other words, we ask: Do experiences with violent crime victimization elevate an individual's propensity to commit crimes of any type or do they particularly heighten one's proclivity for violence? The second issue deals with the extent to which the effects of violent victimization on offending depend on other variables. Agnew's theory predicts that the effects of strains on crime are moderated by other criminogenic risk factors, including particular personality traits, social controls and associations with criminally involved peers (e.g., Agnew, 2006; Agnew, Brezina, Wright & Cullen, 2002). But results from research testing the conditional effects of strains, including those focused on the criminogenic impact of violent victimization, have yielded mixed results with some supporting and some contradicting theoretical expectations (cf., Agnew et al., 2002; Baron, 2009; Botchkovar, Tittle & Antonaccio, 2009; Hay & Evans, 2006; Kort-Butler, 2010; Turanovic & Pratt, 2013).

In a recent extension of GST, Agnew (2013) has suggested that the inconsistent results likely stem from the fact that prior studies have not sufficiently evaluated the combination of conditions most likely to intensify criminogenic effects of severe and unjust strains. Rather, he notes that past research is limited because it typically has examined how the effects of strain are moderated by a particular risk factor

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(e.g., self-control, attachment to parents, delinquent peers) considered in isolation from others. Yet, Agnew's recent thesis is that the criminogenic impact of strains is most likely to be exacerbated when individuals face a deleterious confluence of multiple risk factors. Hence there is great need for additional research that seeks to determine if this combined risk thesis is supported empirically.

To summarize, in the current research article we attempt to better understand whether and how violent victimization spurs criminal offending, with aspects of GST providing our theoretical guidance. More specifically, using data from a large sample of adolescents we address the two unresolved theoretical issues regarding the victimization-offending relationship identified above. First, we examine whether variations in violent crime victimization predict an individual's general proclivity for crime *and* the nature—violent vs. nonviolent—of their criminal behavior. Next, drawing upon Agnew's (2013) recent "confluence of risk factors" conditional effects thesis, we estimate the degree to which the effects of violent victimization on criminal behavior (overall level and violence propensity) vary systematically according to where individuals are positioned on a multidimensional risk index that incorporates well-established correlates of criminality including personality traits, social relationships, and deviant attitudes. The conclusion of the article considers implications of our findings for 1) a more nuanced understanding of the relationship between violent crime victimization and criminal offending, and 2) the relevance of GST for understanding this complexity.

## Background and review of research

### *General Strain Theory, violent victimization and criminal behavior*

Criminal victimization, especially violent crime victimization, has been linked to a variety of negative outcomes including lower educational attainment, depression, sleep deprivation, poor mental and physical health, as well as several forms of delinquent/criminal behavior (Agnew, 2002; Bouffard & Koeppel, 2014; Hay & Evans, 2006; Johnson, Giordano, Longmore & Manning, 2014; Kort-Butler, 2010; MacMillan & Hagan, 2004; McGrath, Marcum & Copes, 2012; Moon, Morash, McCluskey & Hwang, 2009). Focusing on the latter, Agnew's General Strain Theory is a leading theoretical account of why violent crime victimization may lead a person to an involvement in crime (see Agnew, 1992, 2002, 2006, 2013). Extending early strain theory which attributed crime primarily to the inability to achieve desired goals (e.g., Cloward & Ohlin, 1960; Cohen, 1955; Merton, 1938), Agnew's GST posits that criminal behavior varies with two additional forms of strain, the loss of valued things and, most important for present purposes, *negative treatment from others*. These categories of strain are likely to elicit a criminal coping response when they are particularly severe and unjust. Violent criminal victimization is a primary example. It is a severe and unjust form of negative treatment that also may result in the loss of valued things. Therefore, according to the logic of the theory, it should increase overall involvement in criminal behavior as individuals use crime to escape from strains (assaulters), exact revenge against transgressors, or dull negative feelings invoked by victimization experiences. As noted above, numerous studies support this argument, reporting that violent crime victimization is positively associated with the likelihood or level of offending (e.g., Agnew, 2002; Baron, 2009; Hay & Evans, 2006; Jang & Johnson, 2003; Kort-Butler, 2010; Moon, Morash, McCluskey & Hwang, 2009; Piquero & Sealock, 2000, 2004; Turanovic & Pratt, 2013).

Yet most prior research on the relationship between violent victimization and offending has focused only on an individual's overall crime propensity (or their quantity of offending), not on their distinct proclivity for violence (whether they are more likely to choose violence when they do offend). Consequently, there is little certainty about whether violent crime victimization affects an individual's tendency to commit violent as opposed to nonviolent crimes, net of the impact that violent victimization has on their overall propensity for criminal offending. [1] Inattention to the impact of strains on the *nature* of offending may be due to the fact that GST theory applies to "any act which is condemned by most others in the society or that carries more than a trivial risk of punishment" (Agnew, 2006: 17). However, recent work does contend that particular strains will have varying effects by crime types (Agnew, 2006, 2013). Most important for the present study, it is argued that strains involving provocations by others—including violent crime victimization—will more commonly produce violent offenses than property crimes or drug use (Agnew, 2006, 2013).[2] In light of this argumentation, we believe GST proposes that severe forms of negative treatment like violent victimization should systematically increase both the overall *quantity* of criminal behavior and the *propensity for that behavior to be violent rather than nonviolent*.

While some extant GST studies have examined whether measures of strain are predictive of multiple criminal offense types (see e.g., Botchkovar, Tittle, & Antonaccio, 2009; Hay & Evans, 2006; Jang, 2007; Mazerolle & Piquero, 1998; Mazerolle, Piquero & Capowich 2003; Peter, LaGrange & Silverman, 2003), they do not explicitly distinguish between the effects that strains have on an individual's overall propensity to commit crime of any type and the effects that strains have on an individual's propensity to utilize a particular criminal coping style, such as violence, more than others (i.e., nonviolence). To fill this salient gap in the research literature, the present study investigates the following two research hypotheses:

**H1.** *Violent victimization will be positively associated with the overall propensity for criminal offending.*

**H2.** *Net of its impact on the overall propensity for offending, violent victimization will be positively associated with the propensity for violent rather than nonviolent offending.*

### *Conditioning impact of a confluence of risk factors*

As noted above a key argument in GST posits that the effects of strains on criminal offending vary as a function of numerous factors including individual personality traits, sources of conventional social controls, and exposure to crime-involved peers (Agnew et al., 2002; Aseltine, Gore, & Gordon, 2000; Baron, 2009; Botchkovar, Tittle & Antonaccio, 2009; Chueng & Cheung, 2010; Kort-Butler, 2010; Mazerolle & Piquero, 1997; Moon et al., 2009; Ousey & Wilcox, 2007; Paternoster & Mazerolle, 1994; Peter, LaGrange & Silverman, 2003). Specifically, Agnew suggests that the impact of strains on offending should be strongest for individuals whose personalities feature low levels of "constraint" and high levels of "negative emotionality" (Agnew, 2006; Agnew et al., 2002). Moreover, strains are expected to have greater impact on criminal behavior for individuals with weak attachments to conventional social institutions (e.g., parents, schools) or who have greater association with friends who engage in delinquent behaviors (see Agnew, 2006, pp. 100-101).

