



Suicidal and violent behavior: The role of anger, emotion dysregulation, and impulsivity



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ABSTRACT

Suicidality and violence are serious public health problems. A rich literature supports the relationship between suicidality and violence, including common associations with trait anger. However, less is known about how trait anger may facilitate these behaviors. Two potential mechanisms in this relationship are emotion dysregulation and impulsivity, both of which are linked to increased anger, suicidality, and violence. We investigated anger as a common underlying factor for both suicidal and violent behavior, and emotion dysregulation and impulsivity (i.e., negative and positive urgency) as potential mediators in this relationship. Results demonstrate that trait anger was associated with both suicidal and violent behavior. Further, emotion dysregulation mediated the anger and suicidal behavior relationship whereas both negative and positive urgency mediated the anger and violent behavior relationship. Although trait anger may be a common underlying factor for both suicidal and violent behavior, the nature of these relationships seems to vary significantly.

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1. Introduction

Intentional harm towards the self and others is a major public health concern. At the extremes, suicide and homicide are leading causes of mortality, second only to accidental death, among young people (CDC, 2012, 2013). Less severe acts of harm towards self and others are even more ubiquitous. Between 1.9% and 8.7% of individuals attempt suicide in their lifetime (Nock et al., 2008), while 12% of adolescents report physical violence in romantic relationships (Halpern, Oslak, Young, Martin, & Kupper, 2001). These acts of non-fatal harm are of great concern, not only for their direct adverse consequences (Clarke & Whittaker, 1998; Krug, Mercy, Dahlberg, & Zwi, 2002), but also because of the increased likelihood of engaging in other forms of harm. The relationship between suicidal and violent behavior has been long recognized with many psychoanalysts claiming that suicide is aggression turned inward (Plutchik & van Praag, 1986). More recently, empirical evidence has shown that individuals with a history of violence are more likely to engage in self-harm (Greening, Stoppelbein, Luebke, & Fite, 2010; Zhang et al., 2012). Likewise, individuals with past suicide attempts are more likely to have a history of violence (Keilp et al., 2006).

One trait that may predispose individuals to suicidal and violent behavior is anger. A rich literature shows a relationship between elevated anger and violence. Anger is the primary motivator for violent behavior and is the most common emotion experienced when engaging in aggression (Averill, 1983). Furthermore, increased anger is repeatedly associated with violence across clinical and non-clinical samples (Deffenbacher, Deffenbacher, Lynch, & Richards, 2003; McCloskey, Berman, Noblett, & Coccaro, 2006; Ramírez & Andreu, 2006). Although less extensively studied, anger is also linked with suicidal behavior in both community and psychiatric populations (Giegling et al., 2009; Horesh et al., 1997; Lehnert, Overholser, & Spirito, 1994).

The mechanism(s) through which anger may facilitate suicidal or violent behavior is less clear. Several intrapersonal variables, most notably emotion dysregulation and impulsivity, have been linked to suicidal and violent behavior, as well as anger (Giegling et al., 2009; Rajappa, Gallagher, & Miranda, 2012; Ramírez & Andreu, 2006). Emotion dysregulation is associated with aggressive responding on laboratory tasks (Cohen, Zeichner, & Seibert, 2008) and discriminates between those who have and have not engaged in intimate partner violence (Gratz & Roemer, 2004). Likewise, emotion dysregulation is predictive of suicidal behavior (Rajappa et al., 2012). Emotion dysregulation is also strongly correlated with heightened trait anger (McCloskey et al., 2009). Although emotion dysregulation has been associated with both suicidal and violent

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behaviors, a more direct examination of how this trait may influence the pathway from anger to such behaviors is needed.

