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Contents lists available at SciVerse ScienceDirect

Journal of Research in Personality

journal homepage: www.elsevier.com/locate/jrp

Gratitude and grit indirectly reduce risk of suicidal ideations by enhancing meaning in life: Evidence for a mediated moderation model



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ARTICLE INFO

Article history:

Available online 24 April 2013

Keywords:

Gratitude

Grit

Suicide

Meaning in life

Resilience

ABSTRACT

We examined meaning in life as a suicide resiliency factor. Since meaning in life may be hard to directly modify, we examine gratitude and grit as factors that synergistically confer resiliency to suicide by increasing meaning in life. Using a longitudinal study of 209 college students, we find that gratitude and grit interact such that individuals endorsing high gratitude and grit experience a near absence of suicidal ideations over time. Testing a mediated moderation model we find that grit and gratitude confer resiliency to suicide by increasing meaning in life. Our findings illustrating the importance of examining co-occurring personality factors as well as the mechanisms of these factors that can confer resiliency to suicide.

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1. Introduction

Over 36,000 people die from suicide each year in the United States, a number twice as large as the number of deaths from homicide (Centers for Disease Control, 2012). This statistic represents just the “tip of the iceberg” as countless others have thoughts about suicide and fail to complete suicide. Given these sobering statistics, finding factors that confer resiliency to suicide is imperative. Meaning in life is one such resiliency factor. People who believe that they are valued, worthy members of their social network and feel a sense of self-efficacy and purpose have a stronger will to live (Baumeister, 1991; Edwards & Holden, 2001; Joiner, 2005). Possessing clear reasons for living and leading a life that is viewed as significant with an overarching purpose is incompatible with suicide (McKnight & Kashdan, 2009; Steger, 2009).

Several theories of suicide risk directly or indirectly address the absence of meaning in life as a path to suicidality. For example, increased perceptions that one is a burden to others (a key component in Joiner's theory of suicide) has been found to predict decreased meaning in life in elderly individuals over time (Van Orden, Bamonti, King, & Duberstein, 2012). The authors suggest that this implies that decreases in meaning in life mediate the relationship between risk for suicide (perceived burdensomeness) and suicide ideation. Thus, it may also be that increases in meaning in life confer resiliency against suicide, or that it mediates the relationship between more distal resiliency factors against suicide and suicidal ideations.

Despite the potential resiliency of possessing a sense of meaning in life, this construct might not be directly modifiable. Alternative approaches that lead to increasing meaning in life may be more feasible. In fact, an intervention to reduce suicidal ideation in retirees *indirectly* addressed meaning in life by targeting value clarification, goal planning and implementation, self-efficacy in reaching goals, the linkage of goals to a larger purpose, and the enhancement of social resources to support these efforts (Lapierre, Dubé, Bouffard, & Alain, 2007). Older adults in the treatment group, compared to the control group, experienced significant increases in meaning in life and decreases in psychological distress that were maintained at a 6-month follow-up. By carefully targeting constructs related to meaning in life, clinicians might be able to indirectly enhance meaning in life. We sought to address whether the mechanism that leads resiliency factors to predict a reduction in suicidality is an increase in meaning in life. To address this issue, we examined two complementary psychological strengths: gratitude and grit. Gratitude is an interpersonal psychological strength that entails noticing the benefits and gifts received from others. Grit is an intrapersonal psychological strength characterized by the presence of long-term interests and passions, and the willingness to persevere through obstacles and setbacks to make progress toward goals aligned or separate from these passionate pursuits. This combination of inter- and intrapersonal strengths might confer an optimal combination of resiliency to suicide.