In their initial empirical test of GST, Agnew and White (1992) investigated whether the effects of strains were dependent on measures of delinquent friends and self-efficacy. Results were mostly consistent with the theory's conditional effects expectations. Specifically, positive associations between strain and delinquency and strain and drug use were stronger for individuals with greater exposure to delinquent friends. Moreover, the effect of strain on delinquency (but not drug use) was weaker among individuals with greater self-efficacy. Reinforcing the spirit of those results, several more recent studies have found that the relationship between measures of strains and the quantity of offending are dependent on variations in personality traits or social relationships (e.g., Agnew et al., 2002; Baron, 2009; Chueng & Cheung, 2010; Kort-Butler, 2010; Moon et al., 2009).

However, findings regarding the conditional effects of strains on crime have been far from uniform. In fact, numerous studies fail to find evidence that the risk factors identified in the theory moderate the effects of strains on criminal behavior (Aseltine, Gore, & Gordon,

2000; Botchkovar, Tittle & Antonaccio, 2009; Mazerolle & Piquero, 1997; Ousey & Wilcox, 2007; Paternoster & Mazerolle, 1994; Peter, LaGrange & Silverman, 2003). Consequently, recent summaries of the GST literature have noted that the conditional effects portion of the theory is unsettled (Agnew, 2006, 2013).

According to Agnew (2013), there are several plausible reasons why interaction effects involving key strains and theoretically salient risk factors have been inconsistent. Of interest here is the idea that prior studies have failed to investigate the confluence of conditions that are most likely to yield criminal coping responses to strain. Specifically, GST suggests that the criminogenic impact of strains is most probable when severe and unjust strains happen to individuals who have high-risk personality traits AND who are embedded in multiple high-risk social circumstances. Notably, criminal coping is particularly likely for individuals with a combination of the following personal and social characteristics: low self-control, low social control, favorable beliefs toward crime, greater associations with criminal peers, and membership in gangs. Indeed, Agnew (2013) contends that "it is critical to consider such characteristics *in combination*, so as to better index the individual's overall propensity for criminal coping" (p. 662, emphasis added). Unfortunately, he also suggests that to date quantitative researchers have not adequately assessed this combined conditional effects argument. Thus, to address this limitation in the research literature, the current study examines a third hypothesis:

**H3.** *The effect of violent victimization on the overall propensity for criminal offending will be significantly higher among individuals who are positioned higher on a multidimensional risk measure that encompasses salient personality traits, social controls, criminal peer associations, and pro-crime attitudes.*

Finally, bringing together each piece of the argument presented above, it is our assertion that GST's "combination of risks" conditional effects thesis should apply to the propensity for violence as well as the overall propensity for offending. In other words, for individuals who are positioned highly on the aforementioned combination of risks, the effect of violent victimization on the propensity for violent (relative to non-violent) criminal coping behavior should also be elevated. Hence, our analysis investigates a fourth hypothesis:

**H4.** *The positive association between violent victimization and the propensity for violent offending will be significantly greater among individuals with a combination of high-risk personality traits, social relationships and attitudes toward crime.*

In recapitulation, our conceptual framework asserts that violent crime victimization is a severe and unjust form of strain that should be systematically associated with an individual's overall criminal offending propensity and their propensity to utilize violence rather than non-violent strategies of criminal coping. Moreover, based on Agnew's recent refinements of GST, we believe there is good reason to expect that the effects of violent victimization on both dimensions of offending—the overall propensity and the proclivity for violence—vary as a function of the extent to which individuals who get victimized have a particularly high-risk combination of personality traits, social relationships and pro-crime attitudes. In the sections that follow, we turn our attention to the data, measures and analytic methods used to test the four specific hypotheses extracted from the preceding conceptual framework.

## Data, measures, and analytic methods

### *Data*

Data for this study come from the Rural Substance Abuse and Violence Project (RSVP), a prospective longitudinal panel study of self-reported substance use, criminal victimization, and criminal offending among students in schools in the state of Kentucky (NIDA Grant DA-11317). The RSVP project data were first collected in the spring of 2001 when the participating panel of students was in the seventh grade and follow-up surveys took place during the spring of the three subsequent years (i.e., 2002, 2003 and 2004). Despite its name, the RSVP study employed a multi-stage sampling procedure that selected a random sample of 30 counties *across the rural-urban continuum,* from population-based strata. Within the 30 selected counties, all 74 public schools containing seventh graders were contacted and 65 agreed to participate. The targeted population was 9,488 seventh graders enrolled in those 65 middle schools at the initiation of the study. Given the longitudinal design and the minor status of the respondents, the study required active parental consent. The "Dillman method" for mailed surveys was used to obtain active consent from parents. Forty-three percent of parents agreed, resulting in 4,102 youths with parental approval for study participation.[3] Using a mass administration method at the participating schools, complete surveys were obtained from 3,692 students in wave one and 3,638 students in wave two. In waves three and four, when most students had traversed from the originally sampled middle-schools into local high-schools, complete surveys were obtained from 3,050 and 3,040 respondents, respectively. The current analysis uses data from wave 4 of the RSVP dataset.[4] Wave 4 data are useful because they contain a more extensive set of individual personality measures than were obtained in the first two waves of the survey.[5]