Although impulsivity was once conceptualized as a facet of emotion dysregulation (Eysenck & Eysenck, 1969) it has since been recognized as an independent construct, where emotion dysregulation is central to coping with emotional experiences (Gratz, 2007) and impulsivity is related to a general propensity to act rashly (Whiteside, Lynam, Miller, & Reynolds, 2005). Both suicidal and violent behavior have been associated with impulsivity (Anestis, Selby, & Joiner, 2007; Mann et al., 2009; Shorey, Brasfield, Febres, & Stuart, 2011); however, specific facets of impulsivity may be more relevant to emotion dysregulation. Negative and positive urgency refer to rash behavior in response to negative and positive emotional experiences, respectively (Cyders et al., 2007; Whiteside & Lynam, 2001), and may facilitate risk behavior in different ways. For example, when experiencing distress one may act rashly to reduce negative affect whereas rash behavior may also be used to enhance an existing positive mood (Cyders & Smith, 2008). Some research has suggested the importance of negative urgency in suicidal (Anestis & Joiner, 2011) and violent (Settles et al., 2012) behavior, but research has been limited. The tendency to act rashly in response to both negative and positive emotions may be an influential factor, but these relationships need to be explored.

The aim of the current study was to assess potential pathways leading to suicidal and violent behavior by examining the role of trait anger, in addition to emotion dysregulation and impulsivity. We aimed to first replicate previous findings suggesting that trait anger may be a common underlying factor for both suicidal and violent behavior and then examined emotion dysregulation and impulsivity as mediators in this relationship. Given the support for the relationships between emotion dysregulation and suicidal and violent behavior, and anger, it is expected that emotion dysregulation will mediate the relationship between anger and both suicidal and violent behavior. Similarly, relationships established with negative urgency suggest that it may facilitate the progression from anger to suicidal and violent behavior. The role of positive urgency is less clear. Direct evidence has not examined the relationship between positive urgency and suicidal and violent behaviors, but it has been suggested that anger may serve as a positive, versus negative, emotion (see Litvak, Lerner, Tiedens, & Shonk, 2010 for review). As such, it was also expected that positive urgency would serve as a mediator.

2. Method

2.1. Participants

Participants were 2,295 undergraduate students from a large urban university. Participants were aged 18–57 ($M = 20.94$, $SD = 3.42$), 61% female, and predominately Caucasian (61%), African American (13%), and Asian American (13%). Participants were classified based on their history of suicide attempts (SA), specifically, as reporting one or more suicide attempts (SA+; $n = 108$) or no attempts (SA–; $n = 2,177$). They were also classified as having a history of violent behavior (VB+ group; $n = 555$) or no history (VB– group; $n = 907$). Because many participants ($n = 794$, 34.6%) reported occasional violent behavior (i.e., 1–3 acts), individuals were categorized as having a history of violent behavior if they reported four or more lifetime acts of physical aggression against another person (top quartile of violent behavior).

2.2. Materials

2.2.1. Suicidal behavior

The Suicide Behavior Questionnaire-Revised (SBQ-R; Osman et al., 2001), a 4-item questionnaire measuring dimensions of

suicidality, was used to assess the presence of suicide attempts. Only the item regarding lifetime suicide attempts was used in the current study (i.e., “I have attempted to kill myself, and really hoped to die”). The SBQ-R has good psychometric properties (Osman et al., 2001).

2.2.2. Aggressive behavior

The Lifetime History of Aggression (LHA; Coccaro, Berman, & Kavoussi, 1997), an 11-item questionnaire, was used to assess the frequency of violent behavior. Two items specifically addressing violence were used in the current study [i.e., “Get into physical fights with other people,” “Deliberately hit another person in anger (whether during a physical fight or not)”. The measure’s psychometric properties have been previously established (Coccaro et al., 1997).

2.2.3. Anger

The State-Trait Anger Expression Inventory 2 – Trait Anger Subscale (STAXI-T; Spielberger, 1988) is a 10-item self-report measure of trait anger that has strong psychometric support (Spielberger, 1988). In the present study, the STAXI-T had good internal consistency ($\alpha = .85$).

2.2.4. Emotion dysregulation

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item questionnaire used to assess difficulties in regulating emotions. It assesses six dimensions, in addition to an overall composite score (used in the current study) of emotion regulation. The DERS overall composite has strong psychometric properties (Gratz & Roemer, 2004) and demonstrated excellent internal consistency in our study ($\alpha = .94$).

2.2.5. Impulsivity

The UPPS-P Impulsive Behavior Scale (UPPS-P; Cyders et al., 2007; Whiteside & Lynam, 2001) is a 59-item questionnaire measuring five dimensions of impulsivity, including negative and positive urgency (tendency to engage in impulsive behaviors when experiencing negative and positive affect, respectively). The psychometric properties of the UPPS-P have been supported (Cyders et al., 2007; Whiteside & Lynam, 2001). In our study internal consistency was strong (negative urgency, $\alpha = .87$; positive urgency, $\alpha = .95$).

