

**Anger, Violence, and Recidivism in Justice System Involved Youth**

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**Abstract**

Anger is considered integral for motivating youths' criminal activity. To assess how anger and its features (fuse and duration) are associated with youths' patterns of violence and offending, we studied official risk and (re)offending data among a sample of justice-involved youth ( $M_{age} = 14.87$ ,  $SD = 1.40$ ) in the United States ( $N = 548$ ). Short anger fuse was associated with increased likelihood of being currently violent, whereas prolonged anger was related to current violence only in mid- to late-adolescence. Youth who had exclusively nonviolent prior(s) were at greater odds of nonviolent recidivism if they reported a short fuse. Alternatively, youth who had violent prior(s) were at greater odds of reoffending if they reported prolonged anger. Overall reported anger was associated with current violence, but not recidivism. This suggests that, in youth, short fuse predicts the continuation of a nonviolent offending pattern, whereas, among violent offenders, prolonged anger predicts recidivism.

*Keywords:* anger, crime, juvenile delinquency, recidivism, violence

### **Anger, Violence, and Recidivism in Justice System Involved Youth**

Anger is an internal state thought to be key for motivating criminal, and especially violent, behavior. Agnew's General Strain Theory (GST) posits that when a strain in life occurs, anger may arise, which can amplify the pain already felt from these struggles (Agnew et al., 2002). Constant and repeated challenges can escalate anger, driving actions aimed at reducing, avoiding, or distracting from the pain, including criminal activities and violence (Agnew et al., 2002; Mikolic et al., 1997; Potegal et al., 2007; Potegal, 2010; Pruitt et al., 1997). In support of this theory, research shows that youth who report more problems at home and school, also report more anger, which is associated with subsequent delinquency (Colder & Stice, 1998; Sigfusdottir et al., 2004, 2010). Further, of all personality traits, a disposition towards anger has been found to be most strongly associated with offending in youth, with the exception of offending due to compliance (e.g., peer pressure; Gudjonsson & Sigurdsson, 2007).

Juvenile courts in the U.S. often assess justice-involved youth's anger or frustration-tolerance (along with other measures) to estimate their risk of recidivism. However, still unclear is (1) whether anger predicts offending among youth who have *already* offended, (2) whether different features of anger (fuse vs. length of episodes) are differentially important for offending behavior, (3) whether age and time influence these relations, and (4) whether anger is related to different profiles of offending (violent vs. nonviolent). To address these gaps, we used court records from a Midwest county to assess whether overall anger, subtypes of anger (fuse and duration), age, and violent offending history influenced adjudicated youths' current and future violent behavior and recidivism.

### **Anger and Recidivism in Youth**

Contact with the criminal justice system often begins during adolescence, making it a key period to target for crime prevention (Moffitt, 2007). However, research on anger and recidivism has generally focused on adult samples, leaving it unclear whether youths' tendencies towards anger meaningfully relates to their recidivism (Novaco, 2020). In the adult literature, the findings have been mixed on whether trait anger is associated with recidivism (Farzan-Kashani & Murphy, 2017; Kimonis et al., 2011; Klepfisz et al., 2014; Lila et al., 2019; Loza & Loza-Fanous, 1999; Mills & Kroner, 2003). However, the Loza and Loza-Fanous (1999) and Mills and Kroner (2003) samples have been noted to have unusually low levels of anger relative to other similar studies, thus methodological differences between studies may explain some of these discrepancies (Novaco, 2020). Further, anger management cognitive-behavioral therapy tends to reduce (especially violent) recidivism in adulthood (Henwood et al., 2015). Of the limited research that has focused on adolescence, several researchers have found an anger-recidivism link. For instance, Kelly et al., (2019), Cornell et al., (1999), and DeLisi et al., (2010) all found an association between trait anger and institutional violent and/or nonviolent antisocial misconduct/offending over a two-, three-, and twelve-month timespan, respectively. Thus, an angrier disposition is related to youths' short-term future antisocial behavior among institutionalized youth. However, it remains unclear whether anger can predict long-term recidivism in samples that also include youth released into the community (e.g., parolees, discharged, etc.). Despite limited research on this topic, measures of anger/frustration are included in recidivism risk assessments for youth. Understanding these relations is crucial for optimizing and tailoring assessments to the unique needs of each youth.

### **Subtypes of Anger and Offending**

GST posits that anger can lead to delinquency, however, it does not expand on whether certain features of anger may be more relevant for violent versus nonviolent offending (Agnew et al., 2002). Aggressive/violent behaviors and nonviolent rule-breaking behaviors are related but distinct forms of antisocial conduct. For instance, the rank-order stability of aggressive behavior is high across development, whereas rule-breaking is only moderate (Broidy et al., 2003; Burt, 2012; Stanger et al., 1997; Verhulst & Van Der Ende, 1995). Additionally, they have differing developmental trajectories; physical aggression peaks at ages 2 to 4 and typically decreases from then on, whereas rule-breaking behavior peaks during adolescence and decreases into adulthood (Burt, 2012; Côté et al., 2007; Tremblay, 2010). The small proportion of young children that continue to aggress as they age also tend to be those that perpetrate more severe forms of violence (Odgers et al., 2008).

The different developmental trajectories of antisocial behavior map onto Moffitt's developmental theory of crime, which suggests there are two main types of offenders: life-course and adolescent-limited offenders. Life-course offenders are theorized to demonstrate antisocial tendencies early-on and continue this behavior across their lifespan; these individuals tend to commit the most serious violent crimes. Adolescent-limited offenders engage in more nonviolent rule-breaking behavior, are more influenced by their peers' delinquency, and desist offending by or in early adulthood (Moffitt, 2018). Together, this suggests that these different antisocial behavior profiles have differing motivations and mechanisms behind their expression.

Every episode of anger has a rise and fall (Potegal, 2010). The rise is how quick someone is to anger (latency) and the fall is how long they stay angry (duration). The initial escalation of anger is provoked by a goal being blocked and/or in response to a perceived wrong. Prolonged anger can be caused by various cognitive processes, including rumination, imagery, and

symbolic cues (Novaco, 2016; Potegal, 2010). These distinctions are important, given that adult male parolees with violent histories have prolonged episodes of anger (duration), but not shorter anger fuses, when compared to a community sample (Fernandez et al., 2018). Similarly, when community-recruited participants were told an anger-inducing story, those given instructions to ruminate about emotion-evoking questions were more aggressive in response to criticism eight hours later compared to those told to focus on non-emotion evoking questions (Rusting & Nolen-Hoeksema, 1998). This suggests that ruminating on perceived wrongs—which prolongs anger—may be especially related to aggression (Bushman et al., 2005; Mikula et al., 1998; Rusting & Nolen-Hoeksema, 1998; Stets & Tsushima, 2001). Further, anger rumination has been found to increase future experiences of anger, making prolonged anger a potentially important indicator of future anger-motivated behavior (Borders & Lu, 2017; Potegal, 2010). Thus, long anger duration may be especially predictive of violent offending.