2. Gratitude

Gratitude is a mindful appreciation of benefits and gifts that can be attributed to the kindness of other people (e.g., McCullough, Kilpatrick, Emmons, & Larson, 2001). Although there is some debate in

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the literature over whether gratitude is a personality trait or an emotional state, the general consensus is that gratitude can be conceptualized at different levels of analysis: affective trait, mood, or emotion (McCullough, Tsang, & Emmons, 2004). At the trait level, gratitude can be viewed as “part of a wider life orientation towards noticing and appreciating the positive in the world” (Wood, Froh, & Geraghty, 2010, p. 891) and individuals with this life orientation experience more frequent, intense, and enduring associated states in daily life. The relationship between trait and state gratitude is evidenced by experience sampling and experimental studies (McCullough et al., 2004; Wood, Maltby, Stewart, Linley, & Joseph, 2008). For this study, we used a measure of the higher order personality trait of gratitude and unless otherwise specified, refer to the personality trait rather than the associated emotional and mood states.

There is considerable evidence that grateful individuals have stronger social bonds and more positive views of their social environment, thereby endorsing a greater sense of belonging (Kashdan, Uswatte, & Julian, 2006; Lambert, Clark, Durtschi, Fincham, & Graham, 2010; Wood et al., 2008). A lack of belonging is associated with suicidal ideations in primary theoretical models of suicide by Baumeister (1991) and Joiner (2005). Within Baumeister's theory, social isolation and withdrawal is one of the final steps that leads to a decision to kill oneself. Within Joiner's theory, a thwarted sense of belongingness is one of two key factors that predict the desire to die (the other being perceptions of burdensomeness). Thwarted belongingness has been found to predict suicide ideations in multiple studies of college students (Joiner et al., 2009; Van Orden, Witte, Gordon, Bender, & Joiner, 2008) and diverse samples such as drug addicts (Conner, Britton, Sworts, & Joiner, 2007) and the military (Anestis, Bryan, Cornette, & Joiner, 2009; Bryan, Morrow, Anestis, & Joiner, 2010). Since a lack of belongingness is a centerpiece of major theories of suicide (Baumeister, 1991; Joiner, 2005), gratitude may confer resiliency toward suicide by increasing a sense of belonging.

We are aware of only one study on the relevance of gratitude to suicidality (Li, Zhang, Li, Li, & Ye, 2012). This study found that gratitude had an inverse association with suicidal ideations and past suicide attempts in a cross-sectional examination of adolescents from China. They also found that gratitude served as a buffer such that individuals with a high degree of stressful events had lower levels of suicidal ideations if they also had high levels of gratitude. Finally, they found that these associations were mediated by self-esteem. Although this study showed initial promise into exploring gratitude as a resiliency factor in suicide, it was limited by the cross-sectional design and a sample of adolescents from 12 to 19 limits generalizability.

Gratitude involves an appreciation of the psychological and social resources that are available in one's life. But what happens when people are confronted with life setbacks or obstacles? Perhaps grateful individuals only experience resiliency when these same individuals also possess characteristics that allow them to persevere through setbacks and obstacles. Thus, while gratitude confers benefits for appreciating the good, a complementary psychological strength is needed that allows someone to persevere through the bad. Grit may be one such strength that complements the resiliency conferred by gratitude.

3. An additional resiliency factor in predicting suicidality: grit

Grit is a psychological strength involving the pursuit of long-term goals with perseverance and passion (Duckworth, Peterson, Matthews, & Kelly, 2007). Grit is conceptually and empirically related to personality traits such as conscientiousness, but represents a different construct. Indeed, “grit overlaps with achievement aspects of conscientiousness but differs in its emphasis on

long-term stamina rather than short-term intensity. The gritty individual not only finishes tasks at hand but pursues a given aim over years” (Duckworth et al., 2007, p. 1089). That is, conscientious individuals might pursue the completion of short-term goals whereas gritty individuals possess clear long-term passions and make progress toward short-term goals inside and outside the context of established, long-term passionate pursuits. The consistent, stable interests that are a defining feature of grit reflect a future orientation, and future thinking is associated with resilience to suicide (Hirsch et al., 2006). Grit is also conceptually related to psychological variables such as self-control and impulsivity, but again represents a different construct. Indeed, Duckworth et al. (2007; studies 2 and 5) found that grit predicts success in a military leadership program at West Point and success in competitive spelling bees even after accounting for the variance attributable to self-control. In a study of career changes and educational attainment in 1554 adults (average age of 45.64, $SD = 11.27$), even after controlling for the variance attributable to age, conscientiousness, and other Big Five personality traits, grit was positively related to the level of education attained in their lifetime and inversely related to the number of lifetime career changes (Duckworth & Quinn, 2009). Thus, it may be that gritty individuals possess self-control and regular commitment to goals (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2010) that allows them to resist impulses (to engage in self-harm) and focus on future goals (e.g., completing graduate school) which stops them from ultimately attempting suicide.

