The Role of Life Satisfaction in Predicting Youth Violence and Offending: A Prospective
Examination

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Abstract

Life satisfaction in adolescence has been shown to protect against numerous negative outcomes (e.g. substance-use, sexual risk-taking), but limited work has directly explored the relationship between life satisfaction and youth violence and offending. As such, we conducted a prospective assessment to explore this relationship among community ($n = 334$), and at-risk youth ($n = 99$). Findings suggest life satisfaction is significantly associated with decreased offending and violence within both samples and adds incremental value above established risk factors in predicting violent and total offending among community youth. Furthermore, moderation analyses indicate that the protective value of life satisfaction is greater for youth with high callous-unemotional traits. Mediation analyses suggest that youth who are unsatisfied with their lives may seek out substance use, in turn elevating risk for offending. Together these findings indicate that efforts to improve overall life satisfaction may help prevent adolescent offending. However, future research is needed.

Keywords: Youth offending, violence, life satisfaction, protective factors

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Criminal behavior and violence rank among the most costly and detrimental social problems facing today's general public. Given the high humanitarian (e.g., injury, death) and financial toll of violence and criminal conduct (e.g., costs associated with incarceration), an important objective is to understand the factors that facilitate and sustain antisocial behavior. Because individuals who develop a pattern of offending early in life are more likely to continue a criminal trajectory into adulthood (Cale, 2015; Loeber et al., 2011) researchers have long recognized the importance of studying youth violence and delinquency to develop intervention and treatment programs that encourage desistance from criminal careers.

More recently, the field has witnessed increasing interest in studying not only factors that increase risk for antisocial youth outcomes, but also those that protect against the development of delinquent trajectories. Although researchers and practitioners widely agree that protective factors are important, research on protective factors has been slow to advance. One of the primary barriers to research in this area revolves around the argument that many so-called protective factors are merely inverted risk factors (e.g., high school commitment vs. low school commitment). To address this issue, the present study examined a relatively novel protective factor: Life satisfaction. Importantly, although high life satisfaction is associated with numerous positive outcomes (Diener & Chan, 2011; Martin, Huebner, & Valois, 2008), low life satisfaction does not constitute an established risk factor in most evidence-based theoretical models of antisocial behavior (e.g. Catalano & Hawkins, 1996; Bonta & Andrews, 2017). Here we explore whether adolescents with high life satisfaction are less likely to offend, and investigate the impact of substance use and psychopathic personality features on the relationship between life satisfaction and delinquent behavior. In doing so, we advance the state of the literature on protective factors and provide insight into the potential value of life satisfaction for intervention and assessment purposes.

Risk and Protective Factors

To date, decades of research have been dedicated to quantifying youth risk for criminal and antisocial behavior. Such research has resulted in the development of highly effective and widely utilized offender management and rehabilitation models, such as the Risk-Need-Responsivity model (RNR; Bonta & Andrews, 2017). The RNR model, along with other similar risk (or deficit) based models of offending behavior, aim to mitigate risk for future offending by targeting individual criminogenic needs (i.e., dynamic offender attributes which increase likelihood of offending behavior) and tailoring treatment to individual learning style and ability. Interventions that adhere to RNR principles are effective in reducing recidivism (Andrews & Dowden, 2005). Moreover, empirical work has demonstrated that treatments that ignore RNR principles are generally unsuccessful or detrimental (Andrews & Bonta, 2010; Katsiyannis, Whitford, Zhang, & Gage, 2017).

Although criminogenic needs are relevant in understanding youth criminality and informing rehabilitation strategies, risk-based models of youth rehabilitation have received criticism for their deficit or "problem-centered" orientation (Ward, Mann, & Gannon, 2007; Ward & Stewart, 2003; Ward & Willis, 2010; Ward, Yates, & Willis, 2012). Indeed, the

application of risk management models to young offenders has been faulted for placing too much emphasis on avoidance of community harm, and not enough focus on enhancing offender capabilities and strengths (Ward & Marshall, 2004; Ward & Stewart, 2003; Ward et al. 2012). Emerging theory that bridges the positive psychology and criminal offending literatures provides strong reasons to expect that applying strengths-based approaches to the problems of youth violence and offending may be beneficial in militating individuals against future criminal behaviors and increasing desistance (Tweed, Bhatt, Dooley, Spindler, Douglas, & Viljoen, 2011). For example, the Good Lives Model (Ward & Stewart, 2003) incorporates insights from positive psychology and Self-Determination Theory (Ryan & Deci, 2000) to argue that offender intervention strategies should prioritize addressing human needs related to well-being (Ward, Mann, & Gannon, 2007; Ward & Stewart, 2003). Under this model, once offenders are provided with healthy strategies to meet these needs and improve quality of life, a reduction in offending behavior will follow as a logical outcome.

The notion that criminal offending and violence research should strive for a more balanced approach to understanding criminal behavior is gaining traction in the field. More recently researchers have extended empirical focus to include the exploration of protective factors and resilience assets (i.e., conditions or attributes that eliminate or mitigate risk) as opposed to focusing solely on risk factors (Perkins & Borden, 2003), particularly among youth populations. For instance, protective factors (e.g., strong attachments and bonds, resilient personality traits, prosocial involvement) are now included within several risk assessment tools, such as the Structured Assessment of Violence Risk in Youth (Borum, Bartel, & Forth, 2003), the Short Term Assessment of Risk and Treatability-Adolescent Version (Viljoen, Nicholls, Cruise, Desmarais, & Webster, 2014), and the Structured Assessment of Protective Factors-Youth Version (de Vries Robbé, Geers, Stapel, Hilterman, & Vogel, 2015). Several recent evaluations of such tools suggest that higher scores on protective factors are associated with decreased levels of violence and offending (e.g. Borum, Lodewijks, Bartel, & Forth, 2010; Desmarais, Wilson, Nicholls, & Brink, 2010), and that protective factors add significant incremental value above risk factors in explaining violent and criminal behavior (Lodewijks, de Ruiter, Doreleijers, 2010; but see Viljoen, Bhanwer, Shaffer, & Douglas, 2018).

