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Continuity and Change in Adolescent Victimization: Examining the Effects of Stable and Dynamic Influences

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Abstract

After decades of treatment as a fairly distinct topic, recent research on victimization has begun to draw on theoretical approaches previously directed at understanding criminal behavior. The current study expands this research by studying victimization and its relationship to key developmental influences with data from 3,976 adolescents. We first detail the longitudinal process that underlies continuity and change in victimization and then consider the impact of time-stable and time-varying covariates that reflect mechanisms within those explanations. Findings suggest that time-varying markers of risky lifestyle and attachment affect victimization, but also that victimization affects risky behaviors and prosocial ties.

Keywords

adolescent victimization; school violence; theories; developmental

According to the National Crime Victimization Survey (NCVS), individuals aged 12 to 17 had a higher rate of victimization than other age groups (Truman & Langton, 2014). The relative young age that puts adolescents at risk for victimization is not unlike the age-crime curve that has been a central finding in criminal behavior for some time (Farrington, 1986; Sweeten, Piquero, & Steinberg, 2013). Beyond this increased risk for victimization in the short term, the long-term repercussions may be greater in that such experiences appear to be more strongly related to various problem outcomes than for adults (Menard, 2002). It is also clear that youth experience higher rates of victimization while at school than in other settings. For example, findings from the 2014 Indicators of School Crime and Safety report show that students between the ages of 12 and 18 experienced higher rates of violent victimization at school rather than outside of school (Robers, Zhang, Morgan, & Musu-Gillette, 2015). This suggests that victimization at school is not an infrequent occurrence and that further research is necessary to understand who is at risk, why that is the case, and the consequences for individual youth, schools, and communities.

These broader questions about the etiology and implications of victimization have begun to receive greater attention. In particular, a recent shift in victimization research acknowledges of a possible “victim-offender overlap” that reflects individuals who may be classified in both categories (see Berg 2011; Jennings, Piquero & Reingle, 2012). Initial studies of this relationship generally explored the degree to which the personal characteristics and lifestyles

of offenders and victims were comparable (e.g., Gottfredson, 1981). In essence, this raised the question of whether the underlying mechanisms that increase the likelihood of becoming an offender (e.g., individual propensities and lifestyle) could also increase the likelihood of becoming a victim. Recent research has looked at similarities and differences in offending and victimization processes (see, e.g., Piquero & Hickman, 2003; Schreck, 1999) and some studies have begun to integrate the understanding of adolescent victimization and development as well (e.g., Jennings et al., 2012; Sullivan, Ousey, & Wilcox, 2016).

CRIME THEORY AND ADOLESCENT VICTIMIZATION

Although distinct theories have been developed to explain victimization and offending individually, the degree of overlap suggests that there may be some similar mechanisms affecting their observed patterns and that relationship. For example, low self-control, which was originally proposed by Gottfredson and Hirschi (1990) to explain criminal and analogous behavior, has proven useful in understanding victimization as well (Pratt, Turanovic, Fox, & Wright, 2014; Schreck, 1999). Considering other possible shared mechanisms, the opportunity for victimization has often been explained through some combination of the presence of high-risk situations, decreased guardianship, exposure to motivated offenders, and the attractiveness of the target (Cohen & Felson, 1979; Hindelang, Gottfredson, & Garofalo, 1978; Miethe & Meier, 1990). Literature on the relationship between delinquent behavior and victimization has also generally followed this pattern to explain why individuals who engage in delinquent behavior may also more likely to be victimized. Essentially, individuals who engage in risky behaviors are at increased risk because they are exposed to offenders regularly, they are probable targets based on their lifestyle, or because they are unsupervised and lack guardianship (Jensen & Brownfield, 1986; Schreck, Miller, & Gibson, 2003; Zhang, Welte, & Wieczorek, 2001). Similarly, while social bond theory is a standalone framework used to explain offending (Hirschi, 1969), guardianship is one of the key components of the lifestyle-routine activities theory (L-RAT). Arguably, that component of L-RAT processes may be affected by the presence of strong attachment to prosocial ties (e.g., school, parents) in that individuals who have such ties will have others whom they can seek out for guidance or protection, in effect reducing their risk of being targeted by virtue of elevated interpersonal guardianship (Tillyer, Tillyer, Miller, & Pangrac, 2011). In contrast, individuals who have bonds with delinquent peers could actually be more likely to experience victimization (Schreck, Wright, & Miller, 2002).

CAUSES AND CONSEQUENCES OF VICTIMIZATION OVER TIME

The theories described above are useful for understanding victimization, but they tend to be studied using cross-sectional data (for some exceptions see Esbensen & Carson, 2009; Finkelhor, Ormrod, & Turner, 2007; Pellegrini & Bartini, 2000; Schreck, Stewart, & Fisher, 2006). This limits our understanding of the underlying mechanisms that affect victimization and offending over time as it is possible—or even likely—that these processes are dynamic during adolescence. Generally the mechanisms are described as being similar, but without some temporal perspective, it is difficult to know the extent to which this is true with respect to some aspects of extant theories. For instance, does earlier victimization weaken guardianship over time, which subsequently increases later risk of victimization? Or, does

victimization subsequently further entrench an individual in risky lifestyles? Some studies imply that a reciprocal relationship should be examined (see, e.g., Christiansen & Evans, 2005; Turanovic & Pratt, 2014; Wittenbrood & Nieubeerta, 2000), but to date little research has examined the dynamic roles played by these key processes during adolescence.

Research examining correlates of adolescent victimization shows that high levels of impulsivity are related to an increased risk of victimization (Jennings, Higgins, Tewksbury, Gover, & Piquero, 2010; Schreck, 1999). Schreck et al. (2006), for example, examined the effect of low self-control on risky lifestyles and subsequent victimization in an adolescent sample as well as whether individuals who were victimized changed their lifestyle to avoid victimization at a later time point. Their findings suggest that youth with low levels of self-control have a stable and strong risk of victimization over time and that they continue to engage in risky activities. Conversely, individuals with higher levels of self-control tend to change their lifestyle after victimization.