A short anger fuse may lead youth to skip cognitive processing steps impairing rational and reasoned thinking (De Castro et al., 2005). Effective emotion regulation and impulse control can create a buffer between the experience of an emotion and acting on that emotion, resulting in fewer emotionally-driven behaviors (Calvete & Orue, 2012; Garofalo & Velotti, 2017). A short fuse combined with impulse and emotion regulation difficulties may lead youth to commit offences with little forethought (Kalvin & Bierman, 2017). The maturation of the prefrontal cortex during adolescence is related to increased emotion regulation and decreased impulsivity (Loeber et al., 2012; Swartz et al., 2014; Sweeten et al., 2013). To our knowledge, researchers have yet to investigate how anger latency and duration changes over the course of adolescence. However, experiences of anger have been reported to be higher in *older* adolescents (Wong et al., 2018). Therefore, although emotion regulation and impulse control increases as adolescents

age, latency to anger may not (Steinberg et al., 2008; Zeman et al., 2006). Perhaps youths' gains in anger regulation and impulsivity buffers their quick tempers from translating into inappropriate behaviors. Therefore, earlier in development—when youth have more difficulty regulating anger and impulses—the relation between being quick to anger and offending may be stronger (Cole et al., 2011). Additionally, parolees with violent histories were found to have longer anger duration but not shorter fuses (Fernandez et al., 2018). This compliments research demonstrating that premediated, but not impulsive, aggression is linked to violent recidivism (Swogger et al., 2015). These impulsive aggressors may represent individuals who are easily provoked and have difficulty inhibiting the expression of their anger (i.e., reactive aggressors), but do not have proclivities towards serious violent acts (Barratt et al., 1999; Jambon et al., 2019; Martinelli et al., 2018; Mathias et al., 2007; Swogger et al., 2015). Alternatively, premediated (proactive) aggressors may ruminate on perceived injustices, which prolongs and intensifies their anger, overwhelming regulatory capacities leading to more serious explosions of violence (Novaco, 2016; Potegal, 2010; White & Turner, 2014). Thus, prolonged anger may be linked to intense, brooding anger that leads to persistent violent offending. On the other hand, a short fuse may be linked to less serious forms of offending that often desist by early adulthood due to gains in impulsivity/regulation (i.e., adolescent-limited offender).

Overall, previous research suggests that the rise and fall of anger episodes may affect different aspects of how individuals respond to anger. Yet, past research on (re)offending has not differentiated between anger fuse and duration and how they may relate to violent versus nonviolent delinquency. Given that anger/frustration is currently used in youths' recidivism risk assessments (e.g., Youth Level of Service/Case Management Inventory; YLS/CMI), it is critically important to understand whether anger is a useful predictor of reoffending and in what

contexts. Understanding the connection between anger fuse and duration and recidivism may improve risk assessment predictions, which inform court-ordered programming and treatment.

### **Present Study**

Juvenile court-provided data was used to assess several cascading questions about justice system-involved youths' anger, violence, and recidivism. We hypothesized that prolonged anger would be uniquely tied to patterns of violent offending (i.e., linked to current and future violence among youth who have violent pasts). If this is the case, then experiencing prolonged bouts of anger may be a feature of persistently violent individuals. On the other hand, a short anger fuse (i.e., latency) was expected to motivate less serious offending behavior, and that this relation would dissipate in older adolescents as they typically have greater self-regulation (i.e., they would fit an adolescent-limited offender profile). Lastly, as researchers have reported gender differences for justice-involved youths' traits and offences, gender was assessed as a potential moderator (Benda, 2005; Cauffman et al., 2007; Habersaat et al., 2018; Wong et al., 2018).

## **Method**

### **Participants**

In accordance with a data sharing agreement, the court-provided sample included 602 adjudicated youth who completed the MAYSI-2 assessment between November 2014 and May 2018. The MAYSI-2 questionnaire is administered to all new formally processed youth in the partnering county. If youth were diverted from formal processing or they had been under court jurisdiction previously, they did not receive the MAYSI-2 and were therefore excluded from this sample. Of these youth, 11 had missing data that did not allow us to connect their responses to their YLS/CMI and recidivism data. We excluded from all statistics participants who had primarily sexual offences (i.e., 50% or more of prior(s) or reoffense(s) were sexual in nature;  $n =$



43) as not all sexual crimes are violent (e.g., public sex acts) and the motivation for sex crimes may differ from other violent and nonviolent crimes (Seto, 2019). Thus, our sample included 548 adjudicated youth, of whom 337 had committed only nonviolent prior offence(s) and 211 had committed at least one violent prior offence. We had access to MAYSI-2 and recidivism data for all youth ( $N = 548$ ) and a subset of these youths' YLS/CMI data ( $n = 480$ ).

Youth were 11- to 18-years-old ( $M = 14.87$ ,  $SD = 1.40$ ; 39% girls) and resided in Midwestern United States. Prior offence history was based on youths' five most recent charges. Offences were considered violent if they were charged with assault or fighting, while all other charges were considered nonviolent (e.g., theft, non-assault weapon charges, drugs, joyriding, truancy, resisting arrest). Youth were classified as having violent prior(s) when they had either exclusively violent prior(s) ( $n = 45$ ) or mixed violent and nonviolent offending histories ( $n = 166$ ). For example, a youth charged with both assault and unarmed robbery at the same time would have two charges, one violent and one nonviolent, and would be grouped with those who have violent prior(s). An independent t-test showed that the average number of priors between those with violent ( $M = 3.36$ ,  $SD = 1.37$ ) versus only nonviolent prior(s) ( $M = 2.16$ ,  $SD = 1.39$ ) was significant,  $t(552) = -9.96$ ,  $p < .001$ . As our goal was to differentiate between youth who do and do not commit violent offences, we controlled for youths' number of priors in all analyses.