To date, goal planning, conscientiousness, and self-control have been linked to suicidality (e.g., Lapiere et al., 2007), but grit has not. Yet, there are several reasons why grit may be a viable source of resiliency. First, “gritty” individuals are more likely to persevere following setbacks, loss, and adversity. Although like others, gritty individuals view negative events as painful, they may be more likely to maintain or alter their course instead of aborting goal related efforts. Prior work suggests that this sense of personal agency and flexibility when confronting goal obstructions protects against suicide, whereas the converse, hopelessness, is a major risk factor for suicide (Brown, Beck, Steer, & Grisham, 2000). If grit confers perseverance and opportunities for hope, it may serve as a protective factor against suicide.

Second, compatible with theories of suicide risk (Baumeister, 1990, 1991), grit allows individuals to create and sustain life goals that are a primary source of meaning and purpose in life. Baumeister's (1990) escape theory of suicide states that suicide arises from a desire to escape the negative emotions created by sub-optimal comparisons between the present self and standards about what ought to be or could ideally become. The meaningful pursuits of gritty individuals allow them to bridge the gap between present and ideal selves.

4. Gratitude and grit as “supercharged” resiliency factors

Although grit and gratitude may serve as separate resiliency factors, when both are present they may confer synergistic benefits in protecting against suicidality. Resiliency factors studied in isolation do not map onto reality, as people possess a matrix of personality dimensions and combinations of traits. Studying co-occurring resiliency factors offers a more nuanced, broadened understanding of how one factor alters another on suicidal risk. Of the 71 studies in a recent review of resiliency factors to suicide (Johnson, Wood, Gooding, Taylor, & Tarrier, 2011), not a single researcher examined interactions between multiple resiliency factors. To predict suicidality, it is important to examine the interdependence of risk and resilience factors (e.g., Almeida, 2005).

Our hypotheses on co-occurring resiliency factors to suicide can be viewed as an extension of a body of literature on co-occurring

risk factors places to suicide. For instance, several studies have shown that individuals at greatest risk for suicide possess a combination of high neuroticism and other psychological traits such as low extraversion (Fang, Heisel, Duberstein, & Zhang, 2012; Mehryar, Hekmat, & Khajavi, 1977), low constraint [impulsivity] (Engström, Alling, Gustavsson, Orelund, & Träskman-Bendz, 1997; Verona, Patrick, & Joiner, 2001), and high levels of hopelessness (Beautrais, Joyce, & Mulder, 1999). Despite these findings, no study to date has examined combinations of personality traits that confer resiliency to suicide. Risk and resiliency represent different dimensions (Kraemer, Stice, Kazdan, Offord, & Kupfer, 2001). According to Kraemer and her colleagues, risk factors increase the probability of undesirable, adverse outcomes. In contrast, resilience “is a pattern of behavior and functioning indicative of positive adaptation in the context of significant risk or adversity” (Keyes, 2004, p. 224). Risk and resilience are related, but are not interchangeable. This conceptualization fits with prior factor analytic work providing empirical evidence for the distinctiveness of approach/positive/resilient psychological factors from avoidance/negative/risk factors (e.g., Carver, 2006; Elliot & Thrash, 2002). Findings on risk factors are insufficient for understanding how healthy outcomes arise during the dynamic period of adult development. Moreover, it is important to examine combinations of psychological traits that can confer resiliency to suicide, as an entire matrix of personality dimensions exist in each individual. Thus, we present the first study to our knowledge to address synergistic combinations of psychological factors that confer resiliency to suicide.