### *Measures*

#### *Dependent variable*

As outlined above our interest is centered on examining main and interactive effects of violent crime victimization on two dimensions of criminal offending: 1) the overall propensity to commit crimes (regardless of type) and 2) the propensity for violence versus non-violence. We expect these two dimensions to be correlated because, across individuals, frequency and seriousness of offending tend to vary together in a positive direction; that is, individuals who commit a higher volume of offenses also are likely to have a higher share of their offenses involve violent (i.e., more serious) behavior. Therefore, it is important to account for this covariance and explicitly distinguish the effect of violent victimization on the propensity for offending (generally) from the effect of violent victimization on the tendency for violence. To do this, we utilize a multilevel latent variable model (described in detail in the "analytic methods" section below). The level-1 equation in this multilevel model is a measurement model, it defines two latent variables that reflect, respectively, an individual's: 1) overall offending propensity and 2) their violence propensity. These latent variables are derived on the basis of individual's responses to nine survey questions that ask about frequency of involvement in four violent offenses (two indicators of assault and two indicators of robbery) and five nonviolent offenses (three measures of substance use and two measures of theft) during the current school year. Respondent's scores on each of these offense items are coded: 0 = "never", 1 = "less than once a month", 2 = "about once a month", 3 = "about 1-2 times per week" and 4 = "daily or almost daily".

#### *Independent variables: violent victimization*

GST suggests that criminal behavior as a coping response is most likely to occur when individuals experience severe and unjust strains. Our interest in the current study is on the effects of one such strain: violent crime victimization. Our measure of this strain is an index created by summing responses from five survey questions. These questions ask respondents to report the number of times during the current school year that they have been the victim of an act of physical assault, robbery, sexual battery, threat with a firearm or threat with another (non-gun) weapon. Responses for each of these items are coded between 0 ("zero victimizations") and 10 ("10 or more victimizations"). After

summing the items, scores on the *criminal victimization* index range between zero and fifty (mean = 3.01; Cronbach's alpha = .82).

*Measures of conditioning factors*

As we articulated earlier, GST suggests that important explanatory variables from other crime theories (e.g., social bonds theories, social learning theory, low self-control theory) work as conditioning factors that moderate the magnitude of strains on criminal behavior. To examine this argument, we include several additional predictors in our analyses. First, we compute two measures of conventional social controls: mother bonds and school bonds. The measure of *mother bonds* consists of twelve survey items that tap the level of emotional closeness, understanding, communication and supervision between the respondent and her/his mother. Responses for each of these items were originally coded 1 = "never" to 5 = "always" and scores on the summative mother bonds index range between five and sixty (Cronbach's alpha = .91). *School bonds* is an index comprised of seven survey questions that tap the extent to which respondents believe that their teachers care about and take an interest in them, the extent to which respondents feel that school is worthwhile and important, and the degree to which they look forward to going to school. These items were initially scored on a four-point scale ranging from 1 = "strongly disagree" to 4 = "strongly agree"; scores on the summative school bonds index range between of seven and twenty-eight (Cronbach's alpha = .73). We also include an index of *impulsivity/low self-control* that sums responses to ten questions that ask respondents whether they have difficulty controlling their temper, lose control of their actions when angry, have difficulty remaining seated while in school, have trouble keeping their attention on tasks, are easily distracted or thrown off task or get restless whenever they are supposed to sit still. Responses to these individual items are coded 1 = "never true" to 4 = "always true" and scores on the impulsivity index range between ten and forty (Cronbach's alpha = .91). Next, we construct a measure of *delinquent friends* with sixteen dummy-coded items (1 = "yes", 0 = "no") that indicate whether any of the respondents "closest friends" have engaged in a particular form of delinquent behavior (e.g., smoking marijuana, using cocaine, getting drunk on alcohol, skipping school, physically attacking someone, vandalizing property) during the current school year. Scores on the delinquent friends index range between zero and sixteen (Kuder-Richardson reliability = .89). The impact of attitudes favoring deviance and crime are tapped by an index of *deviant values* which is computed from twelve questions asking respondents to indicate how wrong it is for someone their age to engage in a variety of behaviors including cheating on tests, destroying property, stealing things, using alcohol or drugs, hitting others without provocation and carrying weapons in school. These items were initially coded so that higher values reflect greater disapproval of deviant behavior (1 = "not wrong at all", 4 = "very wrong"). We reverse coded the items so that higher scores reflect greater approval of deviant behavior. The resulting deviant values index ranges between twelve and forty-eight, (Cronbach's alpha = .95). Finally, we include a single-item dummy-coded measure of gang membership which asks respondents to indicate whether they consider themselves to be part of a gang (1 = yes, 0 = no). The preceding measures are similar to variables employed in numerous prior studies, most of which support their theoretically expected effects on measures of self-reported offending (e.g., Brauer, 2009; Haynie, 2001; McGloin et al., 2011; Melde & Esbensen, 2013; Ousey & Wilcox, 2007; Warr & Stafford, 1991; Wright et al., 1999).

As we discussed above, Agnew (2013) has argued that it is essential to gauge the overall impact of these variables by, for example, "…combin(ing) several conditioning variables into a scale, including variables such as self-control, social control, association with delinquent peers, and beliefs regarding crime" (p. 665). Thus, while in our initial analyses of the effects of violent victimization on offending we estimate independent effects for each of the preceding variables, our examination of GST's conditional effects thesis follows Agnew's suggestion, utilizing a multidimensional *risk index* that we create by averaging standardized scores for those measures of impulsivity/low self-control, mother bonds (reverse scored), school bonds (reverse scored), delinquent friends, deviant values, and gang membership described above.

*Control variables*

To account for the effects of major demographic factors on the level and nature of offending, we included two additional controls in our analysis. First, we measure the gender of the respondent with a dummy variable coded one for males and zero for females. Second, we include a dummy variable that distinguishes nonwhites and whites (nonwhites = 1, whites = 0).

Descriptive statistics for all of the observed variables used in the analyses are presented in Appendix A.