2.3. Procedures

Participants completed a series of self-report measures as part of a larger study examining aggression and self-aggression. All participants provided informed consent and received course credit for their participation.

2.4. Analytic strategy

Our analytic approach to test our main model had two steps. The first step involved testing a multiple mediator model in which emotion dysregulation, negative urgency, and positive urgency mediated the relationships between anger and SA and anger and VB. We also tested a version of our full model where the order of predictors were switched such that anger mediated the relationships of emotion dysregulation, negative urgency, and positive urgency with SA and VB, allowing us to test the quality of the direction of the proposed model.

The second step involved separately testing each single mediator and single outcome to examine each relationship in isolation (e.g., emotion dysregulation as a mediator of the relationship between anger and VB). This was accomplished by nesting each smaller model in the multiple mediator model. This approach

Table 1
Study variables as a function of suicide attempt (SA) and violent behavior (VB) history.

	SA+ (n = 108)	SA- (n = 2177)	F statistic (η_p^2)	VB+ (n = 555)	VB- (n = 907)	F statistic (η_p^2)
Trait anger	20.05 (5.91)	16.72 (4.93)	48.42*** (.02)	19.06 (5.37)	15.14 (4.24)	248.97*** (.15)
Emotion dysregulation	99.93 (24.99)	83.11 (21.75)	67.58*** (.03)	87.40 (23.32)	80.33 (21.04)	46.94*** (.03)
Negative urgency	29.82 (6.85)	26.36 (6.54)	28.29*** (.01)	28.27 (6.22)	25.06 (6.54)	100.96*** (.07)
Positive urgency	28.56 (10.67)	25.82 (9.25)	10.56** (.01)	28.13 (9.18)	23.85 (8.82)	67.42*** (.05)

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

allowed us to examine comparative model fit of the single mediator/outcome model with the multiple mediator/outcome model.

We tested all models using Mplus 7.0 (Muthén & Muthén, 1998–2013) with WLSMV estimation. Model comparisons were conducted using the DIFFTEST option, which produces a directional chi-square test of comparative model fit. A significant chi-square test indicated that increasing model constraints worsened model fit over the less constrained model. Indirect effects were examined using bias corrected bootstrapping with 1,000 bootstrapped samples.¹

3. Results

3.1. Preliminary analyses

Those with and without a history of SA and those with and without a history of VB were compared on demographic variables. There were more SA+ females ($n = 84$, 78%) than males ($n = 23$, 22%), $\chi^2(1, 2,295) = 22.63$, $p < .001$. Conversely, there were more VB+ males ($n = 292$, 53.50%) than females ($n = 254$, 46.50%), $\chi^2 = 94.67$, $p < .001$. SA+ individuals were significantly older ($M_{age} = 21.81$, $SD = 4.13$) than SA- ($M_{age} = 20.91$, $SD = 3.38$), $t(2,270) = -2.68$, $p = .008$. There was also a marginal age difference for VB+ ($M_{age} = 21.18$, $SD = 3.48$) and VB- ($M_{age} = 20.82$, $SD = 3.34$) groups, $t(451) = -1.97$, $p = .05$. Race did not vary as a function of SA ($\chi^2 = 6.99$, $p = .07$); however, significantly more VB+ individuals identified as Caucasian ($\chi^2 = 20.92$, $p < .001$). SA+ (versus SA-) participants were significantly more likely to be VB+, $\chi^2 = 7.90$, $p = .01$ ($n = 59$, 54.8%). Measures of trait anger, emotion dysregulation, and positive and negative urgency were all positively inter-correlated (r 's = .26–.60).

3.2. Suicide attempt and violence history

Differences in trait anger, emotion dysregulation, and positive and negative urgency as a function of SA and VB history were examined via ANCOVAs with gender and age as covariates. Both SA+ and VB+ individuals reported higher levels of trait anger, emotion dysregulation, and positive and negative urgency compared to their counterparts (see Table 1).