One question that may arise is why focus on grit and gratitude out of the multitude of personality traits that increase meaning in life and thus buffer suicide. We hypothesized that grit and gratitude are complementary protective factors for several reasons. First, gratitude is external while grit is internal. Individuals report gratitude towards external things: the actions of others, a sunny day, or a tasty meal. On the other hand, gritty individuals have an internal characteristic that helps them persevere through challenges. An individual with both internal and external strengths may be the most resilient to suicide. Second, gratitude involves a past and present time orientation whereas grit involves a future time orientation. Individuals express gratitude for past events (the financial support of parents) and present experiences (a friend shows interest in your story). If a grateful individual does not expect the future to induce as much gratitude, they may not experience the protective benefits of gratitude on suicide. However, a gritty individual may have the ability to persevere through less positive times in the future to obtain their goals and passions. Thus, the combination of the two factors would allow an optimal positive time orientation towards the past, present, and future.

5. The present study

In this prospective study, we examined the effects and mechanisms of grit and gratitude on suicidal ideations. This is the first study to prospectively examine either of these factors in predicting suicidal ideations, and the first to test a synergistic model between an interpersonal (gratitude) and intrapersonal (grit) factor for a more sophisticated model of resiliency. We hypothesized that (a) individuals with high gratitude and grit would show the least suicidal ideation compared to individuals with any other configuration of grit and gratitude and (b) based on theoretical models of why people try to intentionally kill themselves (e.g., Baumeister, 1991), this effect would be mediated by increases in meaning in life. Furthermore, given that depression and suicide are highly related (e.g., Vrshek-Schallhorn, Czarlinski, Mineka, Zinbarg, & Craske, 2011), we conducted both analyses controlling for depression. This allowed a test of construct specificity to suicide under more stringent methodological conditions.

6. Method

6.1. Participants

A total of 209 college students (84.2% female; mean age = 20.51, $SD = 4.12$, range 17–50) were recruited for an IRB-approved online study. Approximately 54% of the sample was Caucasian, 20% Asian, 13% African American, and the remaining 13% self-classified in “other” racial/ethnic groups.

6.2. Procedure

Participants completed online self-report measures twice separated by approximately 4 weeks. The second time point (T2) was completed an average of 26.28 days ($SD = 3.45$ days) after completion of the first time point (T1). Participants completed measures of grittiness (Grit Scale), gratitude (GQ-6), meaning in life (MLQ), depressive symptoms (BDI), and current suicidal ideations (BSS) at both T1 and T2.

Stringent procedures for human participant protection were enacted under the supervision of a licensed clinical psychologist (JHR), approved by the university Institutional Review Board, and commensurate with similar studies of suicidality in college students (e.g., Arria et al., 2009). All participants were informed that the study would be anonymous unless they revealed intentions to harm themselves. If a participant endorsed imminent risk (e.g., agreement with the item “I am sure that I shall make a suicide attempt”), the university police would be called. None of the participants in the study met such criteria. For participants who indicated elevated, but not imminent risk, for suicide (e.g., endorsing “I have a moderate to strong wish to die”), they were contacted via email and asked to contact the experimenters or the counseling center within 48 h. This protocol was enacted nine times throughout both time points in the present study. All nine participants responded within 48 h. Regardless of risk level, all participants were given information about mental health campus resources at the end of the study.

6.3. Questionnaires

Beck suicide scale (Beck & Steer, 1991) is a 21-item measure that assesses current suicide intent. Similar to prior work (e.g., Van Orden et al., 2008) and the recommendations of the scale creators (Beck, Steer, & Ranieri, 1988), we used only the first 19 items to measure suicide ideation. The other two items assess suicide history, which is conceptually different from current suicide ideation and thus, is not included in the scoring of the measure. Including these items would mix a prior history of suicidality and the current research focused on changes in suicidality during a specific temporal period in longitudinal analyses. Studies of psychometrics of the BSS find that it correlates strongly with clinician ratings of suicidality in psychiatric inpatients ($r_s > .90$; Beck et al., 1988).

Beck depression inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item measure of current depression symptoms. We used this measure for tests of specificity to suicide. In accordance with previous suicide research (e.g., Beck, Steer, Beck, & Newman, 1993), the BDI item assessing suicide (item #9) was removed to avoid contamination with the dependent variable.

