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Role of Thwarted Belongingness and Perceived Burdensomeness in the Relationship between Violent Daydreaming and Suicidal Ideation in Two Adult Samples

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Abstract

Background—Despite evidence that violent daydreaming is a correlate of suicidal ideation, no research has examined the mechanisms underlying this association. The interpersonal theory of suicide may provide insight. This theory postulates that individuals with high suicidal desire experience intractable feelings of perceived burdensomeness (PB) and thwarted belongingness (TB). Violent daydreaming may fuel negative attitudes towards others and oneself and turn attention away from loved ones, thereby increasing feelings that one is a burden on others (PB) and socially disconnected (TB). However, no studies have tested TB and PB as explanatory mechanisms. In this study, we aimed to examine the relationships between violent daydreaming, PB, TB, suicidal ideation, and depression in two samples ($N=818$).

Method—Study 1 was comprised of general undergraduates, and Study 2 selected for undergraduates with a history of ideation. Self-report measures were administered and indirect effects analyses were conducted.

Results—In both studies, violent daydreaming was associated with increased feelings of PB, TB, and ideation severity. Consistent with the interpersonal theory, TB and PB were significant parallel mediators of the relationship between violent daydreaming and suicidal ideation, beyond sex and age. In contrast to Study 1, results were no longer significant in Study 2 after accounting for depression.

Originality/Value—This was the first study to test TB and PB as mechanisms underlying the relationship between violent daydreaming and suicide risk. Findings highlight the importance of monitoring and addressing violent daydreams and interpersonal functioning throughout treatment to mitigate risk.

Keywords

violent daydreaming; suicidal ideation; perceived burdensomeness; thwarted belongingness; interpersonal theory of suicide; depression

Introduction

Emerging adulthood is a developmental period that is often associated with the transition to college, involving significant stress and changes in social support. One survey of first-year undergraduates conducted in 2010 revealed that many young adults start college in an emotionally vulnerable state and lack the skills to manage the college stressors (Sieben, 2011). Therefore, college may increase risk for non-suicidal self-injury (NSSI) and suicidal behavior. Indeed, researchers estimate that approximately 12–38% of older adolescents and young adults have engaged in NSSI (Gratz et al., 2002; Heath et al., 2008; Jacobson and Gould, 2007; Polk and Liss, 2007; Whitlock et al., 2006), while the rate of lifetime NSSI among the general adults is approximately 5.9% (Klonsky, 2011). Furthermore, 28–55% of young adults engaging in NSSI also report suicidal ideation (Klonsky, 2011; Muehlenkamp & Kerr, 2010). As suicide is the second leading cause of death among young adults between the ages of 15 and 29 (WHO, 2016), research among young adults is needed to understand the processes connecting risk factors to suicide-related behaviors as this provides clinicians with tangible therapeutic targets.

Emerging evidence suggests that *violent daydreaming*, conceptualized as specific periods of enduring, vivid, and emotional thoughts about violent acts, such as death, suicide and revenge (Selby, Anestis, & Joiner, 2007), may be a suicide risk factor. Though active ideation is similarly violent in that it focuses on the actions of hurting oneself, it is distinct from violent daydreaming, as active ideation is not necessarily a spontaneous fantasy or daydream (Chu et al., 2016b; Silverman et al., 2007). Violent daydreaming has been anecdotally reported among high-risk individuals (e.g., Rudd, Joiner, & Rajab, 2001; Shneidman, 1996), and supported empirically, with research finding that individuals with a history of suicide-related behaviors reporting more violent daydreams about death (Chu et al., 2016b; Crane et al., 2011; Hales et al., 2011; Holmes et al., 2007; Selby et al., 2007).

Despite evidence to suggest a relationship between violent daydreaming and suicidal ideation, less is known about the mechanisms underlying their association. To our knowledge, one study has examined factors influencing this relationship. Selby and colleagues (2007) demonstrated that the relationship between violent daydreaming and suicidal ideation was stronger among individuals with more severe symptoms of depression. Similarly, others have found that at the time of greatest distress, individuals with a history of attempts and/or depression reported more frequent and vivid suicide-related mental imagery (Crane et al., 2011; Holaday, 2013; Holmes et al., 2007). Hales and colleagues (2013) noted that suicide-related mental imagery occurs across different psychiatric disorders, including depression and bipolar disorder. Despite evidence that depression and distress moderate the effect of violent daydreaming on ideation, no research has examined the factors explaining their association. Recent efforts to elucidate the processes contributing to suicide risk have turned to theoretical suicide models (e.g., Chu et al., 2016a). Thus, to better understand the connection between violent daydreaming and suicidal ideation, it may be useful to turn to one such model: the interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010).