*Analytic methods*

Our primary analytic method involves a multilevel modeling item response approach similar to that employed by Osgood and Schreck (2007) to study criminal specialization. The model is specified as a two-level regression model with item-level responses on each of the seven criminal offense items nested within individual subjects. The Osgood-Schreck approach is useful for our purposes because we are interested in two correlated outcomes for individuals: (a) their *overall offending propensity level* and (b) their *other-directed offending tendency*. Because the offense items that we use are highly skewed ordinal measures, we utilize an ordinal logistic regression estimator. In formal terms, this model is represented as:

$$[\text{Level-1 Equation}] \qquad \text{logit}_{\text{mij}} = \tau_m - \left[\beta_{0\text{j}} + \beta_{1\text{j}} V + \sum_{\text{i}=2}^{\text{I}-1} \beta_{\text{ij}} D_{\text{ij}}\right] \tag{1}$$

$$[\text{Level-2 Equations}] \qquad \beta_{0j} = \gamma_{00} + \gamma_{01} X_{1j} + \gamma_{02} X_{2j} + \ldots + u_{0j} \tag{2}$$

$$\beta_{1j} = \gamma_{11} X_{1j} + \gamma_{12} X_{1j} + \ldots + u_{1j}. \tag{3}$$

The level-1 model (Eq. (1)) is a measurement model that uses nonlinear link functions to relate the probabilities of the possible ordinal responses for each item to the two latent variables we are measuring. Specifically, we employ a cumulative logit model. The level-1 equation indicates that the log-odds of a particular ordinal response category for a specific offense item is a linear function of several terms. The first term, $\tau_m$, represents the thresholds for the ordinal logit model. Next is a common constant term, $\beta_{0j}$, a random-coefficient which captures individual-differences in the overall offending levels across all of the offense items. Scores on this latent variable represent individual's general propensity for offending. The extent to which an individual is more inclined to commit violent as opposed to non-violent offenses, is tapped by $\beta_{1j}$, a randomly-varying slope term associated with *V*, a "group-mean centered" dummy variable that takes on positive values for the violent offenses and negative values for the offenses that are not violent. Individuals with a greater tendency for violent offending (relative to nonviolent) will have higher scores on the violent offense items and positive values on $\beta_{1j}$. Due to the use of the logit estimator, the intercept-term $\beta_{0j}$ reflects the log-odds of a particular ordinal offense score across all items, while the slope coefficient associated with the *V* variable reflects the difference in the log-odds of a particular offense score on the violent offense items relative to the nonviolent offense items. As represented in the level-2 equations, these coefficients are specified as random, thereby yielding Level-2 variance terms ($\tau_{00}$, $\tau_{11}$) that indicate the extent to which both the overall offending propensity and the propensity for violence vary across individuals.

The log-odds of a particular categorical response also depend on the base rate of the seven offense items. The parameters $\beta_{ij}$ in Eq. (1) reflect differences in base rates among the offense items. They are introduced into the model through a series of dummy variables, $D_{ij}$, that are coded to represent which offense item corresponds to which response (i.e., if the offense score reflects an individual's response on the first of the nine offense items, that item dummy variable will be coded 1 and all others will be coded 0). Less frequently occurring offense items will have lower values of $\beta_{ij}$. These item dummy variables adjust for differences in the rates at which these nonviolent and violent offending items are committed by the entire sample. They are specified as fixed parameters in the Level-2 equation.

The random coefficients from the level-1 equation ($\beta_{0j}$ and $\beta_{1j}$) are latent variables that are the outcomes of interest—*overall offending propensity* and *violence propensity*—in the level-2 equations. As represented in Eqs. (2) and (3), we predict the overall offending propensity (i.e., the random intercept) and the violent offending propensity (i.e., the random-slope) using the measure of violent crime victimization as well as the measures of impulsivity/low self-control, social bonds, delinquent friends, deviant values, gang membership, plus our controls for gender and race. These explanatory variables are represented by the X's included in those equations. The level-2 slope terms in Eq. (2), ($\gamma_{01}$, $\gamma_{02}$), reflect the effects of the measure of strain and other explanatory variables on the overall offending propensity. The level-2 slope terms in Eq. (3), ($\gamma_{11}$, $\gamma_{12}$), represent the effects of the independent variables on the propensity for violent offending.

## Results

### *Main effects of strains on the level and nature of criminal coping*

We begin our analysis by estimating a basic "unconditional" measurement model that contains no explanatory or control variables, presented in the first model of Table 1. This model provides a gauge of the extent that $\beta_{0j}$ and $\beta_{1j}$, the latent measures of overall offending propensity and the tendency for violence, vary systematically. The results presented here suggest that variance components for both latent variables are randomly varying; estimated variance for each is greater than twice its respective standard error. Thus, both the overall propensity for offending and the tendency for violent rather than nonviolent offenses vary more than would be expected by chance. In addition, we see evidence that these two dimensions of offending are related. Specifically, the covariance between them is significant and positive such that violence is a greater share of the offending repertoire of individuals who exhibit higher overall levels of offending than it is for individuals with lower levels of overall offending.

In the second model of Table 1 we present an initial examination of whether our measure of strain, violent victimization, is predictive of variation in the level and nature of criminal behavior in equations that contain no additional explanatory variables. With regard to the effects of violent victimization on overall offending, the results of model 2 are consistent with our first research hypothesis derived from GST. Specifically, a unit increase on the violent victimization index multiplies the