Grit scale (Duckworth et al., 2007) is a 12-item measure that assesses perseverance for long-term goals that reflect passionate interests or personally valued aims. The full scale contains items that assess perseverance of effort (“Setbacks don’t discourage me”) and reverse-scored items that assess the consistent pursuit of passionate interests (“New ideas and projects sometimes distract me from previous ones”). Reliability and construct validity

has been shown in studies predicting performance of military cadets and spelling bee contestants (Duckworth et al., 2007).

Gratitude questionnaire (GQ-6; McCullough, Emmons, & Tsang, 2002) is a six-item measure that assesses the general tendency to experience gratitude. Five items were positively keyed (e.g., “I am grateful to a wide variety of people”) and one item was negatively keyed (“Long amounts of time can go by before I feel grateful to something or someone”). Reliability and construct validity has been shown in studies predicting positive and negative experiences in daily life (e.g., McCullough et al., 2004).

Meaning in life questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006) is a 10-item measure of the extent to which individuals feel their lives are meaningful (5-items) and the extent to which they are actively seeking meaning (5 items). Evidence for the distinctiveness and validity of these dimensions has been shown in multiple studies with various methodologies (e.g., Steger & Kashdan, 2007; Steger, Kashdan, Sullivan, & Lorentz, 2008).

6.4. Analytic strategy

Suicidal ideation in the general population is a relatively low base-rate occurrence and we found evidence of positive skewness in our sample (3.93, $SE = 0.17$). To avoid violating assumptions of regression, a negative binomial model was used instead of ordinary least squares regression (Gardner, Mulvey, & Shaw, 1995).¹ Although negative binomial models are most commonly used with count dependent variables, there is evidence that they also perform well with overdispersed non-count variables (Wooldridge, 2002). We tested two negative binomial regression models. The first model had all covariates (e.g. baseline measures and control variables) and main effects. The second model tested moderation by adding the interaction term to the variables from the previous model. An increase in overall χ^2 would provide evidence of improved fit over the first model. The interaction between gratitude and grit was calculated by first mean centering the gratitude and grit variables and then multiplying them to avoid issues of collinearity with the interaction term. The main effects of gratitude and grit that are reported are the centered variables. The means and standard deviations reported are from the un-centered variables. This analytic approach follows the recommendations of Aiken and West (1991).

We conducted a mediated moderation analysis using AMOS 18.0 (Arbuckle, 2006) to test the hypothesis that the interaction between grit and gratitude predicted decreased suicidal ideations and this effect was mediated by changes in meaning in life. Bias-corrected bootstrapping was used to examine the indirect (mediated) effects of increases in meaning in life (MacKinnon, Lockwood, & Williams, 2004). Since negative binomial regression is not possible in AMOS, we log transformed BSS scores to account for the non-normal distribution.

7. Results

7.1. Descriptive statistics

Table 1 displays means, standard deviations, and correlations between study variables, along with alpha coefficients for each construct under study. All variables were significantly correlated in the expected direction. Approximately 15% of the sample endorsed clinically relevant levels of suicide ideation on the BSS (scores greater than 0) at time 1, and 9% endorsed clinically relevant levels of suicide ideation at time 2. These rates are comparable to, and even

slightly above what might be expected. A recent cohort study of college freshmen found a 6% point-prevalence rate for suicidal ideation (Arria et al., 2009). The means and standard deviations of the BSS are also comparable with or slightly above other studies in unselected college samples that used the same measure (e.g., Van Orden et al., 2008; Study 1: $M = 0.77$, $SD = 2.55$).

7.2. Gratitude and grit as synergistic protective factors

Table 2 displays the results of analyses testing the interaction between gratitude and grit on changes in suicidal ideations. The first negative binomial model with covariates and main effects was significant; the second model was significant with a better model fit. Fig. 1 illustrates that the pattern of findings were consistent with our hypothesis that gratitude and grit synergistically predict reduced suicide ideation. At high gratitude (1 SD above the mean), the association between grit and suicide ideation was negative (simple slope = -0.60 , $t = -3.21$, $p < .01$). At low gratitude (1 SD below the mean), the association between grit and suicide ideation was non-significant (simple slope = -0.14 , $t = -1.19$, $p = .24$).