Yet despite promising findings, there exists some skepticism in the field that protective factors yield additive benefits above risk factors. Among the most frequently cited concerns are that protective factors are merely "recycled" risk factors that provide little or no additive value for risk assessments (e.g., Harris & Rice, 2015). Though some protective factors can be re-phrased as risk factors (e.g. self-control vs. impulsivity), it is currently unclear whether the inverses of all protective factors constitute validated risk factors.

Life Satisfaction and Youth Offending

One variable without an established corresponding risk factor is life-satisfaction, which has been defined as the cognitive appraisal of one's quality of life as a whole, encompassing high levels of positive affect and low levels of negative affect (Diener, 1984). As a construct, life satisfaction has been shown to predict positive outcomes, such as financial stability in later life (de Neve & Oswald, 2012), decreased negative peer-to-peer interactions, increased prosocial experiences (Martin, Huebner, & Valois, 2008), and increased longevity (Diener & Chan, 2011).

Importantly, life satisfaction has also been linked to increased prosocial behaviors, psychosocial functioning, and positive interpersonal relationships among youth (Proctor, Linley, & Maltby, 2009).

Recent empirical work also suggests that life satisfaction may protect against the development of delinquent behavior and predict desistance from crime among adolescent offenders. For example, Sun and Shek (2010) found that life satisfaction was associated with positive youth development—a construct referring to interrelated variables such as bonding, social competence, moral competence, and self-determination. Positive youth development programs in turn, have been shown to have a significant impact on adolescent behavioral outcomes. According to a comprehensive review of several youth development programs in the United States, about 76% of these programs increased youth prosocial behaviors, and about 96% decreased problem behaviors such as delinquency and substance abuse (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004).

Correlational work has also shown that life satisfaction (or lack therefore) is associated with prosocial and antisocial outcomes among youth. Specifically, life *dis*satisfaction has consistently exhibited moderate to high positive correlations with problem behaviors such as drinking and driving, violence and aggression, substance use, sexual risk-taking, dating violence, and theft (Valois, Zullig, Huebner, Kammermann, & Drane, 2002). Conversely, high life satisfaction has been shown to negatively predict a range of antisocial criteria including substance use and violence (Desousa, Murphey, Roberts, & Anderson, 2008; MacDonald, Piquero, Valois, & Zullig, 2005), but increases the likelihood of a number of desirable adolescent outcomes such as emotional competence, self-efficacy, belief in the future, prosocial involvement, and resilience (Sun & Shek, 2009).

Although a growing body of work suggests that life satisfaction is associated with antisocial behavior in youth, the majority of this work is cross-sectional. That is, information on life satisfaction and relevant outcome variables are collected at a single time point. Such designs allow for the assessment of the association between two variables, but do not establish temporality—an important feature for inferring causal relations between the variables of interest. To the best of the authors' knowledge, only two longitudinal studies have explored the influence of life satisfaction on antisocial behavioral outcomes. In particular, one study with adult forensic psychiatric outpatients found that health satisfaction and life fulfillment significantly predicted decreased self-reported violent and general offenses at a 3-month follow-up while controlling for risk level, and general satisfaction was found to buffer risk for violent re-convictions (Bouman, Schene, & de Ruiter, 2009). These findings were supported by recent work by Van Damme and colleagues (2016), who applied the Good Lives Model to a sample of 95 detained female adolescents to explore the impact of quality of life on future mental health problems and offending. The authors found that females with the lowest quality of life scores at baseline had the highest rates of mental health problems at discharge. Mental health problems (measured by the Massachusetts Youth Screening Instrument-Version 2; MAYSI-2), in turn, were significantly associated with offending behavior at 6-month follow-up. Furthermore, structural equation modeling confirmed a significant indirect pathway from quality of life to offending behavior, such that low quality of life increased risk of mental health problems, which subsequently increased risk for future offending.

Despite promising findings, it is also possible that increased life satisfaction could be associated with negative outcomes—especially within certain subsets of criminally inclined youth. Indeed, certain classically positive attributes, such as social intelligence or self-esteem, have been shown to be associated with *increases in* antisocial behaviors in some cases. For example, high social status and skills have been shown to accompany increased power and use of relational aggression and peer manipulation among adolescent bullies (Peters, Cillessen, & Sholte, 2010). Similarly, though high self-esteem is generally thought to be an indicator of psychological health and well-being, holding oneself in high-regard is linked to increased violence and aggression in response to ego threats among adults and youth (Baumeister, Smart, & Boden, 1996). As such, it is possible that life satisfaction among offenders may *increase* criminal effectiveness and reinforce criminal behaviors—especially among youth exhibiting psychopathic features and callous unemotional (CU) traits. CU traits are distinguished by decreased empathetic concern, deficient affective experience, lack of remorse or guilt, and are marked by a pattern of behavior that reflects disregard for the well-being of others (Frick & White, 2008). Youth with high CU traits are often over-represented in adolescent offending populations and commit violent and aggressive acts at a higher rate than others (Frick & White, 2008;Thornton, Frick, Shulman, Ray, Steinberg, & Cauffman, 2015). As such, it is possible that for youth with high CU traits, high life satisfaction may result in limited motivation to change antisocial behaviors and desist in offending. In other words, youth with high CU traits who are also satisfied with the state of their lives (and see benefit in antisocial action) may do little to decrease engagement in delinquent activities. Although this appears an important question for research exploring the value of life satisfaction for youth offenders, it has yet to be explored in prospective research.

Current Study

Despite increasing interest in the influence of life satisfaction on antisocial and offending behavior in youth, rigorous empirical work exploring this relationship is scarce and the majority is cross-sectional, thereby precluding causal inferences. Thus, the aim of the present study was to build upon preliminary findings in the literature by employing a prospective design to determine if life satisfaction may prevent adolescent offending from a primary prevention perspective (i.e., among community youth of the age that offending behaviors commonly first appear; see Loeber & Farrington, 2011), and a secondary prevention perspective (i.e., among youth who are already at-risk or have had contact with the justice system (van Dijk & de Waard, 1991). Within these two samples we explored the following questions: First, is life satisfaction predictive of decreased self-reported delinquent behavior (total and violent offending) at six-month follow-up? Second, is life satisfaction related to self-reported total and violent offending after controlling for established risk factors? That is, does life satisfaction add incremental value in predicting the incidence rate of self-reported offending? Because it is possible that life satisfaction may antagonize offending in certain subsets of youth, such as those displaying highly callous unemotional traits or psychopathic features, a third aim of the present work is to determine whether CU and/or general psychopathic tendencies moderate the relationship between life satisfaction and offending. Finally, given recent findings in the literature regarding the indirect influence of substance abuse/mental health problems on the relationship with life satisfaction and offending (Mohamad, Mohammad, Mat Ali, & Awang, 2018; Van Damme Hoeve, Vermeiren, Vanderplasschen, & Colins, 2016), we employ mediation analyses to

examine the relevance of substance use problems within both samples. All materials related to this research are available upon request to the first author.