According to the interpersonal theory of suicide, individuals who engage in near-lethal or lethal suicide behavior have the desire and the capability for suicide (Van Orden et al.,

2010). Suicidal desire occurs when individuals simultaneously experience intractable feelings of perceived burdensomeness (i.e., one is a burden on others) and thwarted belongingness (i.e., one is disconnected from others). Further, individuals may develop the capability for suicide by experiencing painful/provocative events that elevate pain tolerance and fearlessness about death. The interpersonal theory proposes that thwarted belongingness and perceived burdensomeness are proximal suicide risk factors. Thus, one potential method by which violent daydreaming impacts suicidal desire is by exacerbating feelings of thwarted belongingness and perceived burdensomeness. Specifically, violent daydreaming may distance the individual from others and fuel negative attitudes about one's value in social contexts.

Although no studies have directly examined the relationship between violent daydreaming and these interpersonal theory constructs, preliminary evidence indicates that daydreaming may negatively impact social connectedness. From a developmental perspective, previous research on the broader construct of maladaptive daydreaming (i.e., fantasy activities that replace human interaction and/or interferes with functioning) suggests that the tendency to daydream may develop in childhood as a coping strategy for loneliness, social isolation, and rejection (Somer, 2002; Somer et al., 2016). Based on case studies of maladaptive daydreamers, Somer and colleagues (2016) further posited that the tendency to engage in excessive daydreaming may lead to increased disconnection from others, which fuels maladaptive daydreaming in adulthood.

Indeed, recent research has indicated that daydreaming was associated with loneliness among young adults (Yousaf, Ghayas, & Akhtar, 2015), particularly when daydreaming about "non-close" others (Mar, Mason, & Litvack, 2012). One possibility is that enduring focus on daydreaming about violence towards oneself turns attention away from loved ones, thereby distancing the individual from social connections and heightening feelings of thwarted belongingness. Additionally, previous studies have shown that violent daydreaming about others is associated with greater negative emotions (Selby et al., 2007), and negative emotions have been shown to distance the individual from others (Cacioppo & Hawkey, 2009) and increase feelings of thwarted belongingness and perceived burdensomeness (Rogers et al., 2016a). Thus, daydreaming about violence may fuel negative attitudes towards others and oneself, thereby increasing perceptions of being a burden on others, social disconnection, and suicidal desire. Further, some research indicates that re-experiencing symptoms (i.e., mentally reencountering a painful and/or provocative experience), which are similar to violent daydreaming, are significantly and positively related to perceived burdensomeness and thwarted belongingness (Bryan & Anestis, 2011), and suicide risk (Bell & Nye, 2007). Altogether, these findings suggest that violent daydreaming may impair social functioning. This potential connection is particularly pernicious as impaired social functioning is one of the most robust risk factors for suicidal behavior (Beautrais, 2001).

In order to better understand the pathways between violent daydreaming and suicide risk, this manuscript investigates the relationships between violent daydreaming, thwarted belongingness and perceived burdensomeness, and suicidal ideation in two samples of undergraduate students living in the United States. As discussed previously, given the high

rates of suicide-related behaviors among young adults (WHO, 2016), including those attending college (American College Health Association, 2014), there is strong rationale for examining these pathways in this population.

First, we examined whether violent daydreaming would be positively associated with the thwarted belongingness, perceived burdensomeness, and suicidal ideation. Next, we examined whether thwarted belongingness and perceived burdensomeness would account for the relationship between violent daydreaming and suicidal ideation, beyond age and sex. Consistent with the interpersonal theory, we expected thwarted belongingness and perceived burdensomeness to emerge as parallel mediators.

To strengthen our findings, we conducted a series of additional analyses. First, we included depressive symptoms, a correlate of violent daydreaming and suicidal ideation (Chu et al., 2016b; Selby et al., 2007), as a covariate in our primary analyses. Of note, given recent evidence that found that the construct of suicidal ideation was no longer valid after the portion of variance accounted for by depressive symptoms was removed (Rogers, et al., 2016b), these analyses are considered exploratory. Next, to evaluate the specificity of the two proposed parallel mediators, we examined whether: (1) violent daydreaming would mediate the relationship between thwarted interpersonal needs and suicidal ideation, (2) depressive symptoms¹ would mediate the relationship between violent daydreaming and suicidal ideation, and (3) depression significantly moderated the relationship between violent daydreaming and suicide, which has been reported previously (Selby et al. 2007). We hypothesized that violent daydreaming and depressive symptoms would not emerge as significant mediators, which supports the robustness of thwarted belongingness and perceived burdensomeness as parallel explanatory variables.

