



Maturing Out of Victimization: Extending the Theory of Psychosocial Maturation to Victimization

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Abstract

Adolescents are at a relatively high risk of victimization. Within criminology, victimization has been largely attributed to risky behaviors and low self-control. Yet, these factors explain only a modest amount of victimization, suggesting that other theoretical predictors may offer additional insight. One factor that may predict victimization, as well as decreasing victimization risk after adolescence, is psychosocial maturation. Using data from the longitudinal Pathways to Desistance study, this study tested the association between psychosocial maturation and victimization. The analytic sample for this study (1087 individuals; 5681 yearly observations) included participants under 18 years at study recruitment. On average, each participant contributed 6 years of data. The victimization measure captured different types of threats and assaults (including rape and gunshot). Results showed 978 (17.2%) observations during which participants reported victimization. On average, psychosocial maturation increased with age while victimization risk decreased. Crude and adjusted models of the between-individual effect showed that a one standard deviation increase in psychosocial maturation was associated with 39% and 20% lower odds of victimization, respectively. Crude and adjusted models of the within-individual effect showed that a one standard deviation increase in psychosocial maturation was associated with 22% and 17% lower odds of victimization, respectively. Psychosocial maturation appears to be a relevant predictor of victimization and aids in our understanding of victimization risk throughout adolescence and early adulthood.

Keywords Psychosocial maturity · Victimization · Adolescence · Juvenile offenders

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Introduction

During the transition to adulthood, adolescents develop physically and psychologically, experience peer pressure, and face greater responsibilities (Steinberg & Morris, 2001). Along with these developments, victimization risk also changes during adolescence. Much like the risk of offending, the risk of victimization peaks during adolescence and declines with age (Finkelhor et al., 2013; Fisher et al., 2015; Gottfredson, 1981; Hindelang, 1978; Jennings et al., 2011, p. 201; Lauritsen et al., 1991; Macmillan, 2001; Moffitt, 1993). This pattern has been found in many democracies around the world (Hullenaar & Ruback, 2020; Lifvin et al., 2020; Ródenas & Doval, 2020). Due to the similar life-course patterning of offending and victimization, scholars have reasoned that as adolescents age they cease offending, lowering their risk of being a victim of retaliation and the risk of being victimized by a peer (Cohen et al., 1981; Gottfredson, 1981; Hindelang, 1978; Lauritsen & Laub, 2007; Lauritsen et al., 1991). However, some research suggests that the offending-victimization relationship is less strong after adolescence (Schreck et al., 2017), which suggests that the causes of the decline in crime with age (desistance) may be similar to the causes of the decline in victimization into adulthood.

Since at least the mid-1990s, researchers have proposed that we move beyond ideas of adolescents' activities as the cause of victimization towards a developmental approach (Finkelhor & Asdigian, 1996). A developmental perspective does not deny that certain activities may be risky, but seeks to understand the origins of vulnerability to victimization. Some evidence, for example, points to pre-adolescent victimization and adversity as a source for the co-occurrence of victimization and offending during adolescence (Anda et al., 2006; Beckley et al., 2018; Widom, 1989). The theory of low self-control, for example, argues that high-risk traits, including impulsivity and aggression (i.e., low self-control), develop during early childhood (Gottfredson & Hirschi, 1990). These traits remain relatively stable and represent a consistent risk for victimization throughout life. Low self-control has been shown to be a consistent, but weak risk for victimization (Pratt et al., 2014), perhaps due to the influence of personality disorders (Fanti & Kimonis, 2013; Flexon et al., 2016; Linton & Power, 2013). Research has shown the importance of considering how increasing self-control with age may reduce the risk of victimization (Daigle et al., 2008).

Along with low self-control, criminologists have also examined how victimization may be influenced by external factors, such as social relationships, or age-related life events, like employment and marriage. Theoretically, these events and relationships increase social controls and thereby lower the likelihood of crime (Sampson & Laub, 1993). US-based longitudinal studies of both nationally representative and high-risk samples have shown little support for the impact of these types of events on victimization (Daigle et al., 2008; Schreck et al., 2017).

Victimization itself has been explored as an event that may encourage individuals to adopt precautions against re-victimization (Hindelang et al., 1979). Evidence indicates that interventions targeted at changing a known-victim's behavior

are effective (Grove et al., 2012). But, US-based longitudinal studies have indicated that younger adolescents are unlikely to independently alter their behavior after victimization (Schreck et al., 2006; Turanovic & Pratt, 2014, 2019). One study of individuals aged 12 years and older, drawn from a nationally representative US sample of households, found that violent victimization limited shopping behavior but had little impact on whether evenings were spent away from home (Averdijk, 2011). Although this study did not control for age, age-related factors (such as marriage and employment) had little influence on whether individuals altered their behavior following crime victimization.

A maturation-based framework is a distinct departure from the existing literature, but may be useful, given the normative nature of the age-victimization relationship. Psychosocial maturation describes development from adolescence to adulthood in terms of non-cognitive development, specifically focusing on social and emotional changes instead (Cauffman & Steinberg, 2000). The most current iteration of psychosocial maturation can be traced to the work of Steinberg and Cauffman (1996), who argued that three major factors, temperance, responsibility, and perspective, contribute to mature decision-making, and each increases from adolescence to adulthood. Temperance is related to impulsivity, in some ways similar to self-control, responsibility refers to identity and self-reliance, and perspective is the tendency to think about others when making decisions (Cauffman & Steinberg, 2000). Psychosocial maturation has been shown to increase from adolescence to adulthood in ways consistent with the more socially responsible behavior that occurs during this time. Thus, scholars have linked increases in psychosocial maturation to decreases in crime over the life course (Steinberg et al., 2015).

Psychosocial maturation theory can be connected to many existing theories of victimization, explaining both psychosocial and behavioral risks for victimization. Psychosocial maturation also contributes to our understanding of adolescent behaviors and certain concomitant neurological changes (Casey et al., 2008; Crone & Dahl, 2012; Spear, 2007; Steinberg, 2008). Greater psychosocial maturation has been shown to predict less offending and, given the correlation between victimization and offending, we may expect greater psychosocial maturation to predict a lower risk of victimization (Monahan et al., 2009, 2013). Yet, we argue that psychosocial maturation is a useful predictor of victimization beyond its mediated effect through offending. Psychosocial maturation offers a theoretical explanation for how characteristics related to vulnerability and risk change as children age. Psychosocial maturation may allow us to explain why only some adolescents who engage in delinquent and risky behavior may be victimized. To date, despite an extensive evidence base for the patterning of both psychosocial maturation and victimization across age, we are unaware of any research that examines how those two simultaneous life processes are related to one another.

This study tested whether psychosocial maturation predicted adolescent victimization among a sample of adjudicated adolescents followed for approximately 7 years. As part of that endeavor, we covaried for a variety of theoretically relevant characteristics to ensure the robustness of our results. This study empirically demonstrated how psychosocial maturation and victimization risk changed throughout adolescence. This

study also weighed the utility of psychosocial maturation as a predictor of victimization in light of offending, routine activities, and childhood adversity.