It is also possible that some of the risk factors associated with victimization are actually consequences of being victimized at an earlier time point. Lauritsen, Sampson, and Laub. (1991) argued that engaging in a delinquent lifestyle (e.g., having delinquent peers) increased victimization, but also that being victimized increased embeddedness in a delinquent lifestyle. Cross-lagged analyses with adolescent samples indicates that engaging in risky behaviors like substance use or delinquency at an earlier point in time is significantly related to victimization at a later time point (Begle et al., 2011; Zhang et al., 2001). At times, this relationship also affects risky behaviors where individuals who are victimized at an earlier time point are more likely to use substances and/or commit delinquent acts later on (Begle et al., 2011). Therefore, the relationship could take on greater complexity when studied over time, with victimization serving as either an independent or dependent variable depending on when it is viewed in that sequence.

Other research has looked at reciprocal effects between violent/household victimization and routine activities (e.g., evening away from home) in persons 12 and older (Averdijk, 2011), between victimization and internalizing/externalizing problems among adolescents (Hodges & Perry, 1999), and between victimization and behavior changes among a sample of adult males (Vecchio, 2013). The general consensus in these studies is that it is important to understand not only how victimization affects subsequent behavior, but also how post-victimization actions might affect future risk. To better capture the possible dynamics at work in the underlying mechanisms affecting victimization over time, it is important to consider the ways in which these time-varying processes may affect the risk of victimization and also how they may be impacted. Like delinquent and criminal behavior, adolescent victimization has some identifiable influences and also has important implications for later development. Using a developmental and life-course view, Sullivan et al. (2016) considered persistent heterogeneity, state dependence, and mixed explanations for observed longitudinal trends in delinquency and victimization. They found that a mixed explanation model best fit the data and that there were a number of similarities in the mechanisms affecting violent offending and victimization (and some differences as well).¹

State dependence perspectives argue that earlier experiences or behaviors have an effect on the recurrence of those same experiences at subsequent time points. This might include the loosening of prosocial bonds and/or greater exposure to criminogenic situations or social groups (Nagin & Paternoster, 2000). Research on adolescent victimization has generally used attachment as a proxy to measure guardianship (Schreck & Fisher, 2004; Schreck et al., 2003; Spano & Nagy, 2005; Tillyer et al., 2011). More specifically, attachment to school (Lauritsen, Laub, & Sampson, 1992; Schreck et al., 2003; Wilson, 2004) has been linked to decreases in adolescent victimization. On the other hand, research suggests that engaging in risky behaviors could increase an adolescent's risk for victimization (Chen, 2009; Lauritsen et al., 1991; Loeber, Kalb, & Huizinga, 2001; Windle, 1994). Engaging in delinquency or having associations with delinquent peers have also been found to increase risk of adolescent victimization (Schreck et al., 2003; Stogner, Miller, Fisher, Stewart, & Schreck, 2014; Tillyer et al., 2011). This increased contact with offenders likely places adolescents in risky, criminogenic situations where they are more likely to become victims.

Extending the lifestyle perspective further, the potential link between gang membership and victimization has also been an object of research as gang members generally engage in a wide variety of offending behaviors (Pyrooz, Turanovic, Decker, & Wu, 2016). Even though some adolescents reported joining a gang for their own protection, this involvement in gangs has actually been found to increase their risk of victimization compared to non-gang affiliated peers (Peterson, Taylor, & Esbensen, 2004; c.f. Gibson, Miller, Jennings, Swatt, & Gover, 2009). Research has shown that the combination of gang member status and engaging in delinquent acts actually increases victimization among adolescents (Peterson et al., 2004). Additionally, by being in a gang, youth are less likely to have prosocial guardians to serve as buffers from the offenders they associate with, more likely to engage in risky behaviors, have greater exposure to illicit substances, and be targets for retaliation, which could substantially increase their risk of victimization (Katz, Webb, Fox, & Shaffer, 2011; Taylor, Freng, Esbensen, & Peterson, 2008; Taylor, Peterson, Esbensen, & Freng, 2007). Similarly, research has found that exposure to illicit opportunities (e.g., drugs, alcohol) is also associated with victimization (Ramos-Lira, Gonzalez-Forteza, & Wagner, 2006).

In contrast to these dynamic explanations, population heterogeneity refers to the initial propensity to commit a crime or become a victim that has reverberations over time (Nagin & Paternoster, 2000, p. 119; Pease, 1998). Given previous research linking self-control to victimization experiences, it is also important to control for between-individual differences that have an enduring effect on the risk of victimization. Individuals who are impulsive (e.g., low self-control) may be less likely to understand the consequences of their actions (Schreck, 1999) and be more likely to engage in risky behaviors. The treatment of self-control as a factor that drives stable, between-individual differences in antisocial behavior that recur over time means it is an example of enduring individual differences that affect a process of continued victimization over time (Gottfredson & Hirschi, 1990).

¹Protective factors can be defined as factors that reduce the likelihood of victimization as indicated by an inverse relationship (Goldbaum, Craig, Pepler, & Connolly, 2003; Jackson, Chou, & Browne, 2015) or events, opportunities, or experiences that buffer or diminish the likelihood of engaging in risky behaviors (Resnick, Harris, & Blum, 1993; Resnick, Ireland, & Borowsky, 2004). We focus on the former operationalization here.

Understanding longitudinal processes affecting the development of victimization risk and its consequences has important implications for the response to adolescent victimization as well. While numerous factors put adolescents at risk, experiencing victimization at a young age can also lead to later vulnerability or other problems, including further victimization. Using data from the National Youth Survey (NYS), Menard (2002) found that respondents who were victimized during adolescence were at increased risk of victimization as adults and were twice as likely to report symptoms of post-traumatic stress disorder (PTSD) later in life. Similarly, results from the National Survey of Adolescents (NSA) indicate that youth between the ages of 12 to 17 who were victimized were more likely to experience subsequent mental health and delinquency problems (Kilpatrick, Saunders, & Smith, 2003). While recognition of potential consequences identifies the stakes for intervention, it is important that suggestions for policy and practice rest on an elaborated understanding of key processes that may be generating a particular relationship (Pawson & Tilley, 1997; Wikström, 2007). Youth experience victimization at a relatively high rate and individuals who work with them on a regular basis, or even intermittently, should be aware of the underlying processes that affect risk and the consequences of these experiences. Greater insight into the nature of those processes and outcomes can help in identifying the actions that should be taken by those who aim to prevent victimization or respond to it.