**Table 1**
Multilevel Latent Variable Ordinal Regression Models of Overall Offending & Violence Propensity

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| *Predicting Overall Propensity, $\beta_{0j}$* | | | | | | |
| Violent Victimization | | .190** | .086** | .085** | .091** | .102** |
| Impulsivity/LSC | | | .064** | | | |
| Mother Bonds | | | -.026** | | | |
| School Bonds | | | -.076** | | | |
| Delinquent Friends | | | .238** | | | |
| Deviant Values | | | .042** | | | |
| Gang Membership | | | .683* | | | |
| Nonwhite | | | .011 | -.091 | -.080 | .137 |
| Male | | | .497** | .373** | .373** | .459** |
| Multidimensional Risk Index | | | | 2.435** | 2.467** | |
| Victimization * Risk Index | | | | | -.006 | |
| High Risk Dummy | | | | | | 2.124** |
| Low Risk Dummy | | | | | | -1.677** |
| Victimization * High Risk | | | | | | .014 |
| Victimization * Low Risk | | | | | | .128* |
| *Predicting Violent Propensity, $\beta_{1j}$* | | | | | | |
| Violent Victimization | | .114** | .109** | .106** | .135** | .157** |
| Impulsivity/LSC | | | .033* | | | |
| Mother Bonds | | | -.004 | | | |
| School Bonds | | | .001 | | | |
| Delinquent Friends | | | -.005 | | | |
| Deviant Values | | | -.050** | | | |
| Gang Membership | | | -.184 | | | |
| Nonwhite | | | 1.233** | 1.210** | 1.248** | 1.244** |
| Male | | | 1.390** | 1.287** | 1.291** | 1.306** |
| Multidimensional Risk Index | | | | -.231 | -.140 | |
| Victimization * Risk Index | | | | | -.030* | |
| High Risk Dummy | | | | | | .198 |
| Low Risk Dummy | | | | | | .463 |
| Victimization * High Risk | | | | | | -.068† |
| Victimization * Low Risk | | | | | | -.040 |
| Variance: Overall Offending | 9.164** | 6.418** | 3.594** | 4.014** | 4.052** | 4.412** |
| Variance: Violence Propensity | 10.704** | 8.788** | 8.204** | 8.335** | 8.319** | 8.338** |
| Covariance: Overall & Violence | 3.270** | .841† | .632† | .674* | .728* | .752* |
| AIC | 24042.71 | 23597.99 | 22584.29 | 22763.84 | 22763.60 | 22869.66 |
| BIC | 24165.13 | 23736.73 | 22853.60 | 22951.54 | 22967.63 | 23106.33 |

**p < .01, *p < .05, †p < .10. Robust standard errors computed for all models. All level-1 models also contain item base rate. dummy variables (coefficients not shown).
N = 2,883 individuals.

odds of a higher score on overall offending index by a factor of 1.21 (i.e., exp[.190]). Turning to the level-2 equation for the violent propensity index, we address our second research hypothesis which deals with the question of whether violent victimization affects the propensity for violent, as opposed to nonviolent, criminal offending. Again we find supporting evidence. In this case, a unit increase in violent victimization is associated with a .114 increase in the violent propensity index. Stated differently, the ratio of the odds of a particular violent offense score to a particular nonviolent offense score increases by 12 percent for each unit the violent victimization index is increased. Consistent with the conclusion that violent victimization is explanative of the level and nature of offending, the random variance terms for $\beta_{0j}$ and $\beta_{1j}$ are reduced notably between the first and second models of Table 1. Also of note here is the covariance between the latent measures of overall offending and violence propensity is substantially reduced after taking into account the impact of violent victimization. Indeed, the magnitude of the covariance estimate in model two is only one-quarter of that observed in the first model and its p-value has risen from less than .01 to greater than .05. This suggests that a substantial share of the correlation between the quantity and nature of offending among individuals occurs because of the variation these two criminal offending dimensions share with the measure of violent victimization.

Model 3 elaborates our analysis by estimating main effects for all of the "conditioning factors" (i.e., predictors derived from other etiological crime theories) as well controls for race and sex. Nearly all of these variables have significant associations with the latent propensity for overall criminal offending. In accordance with theoretical expectations and prior research, propensity for criminal offending of any type is higher for individuals with greater levels impulsivity/low self-control, lower levels of mother bonds, fewer bonds to school, lower scores on the delinquent friend index, fewer deviant values, and for those who are male or who self identify as a gang member. Moreover, controlling for the effects of these factors attenuates the association between violent victimization between overall offending with the coefficient for the latter declining from .190 in model 2 to .086 in model 3. Nevertheless, the evidence still supports our first GST hypothesis as the violent victimization slope is positive and statistically significant with a p-value less than .001. In addition, the z-test statistic associated with the violent victimization coefficient is of similar size as that for the measure of impulsivity/low self-control and is exceeded only by the test statistic for the delinquent friends measure. Hence, after controlling for many key variables from other prominent crime theories, there remains compelling evidence of a notable association between violent victimization and the latent index of overall offending.

There also is good evidence that violent victimization affects the nature of offending, net of the aforementioned explanatory/control variables and net of effects on overall offending. The results in model 3 indicate that for individuals with greater experience of violent victimization there is an increase in the log-odds of a violent criminal response relative to a nonviolent response. Also of note, the relationship between violent victimization and the tendency for violent (as opposed to nonviolent) offending is changed little—decreasing slightly from .114 in model 2 to .109 in model 3—by the addition of the controls for salient criminal offending predictors such as impulsivity, delinquent friends, social bonds or deviant values. These results support our second hypothesis. Net of its impact on overall offending, increased exposure to violent crime victimization is associated with an elevated propensity for criminal coping to be in the form of violence. Interestingly, when looking at the other predictors in the model, only the measure of impulsivity/low self control (positive association) and deviant values (negative association) have significant effects on the propensity for violence.[6] Thus it appears that individuals with greater impulsivity are more likely to commit crime and a greater relative share of that crime will involve violence than is true for individuals with lower impulsivity. In contrast, while individuals with more deviance supportive values are more likely to engage in offending, their tendency is for a greater preponderance of nonviolent offenses compared to their counterparts with fewer deviance supportive values.

### *Conditional effects of violent victimization on the level and nature of criminal coping*

Having found support for the first two hypotheses derived from GST, we now shift our attention to the investigation of that theory's conditional effects argument. Prior to computing models that explicitly examine Agnew's "combined risk factor" conditional effects thesis, we combined the various risk factor measures (i.e., mother bonds, school bonds, impulsivity/low self-control, delinquent friends, deviant values, gang membership) into a multidimensional risk index as described previously in a methods section. We then estimated the main effect of this index along with our measure of violent victimization and the controls for race and gender. Results shown in model 4 are basically as expected, given the findings just discussed. The measure of violent victimization has a significant positive association with both latent criminal offending variables, and the multidimensional risk index has a substantial positive association with overall offending, but a non-significant association with the violent crime propensity. While the latter result may appear surprising, recall that in model 3 only two of the risk factors (i.e., impulsivity and deviant values) had discernible effects on the propensity for violence and their effects worked in opposing directions; higher impulsivity corresponded with greater violent propensity while higher deviant values scores corresponded with lower violent propensity.

Model 5 presents results from our first examination of the conditional effects hypotheses, addressing the question of whether the multidimensional risk index moderates the effects of violent victimization on the two latent dimensions of offending. Looking first at results regarding the latent measure of overall offending, findings are not supportive of our third hypothesis and are inconsistent with expectations derived from GST. While violent victimization and the multidimensional risk index both affect overall offending propensity, they do not interact in their influence on that outcome. The coefficient for the interaction term is not significant and the point estimate is actually opposite of expectations (i.e., slightly negative). These results suggest there is no statistically discernible difference in the impact of violent victimization on the overall level of criminal offending for individuals who are positioned differently on the combination of risk factors measured in our analysis.