Methods

Procedure

The present study collected data from both a community and at-risk sample of adolescents. Youth in the community sample were grade 8 and 9 students recruited from public high schools within a moderately sized and ethnically diverse city in Western Canada. Youth in the at-risk sample were recruited from outreach programs that provide alternative education, addiction counseling, housing support, as well as youth justice support programming to youth and families. All youth attending these programs that were between the ages of 13 and 18 were invited to participate. Youth were provided with study recruitment materials including information packets and consent forms to take home to their parents/legal guardians. Youth could participate in the study if their parents/guardians provided consent and the youth provided assent. Once permission to participate had been received, youth completed a series of self-report questionnaires, including measures of life satisfaction, substance use, offending behavior, and delinquent peer association, as well as the Antisocial Process Screening Device- Self Report (APSD-SR; Frick & Hare, 2001), a measure of psychopathic traits suitable for use with adolescent populations. Approximately six months after baseline assessment, youth were contacted for a follow-up assessment and completed the same measures included in the initial assessment.

Participants

Community sample. A total of 417 youth were recruited from public high schools in a large metropolitan centre (location redacted for blind review). Participant attrition was 16.1%, with 67 youth who did not complete a follow-up assessment. Of the youth for whom follow-up information was obtained, 12 individuals (3.0%) had missing baseline life satisfaction data (i.e. one or more of 6 questions left unanswered), or had missing offending data at six-month follow-up (i.e. more than 10% missing data). A further four participants (1.0%) had missing data for psychopathic features (i.e. five or more unanswered questions on the total APSD scale, or 1 or more unanswered questions on the Callous-Unemotional Subscale). These individuals were removed from analyses.[i] The final sample was comprised of 334 high-school students (186 females and 147 males). Age of the participants ranged between 12 and 14 years ($M = 13.10$ years, $SD = 0.40$). The largest proportion of the sample identified as South Asian (e.g., East Indian; 46.4%, $n = 136$), followed by Asian (22.9%, $n = 67$), Caucasian (17.4%, $n = 51$), Indigenous (4.4%, $n = 13$), Hispanic (2.4%, $n = 7$), African (2.4%, $n = 7$), and another ethnic minority group (4.1%, $n = 12$).

At-risk sample. A total of 127 at-risk youth were recruited from 3 community outreach centres, 1 probation centre, and 1 youth custody centre located in the same large metropolitan area (location redacted for blind review). Participant attrition from baseline was 15.7% ($n = 20$). Of the youth who completed follow-ups, a total of 8 youth (7.0%) did not have useable baseline life satisfaction data (i.e., one or more questions left unanswered) or had missing offending data

at six-month follow-up (i.e. more than 10% missing data) and were excluded form analyses.[ii] No additional youth were excluded on the basis of insufficient data for psychopathic features, leaving a final sample of 99 youth between the ages of 12 and 17 (M_{age}= 15.24, SD = 1.54). Participants self-identified as Caucasian/European (45.6%, n = 36), Indigenous (24.1%, n = 19), South Asian (12.7%, n = 10), Hispanic/Latino (7.6%, n = 6), African (5.1%, n = 4), and Asian (5.1%, n = 4).

Measures

Life satisfaction.   Life satisfaction was assessed at the baseline assessment using the Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS; Huebner, Suldo, Valois, Drane, & Zullig, 2004), a widely used, 5-item questionnaire that measures life satisfaction in five domains (i.e., friends, family, self, school, and living environment). Consistent with prior work (Abubaker et al., 2016), an additional item measuring global life satisfaction was also included bringing the total number of items to six. Each item was rated on a 7-point Likert Scale from *terrible* (*1*) to *delighted* (*7*) scale. Internal consistency estimates for the BSMLSS are good within elementary and high school populations and improve when the sixth item is added (Cronbach's alpha [α] = .76 to .85; Seligson, Huebner, & Valois, 2005). In the current study, internal consistency of the BSMLSS was good (community sample: α = .88, at-risk sample: α = .84).

Substance use.   Substance use was examined at baseline and six-month follow-up using the Drug and Alcohol Use-Teen Conflict Survey (DAU; Bosworth & Esplange, 1995), a 6-item questionnaire assessing drug or alcohol use within the past 30 days. Responses were given on a 4-point Likert scale ranging from *never (0)* to *five or more times (3)*. In the current study, internal consistency of the DAU was good at baseline (community sample: α = .78, at-risk: α = .83) and follow-up (community sample: α = .82; at-risk sample: α = .84).

Delinquent peers.   Delinquent peer group association was assessed at baseline using the Delinquent Peer Association Scale (DPAS; Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1994), an 8-item scale which measures the proportion of a youth's friends who are involved in delinquent activities. In the current study, an additional item measuring gang involvement was included, bringing the total number of items to 9. Items were rated on a 4-point Likert-scale ranging from *none (0)* to *most (3)*. This scale has demonstrated good internal consistency in prior research (e.g., α = .88, Thornberry et al., 1994). In the current study, internal consistency of the DPAS was also good (community sample: α = .76, at-risk sample: α = .94).

School problems.   School problems were explored through each youth's responses to three questions on school difficulty and school failure at the baseline assessment. Two yes/no questions, "Have you ever been suspended from school?" and "Have you ever been expelled from school?," were significant positively correlated (community sample: r_{pb} = .20, p <.001; at-risk sample: r_{pb} = .52, p <.001) and were therefore combined into a single outcome assessing school difficulty. The third question, "How often do you get failing grades on school work" assessed school failure. Responses to this item were collapsed into *never* (0) or *sometimes or a lot* (1).