CURRENT STUDY

Research Questions and Hypotheses

Despite these previous findings, more research is necessary to elaborate on relevant developmental mechanisms in victimization experiences—particularly those at work during the high-risk period of adolescence. This study assumes that victimization is determined by multiple influences reflecting distinct developmental processes. With that in mind, it considers whether previously identified risk and protective factors consistent with important theoretical perspectives on victimization help to explain those patterns before considering the effect that victimization itself may have on those influences.

Based on previous research examining similar measures of time-stable and time-varying covariates, it is anticipated that higher levels of impulsivity, exposure to delinquent peers, illicit opportunities, delinquent behavior, and gang membership would be associated with higher risk of victimization. Conversely, a stronger level of school attachment is predicted to act as a protective factor against victimization. Consistent with a state dependence perspective, it is also argued that victimization has an effect on these risk and protective factors that in turn impacts later victimization experiences.

Data and Sample

The data come from a 4-year longitudinal study, the Rural Substance Abuse and Violence Project (RSVP). A multi-stage sampling design targeted 74 public schools across 30 counties, representing both rural and urban areas. Sixty-five of the schools agreed to participate and all 9,488 seventh grade students were eligible for inclusion in the student survey. Active parental consent was given for 4,102 students, which resulted in a 43% response rate; 3,692 students completed surveys at the first time point. Surveys were initially

administered to a panel of adolescents from the state of Kentucky when they were in the seventh grade in the spring of 2001. Follow-ups took place in successive years through 2004. Due to attrition (25%), the follow-up samples comprised 3,638 students at Wave 2, 3,050 at Wave 3, and 3,040 at Wave 4. While some respondents were lost at each point, the overall demographic profile of the sample was stable. Still, students that identified as victims at Wave 1 were more likely to leave the study than those who did not identify as victims (Wilcox, Skubak Tillyer, & Fisher, 2009). The analysis presented here uses Full Information Maximum Likelihood (FIML) estimation, which incorporates all available data and is considered a best practice for analyzing data that can be considered “Missing at Random” (Schafer & Graham, 2002)². This approach is similar to other studies using the RSVP data set (see, e.g., Sullivan, Wilcox, & Ousey, 2011; Ousey, Wilcox, & Brummel, 2008; Wilcox, May, & Roberts, 2006). A total of 3,976 respondents contributed at least some data to the statistical models.

Measures

A list of all constructs in the current study and their constituent items is provided in Appendix A. The dependent variable was a repeated, self-reported measure of *victimization* (see Ousey, Wilcox, & Fisher, 2011). It compiled six survey questions about the number of times respondents experienced, during the current school year on school grounds or while in school-related activities, physical assault, robbery, theft, unwanted sexual contact, threat involving a gun, and threat involving another weapon. The response categories for each of the six victimization items ranged from 0 = “none” to 10 = “10 or more.” Responses were summed for each student to create a victimization index and the natural log was taken to limit the effect of skewness (Cronbach’s $\alpha = .71$ to $.77$).

Four time-stable covariates were included in the analysis. *Impulsivity* was created by summing 11 survey items from data obtained at the initial data collection point. The items captured problems with controlling temper, restlessness, focusing on tasks, and frustration. Responses were recorded on a 4-point scale (1 = “never true” to 4 = “always true”) and ranged from 11 to 44. Higher values indicate higher levels of impulsivity (Cronbach’s $\alpha = .90$). Although this differs somewhat from previous measures and does not fully tap into self-control as laid out by Gottfredson and Hirschi (1990), a meta-analysis by Pratt and Cullen (2000) found that the effect size of self-control was relatively invariant using alternative measures. While some literature has found that self-control fluctuates over time (see, e.g., Burt, Sweeten, & Simons, 2014; Pratt, 2016; Winfree, Taylor, He, & Esbensen, 2006), the current sample indicated a fairly stable pattern of self-control over the four waves (Wave 1 to Wave 2: $r = 0.54$, $p < 0.01$; Wave 2 to Wave 3: $r = 0.55$, $p < 0.01$; Wave 3 to Wave 4: $r = 0.62$, $p < 0.01$). Based on these findings, low self-control was kept as a time-stable covariate in the analysis. We also used indicators from Wave 1 data to control for *race* (0 = non-White, 1 = White), *sex* (0 = female, 1 = male), and *age* (in years).

²Unlike data that are missing completely at random (Acock, 2005), the missing values in the current study may in fact be related to other variables in the model (i.e., “missing at random” or “not missing at random”). Based on the sample attrition, it seems that there are some instances where variable nonresponse is dependent on the distribution of that variable. This is most likely due to a general attrition problem that is relatively consistent across variables, but which could be associated with some items in the models (e.g., victimization). While not ideal when missingness at random cannot be assumed, a maximum likelihood approach to preserve all possible data values is still preferred to listwise deletion in such situations (Graham, 2009).

Though we explored several time-varying covariates that might be involved in a state dependent process, we focus on five in the main analysis. *School attachment* was measured with a summed 7-item index. Items capture how strongly respondents agree or disagree (1 = “strongly disagree” to 4 = “strongly agree”) with statements about getting an education, caring what teachers think, and how much they look forward to going to school, which is similar to composites used in previous research (see, e.g., Lauritsen et al., 1992; Wilson, 2004). Several items were reverse scored so higher values indicate a stronger bond to school (Cronbach’s $\alpha = .73-.75$ across waves). Given that the outcome measure assesses school-related victimization, determining the role of attachment could be especially important in assessing the degree to which school may help serve as a protective factor as anticipated by the role of guardianship in the lifestyle perspective. Self-reported *delinquency* was measured by summing 13 items that tapped into robbery, theft, physical assault, unwanted sexual touching, taking/using a gun or other weapon to school, and vandalism that occurred during the past school year (see, e.g., Lauritsen et al., 1991; Schreck et al., 2006). Responses ranged from 1 = “never” to 5 = “daily or almost daily.” To reduce skewness, a constant of 1 was added to each score and these variables were then log-transformed (natural logarithm) (Cronbach’s $\alpha = .89-.91$ across waves). Exposure to *delinquent peers* was measured by summing 16 dichotomous items (0 = no, 1 = yes) that assessed whether respondents’ friends engaged in delinquent activity during the past year (see, e.g., Ousey et al., 2011; Schreck et al., 2003; Schreck et al., 2006). The items comprised use of drugs or alcohol, cutting school, taking weapons to school, or getting arrested. Responses ranged from 0 to 16 where higher values indicate that more of the respondent’s friends engaged in those acts (Cronbach’s $\alpha = .95-.97$ across waves). *Gang membership* was a dummy-coded item that reflected whether respondents considered themselves to be a member of a gang (0 = no, 1 = yes). *Illicit opportunities* were measured by summing six items that asked respondents how easily they could obtain cigarettes, alcohol, drugs, or a gun (Cronbach’s $\alpha = .85-.89$ across waves). This is similar, but slightly less detailed, to previous composites measuring opportunities for drug use (e.g., Ramos-Lira et al., 2006). Responses were recorded on a 4-point Likert scale and ranged from 6 to 24 with higher values capturing greater access to illicit opportunities. Each measure in the current study has been used in previous victimization research using the RSVP data set (e.g., Henson, Wilcox, Reyns, & Cullen, 2010; Ousey et al., 2008; Ousey et al., 2011).