Method

Participants

Study 1—Participants were 508 undergraduate students enrolled in introductory psychology classes across four semesters at a large, public university in the Southeastern United States. The majority were female (67.0%), with an average age of 18.94 years ($SD=1.66$, range=17–29). Participants primarily identified as White/Caucasian (85.2%), Black/African American (8.8%), Asian (2.9%), American Indian/Alaska Native (.2%), and Other (2.9%); 21.7% identified their ethnicity as Hispanic/Latino(a)/Spanish. With regard to marital status, 92.1% were single/never married, 1.7% were cohabiting, 0.7% were married, 0.4% were divorced, and 0.4% were widowed. The majority of students were freshman (58.0%), 28.2% were sophomores, 11.4% juniors, and 2.4% seniors or higher. A minority of participants reported a previous psychiatric diagnosis (7.0%). In this sample, 2.8% of participants endorsed a history of one previous attempt and 1.6% reported two or more attempts.

¹In order to diminish the overlap between depressive symptoms and ideation (Rogers et al., 2016b), we removed the item assessing suicidal ideation from depression scores. We return to this limitation in the Discussion.

Study 2—Participants were 310 undergraduate students enrolled in introductory psychology classes across four semesters at the same university as Study 1. These data were collected two years after Study 1. Participants average age was 19.09 years ($SD=2.06$, range=18–43). The majority identified as female (79.1%), with 19.0% identifying as male, 0.3% as transgender male, and 0.3% as gender non-conforming. Participants were White/Caucasian (73.8%), Black/African American (9.0%), Asian (8.4%), American Indian/Native American (0.6%), and Other (0.9%); 19.3% were of Hispanic/Latino(a)/Spanish origin. With regard to marital status, 95.3% were single/never married, 2.5% were cohabiting, 0.6% were married, and 0.3% were divorced. The majority of students were freshman (57%), 17.4% were sophomores, 13.7% juniors, and 10.6% seniors or higher. The majority of participants reported lifetime suicidal ideation (83.6%), and 21.8% reported at least one prior attempt.

Procedures

In Studies 1 and 2, all potential participants completed an online screening questionnaire. In Study 2, those indicating a history of suicidal ideation (yes/no) on the screener were prompted to participate by email. All participants completed an informed consent form after reviewing the study goals. Studies 1 and 2 were independently conducted – Study 1 data were drawn from a study that examined cognitive suicide risk factors (Chu et al., 2016b) and Study 2 data were drawn from a study on suicide-specific rumination (Rogers & Joiner, 2016). In both studies, data were collected anonymously online using the same self-report measures. Measures were presented in a randomized order; however, demographic questions were always presented first. Following study completion, debriefing forms and mental health resources were provided. Given the selection of at-risk participants, suicide risk assessments were conducted where appropriate. Both studies were approved by the university's Institutional Review Board.

Measures

Although these two studies were independently conducted, the same measures were administered. Demographic variables (i.e., age, sex, race/ethnicity) and suicide-related symptoms (i.e., suicidal ideation, attempts) were assessed in the demographic questionnaire.

Violent Daydreaming About Others—The Anger Rumination Scale (ARS; Sukhodolsky et al., 2001) is a 19-item measure of the tendency to think about current and past anger-provoking situations. Consistent with prior studies (Chu et al., 2016b; Selby et al., 2007), the 4-item Thoughts of Revenge subscale was used as a proxy for violent daydreaming. Participants were asked to rate how well the items correspond to their beliefs about themselves using a 4-point Likert scale ranging from 1 (*almost never*) to 4 (*almost always*). The ARS-thoughts of revenge subscale exhibited excellent internal consistency in Studies 1 ($\alpha=0.94$) and 2 ($\alpha=0.93$).

Thwarted Belongingness and Perceived Burdensomeness—The Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012) is a 15-item measure of recent feelings of thwarted belongingness (9 items, INQ-TB) and perceived burdensomeness (6 items, INQ-PB). Responses are self-reported on a 7-point Likert scale ranging from 1 (*not at all like me*) to 7 (*very much like me*). Higher scores reflect greater levels of thwarted belongingness and

perceived burdensomeness. Positive items are reverse coded on the INQ-TB. Both subscales exhibited good to excellent internal consistency in Studies 1 (INQ-PB $\alpha = 0.95$; INQ-TB $\alpha = 0.89$) and 2 (INQ-PB $\alpha=0.94$; INQ-TB $\alpha=0.90$).

Suicidal Ideation—The Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991) is a 21-item self-report measure of suicidal ideation/intent over the past week. Responses are scored on a 3-point scale (0–2). Higher scores indicate higher suicidal ideation and intent. Items 1–19 were summed to create a total score for suicidal ideation. Items 20–21, which assess for suicide attempts, were not included in the total. The BSS exhibited adequate internal consistency in Studies 1 ($\alpha=0.77$) and 2 ($\alpha=0.72$).