Psychopathic features. Psychopathic features were assessed at baseline using the self-report version of the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), a self-report measure of psychopathic personality features in youth. The scale was originally designed for use with clinic referred and community-based children but has also been validated for use with adolescent offending populations (Vitacco, Rogers, Neumann, 2003; Shaffer et al., 2016). The APSD includes 20 items in three subscales: Narcissism (7 items; "I brag a lot about my accomplishments, or possessions"), Impulsivity (5 items; "I act without thinking of the consequences"), and Callous-Unemotional (6 items; "My emotions are shallow and fake"). All items on the self-report APSD are answered on a 3-point Likert-scale from *not at all true* (0) to *definitely true* (2). Research has provided support for the three-factor structure of the APSD in community and offender samples (Frick, Bodin, & Barry, 2000; Vitacco, Rogers, & Neumann, 2003). APSD Total scores have demonstrated adequate internal consistency in prior research (α's = .61-.81 Barry, Frick, & Killian, 2003); however, the internal consistency of domain level scores has been somewhat less consistent (α's = .44-.85 for NAR and IMP domains, α's = .22-.61 for CU domain; Lee, Vincent, Hart, & Corrado, 2003; Muñoz & Frick, 2007; Poythress et al., 2006). In line with these findings, in the current study, APSD total scores demonstrated acceptable to good internal consistency (community sample: α = .72; at-risk sample: α = .82), while internal consistency was lower for the CU subscale scores (community sample: α = .44, at-risk sample: α = .38).

Offending. Youth offending behavior was assessed at baseline and 6-month follow-up using the Self-Report of Offending (SRO; Huizinga, Esbensen, & Weiher, 1991), a 24-item measure of engagement in criminal activity. In the current study two sex-related items of the SRO ("Have you ever paid someone to have sex with you?" and "Have you forced someone to have sex with you?"), and an item related to homicide were excluded from data collection due to concerns about the appropriateness of these items with youth. Each item is answered as *yes* (1) or *no* (0). At the baseline assessment, each item was answered regarding a youth's lifetime and at the 6-month follow-up each item was answered in reference the previous six-month period. Total scores representing any offending at the baseline and 6-month follow-up assessments were generated by summing the total number of *yes* responses to each item. In addition, at 6-month follow-up we calculated a violent offending score by summing *yes* responses to 8 items on aggressive and violent behavior (i.e., "Have you ever physically attacked somebody so badly they needed a doctor?"). The SRO has demonstrated results consistent with official measures of delinquency (Chung & Steinberg, 2006). Due to the binary nature of the SRO items, tetrachoric ordinal alphas were computed to assess internal consistency (Zumbo, Gadermann, & Zeisser, 2007). Within the current study, SRO total scores exhibited adequate to good internal consistency (community sample: α = .94; at-risk: α = .79). In addition, internal consistency of SRO violence subscale scores was adequate to good (community: α =.79, at-risk: α = .66).

Demographic control variables. Demographic control variables included a youth's sex (i.e., *female* [0], *male* [1]), age, and ethnicity (i.e., *Caucasian* [0], *ethnic minority* [1]).

Data Analytic Plan

Given that total scores for general and violent reoffending at 6-month follow-up were significantly positively skewed, we used non-parametric approaches to analyze the data. First,

we computed Spearman's rho correlation coefficients (r_s) in IBM © SPSS Version 22 (IBM Corporation, 2013) to examine whether baseline life satisfaction scores were predictive of self-reported total and violent reoffending. Second, we conducted Poisson analyses using the "MASS" package (Hilbe, 2011) in R (R Core Team, 2014) to explore whether life satisfaction added incrementally to common criminogenic factors and demographic characteristics in the prediction of number of self-reported re-offenses. However, given that violent offending in the community sample (χ^2 [1] = 4.60, p = .032) was over dispersed (i.e., high proportion of zeros), we used a negative binomial model rather than a Poisson model, as recommended by Gardner and colleagues (Gardner, Muley & Shaw, 1995)[iii].

Third, we conducted a set of Poisson and negative binomial regression models to test whether psychopathic features (i.e., APSD total or CU subscale scores) moderated the relationship between life satisfaction scores and self-reported total or violent offending (Baron & Kenny, 1986). To reduce nonessential multicollinearity, we centered baseline life satisfaction and APSD total or CU subscale scores and then entered these variables along with their cross-product term in a Poisson or negative binomial regression model (as appropriate to the distribution; Baron & Kenny, 1986).

Last, we conducted mediation analyses, using negative binomial regression, to examine whether recent substance use (i.e., within the past 6-months of the follow-up assessment) mediated the relationship between life satisfaction and total reoffending at 6-month follow-up (Baron & Kenney, 1986). These analyses were conducted using SPSS Version 22 (IBM Corporation, 2013). If regression equations suggested partial or full mediation, we used the Sobel test (Sobel, 1982) to examine if the indirect effect of the independent variable on total offending via the mediator was significant.

Results

Does Life Satisfaction Predict Reoffending?

In both the community sample and the at-risk sample, life satisfaction significantly predicted lower total and violent offending during the six-month follow-up period (see Table 1). As such, we next tested the incremental validity of life satisfaction above common criminogenic and demographic factors in predicting total and violent offending outcomes (Tables 2 and 3). In the community sample, adding life satisfaction to the total offending model provided significant incremental predictive validity over common criminogenic factors and demographic characteristics (χ^2 [9] = 233.10, p < .001, $\Delta \chi^2$ [1] = 9.31, p = .002; see Table 2). In addition, life satisfaction added incremental value beyond common criminogenic factors and demographic characteristics in the prediction of violent offending (χ^2 [9] = 106.63, p < .001, $\Delta \chi^2$ [1] = 5.38, p = .020; see Table 3). In contrast, in the at-risk sample, adding life satisfaction to risk and demographic factors did not improve predictive validity for total offending scores ($\Delta \chi^2$ [1] = 0.40, p = .527; see Table 2) or violent offending models ($\Delta \chi^2$ [1] = 0.01, p = .920; see Table 3).

Do Psychopathic Features Moderate the Predictive Validity of Life Satisfaction?

Within the community sample, APSD total scores did not moderate the association between life satisfaction and total offending when controlling for significant covariates (i.e., delinquent peers, school difficulty, school failure, lifetime offending, and age; interaction Exp [B] = 1.00, p = .135), nor did APSD total scores moderate the association between life satisfaction and violent offending controlling for significant covariates (lifetime offending; interaction Exp [B] = 1.01, p = .125). However, CU traits significantly moderated associations between life satisfaction and total (interaction Exp [B] = 1.03, p < .001) and violent offending (interaction Exp [B] = 1.02, p = .045).