Analytic Plan

All models were estimated in MPlus 7.3 (Muthén & Muthén, 1996–2014). The population heterogeneity perspective is operationalized in a latent growth curve model (LGC) that estimates a random intercept and random slope, allowing for between-individual differences in the initial levels and growth rates of victimization (Hancock & Lawrence, 2006; Preacher, Wichman, MacCallum, & Briggs, 2008). The autoregressive (AR) model captures sequential victimization effects with a first-order lag where victimization measured at each observation point (y_t) is regressed on itself at the previous time point (y_{t-1}) (Marsh, 1993). If the autoregressive coefficients are significantly different from zero, this provides some evidence for a state dependent effect (Nagin & Paternoster, 1991). We capture a mixed perspective on these processes in an autoregressive latent trajectory (ALT) model (Nagin & Paternoster, 2000). Specifically, the ALT model states that the observed repeated measures of self-

reported victimization are a function of a latent growth process *and* autoregressive effects (Bollen & Curran, 2004, 2006; Sullivan et al., 2016).³

After considering each of the unconditional models, we extend the analysis by incorporating the covariates, which were selected for their representation of relevant theoretical processes in victimization. In particular, these are factors that may help to explain enduring between-individual differences in longitudinal patterns of victimization (e.g., impulsivity) or they were added to the autoregressive portion of the model in order to assess one of the processes that might be relevant to a state dependence explanation (e.g., delinquent peers, attachment). As shown in Figure 1, we then add relevant covariates to assess influences on victimization and its subsequent consequences in a dynamic process.

Model fit is assessed with several indices: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). The criterion for acceptable fit for CFI and TLI is 0.90 or higher; RMSEA and SRMR values should be below 0.05 (Hu & Bentler, 1999; Kline, 2010). We also consider the magnitude, direction, and statistical significance of relevant parameter estimates (e.g., growth factors, autoregressive coefficients) to assess the propositions about influences and consequences of victimization that were described above.

RESULTS

Descriptive Statistics

Descriptive statistics for the key variables are presented in Table 1. Forty-eight percent of the sample is male and 89% is White. On average, respondents were 13.4 years of age with a standard deviation (s) of 0.59 at Wave 1. Respondents reported relatively low levels of victimization, which seemed to decrease slightly over time. Youth had the highest rate of victimization at Wave 1 ($\bar{x} = 1.35$, $s = 1.09$) followed by Wave 2 ($\bar{x} = 1.31$, $s = 1.10$), Wave 3 ($\bar{x} = 1.16$, $s = 1.06$), and Wave 4 ($\bar{x} = 1.02$, $s = 1.05$). The standard deviations for these measures suggest a good deal of variation around the means in part due to the prevalence of “0” responses. While it seems most adolescents did not experience or experienced very few incidents of victimization, there were some that reported greater victimization over time. The sample mean for the impulsivity measure was 20.89, with a standard deviation of 7.53. Given the range of the measure, respondents generally had low levels of impulsivity. However, based on the relatively large standard deviation, there is some variability between respondents.

Generally, youth reported slightly stronger attachment to school during Wave 1 ($\bar{x} = 22.43$, $s = 4.05$) than at later waves (e.g., Wave 3 $\bar{x} = 21.59$, $s = 3.78$). Respondents reported similar amounts of delinquent activity over the four waves with the highest reported delinquent activities at Wave 1 ($\bar{x} = 2.75$, $s = 0.22$) and Wave 2 ($\bar{x} = 2.75$, $s = 0.22$). There was only a

³Given the study objectives, this approach has a few advantages over pooled time series regression (Hsiao, 2003). For example, this model allows for the estimation of both between and within-individual covariate effects, which would not be possible in a fixed-effects regression analysis (Allison, 2009). Also, the latent growth curve portion of the model estimates the conditional trend over time and the variation around that trend and the autoregressive portion allows for testing freed direct effect coefficients at each stage. Last, and most importantly, use of this approach presents an opportunity to study linked, indirect structural relationships that would not be available in a pooled fixed or random effects model.

slight decrease in the amount of delinquent activity in subsequent waves (Wave 3 and 4: $\bar{x} = 2.73$, $s = 0.20$). Associations with delinquent peers increased over time. At Wave 1, youths reported the lowest average exposure to delinquent peers ($\bar{x} = 3.64$, $s = 4.22$) with a gradual increase at subsequent collection points (e.g., $\bar{x} = 5.60$, $s = 4.17$ at Wave 4). While most adolescents did not have peers that engaged in many delinquent activities, as respondents aged they tended to report higher frequencies of friends that did. The high standard deviations relative to their respective means reflect the fact that there was a good deal of variation among respondents (likely due to outliers with a lot of peer delinquency). Membership in a gang was quite low over time with the highest proportion endorsement of being in a gang coming at Wave 1 ($\bar{x} = 0.09$). Subsequent gang involvement decreased over time at Wave 2 ($\bar{x} = 0.07$) and then even more during Waves 3 and 4 ($\bar{x} = 0.04$). Youth reported that, over time, access to illicit opportunities increased. On average, respondents said it was easier to obtain illicit goods during Wave 4 ($\bar{x} = 14.81$, $s = 4.46$) and Wave 3 ($\bar{x} = 14.54$, $s = 4.48$) than at earlier time periods (e.g., Wave 1: $\bar{x} = 11.52$, $s = 5.08$). Some of this variation could possibly be explained by the transition from middle school (Waves 1 and 2) to high school (Waves 3 and 4).