## **Measures**

### ***Anger***

To assess overall anger, we used the anger-irritability scale from the Massachusetts Youth Screening Instrument–Version 2 (MAYSI-2), which is a well-validated, widely used, nine-item self-report questionnaire administered by a juvenile court officer (Grisso et al., 2001). However, as we were interested in anger specifically, a subscale was created using the four items

that tapped directly into youths' experiences of anger: "Have you lost your temper easily, or had a "short fuse?"", "When you have been mad, have you stayed mad for a long time?", "Have you felt angry a lot?", and "Have you gotten frustrated a lot?". Reliability for this scale was acceptable ( $\alpha = .75$ ). The distinction between anger fuse and duration is central to addressing the aims of the present study; thus, the first two items were used to further probe potential differences between these features of anger.

Items omitted from our subscale included two items that focused on anger-motivated *actions* instead of experiences of anger: "Have you hurt or broken something on purpose, just because you were mad?" and "Have you thought a lot about getting back at someone you have been angry at?". One item pertaining to youths' hyperactivity, "Have you been really hyper or jumpy?", and two items pertaining to general negative affect/mood, "Have you had too many bad moods?" and "Have you been easily upset?", were omitted due to not being specific to experiences of anger. Items were averaged into a composite score. Youth answered yes or no (coded as 1 or 0) to these questions based on how they had been feeling in the last few months.

Three individuals had a missing data point for an anger item (two for the "Have you felt angry a lot?" item and one for the "Have you lost your temper easily, or had a "short fuse?"" item). Multiple imputations were used to estimate these three missing data points, which were included in these youths' overall anger composite scores ( $m = 10$ ; Graham et al., 2007). The linear regression method was used for imputations and included all study variables in addition to all irritability-anger MAYSI-2 items as predictors.

### ***Current Violent Behavior***

The YLS/CMI is part of the official court process and is a well-validated risk assessment conducted by a trained intake referee or a justice court officer to assess youths' risk level through

a series of questions. To determine youths' physical aggression (i.e., current violent behavior), the YLS/CMI includes several questions regarding destroying property, engaging in physical fights, and physically losing control. The youth is reported as being currently violent if they initiate physical aggression against others, start fights, have engaged in violent actions, and/or views physical aggression as an appropriate way of expressing themselves and dealing with others. Based on these criteria, the justice court officer would assess physical aggression using a dichotomous yes/no choice coded as 1 and 0, respectively. Youth with one minor, isolated aggressive incident with peer(s) were not classified as physically aggressive. The MAYSI-2 and YLS/CMI were not always completed at the same time. Thus, we limited analyses for how anger is related to current violent behavior to only participants that completed their YLS/CMI within a year of also completing the MAYSI-2 ( $n = 480$ ). Of this subset, 50% were administered the YLS/CMI and MAYSI-2 within two days of one another; only 6.5% were completed over 3 months apart ( $M = 0.99$ ,  $SD = 2.18$  months).

### ***Recidivism***

Youths' recidivism was based on official court records indicating whether youth received a new petition in either a juvenile or adult court within two years of completing the MAYSI-2 (during the original petition). Violent and nonviolent recidivism classifications were assessed based on their five first reoffending petitions. Violent recidivism was defined as having at least one recidivism petition for assault or fighting.

### ***Analytic Plan***

We first performed a one-way ANOVA in SPSS v. 26 to compare whether recidivism outcomes differed based on all study variables. We then performed zero-order and partial (controlling for age) correlations to assess associations between all variables. Addressing our

main questions, we assessed whether overall anger, anger fuse, and anger duration were related to youth violence and recidivism through a series of logistic and multinomial regressions. For our first aim—whether overall anger and its characteristics predict youths’ long-term reoffending—we used logistic regressions to assess whether overall anger (Model 1a) and anger fuse and duration (Model 1b) were associated with overall recidivism. Time between youths’ most recent prior offence and completion of the MAYSI-2 varied ( $M = 7.88$ ,  $SD = 11.05$  months). To discern whether relations would be stronger when only considering recent offending behavior versus a more complete history, we repeated the analyses (Model 1c and 1d; statistics reported in-text), but only included prior offences committed within a year of the MAYSI-2 ( $n = 449$ ).

Our second aim was to assess whether anger and its characteristics would be related to patterns of violence, and whether time changed these relations. Multinomial regressions were used to assess whether overall anger (Model 2a) and anger fuse and duration (Model 2b) were associated with *future* violent and nonviolent offending (reference category was youth who did not recidivate). Next, we used logistic regressions to assess whether overall anger (Model 3a) and anger fuse and duration (Model 3b) were associated with *current* violent behavior.

In each model, variables were entered in steps. First, the control variables were entered, which included youths’ age, gender, number of priors, history of violent offences, and time between MAYSI-2 administration and youths’ most recent offence date. When current violent behavior was the criterion, time between MAYSI-2 and YLS/CMI administration was entered in step 1 as a control. In step 2, the anger predictor(s) were entered. To assess whether gender or age of youth moderated relations between anger and outcomes, gender-anger and age-anger interaction terms were entered in steps 3 and 4, respectively. If gender or age significantly

moderated relations, interaction plots were created using RStudio (Version 1.1.463) *interactions* package (Long, 2020). The Johnson-Neyman interval was calculated using this package to assess at what ages the relations were significant. In step 5, the violent prior-anger interaction terms were added. This step assessed whether features of anger are associated with patterns of violent versus nonviolent offending. If violent prior-anger interactions were significant, then additional analyses were completed separating youth by prior offence type (i.e., violent versus nonviolent priors). Lastly, if a relation between anger and violent offending was found, current violence was added as a predictor in the model to discern whether relations between anger and offending were partially mediated by current violent behavior (statistics reported in-text).

All independent variables were centered and interaction terms were created by multiplying the relevant centered variables. Posthoc tests were only conducted if omnibus tests were significant ( $X^2$  statistics reported in tables). Additional analyses were conducted (a) restricting the sample to those who completed the YLS/CMI and MAYSI-2 three or less months apart to test whether the time lag affected findings, and (b) using the full Anger-Irritability scale to assess whether our alteration of the scale affected findings. However, the results did not meaningfully change in these additional analyses (i.e. no changes in  $p$ -value from  $> .05$  to  $< .05$ , vice versa), with the exception of one finding when YLS/CMI-MAYSI-2 time lag was restricted. This change (overall anger\*age on current violence) was very small (OR = 1.6,  $p = .02$  vs. OR: 1.5,  $p = .06$ ), and therefore may have been due to the smaller  $n$  in the restricted sample. Additionally, this finding was explained by the prolonged anger\*age interaction term, thus did not impact the interpretation of our results. As none of our findings meaningfully changed in these sensitivity analyses, these statistics were not reported.