To probe significant interactions, we plotted and examined slopes separately for youth scoring low and high on life satisfaction, and low and high on psychopathic features (i.e., 1 SD above or below mean scores on each measure). Youth with high CU traits and high life satisfaction had a significantly *lower* rate of general and violent offending compared to youth with high CU traits and low life satisfaction scores, but life satisfaction was not related to total or violent offending among youth with low CU traits (see Figures S1 and S2). In the at-risk sample, neither APSD total nor CU subscale moderated the association between life satisfaction and total offending controlling for significant covariates (i.e., substance use, delinquent peers, school difficulty, and school failure; Exp [B] = 1.00 to 1.01, p = .306 to .951) or the association between life satisfaction and violent offending controlling for significant covariates (i.e., school difficulty and school failure; interaction Exp [B] = 1.00 to 1.03, p = .22 to .83).

Does Substance Use Mediate the Relationship Between Life Satisfaction and Any Offending?

To determine if substance use might account for the observed relationships between life satisfaction and total and violent offending in our community and at-risk sample, we specified four mediation models exploring the explanatory relevance of recent substance use problems (see Baron & Kenny, 1986). In the community sample, recent substance use partially mediated the relationship between life satisfaction and total offending, and fully mediated the relationship between life satisfaction and violent offending. In both models, low life satisfaction was a significant predictor of substance use (i.e., test Path A; b = -0.16, Exp [B] = .85, p < .001). When life satisfaction and substance use were simultaneously regressed on total and violent offending (test Path B), substance use remained a significant predictor in the models (respectively, b = .61, Exp [B] = 1.83, p <.001; b = .44, Exp [B] = 1.56, p < .001) and the association between life satisfaction and total offending weakened (test Path C'; b = -.04, Exp [B] = .96, p =.009) or dropped to non-significant (b = -.03, Exp [B] = .97, p = .10, respectively). Evidence of mediation was confirmed in both models using a Sobel test, z_{total} = -4.84, p <.001, $z_{violent}$= -4.84, p<.001). Thus, findings suggest support for an indirect negative pathway from life satisfaction to offending whereby (a) life satisfaction has a significant direct negative impact on substance use (b =-0.16), (b) substance use in turn increases the likelihood of total and violent offending (bs = .61, .44), and (c) the indirect negative effect of life satisfaction via substance use on offending is significant (bs = -0.04, -.003).

In the at-risk sample, substance use once again fully mediated the association between life satisfaction and total offending: test Path A: b = -0.06, Exp [B] = .94, p = .004, test Path B: b = .12, Exp [B] = 1.13, p = .001, test Path C': b = -0.05, Exp [B] = .95, p = .06, which was

confirmed using a Sobel test, $z = -2.12$, $p = .03$. However, we found no evidence of mediation in predicting violent offending for at-risk youth**.**

Discussion

The primary aim of the present study was to examine the role of life satisfaction in the development or continuation of criminal behavior and violence among youth. Overall, our findings suggest that life satisfaction relates in important ways to adolescent offending. Among both community and at-risk youth, baseline life satisfaction was significantly negatively associated with self-reported total and violent offending outcomes at 6-month follow-up. These findings dovetail with recent empirical work in the literature suggesting that individual perceptions of life-quality may exert considerable influence on the decision to engage in criminal activity (Bouman et al., 2009; Van damme et al., 2016), and provide further support for the relevance of subjective well-being for criminal justice-related and forensic psychological research.

Although more research is needed on this subject, findings from the present work support the notion that protective factors and resilience assets are worthy targets for informing intervention and prevention strategies, and hold value for assessment purposes. Here, although non-significant when controlling for established risk factors (e.g. antisocial peers, substance use, and history of past offending), life satisfaction *was* significantly associated with decreased self-reported offending at six-month follow up among at-risk youth. Further, among community youth, life satisfaction was shown to significantly buffer risk for violent and total offending and retained this relationship even while controlling for established risk indicators. Further, adding life satisfaction to risk factors in models predicting offending outcomes improved the explanatory value of the model.

These findings suggest that the protective power of life satisfaction may be of increased salience for youth populations at the cusp of developing antisocial behavioral patterns, but that this value may be more limited for youth who are already at considerable risk for offending. Such results are in line with other prospective work which found that life satisfaction was unable to buffer high-risk levels for violent reconvictions in adult forensic outpatient populations (Bouman et al., 2009), but adds to the literature by suggesting that life satisfaction *does* provide protective and explanatory power in understanding general offending among community youth.

In general there exist good theoretical reasons to suspect that life satisfaction may be relevant for criminal outcomes in youth. In particular, adolescence is a period characterized by significant cognitive, physical, and social environmental changes that often lead to increased stress and pressure (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). In response to myriad internal and external changes, adolescence is a time of critical development for individual coping mechanisms that aid in dealing with the normal stress associated with development. As noted by Compas and colleagues (2001), the development of characteristic coping skills during this period "may place individuals on more or less adaptive developmental trajectories and may be precursors of patterns of coping throughout adulthood" (p. 87). As such, it stands to reason that high general life satisfaction during adolescence may increase the

likelihood of development of more adaptive responses to stress that solidify with the progression of age.

Support for this interpretation is further provided through examination of the pathway linking life satisfaction to decreased offending in our data. In particular, it was found that substance use mediated the relationship between life satisfaction and total offending behavior for community and at-risk youth, and mediated the relationship with violent offending for community youth. These results are similar to past cross-sectional findings (Mohamad et al., 2018) and consistent with the notion that youth with low life satisfaction may turn to inappropriate coping strategies (e.g., substance use) to deal with the normal stress associated with the adolescent developmental period. The link between substance use and delinquent behavior is one of the more well documented findings in the literature on youth offending (Bui, Ellickson, & Bell, 2000; Lipsey & Derzon, 1998), therefore it stands to reason that low (or high) life satisfaction among teens may lead to increased (or decreased) substance use as means of coping with stress and change, which in turn may result in increased (or decreased) offending behavior.