Unconditional Models

A series of three unconditional models were first estimated to provide answers to some basic questions about the longitudinal processes underlying adolescent victimization.⁴ A latent growth curve (LGC) model was used to estimate between-individual differences in initial levels and victimization change rates. The model fit the data fairly well. While the Chi-Square test of model fit was statistically significant ($p < .001$), both CFI and TLI values exceeded 0.95, and the RMSEA and SRMR estimates were below 0.05. The latent intercept estimate was 1.38, which is similar to the Wave 1 mean in Table 1. The unconditional slope was -0.10 , indicating a slightly downward trend in victimization over the observation period. Variance components for both latent growth factors were statistically significant. Next, an autoregressive (AR) model was estimated to establish whether previous victimization affects later victimization. The fit for this model was not as strong as the LGC model as all of the indices fell outside of the acceptable range. The autoregressive effect was, however, statistically significant ($b = 0.49$). The standardized coefficient estimate was 0.48, suggesting a moderate to strong stage-sequential effect of victimization.

Finally, we estimated the unconditional ALT model to operationalize a mixed longitudinal perspective on adolescent victimization. This model fit very well, with a nonsignificant χ^2 value (0.51, 4 df), CFI and TLI above 0.95, and RMSEA and SRMR values well below 0.05. The growth factor estimates were generally consistent with those from the LGC described above: means of 1.35 and -0.13 for the intercept and slope, respectively. Their variance components were statistically significant, suggesting that there is within-population variance that might be explained by time-stable covariates. Although the estimates diminished considerably, from 0.48 to 0.07 on a standardized scale, the autoregressive effects of victimization were still statistically significant. This suggests that, while the latent growth process appears to better capture the observed data, there is some residual state dependent

⁴Full table results are not presented, but are available upon request.

effect at work in the longitudinal victimization patterns. The R^2 values for the observed victimization measures ranged from 0.44 to 0.52. Given this fit for the ALT model, we use that as a base from which to consider covariate relationships with longitudinal patterns of victimization.

ALT Model with Covariates

The previous analyses offer a sense of the degree to which aspects of developmental and life-course perspectives may be relevant in understanding continuity or change in victimization over a portion of early to middle-adolescence. They also suggest that there is residual variance that might be explained further. In light of that, we estimated models to introduce relevant covariates into the longitudinal victimization processes just described.

The results are shown in Table 2. The model fit statistics, which are presented at the bottom of the table, indicate that the model falls somewhat short of acceptable fit. For example, the values for CFI (0.88) and RMSEA (0.05), which are better than the other fit indicators, still lie at or just below recommended cutoffs. All residual variances for observed endogenous variables and latent growth factors were statistically significant, which suggests that further information is necessary to adequately explain the sample variance/covariance matrix. Nevertheless, we do present results of key individual relationships within the model that are relevant to the questions described above. This model included time-varying covariates for bonding to school, delinquent activities, delinquent peers, gang involvement, and illicit opportunities. Peer and maternal bonding variables were also included at early stages in the modeling process. Both variables, but especially peer attachment, had effects that were similar to the school attachment estimates reported here in significance, size, and direction. Consequently, they were removed for the sake of model parsimony and to avoid multicollinearity. We also added indicators for involvement in different types of nondelinquent routine activities (e.g., school-related, community-based), urban/rural indicators, grade average, socioeconomic status (parent education), and family structure (living with both parents), but found that those measures had relatively little influence on victimization.

The LGC estimates shown at the top of the Table 2 operationalize the population heterogeneity portion of the longitudinal victimization process, which focuses on between-individual differences. Both of the residual variance components are statistically significant, meaning there is variance that remains to be explained after accounting for four time-stable covariates (impulsivity, sex, race, and age).⁵ Only impulsivity and age are statistically significant. A one standard deviation increase on the impulsivity scale predicts a 0.31 increase in the starting level of victimization while a one standard deviation increase in age predicts a 0.06 decrease in the starting level of victimization for RSVP youths. Impulsivity and sex effects on the latent growth slope are negative and statistically significant. This suggests that those higher in impulsivity and male youth are expected to have increased negative trends in their victimization patterns across the years captured by this study. Age,

⁵Due to four potential outliers in the Wave 1 age variable (ages 17 to 19), an additional analysis was estimated without these cases to determine their influence on the estimates. The pattern of results was similar to that presented here. Therefore, the cases were included in the final analysis.

on the other hand, has a significant and positive effect on the latent slope, indicating that those who are older are expected to have a smaller negative slope in their victimization patterns across the waves—although the starting point for victimization is lower for older youth as indicated by the intercept. The R^2 for the intercept and slope growths factor are 0.09 and 0.12, respectively.

Similar to the unconditional ALT model described above, there continues to be a statistically significant autoregressive effect ($b = 0.10$) whereby victimization at the previous time period predicts slightly elevated levels of victimization at the subsequent point in the longitudinal sequence. It is important, however, to unpack the relationships that generate that observed process. In this case, we introduced time-varying measures of exposure to school attachment, delinquency, delinquent peers, gang membership, and illicit opportunities. The standardized estimates for delinquency (0.17 to 0.26), delinquent friends (0.06 to 0.11), gang membership (0.02 to 0.06), and illicit opportunities (0.09 to 0.15) on victimization are uniformly significant and positive (with the exception of gang membership at Wave 2). This suggests that a higher level of any of the measures predicts an elevated level of victimization at each wave. At the same time, it is clear that this is a dynamic, state dependent process where victimization at the previous time period has a positive effect on delinquency, delinquent friends, gang membership, and exposure to illicit opportunities at the subsequent one. For example, a one standard deviation-unit increase in victimization at Wave 1 predicts a 0.19 standard deviation increase in delinquent activities, a 0.24 standard deviation increase on the delinquent friends measure, a 0.15 standard deviation increase in gang membership, and a 0.17 standard deviation increase on the illicit opportunities measure at Wave 2. In this way, victimization and the risk factors are both influences and outcomes in the longitudinal process. School attachment is coded such that higher levels on that measure suggest greater attachment and embeddedness. Similar to the other time-varying covariates, it is a significant influence on victimization and is also influenced by it. Its effects, however, are negative in direction and also not quite as strong as some of the other variables (std. est. = -0.04 to -0.07). Still, as the table shows, school bonds, which capture guardianship, have a protective influence on victimization. Importantly, victimization experiences weaken subsequent school attachment at similar levels.