## Results

### **Descriptive Statistics**

Descriptive statistics separated by recidivism outcomes for all variables are provided in Table 1. Of all adjudicated youth ( $N = 548$ ), 37% reoffended within two years. Of those that reoffended, 49% were charged with at least one new violent offence. The results of a one-way ANOVA revealed that youth who did not reoffend were on average older and were more likely to have their gender reported as girl/woman (see Table 1). Youth who violently reoffended had significantly more prior offences, were more likely to have a violent prior, and were more likely to be reported as currently violent than those who nonviolently reoffended or did not reoffend.

Zero-order and partial (controlling for age) correlations for all variables are provided in Table 2. Older youth had significantly more prior charges, were less likely to be currently violent, and were less likely to violently and nonviolently reoffend within two years. Age was not significantly related to youths' reported anger. Boys had a significantly higher number of priors and were more likely to reoffend violently and nonviolently compared to girls. Adjudicated girls reported having a shorter fuse, longer anger duration, and overall higher anger. Having a greater number of priors was associated with lower overall anger and increased likelihood of having a violent prior, being reported as currently violent, and violently reoffending. Overall anger, anger fuse, and anger duration were significantly associated with current violent behavior, but not recidivism. Both having violent prior(s) and being reported as currently violent were associated with violent, but not nonviolent, reoffending. To control for all potentially confounding variables and assess whether age, gender, and violent priors moderated relations between anger and outcomes, logistic and multinomial regressions were performed.

### **Anger and Recidivism**

Supplementary Table 1 and 2 include odds ratios (ORs) and 95% confidence intervals (CIs) from logistic and multinomial regressions on overall anger, anger duration, and anger fuse on overall (Models 1a,b), violent, and nonviolent recidivism (Models 2a,b). Overall anger, anger duration, and anger fuse were not directly associated with any form of recidivism. Age and gender moderated none of these relations. However, offence history significantly moderated relations between anger duration and overall and violent recidivism. Additionally, offence history moderated relations between anger fuse and overall and nonviolent recidivism.

Omnibus tests were significant for these interactions; therefore, we reran analyses separating results by offence history, i.e., youth with violent prior(s) vs. only nonviolent prior(s) (see Table 3 and 4). Among youth with only nonviolent prior(s), having a short fuse was associated with increased likelihood of nonviolently reoffending. Alternatively, for youth with violent prior(s), prolonged anger was associated with increased likelihood of overall recidivism. However, among youth with violent prior(s), prolonged anger was only marginally ( $p < .10$ ) related to violent recidivism (see Table 4). This suggests that the interaction between offence history and prolonged anger on violent recidivism may not be robust and should be interpreted with caution. Lastly, adding current violent behavior to the model did not meaningfully change the relation between anger duration and overall recidivism among youth with violent prior(s) (OR = 2.14, 95% CI = 1.09, 4.21,  $p = .028$ ), suggesting current violent behavior did not mediate this relation.

When analyses were conducted to only include youths' recent offences (i.e., new petitions within the last year of completing the MAYSI-2; Models 1c and 1d), the relation between overall anger and overall recidivism remained non-significant (OR = 0.96, 95% CI = 0.55, 1.66,  $p = .87$ ). Further, the relation between anger fuse and overall recidivism in youth with

nonviolent offence histories (OR = 1.87, 95% CI = 1.08, 3.25,  $p = .026$ ) and the relation between anger duration and overall recidivism in youth with violent offence histories (OR = 1.88, 95% CI = .90, 3.94,  $p = .095$ ) became slightly weaker. This suggests that considering a more complete offence history may improve predictions of youths' recidivism, or at least, that considering exclusively recent charges does not improve recidivism predictions. In summary, we found that anger fuse and duration were related to recidivism, but only when youths' prior offences were considered. Youth with nonviolent offending histories were more likely to continue nonviolently offending if they had a short fuse, whereas youth with violent offending histories were more likely to recidivate overall if they reported prolonged experiences of anger.

### **Anger and Current Violent Behavior**

Supplementary Table 3 includes ORs and 95% CIs from logistic regressions on overall anger, anger duration, and anger fuse on current violent behavior. In Model 3a, overall anger was significantly positively associated with current violent behavior. Age—but not offending history or gender—significantly moderated this relation. Notably, the direct association between overall anger and current violence remained significant even when this interaction term was added. The Johnson-Neyman interval showed that the positive relation between overall anger and current violent behavior was significant in youth aged 14 and older. This suggests that the positive relation between overall anger and current violence was stronger in older youth (see Figure 1).

In Model 3b, short fuse was positively related to current violent behavior in youth. This relation was not moderated by age, gender, or violent offence history. Prolonged anger was not directly associated with current violent behavior. However, it was significantly moderated by age, such that prolonged anger was increasingly positively associated with current violence as youth aged (see Figure 2). The Johnson-Neyman interval showed that the relation between



prolonged anger and current violent behavior was only significant in youth aged 14.5 and older. To assess whether prolonged anger\*age explained the similar moderation relation overall anger\*age, an additional analysis was performed including both terms. When both interaction terms were included in the same model, both terms became non-significant (prolonged anger\*age: OR = 1.22, 95% CI = 0.71, 2.09,  $p = .46$ ; overall anger\*age: OR = 1.42, 95% CI = 0.95, 2.13,  $p = .09$ ). Prolonged anger is one of the items in the overall anger measure, thus this suggests that prolonged anger\*age largely explains the relation between overall anger\*age and current violence. The relation between prolonged anger and current violent behavior was not moderated by youths' violent prior(s) or gender.

Together, these findings suggest that overall anger is related to current violence (especially in mid- to late-adolescence) but is not associated with any form of recidivism. However, differing features of anger are linked to both current violence and recidivism. Short anger fuse is associated with current violent behavior and continuing a pattern of nonviolent offending. Alternatively, prolonged anger is only related to current violent behavior in mid-to-late adolescence and is linked to recidivism among youth with violent offending histories.

### **Discussion**

Anger is considered an internal motivator of youths' criminal behavior (Agnew et al., 2002; Colder & Stice, 1998; Sigfusdottir et al., 2004, 2010). Yet understanding what components of anger are most important for whom, in what contexts, and at what points in development remains largely unexplored. The present study is the first to focus on how overall anger and different features of anger (fuse and duration) may be associated with patterns of violence and recidivism in adjudicated youth.