7.3. Mediated moderation model: changes in meaning in life as mechanism of action

We conducted a mediated moderation analysis to test the hypothesis that changes in meaning in life would mediate the effect of the Grit X Gratitude interaction in predicting decreased suicidal ideation. Fig. 2 shows the results of this analysis with standardized regression weights. Covariances were added between predictor variables (Gratitude, Grit, Grit \times Gratitude) and covariates (baseline meaning in life). The overall model fit of this model was excellent ($\chi^2_{[df=2]} = 4.60$, $p = .100$; $\chi^2/df = 2.30$, $CFI = 0.99$, $TLI = 0.92$, $RMSEA = .08$). The addition of changes in meaning in life significantly increased the variance explained in time 2 suicidal ideation (Model $r^2 = .20$) over the original non-mediated model ($r^2 = .05$). Furthermore, the standardized indirect effects of (a) the main effect of gratitude and (b) the interaction between gratitude and grit through meaning in life were significant ($\beta = -.014$, $.012$ respectively, $p < .05$). This means that gratitude and the synergistic effect of grit and gratitude indirectly predicted suicide ideation through changes in meaning in life.

7.4. Construct specificity

Given that suicide and depression are highly related constructs (Vrshek-Schallhorn et al., 2011), it is important to examine construct specificity of our findings relative to depressive symptoms. It is plausible that our findings thus far are due to changes in depressive symptoms more than they are due to changes in suicidal ideations. Thus, we conducted two sets of supplemental analyses. The first set of analyses answered the question does the interaction between gratitude and grit confer resiliency to suicidal ideations independent of depressive symptoms? To answer this question, we conducted the analyses reported above while controlling for depressive symptoms (BDI). In this model, the interaction between gratitude and grit was still significant ($b = -0.30$, $SE = 0.14$, $\chi^2 = 4.64$, $p = .031$). Moreover, the plot of this interaction was the same as the model without depressive symptoms. These results suggest that grit and gratitude buffer suicidal ideations independent of depressive symptoms.

The second set of analyses answered the question do gratitude and grit synergistically buffer depressive symptoms? To answer this question, we conducted the same analyses as we did to test our main hypothesis, but with time 2 BDI scores as the dependent variable and time 1 BDI scores as a covariate, instead of time 2 and time 1 BSS scores, respectively. Since BDI scores at time 2 were

¹ Although we report only the results for negative binomial regression, we conducted the same analyses using ordinary least squares regression and the same pattern of results held.

Table 1

Internal consistency, means, standard deviations, and intercorrelations between study variables.

	1	2	3	4	5	6	7	8
1. T1 suicidal ideations (BSS)	–							
2. T1 depressive symptoms (BDI)	.58***	–						
3. T1 grit (grit)	–.37***	–.42***	–					
4. T1 gratitude (GQ)	–.42***	–.43***	.44***	–				
5. T1 meaning in life (MLQ)	–.39***	–.32***	.38***	.46***	–			
6. T2 suicidal ideations (BSS)	.76***	.41***	–.28***	–.32***	–.39***	–		
7. T2 depressive symptoms (BDI)	.51***	.79***	–.35***	–.33***	–.27***	.41***	–	
8. T2 meaning in life (MLQ)	–.32***	–.26***	.21***	.38***	.56***	–.27***	–.23***	–
Mean	1.12	7.08	7.19	34.50	50.60	0.60	5.85	49.18
Standard deviation	3.19	7.62	1.33	7.05	9.62	2.20	7.20	9.12
Internal consistency (α)	.78	.90	.80	.88	.82	.89	.91	.76

Note. BSS = beck suicide scale, BDI = beck depression inventory, grit = grit scale, GQ = gratitude scale, MLQ = meaning in life questionnaire.

*** $p < .001$.**Table 2**

Results of negative binomial analyses.