DISCUSSION

Summary of Key Findings

Findings from the unconditional models find support for both population heterogeneity and state dependent processes in adolescent victimization. They also indicate that there was additional variance to be explained in the repeated victimization measures. Earlier victimization was a significant predictor of subsequent victimization across all four waves. The final fit for the ALT model was strong and was used as a base model for the inclusion of time-stable and time-varying covariates. We then investigated models with time-stable and time-varying influence variables that could be associated with adolescent victimization processes. In general, while the fit for the full conditional ALT model was not as strong as the unconditional ALT, nearly all of the hypothesized relationships in the model were statistically significant and reasonably-sized. As would be expected based on previous

research (Pratt et al., 2014; Schreck, 1999), impulsivity had a significant relationship with the starting point and longitudinal trend for victimization, suggesting that it may be an important marker or influence on between-individual differences in victimization risk. Age was also a significant predictor for the longitudinal trend of victimization, but acted as somewhat of a protective factor for older youth. This is consistent with research that indicates youth are less likely to experience victimization as they age (Finkelhor, Turner, Ormrod, & Hamby, 2009; Truman & Langton, 2014).

Delinquency, delinquent peers, gang membership, illicit opportunities, and school attachment all had consistent significant effects on victimization in the conditional ALT model. Further, these variables were also affected by earlier victimization, suggesting that they are a part of a dynamic process that perpetuates victimization over time—beyond the persistent heterogeneity captured in analysis of the between-individual differences in latent growth. As might be expected based on the lifestyle-routine activities perspective (Cohen & Felson, 1979; Hindelang et al., 1978), engaging in delinquent acts, associating with delinquent peers, being involved in a gang, and exposure to illicit opportunities have positive relationships with victimization (both as independent and dependent variables) and therefore perpetuate risk. While all variables were statistically significant (except for gang membership at Wave 2), engaging in delinquency was the most salient predictor of victimization. So, while victimization might be related to risky lifestyles, delinquent activities may create unique opportunities that increase risk of victimization over time. Delinquent peers and illicit opportunities were similarly related to increased likelihood of victimization across the four waves followed by gang membership.

Within the lifestyle framework, increased guardianship should reduce the risk of victimization (Cohen & Felson, 1979; Hindelang et al., 1978). As anticipated, school attachment had a negative relationship with victimization within each wave of the study and is therefore protective. Still, based on the negative effect from previous victimization to later school attachment, that might be attenuated somewhat by earlier victimization. Overall, youth who engaged in any type of risky behavior assessed here or who did not have strong school attachments were consistently at an increased risk of victimization over time. We did also include some other bonding measures in preliminary models (peers, maternal); the results were generally similar to the school attachment variable reported here. Measures of nondelinquent routines (i.e., school sports, school activities, community activities) were not completely consistent in terms of their effect on victimization so they were not included in the final model. Urban/rural classifications, average grades, socioeconomic status (parent education), and family structure (living with both parents) were ultimately not included in the final model due to their poor model fits and lack of significant effects on the variables of interest.

Implications

Taken in their totality, the results demonstrate the value of a mixed perspective on stability/change for understanding longitudinal patterns of victimization. This is similar to what has been found in the previous literature on offending (see Nagin & Paternoster, 2000). Working from that general longitudinal perspective, it is important to consider between-individual

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Considering that adolescents are often victimized at school and schools are generally more likely to know about crimes than other authorities (Finkelhor, Cross, & Cantor, 2005; Finkelhor, Wolak, & Berliner, 2001; Robers et al., 2015), officials and staff are vital in identifying at-risk youth and ensuring that intervention and preventive measures are implemented to protect adolescents and foster resilience (Zimmerman & Arunkumar, 1994). This study found that attachment to school (e.g., being invested in education, thinking teachers care) acted as a protective factor against victimization. Having faculty and staff complete training to not only foster relationships with adolescents, but also to keep watch for risk factors (e.g., delinquent activity, illicit opportunities), could help strengthen the relationship between adolescents and school. If youth do not feel a connection with school, they could become more isolated and vulnerable to victimization because of a lack of guardianship or perceived support (e.g., Tillyer et al., 2011; Wilson, 2004). School officials and teachers may be more attuned to these signals and may be able to identify youth who are at greater risk of victimization. It is also worth considering the extent to which the repeated victimization of a given youth (or a small subgroup of them) might be indicative of a broader effect of school culture or practices (e.g., Astor, Benbenishty, Zeira, & Vinokur, 2002). Building a positive environment at the school-level is closely aligned with fostering resilience in individual youths prior to and following victimization.

The results of the current study indicate that intervening after the first victimization is especially important to prevent subsequent victimizations. The precursors and consequences of victimization will differ depending on the nature of the victimization and individual, but it is clear that early victimization can cascade to affect later victimization. Some youth will likely stay attached, others will detach and internalize, and others may become further enmeshed in delinquent subgroups and engage in more externalizing behaviors (Boivin & Hymel, 1997; Menard, 2002; Siegel, La Greca, & Harrison, 2009). Although there is clearly a victim-offender overlap, the relationship may not be homogeneous within the adolescent population (Reid & Sullivan, 2012), which means that it is important for adults to take youths' victimization experiences seriously and also to understand it in developing an appropriate response. This may require efforts to provide more protection and guidance on multiple fronts.