Psychosocial Maturation and Victimization

The evidence on victimization throughout the life-course, which we discuss throughout this section, indicates that we may better understand changes in victimization through changes in psychosocial maturation. Psychosocial maturation is a concept used to describe the adoption of socially appropriate ways of behavior and interaction, or social norms, by adolescents (Greenberger & Sørensen, 1974). Adolescents, it was argued, learn and internalize social norms during the maturational process. This process was further described in terms of how adolescents develop decision-making skills (Steinberg & Cauffman, 1996). Making decisions consistent with social norms was thought to involve emotional, social, and cognitive development (Cauffman & Steinberg, 2000). On average, adolescents become more psychosocially mature over time (Monahan et al., 2009). However, not all adolescents begin their psychosocial development at the same level and they may mature at different rates (Monahan et al., 2009). Adolescents who have a low starting point and/or lag in their maturational development may fail to understand the social world, act impulsively, and behave in ways contrary to social norms.

Psychosocial maturation, in its most recent theoretical conceptualization, consists of three components: responsibility, perspective, and temperance (Cauffman & Steinberg, 2000). Each of these components may work in different ways to increase the likelihood that an adolescent is victimized. These components also overlap with contemporary theories of victimization. For example, the theory that low self-control increases the risk of victimization overlaps with concepts of perspective and temperance (Schreck, 1999). Likewise, routine activity ideas of target suitability can be associated with increasing ability to protect oneself as one matures. But, psychosocial maturation is not merely a catchall for theories of adolescent victimization. Psychosocial maturation theory is rooted in the paradigm that humans develop as they age. For victimization, psychosocial maturation theory argues that the transition from dependent childhood to independent adulthood entails a risky period of psychological and social development. Psychosocial maturation also adds new explanations, beyond existing theory, of how certain adolescents come to be victimized. Drawing on the works spearheaded by Cauffman, Monahan, and Steinberg (Cauffman & Steinberg, 2000; Monahan et al., 2009, 2013; Steinberg & Cauffman, 1996; Steinberg et al., 2015), we aim to concisely describe the components of psychosocial maturation and expound on the innovative ways that they can help our understanding of who becomes victimized, why, and how victimization risk declines with age.

Responsibility

As adolescents develop, they gain independence and self-sufficiency, development captured by the concept of responsibility. The journey of gaining responsibility begins with a joint process of pulling away from parents and increasing reliance on

peers (Steinberg & Silverberg, 1986). It is during this time that victimization is most likely. The relational shift affects decision-making and pushes adolescents towards risky behaviors that, in their estimation, may win them favor among their peers (Blakemore, 2018). Peers become the main social group as adolescents stop spending time with parents, making risky behavior more likely (Gardner & Steinberg, 2005; Knoll et al., 2015; J. Miller, 2013; Reniers et al., 2017) and increasing the risk of victimization (Olweus, 1993; Troop-Gordon, 2017).

To reach the point of making safety-reinforcing decisions, adolescents must learn whom to trust (which could be no one) and understand that trustworthiness may be situationally dependent. Adolescents who trust potentially harmful peers (such as delinquent peers) have been shown to be at an increased risk of victimization (Jennings et al., 2012). Adolescents' ability to resist the influence of peers has also been shown to be associated with less risky behavior (Peake et al., 2013). It would appear that socializing, in general, would put adolescents in danger. Yet, to avoid bullying victimization, it seems important for adolescents to form friendships (Goldbaum et al., 2003; Pellegrini & Bartini, 2000; Smith & Sharp, 2002). The context of interpersonal relationships is tied to the next aspect of psychosocial maturation, perspective.

Perspective

Adolescents, as they develop, become more aware of the feelings of others and the effects of their own behavior, a change captured by the concept of perspective. When adolescents gain perspective, they develop the ability to understand the short- and long-term consequences of decisions and actions, what is also known as future orientation. Adolescents who are low in future orientation may be at an increased risk of victimization because they cannot understand how their actions may put them at risk (Romer, 2010). The idea that developing a long-term outlook is important for reducing victimization has been supported by evidence (Roze & Koss, 2001; Senn et al., 2015). Adolescents, some have argued, may foresee risks but not appreciate their gravity (Schreck, 1999). Unlike a routine activity perspective, which assesses situations as high risk for all involved, the concept of perspective allows for the possibility that certain adolescents may be at a greater risk than others based on their developmentally-influenced attitudes and behaviors.

Adolescents who have yet to develop perspective are also low in empathy, which likely leads to inconsiderate and offensive behavior (P. A. Miller & Eisenberg, 1988). This behavior may be provoking and increase the risk of victimization (Schreck, 1999). Adolescents who lack empathy may also have few and/or weak interpersonal relationships. As noted above, research on children and adolescents has generally shown that greater social difficulties in areas such as making and keeping friends are associated with bullying victimization (Cook et al., 2010; Goldbaum et al., 2003; Lester et al., 2013). Gaining perspective and responsibility, while also avoiding victimization, seems a precarious process of making independent decisions in the company of peers, possibly while trying to maintain friendships.

Temperance

The concept of temperance describes how adolescents learn to control impulses and suppress aggression. Temperance and low self-control have similar characteristics, but temperance is presumed to change throughout adolescence. This key theoretical difference aligns with evidence that fails to support the stability aspect of low self-control theory (Burt et al., 2006; Piquero et al., 2010). Again, measures of low self-control have shown weak but consistent associations with victimization (Pratt et al., 2014). What seems to be lacking is a more nuanced understanding of the development of the characteristics captured by concepts like low self-control and temperance.

Impulsivity has been shown to change during life, with sensation seeking peaking during mid-adolescence (Forrest et al., 2019; Romer et al., 2010, 2017; Steinberg et al., 2008). Sensation seeking entails seeking out novel, exciting, and intense experiences even if those experiences entail risk or danger (Zuckerman, 2010). Adolescents with low impulse control may grasp that their behavior may have consequences—they have perspective—but they ignore risks in favor of the novel benefits afforded by risky behavior (Cauffman & Steinberg, 2000; Romer, 2010; Steinberg, 2008). For example, adolescents, more so than adults, tend to engage in high-risk behaviors such as binge drinking and delinquency (Steinberg, 2008). Sensation seeking may effectively reduce adolescents' ability to protect themselves (Finkelhor, 1995). Adolescents may engage in high-risk behavior as a way of achieving a thrill, with little regard for how they could be victimized.

Sensation seeking has been linked to the other aspect of temperance, aggression (Cui et al., 2016; Raine et al., 1998; Wilson & Scarpa, 2011). Being aggressive appears to put adolescents at risk of being victimized (Goldbaum et al., 2003; Olweus, 1993). Studies have demonstrated that, among most people, physical aggression declines from childhood to adolescence (Brame et al., 2001; Martino et al., 2008; Nagin & Tremblay, 1999; Xie et al., 2011).