	<i>b</i>	<i>SE b</i>	Wald χ^2	<i>p</i>
Model 1 (<i>df</i> = 3)			176.67	<.001
T1 suicidal ideations (BSS)	0.27	0.04	47.76	<.001
T1 grit (grit)	–0.01	0.19	0.01	.947
T1 gratitude (GQ)	–0.41	0.18	5.42	.020
Model 2 (<i>df</i> = 4)			188.02	<.001
T1 suicidal ideations (BSS)	0.28	0.04	48.66	<.001
T1 grit (grit)	–0.12	0.21	0.36	.550
T1 gratitude (GQ)	–0.54	0.20	7.26	.007
T1 grit \times gratitude	–0.24	0.02	3.40	.046

Note. BSS = beck suicide scale, GQ = gratitude questionnaire.

relatively normally distributed (*skew* = 1.76, *SE* = 0.17), we conducted these analyses using ordinary least squares regression. Neither the main effects of gratitude ($b = 0.01$, $SE = 0.06$, $p = .788$) and grit ($b = -0.18$, $SE = 0.27$, $p = .509$), nor the interaction between gratitude and grit ($b = 0.01$, $SE = 0.03$, $p = .676$) were significant. Time 1 depressive symptoms were the only significant predictor of time 2 depressive symptoms in this model ($b = -.11$, $SE = .01$, $p < .001$). This again suggests specificity of our findings to suicide.

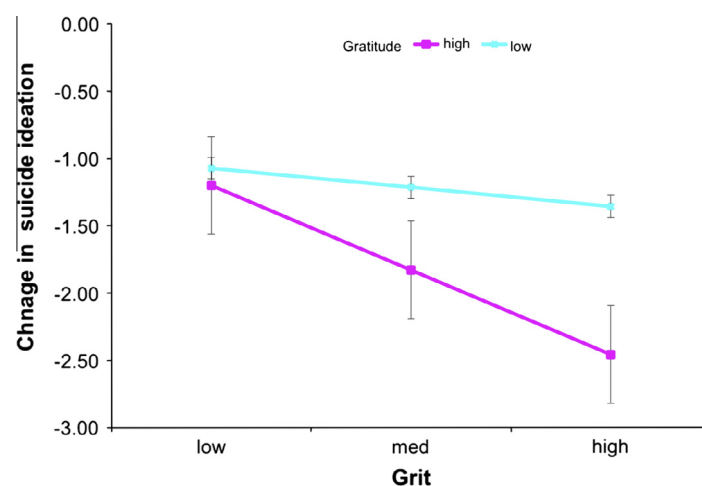
8. Discussion

We found that high levels of gratitude and grit at baseline characterized individuals with the greatest reduction in suicidal

ideation over time. Gratitude emerged as the more important factor in reducing suicidal ideation. However, the presence of only gratitude failed to offer an adequate explanation for resiliency to suicide ideation. Neither gratitude nor grit was sufficient; both were necessary to predict the subset of individuals with a near absence of suicidal ideations over time. Individuals that possessed only one of the two psychological strengths measured in this study had changes in suicidal ideations that were relatively the same as changes experienced by individuals who had neither strength. Only individuals who possessed high levels of both strengths showed significant declines in suicidal ideations over time.

We also found that these changes in suicide ideation, predicted by the combination of high gratitude and grit, were partially mediated by increased meaning in life. Taken together, these results suggest that gratitude and grit work synergistically to enhance meaning in life, offering substantial protection against thoughts about death, suicidal thoughts, or suicidal plans. These findings held even when controlling for depressive symptoms and when predicting change in depressive symptoms rather than suicidal ideations, providing a stringent test of construct specificity (as prior work consistently shows that elevated depressive symptoms are a risk factor for suicidality; e.g., Bolton, Belik, Enns, Cox, & Saareen, 2008).

Our current findings are consistent with the lone published study on gratitude as a buffering factor in predicting depressive symptoms in adults and suicidality in adolescents (Li et al., 2012). Our findings extend this research by exploring additional psychological buffers to suicidality. To our knowledge, this study

**Fig. 1.** Interaction between grit and gratitude in predicting changes in suicidal ideations over a 1-month assessment period.