Depressive Symptoms—The Beck Depression Inventory-II (BDI-II; Beck & Steer, 1987) is a 21-item measure of depression symptom severity within the last week. Items are rated on a 4-point scale (0–3). The total score ranges from 0 to 63, with higher scores indicating more severe depressive symptoms. Given the overlap between BDI-II item 9, which assesses suicidal ideation, and our dependent variable (BSS), item 9 was removed from the total score. In this study, the BDI-II exhibited excellent reliability in Studies 1 ($\alpha=0.90$) and 2 ($\alpha=0.90$).

Statistical Approach

Preliminary Analyses—Prior to conducting primary analyses, data across all samples were screened for outliers and violations of normality. In both studies, the BSS (Study 1 Skew= 2.08, Study 2 Skew= 1.93) evidenced potentially problematic levels of skew and kurtosis; therefore, robust maximum likelihood (MLR) was selected as the estimation method for our analyses. Full information maximum likelihood estimation (FIML) maximizes the likelihood of the model given the data and assumes multivariate normality. Thus, FIML was used to handle missing data. When data are non-normal, FIML can be used (with MLR) to obtain standard errors and test statistics robust to non-normality (Brown, 2006).

Primary Analyses—First, variables of interest were evaluated descriptively and Pearson correlation coefficients were generated to examine between-variable associations. Mediation analyses were used to evaluate the effects of thwarted belongingness and perceived burdensomeness (INQ) as parallel mediators on the relationship between violent daydreaming about others (ARS) and suicidal ideation (BSS), controlling for participant age and sex (model 1).

Mediation, or an indirect effect, occurs when the relationship between an independent variable (X) and a dependent variable (Y) is explained, in part, by a third variable (M) (Hayes, 2013; Preacher, Rucker, & Hayes, 2007). When multiple, parallel mediators are thought to affect the relationship between X and Y, this assumption may be tested utilizing a series of linear regression analyses (Hayes, 2013; Preacher & Hayes, 2008). In this study, bias-corrected bootstrapping mediation, which can surmount the limitations of statistical methods that rely on assumptions of normality, was conducted using a path analytic approach (Stata 13) following procedures recommended by Hayes (2013): 10,000

bootstrapped samples were drawn from the data, and bias-corrected 95% confidence intervals were used to estimate the indirect effects of each of the resampled datasets. If a true zero falls between the upper and lower confidence intervals, there is no significant indirect effect of the mediators. Models 1 and 2 were overidentified. Three fit statistics were reported; cut-offs were in line with Hu and Bentler (1999). The Root Mean Square Error of Approximation (RMSEA) is a parsimony-corrected fit statistic and RMSEA values less than 0.05 are interpreted as good fit and values between 0.06 and 0.08 indicate adequate fit. The Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) were used as indices of comparative fit, with CFI and TLI values between 0.90 and 0.95 indicating adequate model fit.

Additional Analyses—Model 1 was reanalyzed with the inclusion of depressive symptoms as a covariate (model 2). To establish the specificity of thwarted belongingness and perceived burdensomeness as mediators, the following models were also examined using bias-corrected bootstrapping: (model 3) the indirect effect of violent daydreaming about others (ARS) on the association between thwarted belongingness and perceived burdensomeness (INQ) and suicidal ideation (BSS), and (model 4) indirect effect of depressive symptoms (BDI-II) on the association between violent daydreaming about others (ARS) and suicidal ideation (BSS). Models 3 and 4 were just-identified; thus, model fit statistics could not be generated.

Our final aim was to determine whether (model 5) depression significantly moderated the relationship between violent daydreaming and suicidal ideation. Moderation analyses examine whether the strength of the relationship between X and Y may be influenced by a third variable. To test our final aim, hierarchical linear regression analyses were used to examine the relationship between the interaction of depression and violent daydreaming, and suicidal ideation. The predictor variables (BDI, ARS) were both centered at their respective means. In Step 1, centered depression and violent daydreaming variables were entered as predictors, and in Step 2, the two-way interaction between the two centered predictor variables was entered into the regression.

Power—Previous research has indicated that a sample size of 148 is required for adequate power (0.80) to detect small-medium effect sizes for both the α and β paths using a bias-corrected bootstrap mediation approach (Fritz & MacKinnon, 2007). Thus, with sample sizes of 499–508 (Study 1) and 306–310 (Study 2), we were adequately powered for bias-corrected bootstrap mediation analyses.

Results

Preliminary Analyses

Means, standard deviations, and correlations between variables in both studies are presented in Table 1. As hypothesized, violent daydreaming was significantly and positively related to thwarted belongingness, perceived burdensomeness and suicidal ideation in Studies 1 ($r=0.25-0.34$, $ps<0.001$) and 2 ($r=0.19-0.25$, $ps<0.001$). Depressive symptoms were significantly and positively related to key study variables in Studies 1 ($r=0.42-0.56$, $p<0.001$) and 2 ($r=0.27-0.60$, $p<0.001$). Given that Study 2 sampled for lifetime ideation,

self-reported current ideation severity was higher in Study 2 ($M=2.48$, $SD=4.15$) than in Study 1 ($M=0.37$, $SD=0.97$). Mediation models are summarized in Table 2.