Present Study

Psychosocial maturation may contribute to our understanding of victimization and how the risk for victimization changes during and after adolescence. Psychosocial maturation describes how temperance, responsibility, and perspective develop during adolescence in ways that potentially explain both the peak risk of victimization during adolescence and its decline across adolescence. Psychosocial maturation explains this risk pattern in terms of autonomy, decision-making, the types of activities one engages in, and interpersonal interaction. This study tested the association between psychosocial maturation and victimization using longitudinal data on adolescents. Like early studies on low self-control and victimization, this study is based on the theorized influence of psychosocial maturation on autonomy, decision-making, the types of activities one engages in, and interpersonal interaction. We additionally sought to estimate the importance of psychosocial maturation in light of

other established predictors of victimization and how individual change in psychosocial maturation over time was associated with victimization.

Methods

Data

The publicly available longitudinal Pathways to Desistance Study (Pathways) data were used to analyze the association between psychosocial maturation and victimization from mid-adolescence to early adulthood (Mulvey et al., 2004). The Pathways study, started in 2000, recruited youth who were found guilty of a serious crime in the juvenile and adult criminal justice systems of Maricopa County, Arizona and Philadelphia County, Pennsylvania. Youths were aged 14–19 years at the time of the initial (baseline) interview. Following the baseline interview, follow-up interviews occurred every 6 months through month 36, then annually through month 84 (83.8% retention at last wave; Mulvey, 2013). The first six follow-up periods were 6 months apart (the remaining follow-up periods were 1 year apart). To coincide with changes in the year of age (see below for a description), we aggregated the first six follow-up periods into 1-year waves following Monahan and colleagues (2009). This created 8 waves of data (the baseline interview and 7 years of follow-up interviews). Interviews took place in participants' homes and institutions such as group homes, detention centers, and drug treatment facilities. At baseline, half of the sample was located in an institution (Steinberg et al., 2015). At each interview, interviewers read each question aloud to ensure there were no comprehension problems. In the present study, each observation consisted of an individual interviewed during one year of the Pathways Study. The analytic sample for the present study (1087 individuals; 5681 observations) was restricted to participants under 18 years of age at the baseline interview and observations with complete information on all variables. On average, each participant contributed 6 out of 8 waves of data.

Measures

Victimization Outcome

Victimization was based on participant responses to a modified version of the Exposure to Violence Inventory. At each interview, participants were asked whether they had experienced one of six different types of victimization: chased while being afraid of physical harm; beaten up, mugged, or seriously threatened; raped/attempted rape; attacked with a weapon (non-firearm); shot at; and shot. The publicly available Pathways data includes only the summary measure of victimization. This summary measure is reported to have acceptable internal consistency (see <http://www.pathwaysstudy.pitt.edu/>). The summary measure of victimization ranged from 0 to 6, with greater numbers indicating a greater variety of victimization. At the baseline interview, the recall period for victimization was the entire life. Subsequently, roughly

half of the sample reported 2 or more types of victimization at baseline. The baseline interview victimization measure was used in the adverse childhood experiences score (see below).

At follow-up interviews, the recall period for victimization was limited to the time since the last interview. This resulted in most participants (greater than 80% across each interview) reporting no victimization in follow-up interviews. For follow-up interviews, victimization was dichotomized (with 0 representing no victimization and 1 representing any victimization). This dichotomous victimization measure from follow-up interviews was used as the outcome. Summaries of the victimization measure and all other measures in the present study are available in Table 1.

Predictors of Victimization

Psychosocial maturation was a composite measurement calculated, according to instruction from the Pathways Study website (<http://www.pathwaysstudy.pitt.edu/codebook/moj-sb.html>) as the mean of participant scores on three factors: responsibility, perspective, and temperance. Each of these three constructs was empirically derived from different scales and had good psychometric properties (<http://www.pathwaysstudy.pitt.edu/codebook/measures.html>). In this study, we separately tested the composite psychosocial maturation measurement, responsibility, perspective, and temperance. The psychosocial maturation composite measure was standardized on a scale from 0 to 10. Higher scores indicated greater psychosocial maturation. In this study, a one-unit change in the psychosocial maturation composite measure represented approximately a one standard deviation change in the composite measure. As psychosocial maturation was a predictor of victimization, it was measured in the year prior to the measurement of victimization. During the 3-year period in which two measurements from 6-month interviews were combined, psychosocial maturation factors were averaged across each of the two consecutive 6-month measurements.

Responsibility, the first of the three components of psychosocial maturation, was created by averaging the Psychosocial Maturity Inventory (PSMI; Form D; Greenberger et al., 1975) and the Resistance to Peer Influence score (RPI; Steinberg & Monahan, 2007). The PSMI contained 30 items to which participants responded on a 4-point Likert. Items tapped self-reliance (i.e., feelings of internal control and the ability to make decisions without extreme reliance), identity (i.e., self-esteem, clarity of the self, and consideration of life goals), and work orientation (i.e., pride in the successful completion of tasks). Higher scores indicated more responsible behavior. The RPI score averaged 10 items on the degree to which participants acted autonomously in interactions with their peer group (i.e., fitting in with friends, going against the crowd, knowingly doing something wrong). Participants selected, among two opposing views, the one which most appropriately described their perspective and rated the accuracy which with this view described their behavior. Higher scores indicated greater resistance to peer influence.

Perspective, the second component of psychosocial maturation, was created by averaging the Future Outlook Inventory (FOI; Cauffman & Woolard, 1999) and the consideration of others' score. The FOI averaged 8 items drawn from the Life

Table 1 Victimization outcome measure, measures used as predictors of victimization, and covariates: descriptions and summary statistics. Each observation consisted of an individual interviewed during 1 year of the pathways study. The analytic sample for the present study (5681 observations over 1087 individuals) was restricted to participants under 18 years of age at the baseline/initial interview and observations with complete information on all variables. Descriptive information is provided for observations

Variables	Description	Range/metric	Mean (SD)/number (%)
<i>Outcome</i>			
Victimization (number, %)	Six items from a modified version of the Exposure to Violence Inventory (ETV; Selner-O'Hagan, Kindlon, Buka, Raudenbush, & Earls, 1998) documented the types of violence participants experienced (e.g., "Have you ever been chased where you thought you might be seriously hurt?"). The types of experiences included were chased while being afraid of physical harm; beaten up, mugged, or seriously threatened; raped/attempted rape; attacked with a weapon (non-firearm); shot at; and shot. Having experienced one or more of the six scenarios was counted as victimization during that wave	0–1	978 (17.2%)
<i>Predictors of victimization</i>			
Psychosocial maturation composite (mean, SD)	A composite score was developed by members of the Pathways Study to reflect a multifaceted maturity level. The composite score included measures of responsibility, perspective, and temperance (see below for details). The measure was scaled from 0 to 10, with higher scores indicating greater maturity. Using this scaling, one standard deviation was equal to 1 point on the psychosocial maturation scale. Psychosocial maturation was measured in the wave prior to the measurement of victimization	0–10	7.01 (1.00)
Responsibility (mean, SD)	The responsibility measure was created by averaging the 30-item Psychosocial Maturity Inventory (PSMI; Form D; Greenberger, Josselson, Knerr, & Knerr, 1974) and the 10-item Resistance to Peer Influence score (RPI). Higher scores on both scales indicated more responsible behavior and greater resistance to peer influence, respectively. The responsibility measure was scaled from 1 to 10 with higher scores indicating greater responsibility. Responsibility was measured in the wave prior to victimization	0–10	8.01 (1.05)