Turning next to examine the interaction effect on the propensity for violence, we find some evidence that the risk index moderates the effect of violent victimization on the propensity for violent offending. However, the direction of the coefficient contradicts GST-derived expectations and hypothesis 4. More specifically, the results here suggest that for individuals with higher scores on the risk factor index, the impact of violent victimization on the propensity for violence is weakened, not strengthened. In other words contrary to Agnew's argument, violent crime victimization has a smaller impact on the propensity for violence among individuals with greatest levels of risk. [7]

In a final model (Model 6), we consider whether the conditioning impact of the risk index on the violent victimization effect is nonmonotonic. Specifically, we investigate if the effect of violent victimization differs for individuals whose risk index scores are: a) in the top quartile; b) in the middle 50 percent; and c) in the bottom quartile. To accomplish this, we created dummy variables for high risk (top 25 percent on the risk index) and low risk (bottom 25 percent on the risk index) individuals and created interaction terms between those two dummy variables and violent victimization index. In terms of the interaction effects on the overall criminal offending propensity, the results suggest that the violent victimization coefficient is significantly stronger for individuals at the lowest levels of risk (the bottom 25 percent) relative to all others. No differences in the violent victimization coefficient are observed between the high risk group and middle risk groups. Turning to the interaction effects on the propensity for violence, the model suggests there is no discernible difference in the violent victimization

effect between the low risk and middle risk groups. However, among individuals in the highest risk group, the impact of violent victimization on the propensity for violent offending is significantly weaker ($p < .10$) than for those in the middle risk group. In contrast, the violent victimization coefficient is not significantly different between the high risk and low risk groups. Viewed together the interaction effects reported in Model 6 basically confirm the conclusions suggested by the earlier models. More extensive exposure to violent victimization is associated with greater overall offending and a higher propensity for violence, but those effects do not differ across levels of the risk index in a manner that accords with the expectations suggested in Agnew's (2013) recent extension of GST.

Finally, although our reading of GST suggests violent victimization should affect offending within a short time span, the use of contemporaneous measures of victimization and offending does not ensure that our measure of violent victimization is temporally prior to the measures of offending, which could affect the results. To increase confidence in the results reported to this point, we conducted supplemental models that estimated the effects of the explanatory variables measured using wave 3 RSVP data on the wave 4 measures of overall offending and the violence propensity. Results from those models, reported in Table 2, are quite similar to the findings discussed above. Although coefficients are weaker, we find that the lagged measure of violent victimization has significant positive effects both the overall offending and violence propensity, as suggested by GST. However, there again is no evidence supporting Agnew's recent confluence of risk conditional effects thesis. The impact of violent victimization on offending is not greater for individuals with the highest levels of criminogenic risk. In fact, there is some evidence that the effects of violent victimization are weaker for individuals with a high-risk combination of personality traits and social relationships.

## Discussion and conclusion

Recall that the major objectives of this study were twofold. First, we aimed to discern whether violent victimization, a severe and unjust form of strain, was associated with variation in not only an individual's overall level of criminal offending, but also the nature of their offending or the *degree to which violent acts comprise their offending repertoire*. Second, drawing on the GST assertion that the effects of severe strains are conditional, we set out to test Agnew's (2013) most recent statement of that thesis, assuming violent victimization to be a "severe strain." Specifically, we tested whether the impact of violent victimization on the level and nature of criminal offending differs as a function of an individual's position on a multidimensional risk index that encompasses personality traits, social controls, and delinquent peer exposures that are known correlates of offending.

Estimates from multilevel regression equations predicting the effect of violent victimization on individuals' overall propensity for offending are aligned with GST's most fundamental prediction: greater strain leads to more criminal coping behavior. In linking this general strain hypothesis to the victimization-offending relationship specifically, we found that individuals with more experiences of violent victimization have greater odds of higher levels of involvement in criminal behavior.

**Table 2**
Multilevel Latent Variable Ordinal Regression Models of Overall Offending & Violence Propensity

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| *Predicting Overall Propensity*, $\beta_{0j}$ | | | | | |
| Violent Victimization wave 3 | .132** | .033* | .031† | .071** | .074** |
| Impulsivity/LSC wave 3 | | .046** | | | |
| Mother Bonds wave 3 | | -.032** | | | |
| School Bonds wave3 | | -.091** | | | |
| Delinquent Friends wave 3 | | .177** | | | |
| Deviant Values wave 3 | | .054** | | | |
| Gang Membership wave 3 | | .496 | | | |
| Nonwhite | | .203 | .136 | .209 | .377 |
| Male | | .608** | .531** | .545** | .617** |
| Multidimensional Risk Index wave 3 | | | 2.252** | 2.368** | |
| Victimization * Risk Index | | | | -.049** | |
| High Risk Dummy | | | | | 1.860** |
| Low Risk Dummy | | | | | -1.990** |
| Victimization * High Risk | | | | | -.017 |
| Victimization * Low Risk | | | | | -.021 |
| *Predicting Violent Propensity*, $\beta_{1j}$ | | | | | |
| Violent Victimization wave 3 | .081** | .074** | .073** | .119** | .154** |
| Impulsivity/LSC wave 3 | | .054** | | | |
| Mother Bonds wave 3 | | .007 | | | |
| School Bonds wave 3 | | -.018 | | | |
| Delinquent Friends wave 3 | | -.006 | | | |
| Deviant Values wave 3 | | -.033* | | | |
| Gang Membership wave 3 | | -.782 | | | |
| Nonwhite | | 1.069** | .970** | 1.050** | 1.000** |
| Male | | 1.492** | 1.378** | 1.390** | 1.374** |
| Multidimensional Risk Index wave 3 | | | -.079 | .088 | |
| Victimization wave 3 * Risk Index wave 3 | | | | -.051** | |
| High Risk Dummy wave 3 | | | | | .153 |
| Low Risk Dummy wave 3 | | | | | -.315 |
| Victimization wave 3* High Risk wave 3 | | | | | -.114** |
| Victimization wave 3* Low Risk wave 3 | | | | | -.102 |
| Variance: Overall Offending | 6.418** | 6.513** | 6.571** | 6.524** | 6.817** |
| Variance: Violence Propensity | 9.841** | 9.104** | 9.257** | 9.098** | 9.188** |
| Covariance: Overall & Violence | 2.454** | 2.083** | 2.045** | 1.973** | 1.974** |
| AIC | 20877.51 | 20348.47 | 20397.50 | 20374.72 | 20452.61 |
| BIC | 21013.99 | 20613.42 | 20582.16 | 20575.45 | 20685.44 |

**$p < .01$, *$p < .05$, †$p < .10$. Robust standard errors computed for all models. All level-1 models also contain item base rate.
dummy variables (coefficients not shown).
N = 2,530 individuals.