Finally, despite the possibility that life satisfaction might not be protective in youth with high CU traits, we found the opposite to be true in our data. Although no evidence of moderation was found among community youth, within our at-risk sample youth with high CU traits and high baseline levels of life satisfaction exhibited significantly *lower* rates of both general and violent reoffending at 6-month follow-up. These results suggest that high life satisfaction may be especially salient in protecting against offending among at-risk youth exhibiting CU features. Though contrary to our hypothesis, one possible explanation for this finding lies in recent literature exploring acquired CU traits in youth (e.g. Kerig, Bennet, Thompson, & Becker, 2012). Though traditionally thought to be primarily genetically determined (Viding, Blair, Moffit, & Plomin, 2005), recent work has demonstrated that CU traits in youth may also be acquired as a result of trauma and adverse early life experiences (Kerig et al., 2012). As such, should youth with CU traits acquired due to hostile environmental circumstances find viable means of increasing life satisfaction, the subsequent relief and shift in prevailing affect may help to discourage learned antisocial behaviors. Although we do not have the means in our data to directly explore the causal pathways leading to the development of CU traits for the youth in our sample, future work should explore differential pathways in the development of CU traits among youth to determine how these etiologies may interact with life satisfaction to predict offending.

In sum, the current findings provide support for the value of life satisfaction as an asset that mitigates or buffers future risk for offending in community youth populations. However, the present study is not without limitations. First, we were unable to obtain official offense records or collateral ratings of psychopathic features, and therefore relied on youth self-report. Although the use of self-report instruments when measuring negative characteristics and outcomes may raise concerns regarding response bias and dishonesty, self-reports of criminal activity are a widely used method of measuring offending behavior, in part due to the advantages of this method. In particular, self-report offense data is likely to reflect a more accurate picture of offending behavior than official records alone, which drastically underestimate offense rates (Coleman & Moynihan, 1996). Further, past work has shown that self-reports of offending

robustly predict future offenses (Farrington, 2003) and exhibit high levels of test-retest reliability (Huizinga & Elliot, 1986).

A second related concern pertains to the tendency towards dishonesty and impression management in individuals exhibiting high levels of psychopathic features and callous-unemotional traits (Lilienfeld, Fowler, & Patrick, 2006), thereby introducing measurement error for the APSD. Fortunately, research has indicated a high level of convergence between self-report and third party informant scores, as well as low levels of mean differences across different measurement modalities (Miller, Jones, & Lynam, 2011). Despite these mitigating factors, mono-method measurement strategies can inflate effect sizes, therefore future work would benefit from employing a more diverse range of measurement modalities.

Third, a relatively small number of covariates were included when examining the incremental predictive validity of life satisfaction. As such, although we witnessed promising findings within our sample of community youth, it remains unclear whether life satisfaction would retain incremental predictive validity if a wider range of risk factors were included. For example, though substance use problems, antisocial peer group affiliation, and prior history of offending rank among the more robust risk factors for offending behavior (Gendreau, Little, & Goggin, 1996; Herrenkohl et al., 2000) several large-scale reviews have identified that poor parental supervision, neighborhood disorganization, peer-rejection, and mental health variables such as neuropsychological deficits, impulsivity and emotion regulation problems exhibit important links to youth violence and offending (Dodge & Petit, 2003; Loeber & Farrington, 2011). However, it was not possible examine every variable of interest in the present study. As such, future research should explore the potential incremental predictive power of life satisfaction when including a broader scope of risk variables.

Fourth, although APSD total scores exhibited good internal consistency in our community and at-risk samples, reliability estimates of the CU subscale were low. Though this finding is not entirely unexpected given results of past work exploring the validity of the APSD (Lee et al., 2003; Muñoz & Frick, 2007; Poythress et al., 2006) this may impact the strength of association witnessed between the CU subscale and youth offending outcomes in the present work. A recent study conducted by Ansel et al. (2014) suggests that CU traits may be more reliably assessed using the self-report Inventory of Callous-Unemotional Traits (ICU; Essau, Sasagawa, & Frick 2006). As such, future work might aim to include both instruments when assessing CU traits in youth.

Finally, the ethnic representation observed in our community and at-risk samples differed (i.e., 46% of our community sample identified as South Asian, vs. 12% of our at-risk sample). Although we controlled for demographic variables including ethnicity in all analyses, it is important to note the following issues that may impact interpretation of the current findings. First, though beyond the scope of this paper, future research should explore whether the relationship between life satisfaction and offending might function differently across gender and various ethnic and cultural groups. For example, Western countries have been shown to place increased value on personal happiness and life satisfaction as compared to East Asian cultures (Sims, Tsai, Jiang, Wang, Fung, & Zhang, 2015), and past work has revealed that certain positive health outcomes associated with positive emotions are constrained to cultures that place high

value on such emotions (Yoo, Miyamoto, Rigotti, & Ryff, 2017). As such, it is possible that the protective benefits afforded by life satisfaction may differ between cultures that value the construct more as compared to cultures that de-emphasize its benefits—a relationship that may also be affected by factors such as acculturation and assimilation. Second, research has documented the impact of ethnicity and culture on the experience of interpersonal violence and delinquency among adolescents (for review see Rojas-Gaona, Hong, & Peguero, 2016). According to Agnew's (1992) General Strain Theory, variations in crime and delinquency can be understood to stem from differential strain placed on individuals and groups operating in diverse contexts. Past research has demonstrated that, on average, ethnic and cultural minority groups experience strain in the form of increased discrimination, victimization and harassment, and economic disadvantage (Kaufman et al., 2008)—factors that influence the expression of violence exposure and perpetration (Rojas-Gaona et al., 2016). Relatedly, research exploring the moderating role of key demographic characteristics (e.g., gender, ethnicity) on the association between youth psychopathic features (as measured by the Psychopathy Checklist: Youth Version; Forth, Kosson, & Hare, 2003) and antisocial functioning has demonstrated some support for the notion that ethnicity impacts the relationship between behavioral components of psychopathy and violent recidivism (Edens, Campbell, & Weir, 2007). However, several more recent studies assessing youth psychopathic personality disturbance using the APSD have found no evidence of ethnic differences in the predictive utility of the ASPD across numerous antisocial outcomes (Shaffer et al., 2016; Thornton, Frick, Crapanzano, & Terranova, 2012), suggesting that this concern may be of limited relevance here.