Table 1 (continued)

Variables	Description	Range/metric	Mean (SD)/number (%)
Perspective (mean, SD)	The perspective measure was created by averaging the 8-item Future Outlook Inventory (FOI; based on Cauffman & Woolard, 1999) score and the 7-item consideration of others score. Higher scores on both scales indicated a greater degree of future consideration and planning and greater consideration for others, respectively. The perspective measure was scaled from 1 to 10 with higher scores indicating greater perspective. Perspective was measured in the wave prior to victimization	0–10	6.85 (1.24)
Temperance (mean, SD)	The temperance measure was created by averaging the 7-item suppression of aggression score and the 8-item impulse control score, both from the Weinberger Adjustment Inventory (WAI). Higher scores on each of the subscales delineated below indicate greater suppression of aggression and impulse control, respectively. The temperance measure was scaled from 1 to 10 with higher scores indicating greater perspective. Temperance was measured in the wave prior to victimization	0–10	6.15 (1.68)
Offending (number, %)	Twenty-two self-reported offending (SRO; Huizinga, Esbensen, & Weighar, 1991) items documented the types of offenses participants committed. Offenses included theft, vandalism, prostitution, drug sales, assault, homicide, and robbery. Having committed one or more of the offenses was counted as offending during that wave. Offending was measured in wave prior to the measurement of victimization	0–1	3295 (58.0%)
Unstructured social activities (mean, SD)	Four items from the Routine Activities measure were drawn from the “Monitoring the Future” questionnaire (Osgood, Wilson, O’Malley, Bachman, and Johnston, 1996) and were used to assess the frequency of unstructured socializing. Items specifically tapped activities that occurred in the absence of an authority figure (e.g., “How often did you get together with friends informally?”). A combined mean unstructured socializing score was created from the four items. Higher scores indicated a greater involvement in unstructured activities. Unstructured socializing was measured in the wave prior to the measurement of victimization	1–5	3.19 (0.95)

Table 1 (continued)

Variables	Description	Range/metric	Mean (SD)/number (%)
Adverse childhood experiences (ACEs; mean, SD)	The ACE scale was created from questions about participants' childhood asked at baseline. ACEs were a seven-level ordinal variable with categories: 0–1 (reference) ACE; 2 ACEs; 3 ACEs; 4 ACEs; 5 ACEs; 6 ACEs; 7 or more ACEs. Items included as ACEs were based on Felitti et al. (1998). They were divorced parents, household member arrested/jailed, household member in mental hospital, in-home parent with drug problems, recollection of physical fights between parents, and the six aforementioned types of victimization (chased while being afraid of physical harm; beaten up, mugged, or seriously threatened; raped/attempted rape; attacked with a weapon (non-firearm); shot at; and shot)	0–6	2.74 (1.87)
<i>Covariates</i>			
Age (mean, SD)	Participant's age during the wave in which victimization was measured	15–25	19.7 (2.28)
Previous victimization (mean, SD)	Sum of waves during which victimization (as measured above) was recorded, prior to the wave in which the victimization outcome was measured. This measure is zero for the first wave	0–6	0.48 (0.80)
Female sex (number, %)	Participant sex "female" as recorded at baseline (coded as 1); male sex coded as 0. In the present study, there were 162 female participants (14.8% of all participants). The female participants contributed 1011 (17.8%) observations to the present study	0–1	1011 (17.8%)
IQ (mean, SD)	IQ was measured at baseline. The Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) was used to estimate participants' level of intellectual functioning, with higher scores indicating greater intellectual ability. The WASI is linked to both the Wechsler Intelligence Scale for Children (WISC-III) and the Wechsler Adult Intelligence Scale (WAIS-III), and has been normed for individuals' ages 6 to 89 years. In the Pathways study, the WASI was administered on paper	55–128	84.51 (12.97)

Table 1 (continued)

Variables	Description	Range/metric	Mean (SD)/number (%)
Parent socioeconomic status (mean, SD)	<p>Parent socioeconomic status at baseline was computed using participants' reported parental occupation and education. Parental occupation and education were coded using a seven-point scale ranging from 1 (unskilled employees; professional degree) to 7 (unskilled employees; less than seven years of school) based on Hollingshead's index of social position (Hollingshead, 1957). Both the participant's and collateral report of the parent's education and occupation were used. More weight was given to the collateral report when the parent was the collateral reporter. Otherwise, the lower education and occupation level was taken as reported from either source. The mean of the mother and father occupation was taken when data for both parents were available. When both the occupation and education for the parent were unknown, the participant parent ISP score was not computed. If only one of the two components was known, the missing information was derived using the available data</p>	16.5–77	52 (12.12)

Orientation Task (Scheier & Carver, 1985), the Zimbardo Time Perspective Scale (Zimbardo, 1990), and the Consideration of Future Consequences Scale (Strathman et al., 1994). The items asked participants to rank the degree to which each statement reflected how they usually behaved. Higher scores indicated a greater degree of future consideration and planning. The consideration of others' score averaged 7 items from the Weinberger Adjustment Inventory (Weinberger & Schwartz, 1990), an assessment of an individual's social-emotional adjustment within the context of external constraints. The items asked participants to rank the extent to which their recent behavior (since the last interview) matched a series of statements regarding consideration of others. Higher scores indicated greater consideration for others.

Temperance, the third component of psychosocial maturation, was created by averaging the impulse control score and the suppression of aggression score, both from the WAI. The impulse control and suppression of aggression scores were based on 16 items (8 items each). The measures asked participants to rank how much their behavior in the past 6 months matched a series of statements on self-control and aggressive tendencies. Higher scores indicated greater suppression of impulses/aggression.

Offending was conceptualized as a covariate of psychosocial maturation and victimization. Offending was based on 22 items from the self-reported offending (SRO) instrument (Huizinga et al., 1991). Participants stated whether they had done any of the following offenses: theft, vandalism, prostitution, drug sales, assault, homicide, and robbery. Having committed one or more of the types of offenses during a 1-year period, inclusive of the 6-month aggregated data, was counted as offending. As offending was a predictor of victimization, it was measured in the year prior to the measure of victimization.