However, there was no discernible evidence that the impact of violent victimization on overall criminal coping is stronger among individuals whose personality traits and social relationships place them at high-risk for criminal behavior. In fact, we found some evidence that the opposite is true. Violent victimization raised the odds of offending most dramatically for those individuals who scored in the bottom quartile on the multidimensional risk index. But no differences in the effects of violent victimization on overall offending were observed between individuals in the top quartile and those in the middle fifty percent of the risk index distribution. Thus, we find little evidence that GST's "confluence of risk factors" conditional effects thesis applies to the relationship between violent victimization and overall criminal offending.

With regard to the argument suggesting that violent victimization will affect an individual's propensity for *violent* criminal coping, our analysis again provides clear support. Consistent with expectations derived from GST, violent crime victimization was positively associated with the relative propensity for offending to involve violent as opposed to nonviolent actions. This implies that when individuals exposed to higher levels of violent crime victimization engage in criminal coping, their odds of doing so through violence rather than nonviolence is elevated compared to individuals with less exposure to violent victimization. In contrast, we did not find support for the GST-inspired thesis that greater exposure to a combination of risk factors intensifies the effect of violent victimization on the propensity for violence. Rather, there is again some evidence that the reverse may be true; the effect of violent crime victimization on the propensity for violence is significantly weaker for individuals who scored higher on the risk index.

Taken together, these findings have important implications for greater understanding of the victimization-offending relationship and for GST's relevance for such understanding. As we noted earlier, Agnew's theory is one that offers both generality and specificity in its predictions. On one hand, it is a theory of generality in the sense that many types of crime can be explained by strains. But it is a theory of specificity in that certain strains are posited to have particularly salient effects on some criminal coping behaviors (e.g., violence) and more minor effects on others (e.g., drugs, property crime). Because most prior studies have typically examined the impact of strain on general delinquency measures or have separately modeled the effects of strain on specific crime types, the confounding of strain effects on the level of offending and the nature of offending has not been effectively unraveled. Using an analysis strategy that allows us to account for the confounding of these two dimensions of offending, our findings support the basic generality and specificity propositions of GST with respect to the strain of violent crime victimization, in particular. Supportive of the generality argument, violent crime victimization is predictive of the overall propensity to engage in criminal behavior of any measured kind. And supportive of the specificity thesis, we also find that net of effects on overall offending, violent victimization exhibited a clear and consistent association with the propensity for violence. In sum, consistent with GST logic, the current study results suggest that violent victimization is an important form of strain (negative treatment) that helps explain variation in both the level and the nature of individual criminal offending.

Despite the support found for the aforementioned generality and specificity predictions of GST, the current study does not add weight to the idea that violent victimization affects offending more for individuals with personality traits and social circumstances that place them at higher risk on so-called "conditioning factors". On one hand, this result is not a total surprise given that some prior work has also failed to support this aspect of GST. As Agnew (2013) has argued those earlier findings were questionable on the grounds that they examined moderating effects in ways that did not effectively capture the necessary confluence of multiple risks believed to excite the criminogenic effects of strains. On the other hand, the current study measured the influence of a combination of risks factors and still did not uncover support for the conditional effects thesis of GST. Given that this study is, to our knowledge, the first to empirically test this recent confluence of risk factors conditional effects thesis, the current results should by no means be regarded as definitive. Nonetheless, when considered alongside previous studies that fail to support the interaction effects posited in GST, it is certainly reasonable if criminological scholars develop a bit more than the usual dose of scientific skepticism when it comes to the conditional effects portion of GST.

Why did our study fail to find evidence of the interaction effects predicted by GST? A definitive answer to this question is not completely clear but one possible explanation that has gained momentum in recent research revolves around a "saturation effect" (e.g., Posick & Zimmerman, 2014; Wright & Fagan, 2013; Zimmerman & Messner, 2011; Zimmerman & Vásquez, 2011). Briefly stated, this saturation effect idea suggests that when an individual faces many criminogenic risk factors concurrently, the impact of any single cause is attenuated. Based on this logic, we would expect that the effects of a specific causal mechanism, like violent victimization, would exert more pronounced effects for individuals whose personality traits and social environment locate them in a position of rather low criminogenic risk. In contrast, for individuals who personality traits and social relationships place them in a situation of high criminogenic risk, we would expect the impact of the effects of violent victimization to be more muted. Our findings regarding the relationship between violent victimization and each of the dimensions of offending (overall and violence propensity) certainly appear more consistent with this saturation effect argument than it does with GST's assertion that the effects of strains will be intensified for individuals facing greater criminogenic risks. Still there is enough equivocation in the research literature on the conditional effects portion of GST that firm conclusions remain elusive.

There is little doubt that additional investigation of the conditional effects portion of GST is critical both for reasons of theoretical clarity and for the sake of effective policy/practice. With regard to the latter, Agnew (2006) has suggested that policy strategies aimed at increasing social support and reducing delinquent peer association are important because they will have the effect of decreasing the likelihood that strains will lead to crime. While the current study supports the idea that elevating social support or preventing delinquent peer associations will reduce criminal involvement, it does not support the view that the crime reductions occur because greater social support or decreased delinquent peer associations work to attenuate the violent crime victimization-criminal offending relationship. Yet, it is important to note that our study focused only on one particular and perhaps peculiar strain, violent victimization. It would be unwise to use these results to make any direct inferences about whether the confluence of risks conditional effects hypothesis from GST does or does not apply to other kinds of strains, including other forms of criminal victimization (e.g., thefts) and non-crime strains (e.g., loss of a loved one). Rather than speculate, subsequent work should explicitly examine these questions.