Contrary to our expectations, overall anger was only related to youths' *current* violent behavior and not their future violent or nonviolent recidivism. Past researchers exploring this topic have typically included shorter follow-up periods (i.e., 2-12 months) than our study (2 years). This could mean that overall anger only predicts violence and recidivism over short timeframes in justice-involved youth. Adolescence is a time of cognitive development; normative gains in impulse control and emotion regulation may make measures of anger less robust for predicting long-term outcomes. Thus, overall anger may be useful in predicting adolescents' short-term aggressive behavior, but is less apt in predicting long-term recidivism.

Given that prolonged anger has previously been linked to future aggression and offenders' violent histories, we expected that prolonged anger would be associated with a pattern of violence (Fernandez et al., 2018; Rusting & Nolen-Hoeksema, 1998). We found partial support for this hypothesis; prolonged anger was linked to recidivism, but only among youth with a violent offending history. This suggests that prolonged anger may be especially important for predicting recidivism among youth who are capable of violence. Most violent offenders in our sample also committed nonviolent offences (79%). However, the converse was not necessarily true; only a third (33%) of those who committed nonviolent offences also committed violent offence(s). In other words, those with violent pasts and prolonged experiences of anger may represent a group of persistent offenders that are more likely to reoffend both violently and nonviolently within a couple of years. In GST, it is posited that life strains give rise to pain, which can lead to anger. This anger motivates actions that reduce, avoid, or distract from pain that can include criminal acts. If their anger lingers—through intrusive thoughts or purposeful reactivation of the anger—this may cause youth greater anger intensity and future situational anger, which may motivate criminal activity and lead to a greater *potential* for violent outbursts

(Borders & Lu, 2017; Bushman et al., 2005; Mikula et al., 1998; Potegal, 2010; Rusting & Nolen-Hoeksema, 1998; Stets & Tsushima, 2001). Thus, perhaps, intrusive and/or purposeful thoughts about situations where an individual has felt they've been wronged may be especially tied to patterns of serious offending. Future research should untangle how different features related to long bouts of anger—e.g., unwanted vs. purposeful anger reactivation, anger cool-down length, and anger intensity—explain this relation.

Life-course offenders' antisocial behavior is theorized to originate from neurodevelopmental issues (e.g., low effortful control, executive functioning) and early family adversity (Eme, 2009; Moffitt, 2018). These offenders are also known to engage in both nonviolent and violent behavior and are more likely to commit serious crimes (Moffitt, 2018). Our findings suggest that youth with both a violent offending history and prolonged anger show a similar pattern of offending. Additionally, research suggests that low effortful control makes it more difficult for youth to calm down and stop intrusive thoughts that lead to long bouts of anger (Wilkowski & Robinson, 2007). This may indicate that the 'violent history-prolonged anger' youth profile we have identified overlaps with Moffitt's life-course offender profile. As we did not have access to recidivism records beyond two years, future research should explore whether this 'violent history-prolonged anger' group is more likely to continue offending into adulthood when compared to other justice-involved youth.

As opposed to prolonged anger, which only predicted recidivism among youth with violent prior(s), being quick to anger was associated with only nonviolent offending. More specifically, among youth with nonviolent prior(s), those who reported a short fuse were more likely to nonviolently reoffend, suggesting that having a short fuse is associated with persistently committing nonviolent offences. Youth with a short fuse were also more likely to be currently

violent. Our measure of current violent behavior was assessed by court officers, which may pick up on more minor forms of physical aggression that would not result in a criminal charge (e.g., fights that result in only bruises). This may explain why anger fuse was related to our measure of current violent behavior, but not violent offending. Future research should examine whether the forms and severity of aggression are important for understanding these relations. We would expect that having a short fuse would be related to less serious forms of aggression that are immediate responses to provocation (i.e., impulsive-reactive aggression). Alternatively, prolonged anger may lead to premeditated and/or serious violence, which may include both proactive (i.e., goal-oriented) and reactive forms of aggression. This hypothesis maps onto the reactive-proactive profiles of aggression reported in previous literature: not aggressive, only reactively aggressive, and reactively and proactively aggressive (most severe group; Euler et al., 2017; Marsee et al., 2014; Pang et al., 2013). Together, our findings suggest that a short fuse is associated with continuing a nonviolent pattern of offending. Alternatively, among more serious offenders, prolonged anger is associated with continuing to offend both violently and nonviolently.

Moffitt's theory of crime posits that adolescent-limited offenders engage in less serious antisocial behaviors, such as rule-breaking. Given that short anger fuse was related to a pattern of nonviolent offending, this could indicate that being quick to anger is a feature and motivator of this offender profile. Adolescent-limited offenders desist in delinquent behaviors by/in early adulthood. Thus, we expected that age-related gains in self-regulation would buffer relations between experiences of anger and antisocial behavior (Calvete & Orue, 2012; Garofalo & Velotti, 2017); however, we did not find that age moderated these findings. Our sample was comprised of juvenile justice system involved youth, which limited our sample to those 18-years-

old and younger. Given that crime peaks in mid-to-late adolescence and impulse control continues to develop into early adulthood (DeLisi, 2015; Moffitt, 2018; Steinberg et al., 2008), our sample could be too young to pick up on potential age interactions. Future research should include individuals in early adulthood to assess whether the relation between anger fuse and nonviolent offending weakens with age. Additionally, whether these individuals desist offending altogether is important to determine, as this would confirm that ‘nonviolent-short fuse’ youth represent adolescent-limited offenders.

Interestingly, we found that overall anger and anger duration’s relations to current violent behavior were moderated by age. Overall anger was *especially* related to current violence among youth 14 years and older, whereas prolonged anger was *only* related to current violence among youth 14.5 years and older. Youth in early adolescence tend to commit less serious offences, thus if prolonged anger motivates more serious crimes, it may only start to impact behavior in mid-to-late adolescence (DeLisi, 2015). Alternatively, youth in early adolescence may not have the same perspective on what feeling angry for “a long time” means, which could have impacted results. Our findings indicate that age-related differences are important to consider and underscore the need for future delinquency research to be grounded in developmental psychological science.

### **Strengths and Limitations**

Our findings have high ecological validity as we used the same records that the courts use to make decisions about adjudicated youth. Thus, our findings have direct implications on how courts could improve their risk assessments. Additionally, because the data was court-provided, our sample is virtually the entire county’s population and we had access to all youths’ two-year later recidivism data.