Involvement in unstructured social activities was theorized as a covariate of psychosocial maturation and victimization. Involvement in unstructured social activities was based on the routine activities measure drawn from the "Monitoring the Future" questionnaire (Osgood et al., 1996). Three items specifically tapped activities that occurred in the absence of an authority figure. A fourth item was asked to specify the number of evenings in a typical week the participant spent on fun activities. A combined mean unstructured socializing score was created. As involvement in unstructured social activities was a predictor of victimization, it was measured in the period prior to the victimization measure. During the 3-year period in which two measurements from 6-month interviews were combined, unstructured social activities scores were averaged across each of the two consecutive 6-month measurements. Higher scores indicated a greater involvement in unstructured activities.

Adverse childhood experiences were conceptualized as a confounder of the association between psychosocial maturation and victimization. Adverse childhood experiences were derived from baseline interview questions about life experiences at any time prior to the baseline interview. Items included as adverse childhood experiences (ACEs) were based on the Centers for Disease Control and Prevention's broad definition of ACEs (Centers for Disease Control & Prevention, 2021). They were divorced parents, household member arrested/jailed, household member in mental hospital, in-home parent with drug problems, recollection of physical fights between parents, and the six aforementioned types of victimization. Typically, ACEs are a

sum of the variety of ACEs experienced. In this study, however, ACEs were positively skewed and nearly all participants (99%) experienced one or more ACE. We thus recoded ACE as a seven-level ordinal variable with categories: 0–1 ACE (reference); 2 ACEs; 3 ACEs; 4 ACEs; 5 ACEs; 6 ACEs; 7 or more ACEs.

Covariates

A number of covariates of the association between psychosocial maturation and victimization were included. Each participants' age in years at the time of the interview during which victimization was measured was included as a covariate. Age captures the change in the likelihood of victimization over time. Additionally, psychosocial maturation has been shown to change with age using growth curve modeling (Rocque et al., 2019). A running total of the number of victimizations (the outcome measure) in each annual wave previous to the wave in which the victimization outcome was measured was included. This measure was set to zero at the first measurement occasion of the outcome. Victimization during earlier waves may have affected both maturation and the propensity for later victimization, an autoregressive effect. Sex was measured at baseline. In this study, male sex is coded as 0 and female sex is coded as 1. We were unable to stratify our analysis by sex due to a relatively small number of women in the sample (162 women). IQ was measured at baseline. It was based on the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) and used to estimate participants' level of intellectual functioning, with higher scores indicating greater intellectual ability. Parent socioeconomic status was measured at baseline. It was based on participants' reported parental occupation and education. Parental occupation and education were coded based on Hollingshead's index of social position (Hollingshead, 1957). Both the participant's and collateral report of the parent's education and occupation were used. More weight was given to the collateral report when the parent was the collateral reporter. Otherwise, the lower education and occupation level was taken as reported from either source. The mean of the mother and father occupation was taken when data for both parents were available. When both the occupation and education for the parent were unknown, the score was not computed. If only one of the two components was known, the missing information was derived using the available data.

Analytic Approach

We employed a variety of methods to determine whether psychosocial maturation was a predictor of victimization. Previous research using the Pathways data has shown that individuals become more psychosocially mature as they age (Rocque et al., 2019). We demonstrated this in our analytic sample drawn from the Pathways data. We additionally sought to demonstrate, in the Pathways data, the established finding that victimization declines with age (Hullenaar & Ruback, 2020; Macmillan, 2001). We moved beyond previous research, combining the previous two independent lines of study, by demonstrating the bivariate association between mean psychosocial maturation and the probability of victimization.

We tested the association between psychosocial maturation and victimization using generalized estimating equations (GEE) with robust standard errors. GEE is appropriate when observations are dependent upon one another, as in the Pathways data where individuals were interviewed multiple times. GEE makes an assumption (which is robust to error) about the correlation structure of the data. This correlation structure is then incorporated into the model to allow for correct calculations of standard errors and thus correct confidence intervals. Some evidence indicates that GEE yield more accurate results, relative to maximum likelihood approaches to dealing with non-independence of observations (i.e., mixed or random-effect models) (Hubbard et al., 2010). We additionally used a logit link in the model due to the dichotomous nature of the dependent variable, victimization.

GEE results, like typical regression results, provide information on the average or “between”-individual effect of psychosocial maturation. These results are helpful when trying to understand how psychosocial maturation is associated with victimization in general. However, our research also aimed to understand how individual changes in psychosocial maturation may affect the chance of victimization. That is, we wanted to estimate a “within”-individual effect of psychosocial maturation.

A common approach to separating within- from between-individual effects of a variable measured across multiple points of time is to regress on an individual’s mean of the variable and their deviation from that mean at each period, often referred to as a mean-centered variable. However, models with mean-centered variables have been shown to produce inconsistent estimates when using a logit link in GEE models (Goetgeluk & Vansteelandt, 2008).

One method of overcoming this limitation is to separately estimate within-individual effects using conditional logistic regression models (CLR; also known as “fixed effects models”). CLR model results have been shown to yield similar results to mixed models where within estimates indicate the deviation from the individual’s mean (Neuhaus & McCulloch, 2006). Thus, CLR results are helpful when trying to understand how an individual’s change in psychosocial maturation affects victimization. Across both GEE and CLR methods, we expected greater psychosocial maturation to be associated with lower odds of victimization.

For the GEE and CLR methods, we designed models that tested the crude association between psychosocial maturation measures and victimization. We built upon these models by adjusting for covariates (age, previous victimization, sex, IQ, and parent socioeconomic status), then adjusting for other potential predictors of victimization (offending, unstructured socializing, and adverse childhood experiences). In the CLR models, only time-varying covariates are included in the estimation as the model effectively only estimates effects that change within an individual.

It was possible that the estimates from the CLR models were biased due to “carryover” effects, a term encompassing both direct effects of the predictor variable (psychosocial maturation) or outcome (victimization) at one time-point on itself at the next time-point (often referred to as autoregressive effects), and effects of the predictor variable at one time-point on the outcome at the next time-point, or vice-versa (often referred to as cross-lagged effects) (Selig & Little, 2012; Sjölander et al., 2016). Carryover effects, in this study, would constitute the impact of earlier measures of psychosocial maturation and victimization affecting later measures of

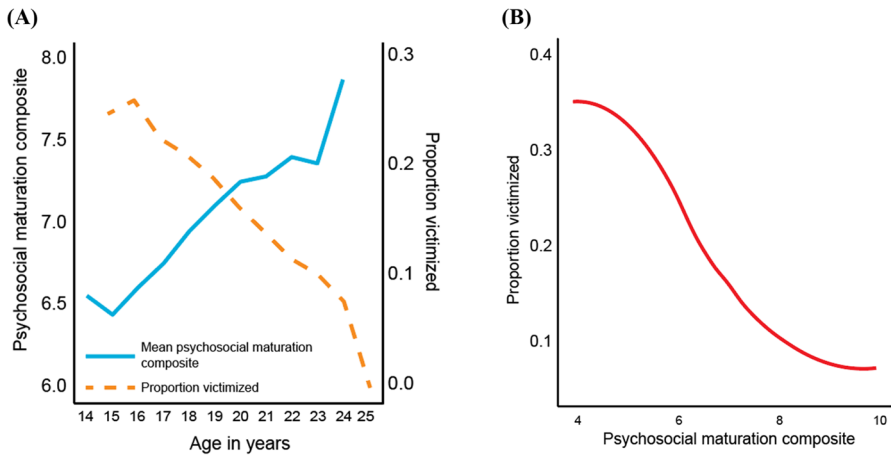


Fig. 1 Panel **A** Mean psychosocial maturation and proportion victimization across adolescence. On average, psychosocial maturation increased with age and the likelihood of victimization decreased with age. Panel **B** Proportion of participants victimized by psychosocial maturation score, smoothed. Participants who had achieved high levels of psychosocial maturation, relative to participants who had low levels of psychosocial maturation, had a lower likelihood of being victimized

psychosocial maturation and victimization. We tested for carryover effects of psychosocial maturation and victimization and found no evidence of bias in our results (“Appendix: Carryover effects” in Supplemental Material).