Study 1

Primary Analyses – Thwarted Belongingness and Perceived Burdensomeness as Parallel Mediators (Model 1)

—First, we examined thwarted belongingness and perceived burdensomeness as parallel mediators of the relationship between violent daydreaming about others and suicidal ideation in Sample 1, controlling for age and sex (model 1). The effect of violent daydreaming on perceived burdensomeness (estimate=0.76, $SE=0.10$) and thwarted belongingness (estimate=1.90, $SE=0.24$), and the effects of perceived burdensomeness (estimate=0.08, $SE=0.01$) and thwarted belongingness (estimate=0.01, $SE=0.004$) on suicidal ideation were all significant. The indirect effect of thwarted belongingness and perceived burdensomeness on the relationship between violent daydreaming and suicidal ideation, controlling for age and sex, was estimated to be between 0.064 and 0.110 (95% CI; estimate=0.087, $SE=0.01$; log likelihood=-6074.82; Table 2; Figure 1A), indicating significance as the 95% confidence interval did not cross zero.

Additional Analyses

Thwarted Belongingness and Perceived Burdensomeness as Parallel Mediators, Controlling for Depression (Model 2)

—The indirect effect remained significant after controlling for depressive symptoms (estimate=0.025, $SE=0.01$; 95% CI=0.011, 0.040; log likelihood=-7718.99; Table 2).

Violent Daydreaming About Others as the Mediator (Model 3)

—Mediation analyses reversing the variables in the α path indicated that the effect of thwarted belongingness and perceived burdensomeness on suicidal ideation was not significantly mediated by violent daydreaming (estimate<0.001, $SE=0.001$; 95% CI=-0.001, 0.001; log likelihood = -7697.75; Table 2), supporting the specificity our primary hypotheses.

Depression as a Mediator (Model 4)

—The effect of violent daydreaming on suicidal ideation was significantly mediated by depressive symptoms (estimate=0.03, $SE=0.01$; 95% CI=0.016, 0.045; log likelihood=-7697.75; Table 2).

Depression as a Moderator (Model 5)

—We tested whether the interaction of depression and violent daydreaming was significantly associated with ideation. Individually, violent daydreaming ($\beta=0.093$, $t=1.959$, $p=0.05$) and depression ($\beta=0.428$, $t=0.161$, $p<0.001$) were significantly related to suicidal ideation. However, the two-way interaction between violent daydreaming and depression was not significantly related to suicidal ideation ($\beta=-0.048$, $t=-1.033$, $p=0.30$), suggesting depression is not a significant moderator.

Study 2

Primary Analyses – Thwarted Belongingness and Perceived Burdensomeness as Parallel Mediators (Model 1)

—Again, we examined thwarted belongingness and perceived burdensomeness as parallel mediators of the relationship between violent daydreaming and suicidal ideation, controlling for age and sex (model 1). The effect of

violent daydreaming on perceived burdensomeness (estimate=0.65, SE=0.16) and thwarted belongingness (estimate=1.26, SE=0.28), and the effects of perceived burdensomeness (estimate=0.27, SE=0.04) and thwarted belongingness (estimate=0.05, SE=0.02) on suicidal ideation were significant. The indirect effect of thwarted belongingness and perceived burdensomeness on the relationship between violent daydreaming and suicidal ideation, controlling for age and sex, was estimated to be between 0.139 and 0.338 (95% CI; estimate=0.238, SE=0.05; log likelihood=-4408.72; Table 2; Figure 1B), indicating significance.

Additional Analyses

Thwarted Belongingness and Perceived Burdensomeness as Parallel Mediators, Controlling for Depression (Model 2)—The indirect effect was no longer significant after controlling for depressive symptoms (estimate=0.06, SE=0.03; 95% CI=-0.004, 0.125; log likelihood=-5447.46; Table 2).

Violent Daydreaming About Others as a Mediator (Model 3)—Mediation analyses reversing the variables in the α path indicated that the effect of thwarted belongingness (95% CI=-0.003, 0.007) and perceived burdensomeness (95% CI=-0.003, 0.009) on suicidal ideation was not significantly mediated by violent daydreaming (estimate=0.69-0.84, SE=0.38-0.40; log likelihood=-5429.4; Table 2), supporting the specificity of our primary hypotheses.

Depression as a Mediator (Model 4)—The effect of violent daydreaming on suicidal ideation was not significantly mediated by depressive symptoms (estimate=0.03, SE=0.02; 95% CI=-0.005, 0.067; log likelihood=-5429.4; Table 2).