As with any study our method has limitations. Because we had access to only juvenile court records, our sample did not include youth who committed the most serious violent crimes (i.e., murders) as they are processed by the adult courts. It is possible that including youth who have committed especially violent crimes may strengthen our findings as features of anger may be increasingly tied to violence as severity increases. Our measures were limited to what the courts implement in practice, thus we used single-items to assess anger duration and fuse. We therefore could not report reliability statistics. However, we still found meaningful relations between these anger items and youths' violent and nonviolent antisocial behavior, with similar or greater effect sizes to other established risk factors (e.g., gender, violent priors, and number of priors, see Supplementary Table 1). Additionally, the relations between anger duration/fuse and outcomes were congruent with past theory and research on these topics (e.g., Fernandez et al., 2018; Potegal, 2010) further suggesting that these anger measures tapped into the relevant constructs. Single-item dichotomous variables (e.g., physical aggression in the YLS/CMI) have been found to individually predict recidivism, supporting that single-item measures can be effective and useful recidivism predictors (Villanueva et al., 2019). Lastly, single-item measures have high ecological validity—i.e., reflect the way courts *actually* measure anger/violence—thus, can be more easily integrated into established risk assessments.

The measures of anger and current violent behavior were assessed based on youth self-report. It is possible that youth were concerned about how their answers would affect their case, which may have influenced their responses. Despite potential social desirability biases, responses were still associated with recidivism. Furthermore, unlike behaviors, emotions are internal states, thus self-report measures are currently the most direct way to measure them.

Our measures did not consider how ongoing contextual factors may affect youths' reports of anger. As the GST suggests, justice-involved youth typically experience more stress at home and school than their peers (low SES, family problems etc.; Agnew et al., 2002). This may elicit greater irritability, resulting in increased anger. Our measure of overall anger could be tapping into environmental factors that cause stress, rather than youths' inherent tendency towards anger (Gray et al., 2003; Wilkowski & Robinson, 2007). Lastly, the data we had access to on whether youth committed a violent offence was based on their five most recent offences. We found that including a more complete offence history improved predictions of recidivism, thus considering full offence histories may strengthen findings. The study is also correlational; therefore, causation cannot be concluded.

### **Implications and Conclusions**

In summary, youth who reported overall higher anger were more likely to be currently violent, especially in mid- to late-adolescence, but they were not at greater risk of reoffending. However, *features* of youths' anger appear to be important for both current violence and recidivism. Youth in mid- to late-adolescence who reported prolonged anger were more likely to be currently violent. Additionally, those with violent offending histories who reported prolonged anger were about twice as likely to reoffend. Youth who reported a short anger fuse were also about twice as likely to be currently violent and—if they had only nonviolent prior offences—nonviolently recidivate. Thus, a violent offending history and prolonged anger in youth predicts potentially more serious recidivism, whereas a nonviolent offending history combined with a short fuse tends to predict less serious, nonviolent recidivism. These differing anger-offending profiles may indicate distinct types of youth offenders, which is important for courts' efforts to tailor programs to youths' needs. Further, many juvenile risk assessments—including the widely

used YLS/CMI—do not include items measuring anger fuse or duration; our findings indicate that separating measures of anger into its subcomponents may improve predictions of youths' recidivism. Knowing whether a youth is at risk for violent versus only nonviolent reoffending is crucial public safety information for courts. Overall, the present research provides a novel addition to the developmental-criminological literature suggesting that features of anger, age, and offending history are important for predicting and understanding youths' risk of violence and recidivism.



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**Table 1**

*Descriptive Statistics by Recidivism Outcome*

	No recidivism ( <i>n</i> = 344)			Nonviolent recidivism ( <i>n</i> = 104)			Violent recidivism ( <i>n</i> = 100)		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Age	15.10 <sup>d, e</sup>	1.37	11.0 – 18.0	14.61 <sup>d</sup>	1.35	11.0 – 18.0	14.34 <sup>e</sup>	1.41	11.0 – 17.0
Gender	0.54 <sup>d, e</sup>	0.50	0.00 – 1.00	0.78 <sup>d</sup>	0.42	0.00 – 1.00	0.68 <sup>e</sup>	0.47	0.00 – 1.00
YLS/CMI time difference <sup>a</sup>	0.49 <sup>d, e</sup>	2.36	-9.0 – 12.0	-0.08 <sup>d</sup>	2.30	-10.0 – 10.0	-0.06 <sup>e</sup>	2.47	-12.0 – 10.0
Charge time difference <sup>b, c</sup>	9.08 <sup>d, e</sup>	12.4	0.00 – 81.0	6.22 <sup>d</sup>	8.62	0.00 – 57.0	5.60 <sup>e</sup>	7.77	0.00 – 49.0
Number of prior charges	2.47 <sup>e</sup>	1.46	1.00 – 5.00	2.59 <sup>f</sup>	1.51	1.00 – 5.00	3.21 <sup>e, f</sup>	1.50	1.00 – 5.00
Overall anger	0.42	0.37	0.00 – 1.00	0.46	0.39	0.00 – 1.00	0.41	0.34	0.00 – 1.00
Anger fuse	0.49	0.50	0.00 – 1.00	0.57	0.50	0.00 – 1.00	0.51	0.50	0.00 – 1.00
Anger duration	0.34	0.47	0.00 – 1.00	0.37	0.48	0.00 – 1.00	0.34	0.48	0.00 – 1.00
Violent prior offences	0.34 <sup>e</sup>	0.95	0.00 – 1.00	0.33 <sup>f</sup>	0.94	0.00 – 1.00	0.60 <sup>e, f</sup>	0.99	0.00 – 1.00
Current violent behavior <sup>c</sup>	0.31 <sup>e</sup>	0.47	0.00 – 1.00	0.37 <sup>f</sup>	0.49	0.00 – 1.00	0.63 <sup>e, f</sup>	0.49	0.00 – 1.00

*Note.* A one-way ANOVA test was conducted to assess mean-level differences between groups. For gender, boys were coded as 1 and girls as 0. YLS/CMI = Youth Level of Service/Case Management Inventory.

<sup>a</sup> Number of months between when YLS/CMI and MAYSI-2 were administered. Positive values indicate MAYSI-2 was administered after YLS.

<sup>b</sup> Number of months between youths' most recent petition date and when the MAYSI-2 was administered.

<sup>c</sup> Only includes a subset of total participants that completed YLS/CMI (*n* = 284, 98, 98, respectively).

<sup>d</sup> Indicates a significant (*p* < .05) difference between the means of the no recidivism and the only nonviolent recidivism groups.

<sup>e</sup> Indicates a significant (*p* < .05) difference between the means of the no recidivism and the violent recidivism groups.

<sup>f</sup> Indicates a significant (*p* < .05) difference between the means of the violent recidivism and the only nonviolent recidivism groups.