Additionally, approximately one-third of participants who reported offending also reported victimization and most (86%) participants who reported victimization also reported offending. This meant it was possible that our results were measuring associations with offending. However, tests of models that combined different victim/offender groupings indicated differences between participants who had been victimized relative to those who had only offended. That is, despite many victims also having offended, they appeared different from individuals who had only offended.

The results below are from analyses of the psychosocial maturation composite score. Each of the three components of psychosocial maturation (responsibility, temperance, perspective) was also analyzed separately.

Results

The initial results confirmed previous findings from analyses of the Pathways data. Results showed that advancing through adolescence corresponded with a mean increase in psychosocial maturation (Fig. 1, panel A). We additionally mapped victimization in our sample and found that adolescents were less likely to be victimized as they aged (Fig. 1, panel A). The bivariate association of psychosocial maturation and adolescent victimization indicated that a mean increase in psychosocial maturation corresponded to lower odds of victimization (Fig. 1, panel B).

Tests of the between-person association of psychosocial maturation and victimization were carried out using generalized estimating equations (GEE). GEE models were fit in a step-wise fashion. The first set of models estimated the crude, or unadjusted, association between the psychosocial maturation measures and victimization. Results showed that a roughly one standard deviation increase in the psychosocial maturation composite reduced the odds of victimization by a factor of 0.61 (95% confidence interval (CI) 0.56–0.67; Fig. 2, “crude association, psychosocial maturation composite”). The impact was not as great for the separate components of responsibility (odds ratio (OR), 0.78; 95% CI, 0.72–0.84), perspective (OR, 0.81; 95% CI, 0.76–0.86), and temperance (OR, 0.75; 95% CI, 0.71–0.78) (see Fig. 2, “crude association” “responsibility”/ “perspective”/ “temperance”). These results indicated that the combined influence of different components of psychosocial maturation, as captured by the psychosocial maturation composite measure,

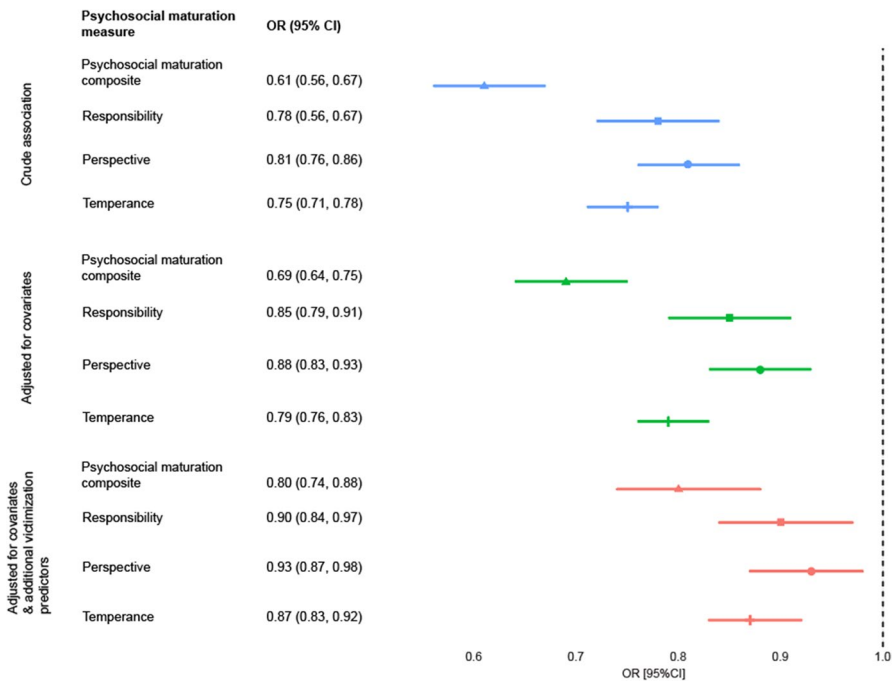


Fig. 2 GEE results of models of psychosocial maturation, responsibility, perspective, and temperance as predictors of victimization. Twelve models, three types for each psychosocial maturation measure, were tested. Results are displayed as odds ratios. Results across all models indicate that all psychosocial maturation measures were associated with lower odds of victimization. Results showed that the effect of the composite measure was stronger than the mean effect of the three components. In crude association models, the psychosocial maturation measure was the only predictor of the outcome of victimization. Models adjusted for covariates included the psychosocial maturation measure and the covariates female sex, IQ, parent socioeconomic status, and age. Models adjusted for additional predictors included the psychosocial maturation measure; covariates female sex, IQ, parent socioeconomic status, and age; additional victimization predictors offending, unstructured social activities, and adverse childhood experiences. Full results are in the supplemental material

was associated with a greater risk than low maturation based on the score from a single component.

The second GEE model estimated the association between psychosocial maturation and victimization adjusting for covariates of sex, IQ, parent socioeconomic status, and age. These variables were theorized to be associated with both psychosocial maturation and victimization. Results showed that a roughly one standard deviation increase in psychosocial maturation reduced the odds of victimization by a factor of 0.69 (95% CI 0.64–0.75; Fig. 2, see “adjusted for covariates, psychosocial maturation composite”), a slightly lower impact relative to the crude estimate. Similar results were found for the responsibility, perspective, and temperance components. Again, relative to the separate components, the composite psychosocial maturation effect was of greater magnitude.

It was possible that the crude association and the association adjusted for covariates could be rendered insignificant upon adjusting for well-established predictors of victimization. The third and final model thus adjusted for covariates and additional predictors of victimization (offending, unstructured socializing, and ACEs). Results showed that a roughly one standard deviation increase in psychosocial maturation reduced the odds of victimization by a factor of 0.80 (95% CI 0.74–0.88, Fig. 2, see “adjusted for additional victimization predictors, psychosocial maturation composite”). Similar results were found for the responsibility, perspective, and temperance components. Again, relative to the separate components, the composite psychosocial maturation effect was of greater magnitude. These results indicated that the association between psychosocial maturation (as well as its components) and victimization was partially mediated and/or confounded by other predictors, but psychosocial maturation still played an independent role as a predictor of victimization.