3.3. Mediation analyses

3.3.1. Full model

The results of the full model are shown in Fig. 1. All paths from trait anger to the mediators were significant. The paths from negative urgency to SA and VB and from positive urgency to SA were not significant; all other paths from mediators to outcomes were significant. Indirect effects (see Table 2) showed that emotion dysregulation, but not negative urgency or positive urgency, were mediators in the trait anger – SA relationship. Conversely, negative

and positive urgency, but not emotion dysregulation, were mediators in the relationship with trait anger – VB relationship.²

We also tested the full model (i.e., with all relevant direct effects) nested within a fully saturated model (i.e., a model with covariances between emotion dysregulation, positive urgency, and negative urgency included). The fully-saturated model exhibited superior model fit to the less-constrained model ($\chi^2(3) = 810.09$, $p < .001$); thus, for sake of simplicity, we do not report the less-constrained saturated model.

We analyzed a supplementary model where the order of the independent variable and mediators from the previous full model were reversed (see Fig. 2). The paths from emotion dysregulation to trait anger, SA, and VB, from negative urgency to trait anger, from positive urgency to VB, and from trait anger to SA and VB were all significant. There were significant indirect effects (see Table 2) through anger on the relationships between emotion dysregulation and SA, negative urgency and SA, and negative urgency and VB. Thus, in addition to the main model, this model suggests that while negative urgency does not mediate the relationship between anger and SA, anger does mediate the relationship between negative urgency and SA.

3.3.2. Independent mediators of the anger – SA relationship

Emotion dysregulation, negative urgency, and positive urgency were explored independently as mediators in the relationship between trait anger and SA (see Fig. 3). Neither the model examining emotion dysregulation ($\chi^2(11) = 1,735.89$, $p < .001$), nor negative urgency ($\chi^2(11) = 1,760.10$, $p < .001$), nor positive urgency ($\chi^2(11) = 2,062.44$, $p < .001$) as a mediator of the relationship between anger and SA improved model fit over the main model. The independent models revealed significant indirect effects through emotion dysregulation and through negative urgency on the anger – SA relationship. However, indirect effects were not significant through positive urgency on the anger – SA relationship (see Table 2).

3.3.3. Independent mediators of the anger – VB relationship

The relationship between trait anger and VB history was explored with emotion dysregulation, negative urgency, and positive urgency as independent mediators (see Fig. 4). Neither the model examining emotion dysregulation ($\chi^2(11) = 1,596.48$, $p < .001$), nor negative urgency ($\chi^2(11) = 1,599.77$, $p < .001$), nor positive urgency ($\chi^2(11) = 1,905.63$, $p < .001$) as a mediator of the relationship between anger and VB improved model fit over the main model. The independent models revealed non-significant indirect effects through emotion dysregulation on the anger – VB relationship; however, the indirect effects through negative urgency and through positive urgency on the anger – VB relationship were significant (see Table 2).

¹ Because the DIFFTEST option cannot be used with bias-corrected bootstrapping in the same model in Mplus; we examined model comparisons and indirect effects in separate analyses. This does not change the overall interpretation, and thus we present all analyses simultaneously.

² We also analyzed the main model using depression symptomology as a covariate. There were no changes to the overall interpretation of the model, thus, we do not include it.