**Table 2**

*Zero-order and Partial Correlations Between All Study Variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	–	–	–	–	–	–	–	–	–	–	–	–	–
2. Gender	.02	–	-.11*	.03	.21***	-.16***	-.10*	-.12**	-.04	.20***	.00	.12*	.22***
3. YLS/CMI time difference <sup>a</sup>	-.03	-.11*	–	.07	-.09*	-.02	-.07	.04	-.13**	-.13**	-.01	-.10*	-.12*
4. Charge time difference <sup>b</sup>	.36***	.04	.05	–	.09*	-.04	-.07	.00	.06	-.07	-.09	-.05	-.05
5. Number of prior charges	.20***	.21***	-.10*	.15***	–	-.10*	-.05	-.07	.39***	.19***	.12**	.26***	.08
6. Overall anger	-.06	-.16***	-.01	-.06	-.10*	–	.78***	.68***	.04	.00	.15**	-.04	.03
7. Anger fuse	-.02	-.10*	-.07	-.07	-.05	.78***	–	.35***	.07	.04	.18***	.01	.06
8. Anger duration	-.02	-.12**	.04	.00	-.08	.68***	.35***	–	.01	.01	.10*	-.01	.02
9. Violent prior offences	.08	-.04	-.13**	.09*	.40***	.03	.06	.01	–	.14**	.22***	.24***	.01
10. Overall recidivism	-.22***	.19***	-.12**	-.14**	.14**	.01	.05	.02	.12**	–	.15**	–	–
11. Current violent behavior	-.21***	.00	-.01	-.17***	.08	.16***	.18***	.11*	.21***	.19***	–	.23***	.03
12. Violent recidivism <sup>c</sup>	-.23***	.12*	-.10*	-.13**	.21***	-.02	.01	.00	.22***	–	.29***	–	–
13. Nonviolent recidivism <sup>c</sup>	-.15**	.20***	-.11*	-.10*	.04	.04	.06	.03	-.01	–	.05	–	–

*Note.* The top half of table are partial correlations controlling for age, while the bottom half are zero-order correlations ( $n = 382-548$ ). For gender, boys were coded as 1 and girls as 0. The violent recidivism variable only included youth who did not reoffend (0) and those that violently reoffended (1). The nonviolent recidivism variable only included youth who did not reoffend (0) and those who only nonviolently reoffended (1).

YLS/CMI = Youth Level of Service/Case Management Inventory.

<sup>a</sup>Number of months in between when the MAYSI-2 and YLS/CMI were administered. Positive values indicate MAYSI-2 was administered after YLS/CMI.

<sup>b</sup>Number of months between youths’ most recent petition date and when the MAYSI-2 was administered.

<sup>c</sup>For correlations between current violent behavior and nonviolent/violent recidivism  $n = 382$  as only a subset had YLS/CMI data.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 3**

*Anger Duration and Fuse on Overall Recidivism by Offence History*

Predictors	<i>Youth with violent prior(s) (n = 211)</i>			<i>Youth with only nonviolent prior(s) (n = 336)</i>		
	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>
Age	0.70	[0.56, 0.89]	.003	0.68	[0.56, 0.84]	< .001
Gender	2.44	[1.32, 4.51]	.005	2.19	[1.24, 3.86]	.007
Charge time difference <sup>a</sup>	0.99	[0.96, 1.02]	.427	0.96	[0.92, 1.00]	.027
Number of priors	1.17	[0.94, 1.45]	.157	1.28	[1.05, 1.55]	.015
Anger duration	1.96	[1.03, 3.73]	.040	0.73	[0.41, 1.28]	.267
Anger fuse	0.73	[0.39, 1.36]	.320	1.95	[1.14, 3.32]	.015

*Note.* Logistic regression odds ratios for adjudicated youths' anger duration and fuse on overall recidivism.

OR = odds ratio, CI = confidence interval.

<sup>a</sup> Number of months between youths' most recent petition date and when the MAYSI-2 was administered.

**Table 4**

*Anger Duration and Fuse on Violent and Nonviolent Recidivism by Offence History*

Predictors	<i>Model 3a: Youth with only nonviolent prior(s) (n = 336)</i>							<i>Model 3b: Youth with violent prior(s) (n = 211)</i>							
	<i>Nonviolent recidivism</i>			<i>Violent recidivism</i>				<i>X<sup>2</sup></i>	<i>Nonviolent recidivism</i>			<i>Violent recidivism</i>			<i>X<sup>2</sup></i>
	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>	OR		95% CI	<i>p</i>	OR	95% CI	<i>p</i>		
Age	0.70	[0.55, 0.88]	.002	0.67	[0.50, 0.90]	.007	13.78**	0.92	[0.66, 1.27]	.595	0.63	[0.49, 0.81]	< .001	14.70**	
Gender	1.89	[1.00, 3.59]	.051	3.02	[1.18, 7.75]	.022	8.26*	17.0	[3.82, 75.7]	< .001	1.23	[0.62, 2.45]	.552	26.21***	
Charge time diff. <sup>a</sup>	0.97	[0.94, 1.01]	.152	0.91	[0.83, 0.99]	.032	9.26*	0.99	[0.95, 1.02]	.417	0.99	[0.95, 1.03]	.544	0.87	
Number of priors	1.18	[0.94, 1.48]	.161	1.49	[1.13, 1.96]	.005	8.63*	1.04	[0.78, 1.40]	.770	1.24	[0.96, 1.59]	.095	2.90	
Anger duration	0.77	[0.40, 1.45]	.410	0.64	[0.27, 1.52]	.314	1.39	2.19	[0.87, 5.53]	.097	1.85	[0.90, 3.81]	.094	4.34	
Anger fuse	2.22	[1.20, 4.11]	.011	1.50	[0.70, 3.22]	.296	6.80*	0.77	[0.31, 1.88]	.564	0.71	[0.35, 1.44]	.349	0.98	