The CLR (within-individual) method yielded similar results to the GEE (between-individual) method. For example, the crude association CLR models showed that a roughly one standard deviation increase in the psychosocial maturation composite reduced the odds of victimization by a factor of 0.68 (95% CI, 0.60–0.78; Fig. 3, “crude association, psychosocial maturation composite”), an 11% difference in magnitude relative to the between-individual effect. Again, the results of the crude model showed that the psychosocial maturation composite measure had a greater magnitude effect than did any single component.

With more adjustments to the models, the within-individual effect of the psychosocial maturation composite score weakened. In models adjusted for covariates and additional victimization predictors, the effect of the psychosocial maturation composite score (OR, 0.83; 95% CI, 0.70–0.99) was nearly the same as the effect of temperance (OR, 0.85; 95% CI, 0.77–0.94) (Fig. 3, “adjusted for covariates & additional victimization predictors” “psychosocial maturation composite”/ “temperance”). With more adjustments to the models, increases in perspective also appeared to increase the risk of victimization, although not significantly so (OR, 1.03; 95% CI, 0.92–1.16; Fig. 3, “adjusted for covariates, perspective”; OR, 1.06; 95% CI, 0.94–1.19; Fig. 3, “adjusted for covariates & additional victimization predictors, perspective”). The results for responsibility consistently indicated that an increase in responsibility was associated with a reduced risk of victimization, but the statistical significance of the result varied.

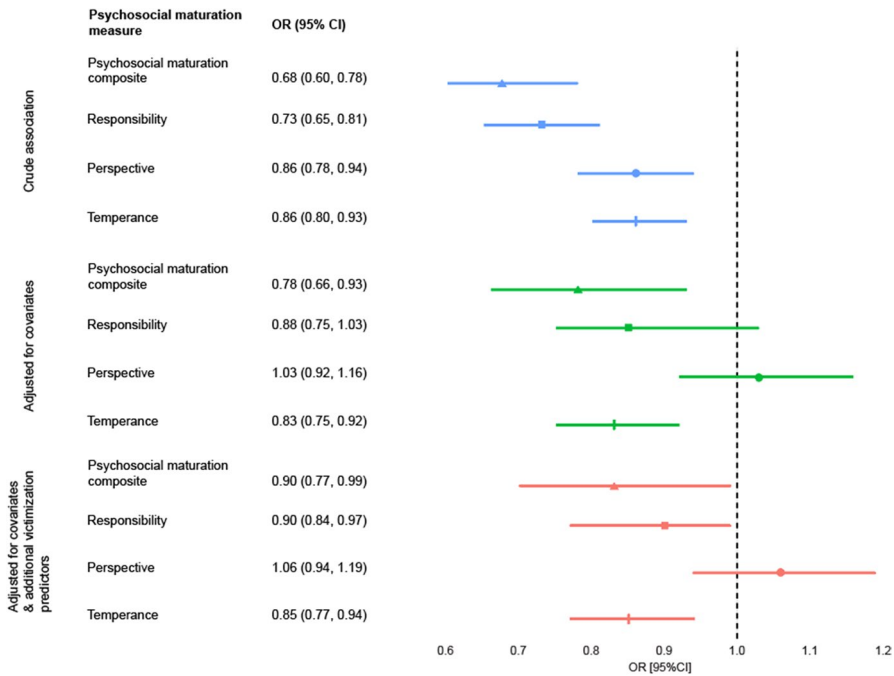


Fig. 3 CLR results of models of psychosocial maturation, responsibility, perspective, and temperance as predictors of victimization. Twelve models, three types for each psychosocial maturation measure, were tested. Results are displayed as odds ratios. Results across all models indicated that the psychosocial maturation composite and temperance were associated with lower odds of victimization. In crude association models, the psychosocial maturation measure was the only predictor of the outcome of victimization. Models adjusted for covariates included the psychosocial maturation measure and covariate age. Models adjusted for additional predictors included the psychosocial maturation measure; covariate age; additional victimization predictors offending and unstructured social activities. Full results are in the supplemental material

Comparing the GEE (between) and CLR (within) methods, the association between the composite psychosocial maturation measure and victimization remained negative (increased psychosocial maturation reduced the odds of victimization). That is, relative to adolescents who, on average, had low levels of psychosocial maturation, adolescents with higher levels of psychosocial maturation had lower odds of being victimized. Also, as adolescents became more psychosocially mature, their odds of victimization decreased. Between adolescents, the psychosocial maturation composite measure showed a greater effect than any of the separate components. However, within-individual adolescents, increases in the psychosocial maturation composite measure appeared to have nearly similar effects of reducing victimization as increases in temperance.

Analyses of the separate components of psychosocial maturation yielded substantively similar results to the results presented below. Full GEE and CLR model results of the psychosocial maturation composite score and the three separate components can be found in the Supplemental Material, Tables S1-S8.

Discussion

The literature on victimization across life is growing. Research has demonstrated that, much like offending, victimization increases into adolescence and then declines (Finkelhor et al., 2013; Fisher et al., 2015; Gottfredson, 1981; Hindelang, 1978; Jennings et al., 2011; Lauritsen et al., 1991; Macmillan, 2001; Moffitt, 1993; Turanovic, 2019). However, our understanding of the changes in victimization during and after adolescence is lacking. In this study, we proposed that psychosocial maturation could help make sense of the spike in victimization during adolescence and its decline as people enter adulthood. Our results showed an association between increases in psychosocial maturation and lowered risk of victimization in a sample of adjudicated adolescents. On average, as adolescents aged, psychosocial maturation increased and victimization decreased. The association between greater psychosocial maturation and lowered risk of victimization was not explained by age, socioeconomic status, or gender. Moreover, psychosocial maturation was an important predictor of victimization beyond other theoretical predictors of victimization including offending, unstructured socializing, and adverse childhood experiences. Additionally, the composite measure of psychosocial maturation showed that multiple sources of low psychosocial maturity compounded the risk of being victimized. The process of psychosocial maturation within adolescents also appeared to be an important predictor of victimization. However, the component of temperance could also be equally helpful in understanding how individual change over time affects one's risk of being victimized.

This study is the first we know of that theoretically linked psychosocial maturation to victimization and represents an advancement in our understanding of victimization from adolescence to early adulthood. As children develop into adults, their psychological and social developments seem to affect their interactions with others in myriad ways that may temporarily increase the risk of victimization. Children pull away from the potential safety offered by parents, they struggle to make decisions, they are attempting to figure out who they are, and they retain childhood tendencies to act impulsively and aggressively. As children mature, their independence from parents becomes less risky as they gain the ability to make independent decisions consistent with their newly formed self-identity, in ways that demonstrate an understanding of the social environment. This process need not start and end in the same place for all individuals, but there is a consistent trend towards greater maturity as people age (Monahan et al., 2009). In this respect, psychosocial maturation theory can help explain the general pattern of peak victimization during adolescence. On the other hand, individual psychosocial maturation allows us to better understand why, for example, not all members in a group of unsupervised youth are threatened or assaulted. Conceptualizing adolescents as vulnerable and/or antagonistic may provide some explanation of how low psychosocial maturation may put adolescents at risk of victimization (Finkelhor & Asdigian, 1996).