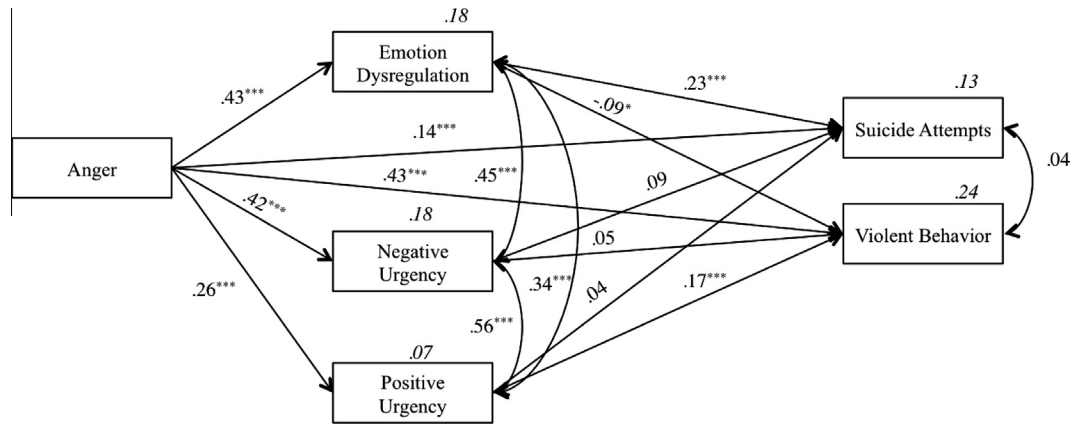


Fig. 1. Combination of emotion dysregulation, negative urgency, and positive urgency as mediators in the relationship of trait anger with suicide attempts and violent behavior. Note: * $p < .05$, ** $p < .01$, *** $p < .001$; standardized estimates reported; R^2 values presented in italics.

Table 2
Summary of indirect effects from all mediational models.

Model	Estimate (SE)	95% CI (LL, UL)
<i>SA history & VB history</i>		
Anger → emotion dysregulation → SA	.10*** (.02)	.06, .15
Anger → negative urgency → SA	.04 (.03)	-.01, .09
Anger → positive urgency → SA	-.02 (.02)	-.02, .01
Anger → emotion dysregulation → VB	-.002 (.02)	-.03, .03
Anger → negative urgency → VB	.05** (.02)	.02, .08
Anger → positive urgency → VB	.04** (.02)	.03, .06
<i>SA history & VB history (reverse model)</i>		
Emotion Dysregulation → anger → SA	.04** (.01)	.01, .06
Negative urgency → anger → SA	.04** (.01)	.01, .06
Positive urgency → anger → SA	-.002 (.003)	-.01, .004
Emotion dysregulation → anger → VB	.12 (.01)	.09, .15
Negative urgency → anger → VB	.12*** (.01)	.09, .14
Positive urgency → anger → VB	-.01 (.01)	-.03, .01
<i>SA history</i>		
Anger → emotion dysregulation → SA	.10*** (.02)	.06, .15
Anger → negative urgency → SA	.06** (.02)	.02, .10
Anger → positive urgency → SA	.01 (.01)	-.01, .04
<i>VB history</i>		
Anger → emotion dysregulation → VB	-.002 (.02)	-.03, .03
Anger → negative urgency → VB	.05** (.02)	.004, .02
Anger → positive urgency → VB	.04*** (.01)	.03, .06

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; standardized estimates presented; indirect effects are based on 1000 bootstrapped samples; SA, suicide attempts; VB, violent behavior.

4. Discussion

The current study aimed to investigate the relationships of suicidal and violent behavior with trait anger, emotion dysregulation, and impulsivity. Suicidal behavior was most strongly associated with emotion dysregulation, but violent behavior was most strongly related to anger and impulsivity. Findings support an association between trait anger and both suicidal and violent behavior, consistent with previous research (Deffenbacher et al., 2003; Lehnert et al., 1994; McCloskey et al., 2006). However, these relationships appear to have potentially distinct pathways. Emotion dysregulation was an important factor in the trait anger–suicide attempt relationship whereas negative and positive urgency were important in the trait anger–violent behavior relationship.

Emotion dysregulation, but not negative or positive urgency, served as a mediator in the relationship between trait anger and suicide attempts. However, when examined independently, negative urgency was also a significant mediator in the relationship, suggesting that although negative urgency may be influential in the anger–suicide attempt relationship, emotion dysregulation may be a more pertinent factor to consider. These findings further suggest that anger may facilitate suicidality through an individual’s reduced ability to control, or cope with, negative affect, specifically anger. This is consistent with previous research demonstrating individuals with a history of suicide attempts reporting perceptions of limited access to emotion regulation strat-