Depression as a Moderator (Model 5)—As in Study 1, individually, violent daydreaming ($\beta=0.79$, $t=1.496$, $p=0.014$) and depression ($\beta=0.449$, $t=8.560$, $p<0.001$) were significantly related to suicidal ideation. However, the two-way interaction between violent daydreaming and depression was not significantly related to suicidal ideation ($\beta=0.001$, $t=0.010$, $p=0.99$).

Discussion

The present study examined the associations between violent daydreaming and thwarted belongingness, perceived burdensomeness, and suicidal ideation in two, young adult samples. As hypothesized, results from both studies indicated that greater severity of violent daydreaming was significantly and positively associated with thwarted belongingness, perceived burdensomeness, and suicidal ideation severity. In line with prior research (Chu et al., 2016a; 2016b), the effect sizes between these variables ranged from small-medium. Further, perceived burdensomeness and thwarted belongingness both accounted for the association between violent daydreaming and suicidal ideation, above and beyond demographic variables. Notably, in both studies, the model with thwarted belongingness and perceived burdensomeness as parallel mediators demonstrated the best fit. Further, in Study 1, which was composed of general undergraduates, results remained significant beyond depressive symptoms; however, in Study 2, which selected for undergraduates with a history

of ideation, results were no longer significant when depressive symptoms were included in the model. Nonetheless, in both studies, the inclusion of depressive symptoms resulted in a poorer fitting model. Furthermore, we were unable to replicate Selby and colleagues' (2007) results as our findings indicated that depression did not moderate the relationship between ideation and violent daydreaming about others. However, Study 1 results indicated that depression mediated the relationship between violent daydreaming and ideation. These results have several empirical and clinical implications.

This study was the first to show that violent daydreaming about others is associated with feelings of social disconnection (thwarted belongingness) and being a burden on others (perceived burdensomeness). As previous research has indicated that non-violent daydreaming about non-close others can engender feelings of loneliness, even after accounting for the breadth of one's social network (Mar et al., 2012), our results add to the growing body of research supporting the link between daydreaming and social functioning.

There are several potential explanations for this link. One possibility is that violent daydreaming about death reinforces and heightens the saliency of these thoughts and desires. Violent daydreaming may influence cognitive processes in a manner similar to that of rumination, which is defined as conscious focus and brooding about negative emotions (Nolen-Hoeksema et al., 2008). Previous research suggests that rumination can increase the saliency and prolong the duration of negative emotions, erode social support, and increase suicide risk (Nolen-Hoeksema et al., 2008; Surrence et al., 2009). In a similar way, violent daydreaming may be reinforcing negative feelings towards others and possibly oneself, leading to increased feelings of social disconnection (Rogers et al., 2016a). Among individuals thinking about suicide, the tendency to engage in violent daydreaming as a coping strategy may exacerbate and elevate these desires. In addition to maintaining negative moods, self-harm desires, and social-distancing behaviors, violent daydreaming may be negatively reinforced by allowing escape from social isolation and other stressors. Altogether, it is possible that a cycle of reinforcement perpetuates violent daydreaming, negative cognitions (e.g., thoughts about self-harm), and social dysfunction. As these factors are all associated with elevated suicide risk, it will be important for future research to examine whether such a pattern exists among violent daydreamers.

A compatible explanation is that frequent violent daydreaming may lead to an inward focus. Consistent with research on psychological disorders with a heightened inward focus (e.g., social anxiety disorder; Spurr & Stopa, 2002), this may diminish attention and social performance during daily interactions, which indirectly affects social functioning. Thus, it is also possible that violent daydreaming decreases the rewarding nature of social interactions.

Further, our work adds to the growing body of research supporting the relationship between violent daydreaming and suicidal ideation (e.g., Chu et al., 2016; Selby et al., 2007) and the utility of investigating violent daydreaming as risk correlate. In line with the interpersonal theory, our results from both samples indicated that feelings of thwarted belongingness and perceived burdensomeness may explain this association and notably, this model demonstrated the best model fit in both studies. The replicability of this finding across both general and higher risk young adult undergraduates is notable given high rates of suicide risk

in this population (WHO, 2016). Nonetheless, as few studies to date have examined violent daydreaming, particularly the processes underlying its relationship with suicide risk, replications in more diverse populations are needed.

Given that depressive symptoms are robust correlates of our key study variables (Selby et al., 2007), it is particularly notable that thwarted belongingness and perceived burdensomeness remained significant mediators even after controlling for depressive symptoms in Study 1. However, we were unable to replicate this finding in Study 2. One possibility is that while both studies targeted young adults, Study 2 participants were recruited specifically on the basis of lifetime suicidal ideation and, thus, reflect a higher-risk sample. Our findings may indicate that the roles of thwarted belongingness and perceived burdensomeness vary on the basis of suicide risk severity. Investigations that replicate our studies are needed to determine whether risk severity drove these disparate results.