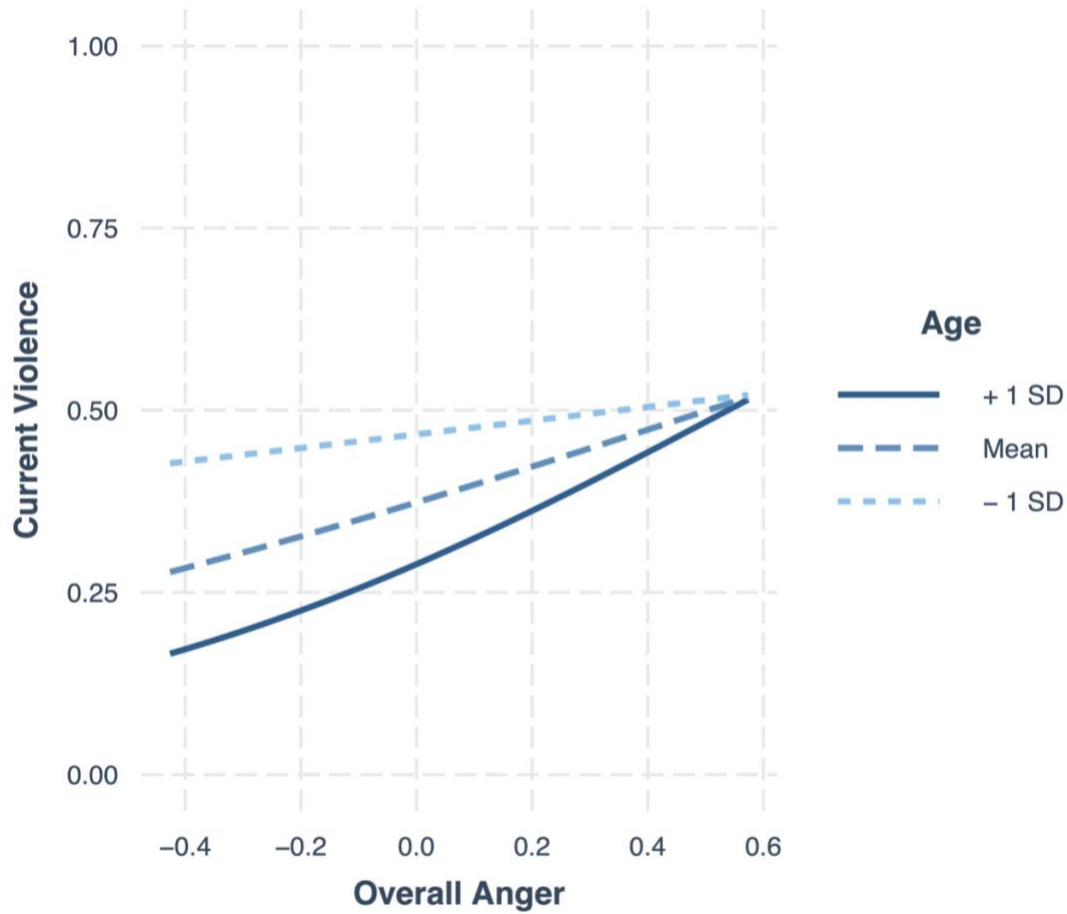
*Note.* Multinomial regression odds ratios for adjudicated youths’ anger duration and fuse on violent and nonviolent recidivism grouped by whether youth had a violent prior offence. The reference category was youth who did not reoffend. *X<sup>2</sup>* values correspond to likelihood ratio tests that indicate whether the model is significantly improved by adding each variable. OR = odds ratio, CI = confidence interval, *X<sup>2</sup>* = Chi-square value, Vio. = Violent., Diff. = Difference.

<sup>a</sup> Number of months between youths’ most recent petition date and when the MAYSI-2 was administered.

\**p* < .05, \*\**p* < .01, \*\*\**p* < .001.

**Figure 1**

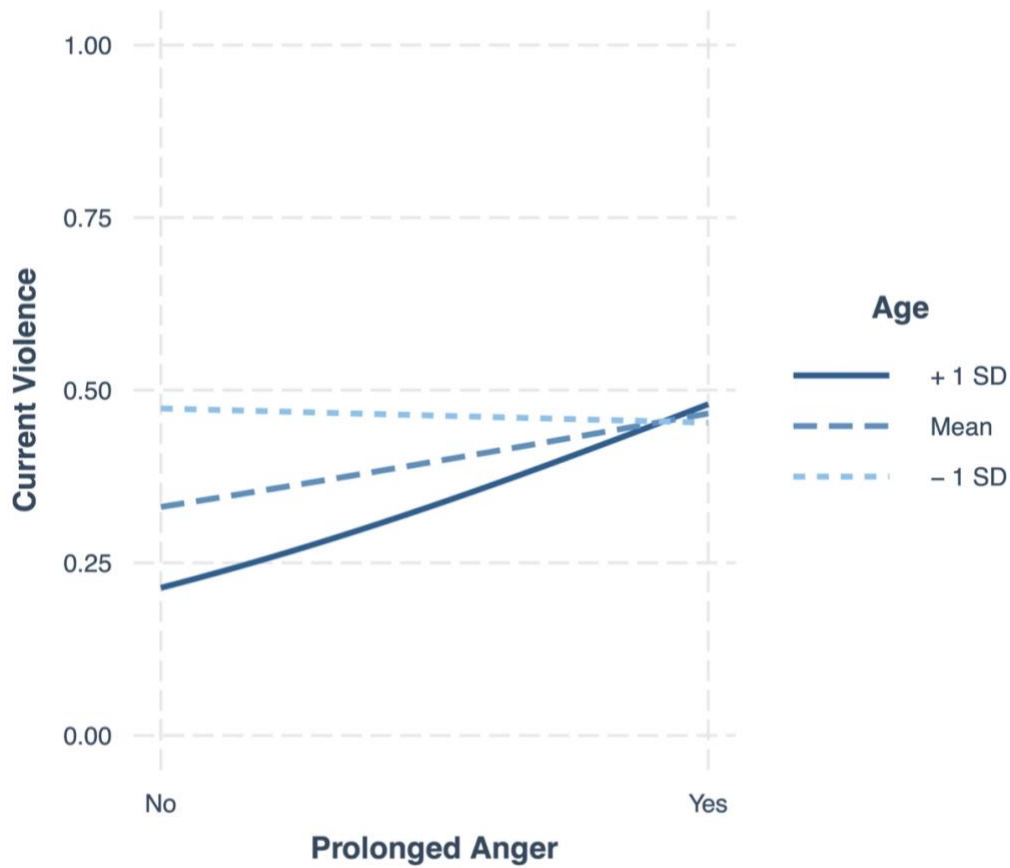
*Overall Anger on Current Violent Behavior*



*Note.* Overall anger and current violent behavior by age. Overall anger was mean-centered. Gender, number of priors, time between MAYSI-2 and YLS/CMI administration, and time between MAYSI-2 and most recent offence were controlled.

**Figure 2**

*Anger Duration on Current Violent Behavior*



*Note.* Anger duration and current violent behavior by age. Gender, number of priors, time between MAYSI-2 and YLS/CMI administration, and time between MAYSI-2 and most recent offence were controlled.