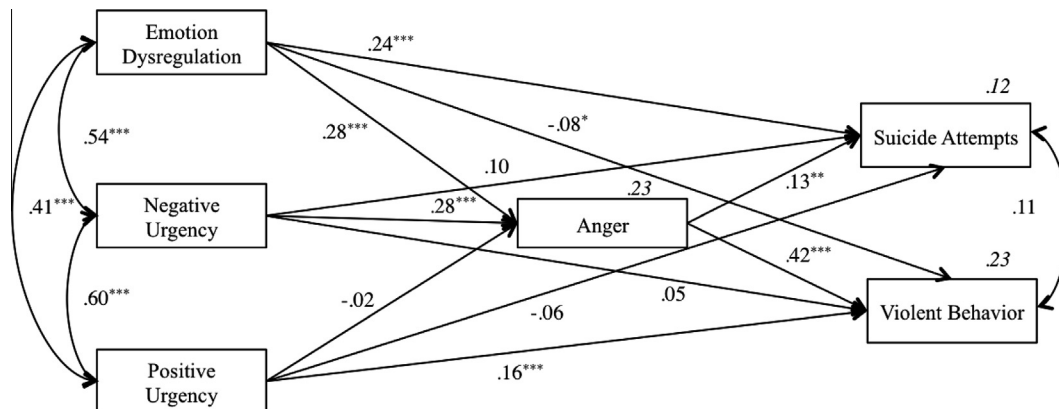


Fig. 2. Anger as a mediator of the relationships between emotion dysregulation, negative urgency, and positive urgency and suicide attempts and violent behavior. Note: * $p < .05$, ** $p < .01$, *** $p < .001$; standardized estimates reported; R^2 values presented in italics.

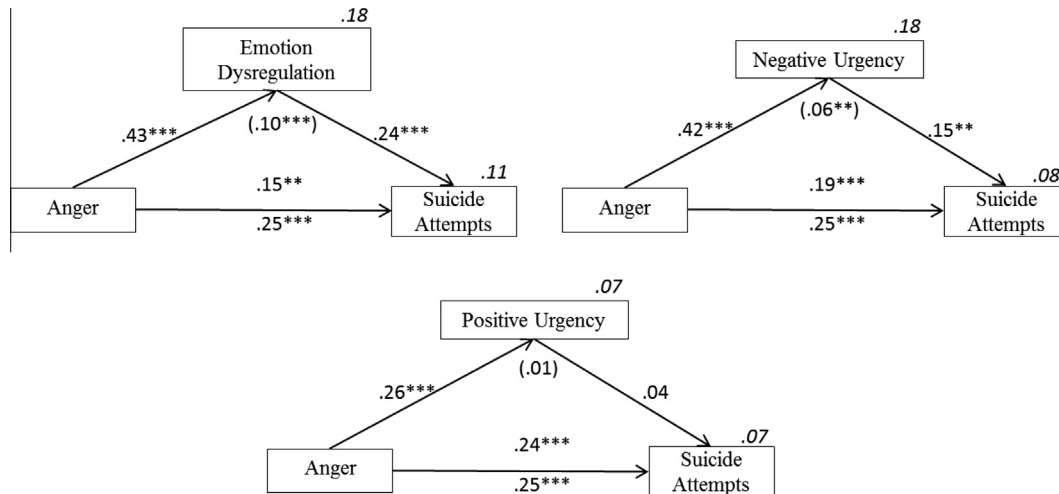


Fig. 3. Independent mediator models between trait anger and suicide attempt history. Note: * $p < .05$, ** $p < .01$, *** $p < .001$; standardized estimates reported; R^2 values presented in italics; indirect effects (based on 1000 bootstrapped samples) appear in parentheses.