Further, in contrast to previous research reporting that depression moderates the association between violent daydreaming and suicidal ideation severity among general undergraduates (Selby et al., 2007), depression was not a significant moderator in either of our samples. One reason for this discrepancy may be the limited sample size ($N=83$) used in Selby and colleagues' (2007) study, which limits the generalizability of their findings.

Alternatively, the equivocal results obtained when depression is included in analyses may be another explanation. Recent research has found that depression and suicidal ideation are intertwined and the construct of suicidal ideation is no longer valid when the portion of variance accounted for by depression is removed from ideation (Rogers et al., 2016b). Rogers and colleagues (2016b) recommend interpreting analyses with depression as a covariate and suicidal ideation as an outcome with caution. Indeed, compatible with their study implications (Rogers et al., 2016b), we found that the inclusion of depression into the model resulted in poorer fit. Thus, future research should examine these constructs in a variety of samples to better understand the role of depression in these associations.

Finally, it is important to note that currently there are no measures designed to evaluate the construct of violent daydreaming, particularly in the context of suicide-related symptoms. This study and others (e.g., Chu et al., 2016; Crane et al., 2012; Selby et al., 2007) have relied on proxy measures for violent daydreaming about others, limiting our ability to understand this phenomenon among at-risk individuals. Given that the role of violent daydreaming in suicide risk has been documented, it will be important for future studies to explore the constructs of violent daydreaming and to develop and validate tools for systematically evaluating these variables.

The present results, should they be replicated by future investigations using clinical samples, may be particularly useful for suicide risk assessment and treatment. Our results suggest that treatments targeting the interpersonal theory variables may be particularly useful for college students engaging in violent daydreaming. For example, cognitive behavioral approaches may be useful for challenging distorted cognitions regarding social burden and disconnection (Stellrecht et al., 2006). Mental health practitioners may encourage patients to identify on-campus groups and activities to increase feelings of connectedness with others.

Further, clinicians working with college populations may consider evaluating engagement in and frequency of violent daydreaming as these patients may be at greater suicide risk. Violent daydreaming may also be a useful treatment target via therapies that incorporate mindfulness, which increases focus on the present (e.g., mindfulness-based cognitive therapy; Williams et al., 2000). Others have suggested that violent daydreaming may serve as a coping strategy (e.g., Somer et al., 2016). Thus, the inclusion of psychoeducation on stress management, problem solving, and emotion regulation (e.g., dialectical behavior therapy; Linehan, 1993) may be particularly useful adjuncts to treatments targeting social functioning.

Limitations/Future Research

The current study results should be considered in the context of limitations. First, given that these data were cross-sectional, inferences regarding causality were precluded. Notably, we tested the specificity of our independent and mediator variables and found support for the directionality of our hypotheses. Nonetheless, future studies employing prospective designs are needed to confirm the roles of thwarted belongingness and perceived burdensomeness as causal mechanisms. While this study examined depressive symptoms as a rival, we did not examine other potential mediators, such as increased suicide capability (c.f. acquired capability; Joiner, 2005). Given research indicating that mentally imagining suicide (e.g., violent daydreaming) may be associated with elevated suicide capability (Joiner, 2005; Van Orden et al., 2010), it will be valuable for future research investigate the impact of violent daydreaming on capability.

Relatedly, although we replicated our hypotheses in two samples, both studies relied on web-based self-report measures, limiting opportunities for clarification and/or control over external influences (e.g., distractions, lack of privacy). Further, although confidentiality was emphasized, future studies may benefit from using measures with less face validity, such as implicit measures of suicidal behavior (Nock et al., 2010). Given that recollections of violent daydreaming can be inherently limited, use of ecological momentary assessments to characterize violent daydreaming may increase validity and reliability. Future studies using behavioral measures of perceived burdensomeness and thwarted belongingness may be informative. Additionally, both samples were comprised primarily of Caucasian females and despite recruiting for lifetime ideation in Study 2, the range of risk severity was restricted in both samples. Thus, future research using diverse, high-risk samples (e.g., inpatients, military personnel) would be useful for understanding how these variables present across populations.

In sum, this study found that violent daydreaming is associated with increased suicidal ideation severity, and thwarted belongingness and perceived burdensomeness accounted for the relationship between violent daydreaming and suicidal ideation in two samples. Violent daydreaming and the underlying mechanisms of its relationship with suicide has thus far received little empirical attention. Thus, our findings represent a novel contribution to the literature and support the utility of targeting social connections in suicide prevention and treatment efforts.

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A

B

Figure 1.

Standardized regression coefficients for the cross-sectional relationship between violent daydreaming about others and suicidal ideation as mediated by thwarted belongingness and perceived burdensomeness in Study 1 (Figure 1A) and Study 2 (Figure 1B).