Limitations

There are a few key limitations that should provide context for the core findings and conclusions of this study. First, victimization items are limited to school-based incidents and results do not necessarily generalize to victimization off school grounds. This is important as victimization in other settings, especially the home, may have different profiles and etiologies from those in schools that might more prominently feature bullying events. Second, the longitudinal window covers only the time frame from early to mid-adolescence, which means that the observed trends may look different with longer or earlier (later) observations. This might also affect our conclusions regarding the longitudinal mechanisms involved with victimization. Third, and relatedly, the specification of the ALT model is subject to the initial conditions problem (Brame, Bushway, & Paternoster, 1999), which may lead to bias in some of the key coefficients (especially autoregressive effects). Fourth, the model treats the logged victimization measures as linear where these are sometimes

distributed as count measures and treated as such to reduce potential bias in the estimates. Fifth, self-control was analyzed as a time-stable factor in the current analysis. Some research, however, indicates that self-control is more dynamic (Burt et al., 2014; Pratt, 2016; Winfree et al., 2006) and that it has a reciprocal relationship with victimization (Agnew et al., 2011). Future research should continue to examine the causes and consequences of self-control as a time-varying factor in relation to adolescent victimization. Finally, the sample is taken from rural and urban counties from the state of Kentucky, but most of the schools are located in rural locations. It is not nationally representative of the U.S. so caution must be used when making inferences about other populations and areas. While these limitations must be considered in evaluating the findings and their implications, this study nevertheless does provide insight on victimization in adolescence and responses to it.

Conclusion

The recent shift toward thinking about victimization and delinquency in complementary ways has generated a number of important insights. In particular, the use of developmental and life-course explanations in conjunction with relevant theoretical mechanisms from existing criminological theory to understand adolescent victimization patterns has answered—and raised—some interesting questions. This work also has implications for prevention and response to adolescent victimization. This study looked at adolescent victimization in a large sample of youth in one U.S. state. We confirmed previous findings that identified general longitudinal processes that are at work in observed patterns of victimization, but then added relevant influences, like impulsivity, involvement in delinquent activities, association with delinquent friends, gang membership, exposure to illicit opportunities, and prosocial attachments, to these models and found that these factors affect, and are sometimes affected by, adolescent victimization. These results informed some suggestions for responding to and preventing victimization in order to try to interrupt this complex longitudinal process.

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Appendix A.: Survey Items Used

Variable	Survey items and coding
Dependent Variable	
Victimization	<p><i>In the current school year, how many times have the following things actually happened to you on school grounds or during school-related activities?</i></p> <ol style="list-style-type: none"> 1. Been physically attacked 2. Been forced to give up money or property 3. Had money or property stolen when you were not around 4. Been touched by someone in a sexual manner without your consent 5. Had a gun pulled on you 6. Had another weapon pulled on you

Variable	Survey items and coding
	Responses coded 0 – 10+
Key Covariates	
Impulsivity	<p><i>How often are the following statements true</i></p> <ol style="list-style-type: none"> 1. I have trouble controlling my temper 2. I have difficulty remaining seated at school 3. I get very restless after a few minutes if I am supposed to sit still 4. When I am angry, I lose control over my actions 5. I have difficulty keeping attention on tasks 6. I get so frustrated that I feel like a bomb ready to explode 7. Little things or distractions/interruptions throw me off 8. I'm nervous or on edge 9. I can't seem to stop moving 10. I don't pay attention to what I'm doing 11. I am afraid I will lose control of my feelings
	Responses coded as: 1 = never true to 4 = always true
School Attachment	<p><i>How strongly do you agree or disagree with the following statements about your school?</i></p> <ol style="list-style-type: none"> 1. I care a lot what my teachers think me 2. Most of my teachers are not interested in anything I say or do (<i>reverse coded</i>) 3. Getting an education is important to me 4. I would quit school now if I could (<i>reverse coded</i>) 5. Most of my classes are a waste of time (<i>reverse coded</i>) 6. I look forward to coming to school most mornings 7. Teachers are interested in the students
	Responses coded as: 1 = strongly disagree to 4 = strongly agree
Delinquency	<p><i>In the present school year, how often have you done any of the following:</i></p> <ol style="list-style-type: none"> 1. Forced someone at school to give up their money or property 2. Forced someone not at school to give up their money or property 3. Stolen someone's money or property at school when they are not around 4. Stolen someone's money or property not at school when they were not around 5. Physically attacked someone at school (punched, slapped, kicked) 6. Physically attacked someone not at school (punched, slapped, kicked) 7. Touched someone in a sexual manner without their consent or against their will at school 8. Touched someone in a sexual manner without their consent or against their will not at school 9. Taken a gun to school 10. Taken another weapon to school (knife, brass knuckles, and so on) 11. Used a gun during a fight 12. Used another weapon (knife, brass knuckles, and so on) during a fight 13. Vandalized public or private property (example: destroyed property, graffiti, and so on)
	Responses coded as: 1 = never to 5 = daily or almost daily
Delinquent Peers	<p><i>Thinking about your closest friends – How many of them have done any of the following things in the present school year?</i></p> <ol style="list-style-type: none"> 1. Smoked cigarettes daily for one week or more 2. Used smokeless tobacco daily for one week or more 3. Gotten drunk 4. Smoked marijuana 5. Used inhalants (huffing) 6. Used cocaine/crack 7. Cut school completely 8. Been suspended from school 9. Taken a gun to school 10. Taken an explosive to school

Variable	Survey items and coding
	<p>11. Taken a weapon to school (knife, brass knuckles, and so on, other than gun or explosive)</p> <p>12. Gotten arrested</p> <p>13. Sold marijuana or other drugs</p> <p>14. Stolen someone's money or property when they were not around</p> <p>15. Physically attacked someone (example: punched, slapped, kicked)</p> <p>16. Vandalized public or private property (example: destroyed property, graffiti, etc.)</p> <p>Responses coded as: 0 = no, 1 = yes</p>
Illicit Opportunities	<p><i>During a typical school day, it is easy for someone my age to get:</i></p> <p>1. Cigarettes</p> <p>2. Alcohol</p> <p>3. Marijuana</p> <p>4. Inhalants</p> <p>5. Cocaine</p> <p>6. A gun</p> <p>Responses coded as: 1 = strongly disagree to 4 = strongly agree</p>
Gang Membership	<p><i>Do you consider yourself a member of a gang?</i></p> <p>Responses coded as: 0 = no, 1 = yes</p>
Sex	<p><i>What is your sex?</i></p> <p>Responses coded as: 0 = female, 1 = male</p>
Race	<p><i>How do you describe yourself?</i></p> <p>Responses coded as: 0 = non-White, 1 = White</p>
Age	<p><i>What is your date of birth?</i></p> <p>Responses coded as: age in years</p>