Continued inquiry on this matter is needed, in part, because the current research contains limitations that should be addressed in future research. For example, the sample studied was not nationally-representative and it only observes the strain-crime association in a snapshot of middle adolescence. Whether similar effects would be seen in cross-sectional analyses of other samples (i.e., different places and/or ages) or in an extended longitudinal analysis remain important empirical questions. In addition, our study was not able to control for individual-specific factors that may contribute to the association between violent victimization and offending. Recent work (e.g., Vaske, Boisvert & Wright, 2012) suggests that a substantial portion of the correlation between victimization and offending in adolescence is due to genetic factors not accounted for in our analyses. One implication of this omission is that our estimates of the impact of violent victimization on offending may be somewhat overstated. Likewise, the extent to which measured criminogenic risk factors moderate the victimization-offending relationship may be impacted by our inability to account for genetic influences. Finally, due to our particular research objectives as well as data

limitations, we did not examine the effects of specific emotional responses that GST suggests mediate the effects of strains on crime. Subsequent research would thus build on the current work by examining whether connections between violent victimization and the propensity for violence is due to the relative preponderance of certain kinds of emotional responses as opposed to others (e.g., anger rather than sadness). Despite these limitations, the current study sheds initial light on key theoretical questions regarding whether violent victimization 1) affects the nature of offending independent of its effects on the propensity to commit crime; and whether 2) the preceding effect plays out differently for individuals who are exposed to a confluence of traits and social circumstances that are considered to be signals of high risk for criminality. We hope that future studies will use this initial light as a springboard for further inquiry and discovery about the links between victimization and offending.

## Appendix A. Descriptive statistics for wave 4 variables in analysis

| Variable | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|
| Male | 0.46 | 0.49 | 0 | 1 |
| Nonwhite | 0.09 | 0.29 | 0 | 1 |
| Mother Bonds | 45.76 | 9.54 | 5 | 60 |
| School Bonds | 21.35 | 3.71 | 7 | 28 |
| Delinquent Friends | 5.57 | 4.14 | 0 | 16 |
| Impulsivity/Low Self Control | 17.64 | 6.84 | 10 | 40 |
| Deviant Values | 18.72 | 8.24 | 12 | 48 |
| Violent Victimization | 2.87 | 6.08 | 0 | 50 |
| Item Offending Score Overall | 0.30 | 0.78 | 0 | 4 |
| Item Offending Score (Violence) | 0.13 | 0.53 | 0 | 4 |
| Item Offending Score (Non-Violence) | 0.44 | 0.91 | 0 | 4 |

## Notes

[1] GST suggests that strains motivate criminal responses in part because they engender negative emotional states such as anger, frustration, or sadness that individuals seek to alleviate through crime. Investigation of whether particular emotional responses mediate the connection between violent victimization and the nature of offending is important, but is also a step beyond the purpose of the current study. Our objective herein is to examine a necessary prerequisite: whether violent victimization systematically affects the nature of the criminal offending—that is, the relative prevalence of violent versus nonviolent criminal responses.

[2] This line of reasoning is not only limited to GST. Felson, Osgood, Horney & Wiernick (2012) point out that similar claims are made by rational-choice explanations (e.g., Tedeschi & Felson, 1994) which conceive of crimes as instrumental responses to dealing with particular forms of stress, such a personal attacks.

[3] The response rate in the RSVP is generally consistent with other studies of students that employ active parental consent (see Elickson & Hawes, 1989; Esbensen et al., 1996). Nevertheless, the response rate obtained in the RSVP study calls into question whether the obtained sample is generalizable to the targeted population of adolescents. Past research suggests that active parental consent procedures often produce samples that are biased on racial characteristics (Kearney et al., 1983). However, comparing demographic characteristics from our sample to Kentucky Department of Education enrollment data for the 65 schools in our sample, we find that the racial composition of our sample is fairly close to the KDE population data. In Year 1 our sample percentage nonwhite is 9.55%, while the corresponding figure from the KDE data (which includes all kids in the selected schools, not just 7th graders) is 10.18%. In contrast, our sample does appear to under-represent males, with about 45.5% of the Year 1 respondents being male, compared to 51.9% for the KDE data. Given known gender patterning of delinquent behavior and victimization, we suspect that non-response may understate the prevalence and overall variability of victimization, delinquent behavior and perhaps other "anti-social" factors. Without explicit data on the non-responders, however, we cannot know with any certainty the extent to which they differ from responders.

[4] The analyses reported in Table 1 and discussed in the results section used listwise deletion of cases with missing values, leaving 2,883 of the 3,040 respondents who participated in the Wave 4 survey. Supplemental models that included all 3,040 observations via full-information maximum likelihood yielded results that were substantively identical to those that are shown. These supplemental model results are available from the first author.

[5] In our view, the GST effects on crime measured in this study are likely to be short-term, situation-specific responses that should be more robust in cross-sectional than longitudinal analyses. However, to check the sensitivity of our results, we also replicated our main cross-sectional analysis with models in which explanatory variables measured at wave 3 were used to predict outcome variable at wave 4. Findings from those analyses, which generally reiterate results from the cross-sectional models, are reported later in Table 2.

[6] Interestingly, in a recent study of data from the National Evaluation of the Gang Resistance Education and Training (G.R.E.A.T.) program, Melde and Esbensen (2013) found that self-reported gang memberships was significantly associated with both overall offending and violence propensity. Although reasons for differences in the findings of the two studies are not clear, there are noteworthy differences in the locations/contexts and ethnic characteristics of the samples analyzed in each study. In light of this, it may be productive for future research to explicitly examine the generality of the gang involvement-violence propensity relationship across varied geographic and social contexts.

[7] As a test of Agnew's (2013) argument our investigation is focused on whether the multidimensional risk index moderates the effects of violent victimization on the two latent measures of offending. However, in supplemental analyses not shown, we also examined interactions between our measure of violent victimization and each of the variables included in the risk factor. Results from those supplemental analyses are consistent with the findings reported above. Specifically, none of the interaction term coefficients supported the GST expectation that violent victimization effects get stronger when the measured "conditioning factor" is set at levels that constitute greater criminogenic risk (e.g., weaker social bonds, greater delinquent peer exposure, higher impulsivity, etc.).

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