Note. ** $p < 0.001$. ARS-TOR = Anger Rumination Scale-Thoughts of Revenge subscale. INQ = Interpersonal Needs Questionnaire-15. BSS = Beck Scale for Suicide Ideation.

Table 1

All Study Variable Means, Standard Deviations and Correlations.

Study 1 – Undergraduates									
	1.	2.	3.	4.	5.	6.	N	Mean	SD
1. ARS-TOR Violent daydreaming about others	–						499	5.59	2.03
2. INQ-15 Thwarted belongingness	0.337**	–					506	20.56	11.38
3. INQ-15 Perceived burdensomeness	0.332**	0.458**	–				506	7.98	4.65
4. BSS Suicidal ideation	0.245**	0.348**	0.491**	–			508	0.37	0.97
5. BDI Depressive symptoms (without item 9)	0.430**	0.419**	0.563**	0.471**	–		501	9.70	8.94
6. Age	0.009	0.052	0.013	0.012	0.084	–	521	18.94	1.66
7. Sex	–0.038	0.096*	–0.095*	0.032	–0.125*	0.072	521	1.33	0.47
Study 2 – Undergraduates with History of Suicidal Ideation									
	1.	2.	3.	4.	5.	6.	N	Mean	SD
1. ARS-TOR Violent daydreaming about others	–						310	6.52	2.39
2. INQ-15 Thwarted belongingness	0.249**	–					309	27.28	11.91
3. INQ-15 Perceived burdensomeness	0.229**	0.575**	–				309	10.63	6.78
4. BSS Suicidal ideation	0.188**	0.406**	0.531**	–			306	2.48	4.15
5. BDI Depressive symptoms (without item 9)	0.265**	0.602**	0.596**	0.469**	–		308	15.10	11.07
6. Age	–0.024	0.020	–0.031	0.021	0.025	–	314	19.09	2.06
7. Sex	–0.16*	0.040	0.010	0.082	0.162*	0.081	321	1.80	0.48

Note.

* p < 0.05;

** p < 0.001.

ARS-TOR = Anger Rumination Scale – Thoughts of Revenge subscale, INQ = Interpersonal Needs Questionnaire-15, BSS = Beck Scale for Suicide Ideation, BDI = Beck Depression Inventory-2 (item 9, which assesses suicidal ideation, was removed), SIV = Schedule of Imagined Violent – Daydreaming about violence towards oneself (yes/no), Sex 1 = male, 1 = female.

Table 2

Summary of Mediation Analyses.

Study 1	Variables	Covariates	Estimate	Robust SE	z	Pr > z	95% CI	Log likelihood	CFI/TLI	RMSEA (90%CI)
Model 1	VD->TB, PB->SI	Age, Sex	0.087	0.011	7.49	0.001	0.064, 0.110	-6074.82	0.92/0.99	0.04 (0.03, 0.05)
Model 2	VD->TB, PB->SI	Dep, Age, Sex	0.025	0.007	3.41	0.001	0.011, 0.040	-7718.99	0.77/0.75	0.28 (0.21, 0.36)
Model 3	TB->VD->SI	Dep, Age, Sex	<0.001	0.001	0.07	0.944	-0.001, 0.001	-7697.75	-	-
	PB->		<0.001	0.001			-0.001, 0.001			
Model 4	VD->Dep->SI	TB, PB, Age, Sex	0.031	0.007	4.15	0.001	0.016, 0.045	-7697.75	-	-
Study 2	Variables	Covariates	Estimate	Robust SE	z	Pr > z	95% CI	Log likelihood	CFI/TLI	RMSEA (90%CI)
Model 1	VD->TB, PB->SI	Age, Sex	0.238	0.051	4.69	0.001	0.139, 0.338	-4408.72	0.95/0.99	0.06 (0.05, 0.07)
Model 2	VD->TB, PB->SI	Dep, Age, Sex	0.061	0.033	1.85	0.064	-0.004, 0.125	-5447.46	0.92/0.91	0.33 (0.25, 0.43)
Model 3	TB->VD->SI	Dep, Age, Sex	0.002	0.002	0.84	0.403	-0.003, 0.007	-5429.4	-	-
	PB->		0.002	0.003	0.69	0.382	-0.003, 0.009			
Model 4	VD->Dep->SI	TB, PB, Age, Sex	0.031	0.018	1.71	0.087	-0.005, 0.067	-5429.4	-	-

Note. Column 1 format: Independent variable->Mediator(s)->Dependent variables. Models 3 and 4 were just-identified and fit statistics could not be computed. VD = violent daydreaming; TB = thwarted belongingness; PB = perceived burdensomeness; Dep = depression; SI = suicidal ideation.