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Figure 1:

Overview of Analytic Process

Note: Correlations were freed between time varying covariates

Table 1:

Descriptive Statistics for Variables in Analysis

Variable	Mean	Standard Deviation	Range
Victimization			
Wave 1 (W1)	1.35	1.09	0.00–4.11
Wave 2 (W2)	1.31	1.10	0.00–4.11
Wave 3 (W3)	1.16	1.06	0.00–4.11
Wave 4 (W4)	1.02	1.05	0.00–4.11
Key Covariates			
Time-stable covariates			
Impulsivity	20.89	7.53	11.00–44.00
Sex (1 = male)	0.48	--	--
Race (1 = White)	0.89	--	--
Age	13.44	0.59	12.00–19.00
Time-varying covariates			
School Attachment W1	22.43	4.05	7.00–28.00
School Attachment W2	21.98	3.96	7.00–28.00
School Attachment W3	21.59	3.78	7.00–28.00
School Attachment W4	21.36	3.69	7.00–28.00
Delinquency W1	2.75	0.22	2.64–4.19
Delinquency W2	2.75	0.22	2.64–4.19
Delinquency W3	2.73	0.20	2.64–4.19
Delinquency W4	2.73	0.20	2.64–4.19
Delinquent Peers W1	3.64	4.22	0.00–16.00
Delinquent Peers W2	4.18	4.94	0.00–16.00
Delinquent Peers W3	5.32	4.34	0.00–16.00
Delinquent Peers W4	5.60	4.17	0.00–16.00
Gang Membership W1	0.09	0.28	0.00–1.00
Gang Membership W2	0.07	0.26	0.00–1.00
Gang Membership W3	0.04	0.21	0.00–1.00
Gang Membership W4	0.04	0.20	0.00–1.00
Illicit Opportunities W1	11.52	5.08	6.00–24.00
Illicit Opportunities W2	12.29	4.97	6.00–24.00
Illicit Opportunities W3	14.54	4.48	6.00–24.00
Illicit Opportunities W4	14.81	4.46	6.00–24.00

Table 2:

Maximum Likelihood Estimates for ALT Model: Victimization with Covariates

	Est. (s.e.)	Std. Est.
Intercept-Mean	−0.72 (0.41)	--
Intercept-Variance Component	0.32 (0.03) *	--
Slope-Mean	−0.91 (0.20) *	--
Slope-Variance Component	0.02 (0.01) *	--
Intercept-Slope Covariance	−0.04 (0.01) *	−0.48
<i>Intercept (Initial Victimization Level)</i>		
on Impulsivity	0.02 (0.002) *	0.31
on Sex (1 = male)	0.001 (0.03)	0.001
on Race (1 = White)	0.02 (0.05)	0.01
on Age	−0.06 (0.03) *	−0.06
<i>Slope (Longitudinal Victimization Trend)</i>		
on Impulsivity	−0.01 (0.001) *	−0.27
on Sex	−0.06 (0.01) *	−0.18
on Race	−0.04 (0.02)	−0.07
on Age	0.03 (0.01) *	0.11
Victimization W1		
on School Attachment W1	−0.02 (0.004) *	−0.07
on Delinquency W1	0.83 (0.08) *	0.17
on Delinquent Peers W1	0.03 (0.01) *	0.11
on Gang W1	0.19 (0.06) *	0.05
on Illicit Opportunities W1	0.03 (0.003) *	0.14
Victimization W2		
on Victimization W1	0.10 (0.02) *	0.10
on School Attachment W2	−0.01 (0.004) *	−0.04
on Delinquency W2	0.94 (0.06) *	0.18
on Delinquent Peers W2	0.01 (0.004) *	0.06
on Gang W2	0.07 (0.06)	0.02
on Illicit Opportunities W2	0.03 (0.003) *	0.15
Victimization W3		
on Victimization W2	0.10 (0.02) *	0.10
on School Attachment W3	−0.02 (0.004) *	−0.06
on Delinquency W3	1.20 (0.06) *	0.22
on Delinquent Peers W3	0.02 (0.004) *	0.09
on Gang W3	0.31 (0.08) *	0.06

	Est. (s.e.)	Std. Est.
on Illicit Opportunities W3	0.02 (0.004) *	0.09
Victimization W4		
on Victimization W3	0.10 (0.02) *	0.10
on School Attachment W4	-0.02 (0.004) *	-0.05
on Delinquency W4	1.38 (0.08) *	0.26
on Delinquent Peers W4	0.03 (0.004) *	0.11
on Gang W4	0.34 (0.08) *	0.06
on Illicit Opportunities W4	0.02 (0.004) *	0.09
School Attachment W2 on Victim W1	-0.53 (0.05) *	-0.15
School Attachment W3 on Victim W2	-0.41 (0.05) *	-0.12
School Attachment W4 on Victim W3	-0.38 (0.06) *	-0.11
Delinquency W2 on Victim W1	0.04 (0.003) *	0.19
Delinquency W3 on Victim W2	0.03 (0.003) *	0.19
Delinquency W4 on Victim W3	0.04 (0.003) *	0.19
Delinquent Peers W2 on Victim W1	1.08 (0.08) *	0.24
Delinquent Peers W3 on Victim W2	0.74 (0.07) *	0.19
Delinquent Peers W4 on Victim W3	0.74 (0.07) *	0.19
Gang W2 on Victim W1	0.04 (0.003) *	0.15
Gang W3 on Victim W2	0.02 (0.003) *	0.10
Gang W4 on Victim W3	0.02 (0.004) *	0.09
Illicit Opportunities W2 on Victim W1	0.80 (0.07) *	0.17
Illicit Opportunities W3 on Victim W2	0.43 (0.07) *	0.11
Illicit Opportunities W4 on Victim W3	0.44 (0.07) *	0.11
Model χ^2 (df)	2791.90 (237) *	
Comparative Fit Index (CFI)	0.88	
Tucker Lewis Index (TLI)	0.82	
Root Mean Square Error Approx. (RMSEA)	0.05	
Std. Root Mean Square Residual (SRMR)	0.12	

Note: N=3976

* p<.05 based on z test of estimate to standard error ratio, χ^2 with 237 degrees of freedom for model fit.