Despite the aforementioned limitations, the present work contributes to research on youth violence and offending in several important ways. This study is the first the authors are aware of to explore the role of life satisfaction in understanding offending behavior from both a primary and secondary prevention perspective (van Dijk & de Waard, 1991). Exploring how life satisfaction functions in each of these samples is important because it highlights the temporal window during which life satisfaction is most likely to increase resilience for offending behavior. The pattern of results observed in the present work suggests that life-satisfaction may be an especially important target of intervention among adolescents who are approaching the age when offending behavior is likely to occur. Given that youth who are satisfied with their lives may be less likely to turn to substance abuse and offending, it is possible that school programs that aim to educate youth about increasing life satisfaction via empirically supported pathways, such as focusing the value of prosocial and generous behavior (Dunn, Aknin, & Norton, 2008), and gratitude (Emmons & McCullough, 2003) may have a positive impact on offense prevention by encouraging youth to adopt positive coping skills.

The current findings also add to the growing body of literature supportive of including protective factors in structured risk assessment tools. In the present work, we focused on life satisfaction and found that youth perceptions of general well-being provided additional value above several well-established risk factors in explaining variance in offending outcomes. As we are the first we are aware of to explore the incremental value of life satisfaction for offending outcomes among youth, future work should attempt to replicate these findings and expand the scope of included risk factors. However, our findings provide preliminary support for the inclusion of factors such as life satisfaction in assessment approaches for youth populations, and in early prevention and treatment efforts.

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Table 1

Descriptive Statistics of Major Study Variables and Correlations with Self-Reported Total and Violent Offending at 6-Month Follow-Up

	Community Sample (n = 334)			**At-Risk Sample (n = 99)**		
	M (SD)/% (n)	r_s with Follow-Up SRO Total	r_s with Follow-Up SRO Violent	M (SD)/%(n)	r_s with Follow-Up SRO Total	r_s with Follow-Up SRO Violent
Life Satisfaction	35.04 (5.62)	-.20***	-.18**	29.41 (6.30)	-.29***	-.20*
Substance Use	0.17 (0.74)	.35***	.32***	3.21 (4.06)	.38***	.31**
Delinquent Peers	1.37 (2.21)	.30***	.24***	4.50 (5.35)	.51***	.43***
School Difficulty	0.11 (0.31)	.29***	.28***	0.72 (0.76)	.46***	.55**
School Failure	21.2 (69)	.24***	.20***	66.7 (66)	-.05	-.05
APSD Total	9.53 (4.38)	.38***	.31***	11.51 (5.90)	.47***	.36***
APSD CU	2.94 (1.71)	.20***	.16**	3.54 (1.87)	.28**	.18
Lifetime SRO Total	0.51 (0.96)	.55***	.56***	2.21 (3.18)	.54***	.50***
Follow-Up SRO Total	0.61 (1.45)	--	.83***	1.03 (1.79)	--	.80***
Follow-Up SRO Violent	0.29 (0.68)	.83***	--	0.42 (0.92)	.80***	--
Male	44.1 (147)	.11	.17**	50.5 (50)	.10	.21*
Age	13.07 (0.39)	-.02	-.03	15.24 (1.54)	.12	.17
Ethnic Minority	82.6 (242)	-.06	-.06	58.2 (57)	-.15	-.16

Note. * p < .05, ** p < .01, *** p < .001 (two-tailed test). r_s = Spearman's rho correlation coefficient. APSD = Antisocial Process Screening Device. SRO = Self-Report of Offending.

Table 2

Incremental Predictive Utility of Life Satisfaction: Total Offending at 6-Month Follow-Up

	Community Sample (*n* = 334)				At-Risk Sample (*n* = 99)			
	b (SE)	Exp (B)	95% CI	Z	*b* (SE)	Exp (B)	95% CI	z
Block 1								
Substance Use	0.18 (0.06)	1.20	[1.05, 1.35]	2.81**	0.07 (0.03)	1.07	[1.02, 1.13]	2.65**
Delinquent Peers	0.08 (0.03)	1.08	[1.02, 1.14]	2.55*	0.06 (0.02)	1.06	[1.01, 1.11]	2.48*
School Difficulty	0.55 (0.23)	1.72	[1.09, 2.70]	2.37*	0.43 (0.19)	1.54	[1.07, 2.23]	2.31*
School Failure	0.59 (0.17)	1.81	[1.28, 2.54]	3.40**	-0.86 (0.27)	0.42	[0.25, 0.72]	-3.20**
Lifetime SRO Total	0.44 (0.07)	1.55	[1.35, 1.78]	6.16***	0.03 (0.04)	1.03	[0.96, 1.11]	0.88
Male	-0.06 (0.20)	0.94	[0.64, 1.39]	-0.29	-0.26 (0.24)	0.77	[0.47, 1.25]	-1.06
Age	-0.39 (0.20)	0.68	[0.46, 0.99]	-2.00*	-0.08 (0.09)	0.93	[0.78, 1.10]	-0.87
Ethnic Minority	-0.30 (0.20)	0.74	[0.50, 1.11]	-1.50	-0.42 (0.21)	0.66	[0.43, 0.99]	-1.98*
Model Fit	χ^2 (8) = 223.79, *p* < .001				χ^2 (8) = 95.07, *p* < .001			
Block 2								
Substance Use	0.11 (0.07)	1.11	[0.97, 1.26]	1.60	0.07 (0.03)	1.07	[1.01, 1.13]	2.36*
Delinquent Peers	0.10 (0.03)	1.10	[1.04, 1.16]	3.39**	0.05 (0.03)	1.06	[1.00, 1.11]	2.13*
School Difficulty	0.65 (0.23)	1.91	[1.22, 2.98]	2.84**	0.43 (0.19)	1.53	[1.05, 2.21]	2.23*
School Failure	0.52 (0.17)	1.68	[1.19, 2.35]	2.98**	-0.88 (0.28)	0.41	[0.24, 0.71]	-3.22*
Lifetime SRO Total	0.43 (0.07)	1.54	[1.34, 1.76]	6.22***	0.04 (0.04)	1.04	[0.96, 1.12]	0.97
Male	-0.02 (0.20)	0.98	[0.66, 1.45]	-0.10	-0.25 (0.25)	0.78	[0.47, 1.27]	-1.01
Age	-0.55 (0.20)	0.58	[0.39, 0.86]	-2.67**	-0.08 (0.09)	0.93	[0.78, 1.10]	-0.86
Ethnic Minority	-0.30 (0.20)	0.74	[0.51, 1.11]	-1.48	-0.41 (0.21)	0.66	[0.43, 1.01]	-1.91
Life Satisfaction	-0.04 (0.01)	0.96	[0.93, 0.98]	-3.12**	-0.01 (0.02)	0.99	[0.95, 1.03]	-0.64
Model fit	χ^2 (9) = 233.10, *p* < .001, Δ χ^2 (1) = 9.31, *p* = .002				χ^2 (9) = 95.47, *p* < .001, Δ χ^2 (1) = 0.40, *p* = .527			