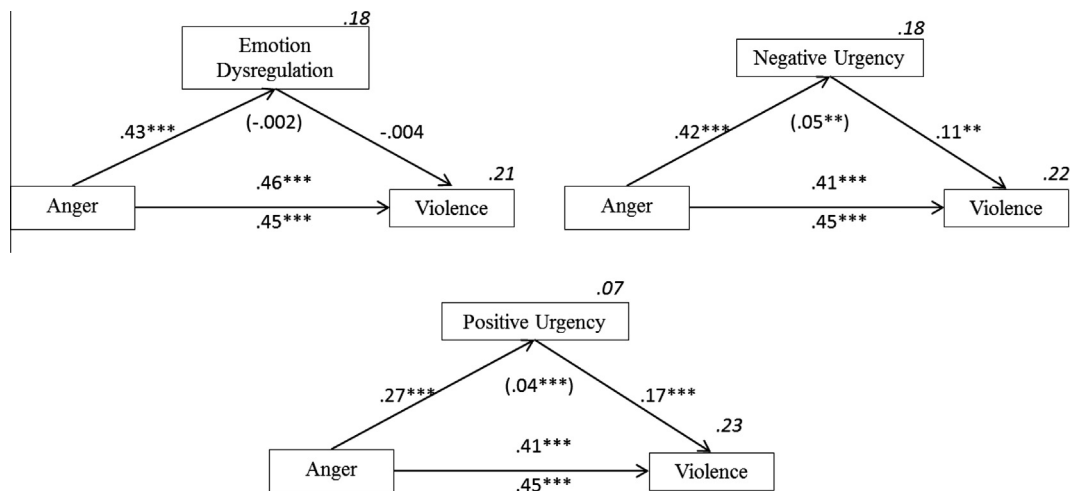


Fig. 4. Independent mediator models between trait anger and violent behavior history. Note: * $p < .05$, ** $p < .01$, *** $p < .001$; standardized estimates reported; R^2 values presented in italics; indirect effects (based on 1000 bootstrapped samples) appear in parentheses.

egies (Rajappa et al., 2012). It is possible then that for individuals with a history of suicide attempts that such suicidal behavior may serve as way to cope with the experience of increased feelings of anger and as a potential mechanism to reduce this elevated negative affect.

Consistent with previous research on the relationship between negative urgency and violence (Settles et al., 2012), negative urgency mediated the relationship between trait anger and violent behavior. A more novel finding was that positive urgency mediated the relationship between trait anger and violent behavior. Although anger does not typically appear to reflect a positive mood state, it has been hypothesized that anger is a positive emotion for some (Litvak et al., 2010) or even a rewarding experience (Sanfey, 2003). Such hypotheses are in line with the current findings in addition to previous work on positive urgency, such as when examining problem drinking (Cyders et al., 2007). Another possible explanation is that angry individuals have a general tendency to act in a violent (aggressive) manner when they are emotionally aroused, regardless if due to a negative or positive emotion. That is, aggression is already part of their behavioral repertoire, as a response to any emotionally arousing stimuli.

Contrary to our hypotheses, emotion dysregulation did not mediate the relationship between trait anger and violent behavior. It is possible that anger, emotion dysregulation, and violence are so intertwined there was not sufficient unique variance for resulting mediation. However, the moderate correlations between the constructs in our sample would argue against this. Another possibility is that emotion regulation is not as strongly associated with violence in a college sample as in a clinical sample. For example, group differences in emotion dysregulation between perpetrators and non-perpetrators of dating violence are inconsistent (Gratz & Roemer, 2004; Shorey et al., 2011). A third (admittedly post hoc) possible explanation is violence is most normative in adolescence and young adulthood (Halpern et al., 2001), thus general emotion regulation deficits are not as influential in the transition from high anger to violence, rather impulsivity is more integral to this process. It was also surprising that negative urgency did not mediate the anger–suicide attempt relationship in the full model, especially given previous research (Anestis & Joiner, 2011). Negative urgency did, however, act as a mediator in the independent model. It is possible that although negative urgency may be important in the progression from anger to suicidal behavior, the impact of emotion

dysregulation may be so strong that this effect discounts the influence of negative urgency.

4.1. Limitations & future research

Study limitations include the lack of generalizability beyond a college sample, single method data collection, and the use of cross-sectional data limiting the ability to test true mediation. To address the cross-sectional nature of the data, we conducted analyses reversing the predictor and mediators of the proposed model as to test the quality of the direction of the proposed model. There were findings from this reversed model (e.g., anger mediating the emotion dysregulation–suicide relationship) that reinforced the difficulties in determining temporal precedence in the model. Given this, we relied on the model that is more theoretically consistent, in this case the proposed full model, and use such findings as a foundation for future research.

4.2. Clinical implications

Overall, our findings suggest that although trait anger may be a common underlying factor of both suicidal and violent behavior, the nature of these relationships varies significantly. Greater emotional dysregulation seems to play a crucial role among those with a history of suicidal behavior; therefore, these individuals may benefit most from treatment focused on more general management of negative emotions, particularly anger. On the other hand, treatment for individuals with a history of violent behavior may be most effective when designed to directly address anger as route for reducing aggression (McCloskey, Noblett, Deffenbacher, Gollan, & Coccaro, 2008).

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