Recent work has argued for the importance of practical means of decreasing vulnerability to victimization (Schreck, 2021), and psychosocial maturation

may be one tool that is helpful in this regard. Psychosocial maturation may be reflective of decision-making ability or behaviors associated with victimization and criminal justice assessments can help better understand such tendencies.¹ For example, using only a 10-item maturity screening tool, low maturation was shown to be associated with reoffending among young men (Wakeling & Barnett, 2017). Upon identification of adolescents low in psychosocial maturity and at risk of victimization, reducing the chance of victimization seems possible through programs targeted at aspects of psychosocial maturation. The successful Enhanced, Assess, Acknowledge, Act (EAAA) Sexual Assault Resistance Program aims to develop foresight of potential danger, improving confidence in decision-making, and encouraging the development of self-identity (<http://sarecentre.org/>). These changes are theoretically related to components of psychosocial maturation (e.g., responsibility). The importance of temperance in reducing victimization risk aligns with evidence on the success of programs aimed at reducing impulsivity and sensation seeking (Piquero & Rocque, 2020; Piquero et al., 2016; Romer et al., 2010). Given the generally high risk of victimization among adolescents, school-wide programs targeting risky behaviors may also be effective if peers take a leadership role and encourage non-risky behavior (Campbell et al., 2008; Paluck et al., 2016).

Theoretically, the findings of this study can be understood within several frameworks. As a theory itself, psychosocial maturation has been applied to crime and delinquency, but may be more generalizable. Because of the well-established link between crime and victimization (Lauritsen et al., 1991), it may not be surprising that a theory of antisocial behavior also explains victimization. However, maturation may be useful in explaining not only risky behavior but engagement in contexts in which the risk of victimization is higher. In this way, psychosocial maturation as an explanation of the risk of victimization could certainly be subsumed under the theory of routine activities. Routine activity theory could, for example, explain psychosocial maturation as the means by which adolescents become more attractive targets or end up in the company of offenders. But, this reductionist approach does little to help us understand the complexity behind the thoughts and behaviors that go into action and, thereby, is of limited utility in reducing victimization risk. Indeed, a routine activity approach would argue that structured settings would be best at preventing victimizations. However, evidence indicates that a lack of parental supervision in general leads to a greater likelihood of victimization and risky situations (J. Miller, 2013; Osgood et al., 1996). Moreover, making unsupervised decisions, and even making risky

¹ An anonymous reviewer correctly noted that the question of developmental maturity needs to be considered when trying to teach people about avoiding risky behaviors, anticipating why people do not take precautions, or why people choose protective actions that are unresponsive to actual risk (or simply are dangerous in themselves). For instance, developmentally immature people may see nothing wrong whatsoever with defensive weapons or mouthing off at a potential attacker—whereas a developmentally mature person would not consider either because both represent courses of action that are extremely dangerous. Recent theoretical work in the area of self-control by Vohs and Piquero (2021) represents a useful step in this direction with their distinction between steering and braking.

decisions, seems to be an important part of adolescent development (Blakemore, 2018; Finkelhor & Asdigian, 1996; Romer, 2010; Spear, 2007). Overall, this study supports arguments that theoretical development on victimization processes over life requires exploration beyond traditional criminological theories (Pratt & Turanovic, 2021).

Future research could expand from this study in several ways. For example, psychosocial maturation occurs in concert with a number of biological changes. Physical maturation, neurological development, and genetic factors have been found to be important in explaining aspects of psychosocial maturation and/or victimization (Crone & Dahl, 2012; Harden & Mendle, 2012; Schreck et al., 2007; Skoog et al., 2016; Stattin & Magnusson, 1990). Testing the age bounds of psychosocial maturation as a correlate of victimization also seems important. Once an individual reaches their peak maturation during adulthood, their identity formation is theoretically complete. Low psychosocial maturation may be less helpful in explaining behavior from middle adulthood and beyond (Wakeling & Barnett, 2017).

To be sure, this study has limitations. The analyses were carried out on a group of adjudicated offenders who, relative to the general population, had high rates of offending. While some research has shown that nearly all adolescents are involved in some form of delinquency or offending, few are actually processed through the criminal justice system (Beckley et al., 2016). It is important to understand whether psychosocial maturation can predict victimization in a general adolescent sample. Also related to the sample, it is difficult to assess the meaning of unstructured socializing, and its implications for routine activity theory, due to the adolescents' adjudicated status and potential legal restrictions on socializing outside of the home and/or with certain friends. This study's results showing that unstructured socializing had non-significant associations with victimization (see Supplemental Material) must be replicated in representative samples of adolescents before drawing conclusions on the relationships between unstructured socialization, psychosocial maturation, and victimization.

This study was also unable to explore sex differences in psychosocial maturation and victimization. While our sample included women, there were likely too few (162 women) to be confident in the power of our analysis to detect a significant result (Li & McKeague, 2013). Evidence of differences in both psychosocial maturation and victimization indicates that further research into sex differences in the association between psychosocial maturation and victimization is a worthwhile endeavor (Cauffman & Steinberg, 2000; Hullenaar & Ruback, 2020).

The measure of victimization in this study was limited to three types of severe violent victimization (assaults, threats, and gun violence) asked about in six questions. This measure thus omitted property crime victimization and potentially lacked sensitivity to detect all violent victimizations. Despite those limitations, a relatively large proportion of adolescents experienced severe violent victimization. Given the evidence that adolescent victims appear to be victimized in many ways (Fisher et al., 2015), we would expect that psychosocial maturation would predict all types of victimization. Research should aim to expand measures of victimization both in terms

of types of victimization and in terms of the number of items used to assess similar types of victimization. Additionally, our measure of victimization was limited to whether or not it occurred during a year, not how often it occurred. Although multiple types of victimization during a year were rare, it is possible that there were multiple occurrences of the same type of victimization. Research into repeat victimization may be important for refining our understanding of the risks of low psychosocial maturation. Finally, with regard to victimization, specifics on the perpetrator and whether the event was random (like being caught in the crossfire of a shooting) would also be helpful in understanding how individual traits impact victimization. Some evidence indicates that the perpetrator traits matter little when considering traits of the victim (Schreck et al., 2021).

This study represents an important first step in understanding how psychosocial maturation may be related to victimization. As psychosocial maturation appears to serve as a protective factor against victimization, at least in our sample of youthful offenders, risk assessments based on psychosocial maturation may be helpful in preventing victimization. The easy and rapid identification of vulnerable individuals may prevent victimization if targeted interventions are developed and implemented.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s40865-021-00182-8>.

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