Note. * *p* < .05, ** *p* < .01, *** *p* < .001 (two-tailed test). *b* = Unstandardized coefficient. SE = Standard error. Exp (B) = Standardized coefficient. 95% CI = 95% confidence intervals of Exp (B). APSD = Antisocial Process Screening Device. SRO = Self-Report of Offending.

Table 3

Incremental Predictive Utility of Life Satisfaction: Violent Offending at 6-Month Follow-Up

	Community Sample (n = 334)				At-Risk Sample (n = 99)			
	b (SE)	Exp (B)	95% CI	Z	b (SE)	Exp (B)	95% CI	z
Block 1								
Substance Use	0.20 (0.09)	1.22	[1.01, 1.44]	2.20*	0.03 (0.04)	1.03	[0.95, 1.12]	0.69
Delinquent Peers	0.04 (0.05)	1.04	[0.95, 1.14]	0.92	0.03 (0.04)	1.03	[0.96, 1.11]	0.87
School Difficulty	0.34 (0.33)	1.40	[0.72, 2.66]	1.02	0.82 (0.32)	2.27	[1.23, 4.28]	2.58**
School Failure	0.60 (0.25)	1.82	[1.11, 2.95]	2.42*	-1.11 (0.44)	0.33	[0.14, 0.78]	-2.51*
Lifetime SRO Total	0.51 (0.10)	1.67	[1.37, 2.03]	5.11***	0.08 (0.06)	1.08	[0.96, 1.22]	1.31
Male	0.01 (0.28)	1.01	[0.58, 1.77]	0.05	0.08 (0.42)	1.08	[0.48, 2.53]	0.19
Age	-0.30 (0.28)	0.74	[0.42, 1.28]	-1.07	-0.04 (0.15)	0.96	[0.72, 1.29]	-0.27
Ethnic Minority	-0.24 (0.29)	0.79	[0.45, 1.44]	-0.81	-0.50 (0.34)	0.61	[0.31, 1.19]	-1.44
Model Fit	χ^2 (8) = 101.25, p < .001				χ^2 (8) = 57.75, p < .001			
Block 2								
Substance Use	0.12 (0.10)	1.17	[0.87, 1.58]	1.28	0.03 (0.04)	1.03	[0.94, 1.12]	0.69
Delinquent Peers	0.07 (0.04)	1.06	[0.94, 1.20]	1.48	0.03 (0.04)	1.03	[0.96, 1.11]	0.86
School Difficulty	0.44 (0.33)	1.58	[0.67, 3.75]	1.33	0.82 (0.32)	2.27	[1.23, 4.28]	2.59**
School Failure	0.50 (0.25)	1.31	[0.66, 2.61]	2.01	-1.11 (0.44)	0.33	[0.14, 0.78]	-2.50*
Lifetime SRO Total	0.50 (0.10)	1.81	[1.36, 2.40]	5.11***	0.08 (0.06)	1.08	[0.96, 1.21]	1.29
Male	0.08 (0.29)	0.76	[0.38, 1.50]	0.28	0.08 (0.42)	1.08	[0.48, 2.53]	0.18
Age	-0.48 (0.29)	0.70	[0.32, 1.55]	-1.62	-0.04 (0.15)	0.96	[0.72, 1.29]	-0.26
Ethnic Minority	-0.21 (0.29)	1.09	[0.51, 2.32]	-0.70	-0.50 (0.34)	0.61	[0.31, 1.19]	-1.44
Life Satisfaction	-0.05 (0.02)	0.95	[0.90, 0.99]	-2.37*	0.00 (0.03)	1.00	[0.94, 1.07]	0.11
Model fit	χ^2 (9) = 106.63, p < .001, $\Delta \chi^2$ (1) = 5.38, p = .020				χ^2 (9) = 57.76, p < .001, $\Delta \chi^2$ (1) = 0.01, p = .920			

Note. * p < .05, ** p < .01, *** p < .001 (two-tailed test). b = Unstandardized coefficient. SE = Standard error. Exp (B) = Standardized coefficient. 95% CI = 95% confidence intervals of Exp (B). APSD = Antisocial Process Screening Device. SRO = Self-Report of Offending

Endnotes

[i] Follow-up analyses were conducted to determine whether there were any differences between youth with complete information and youth with missing life satisfaction or offending data. Results of independent samples *t*-tests indicate that there were no significant differences between youth with complete and incomplete information for level of association with delinquent peer groups, school difficulty, school failure, or substance use. However youth with missing follow-up information were significantly older $t(101.88) = 4.11, \ p < .001$. In addition, 12.2% ($n = 51$) of youth did not provide information on their ethnic background ($n = 41$), school failure ($n = 8$), gender ($n = 1$), or substance use ($n = 1$). These cases were retained for analysis, except for analyses that included these variables as predictors.

[ii] Follow-up independent samples t-tests indicated that there were no differences between youth with complete data and youth that missing data with respect to self-reported substance use, age, or school failure, but youth with missing follow-up information were more likely to experience difficulty in school (i.e. suspensions) $t (121) = 3.74, p < .001$, and associate with a delinquent peer group $t(27.12) = 2.20, \ p < .05$. In addition, one youth (0.8%) did not provide information on their ethnic background. This case was retained for analysis, except for analyses that include ethnic background as a predictor.

[iii] Multicollinearity diagnostics were within acceptable limits (community sample: tolerance = .45 to .93 and variance inflation factor [VIF] = 1.06 to 2.21; at-risk sample: tolerance = .34 to .85 and VIF = 1.18 to 2.91).