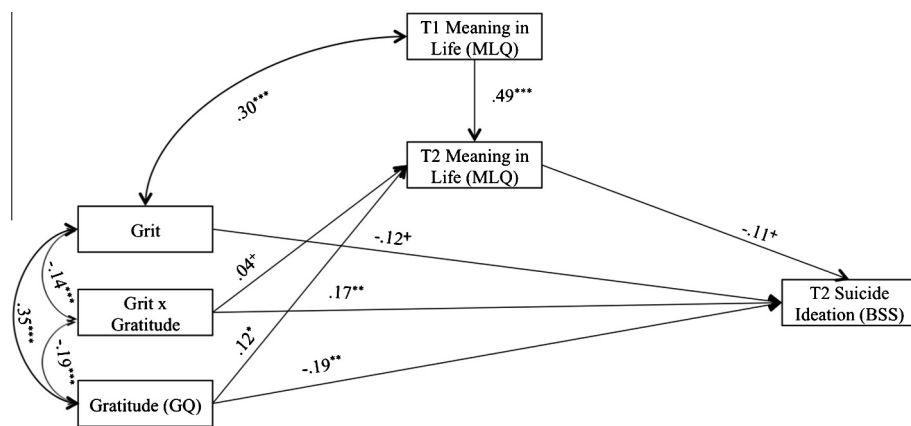


Fig. 2. Mediated moderation analysis demonstrating that changes in meaning in life mediate the interaction between grit and gratitude predicting suicidal ideations. Note. $+p < .10$, $*p < .05$, $**p < .01$, $***p < .001$. BSS scores are log-transformed. The following covariances are not depicted (all $ps < .01$): Grit \times Gratitude \leftrightarrow T1 MLQ, $r = -.20$; GQ \leftrightarrow T1 MLQ, $r = .46$.

is the first to examine grit within the context of suicide prevention. Despite evidence for an inverse association between grit and suicidal ideation, when gratitude was included in the model, grit only predicted suicidal ideations when in combination with high levels of gratitude.

These findings highlight the importance of attending to psychological strengths in combination instead of the contemporary approach of relying on singular predictors (e.g., separate research programs devoted to only gratitude, forgiveness, courage, or grit). Besides moving beyond the main effect of whether gratitude or grit is relevant to suicidal ideations over time, we drew on existing theoretical models to explore “why” with meaning in life as a mediating mechanism. Our tests provided evidence that an increase in meaning in life is at least one mechanism that accounts for why high levels of both grit and gratitude reduce the risk of suicidal ideations to near-zero over a 1-month period.

It is important to address the difference between risk and resiliency within the context of the current findings. Theorists generally agree that rather than representing endpoints on a single continuum, risk and resiliency represent two discrete dimensions (Johnson et al., 2011; Kraemer et al., 2001). The presence of certain variables may confer risk for suicide (e.g. depression), but the absence of such variables only confers the absence of risk, not the presence of resiliency. The same holds for resiliency variables, such as gratitude and grit. The presence of either or both variables may confer resiliency, but the absence of these variables does not imply risk, just the absence of resiliency. Our findings support this idea because we might expect individuals with low levels of gratitude and grit to show an increase in suicidality over time. However, we found that such individuals generally maintained a stable level of suicidal ideations over time or experienced a slight decrease in suicidal ideations compared to participants with a high degree of both gratitude and grit.

We offer speculative ideas on the clinical implications of our findings. In mainstream clinical interventions for suicide, there is rarely explicit or implicit attention to grit, gratitude, or meaning in life (e.g. Donaldson, Spirito, & Esposito-Smythers, 2005; Rudd et al., 1996). It may be easy to integrate existing interventions for gratitude into existing suicide prevention efforts. Rudd et al.'s (1996) suicide intervention includes eight 1-h dyadic psychoeducation classes with homework in addition to groups for problem solving therapy and psychotherapy process. Our findings could easily integrate into the modules for the psychoeducation classes. For example, in their “self-awareness” class, individuals could also be taught awareness of objects of gratitude in their environment.

The homework for this class could be based on existing gratitude intervention, such as writing three things at the end of the day for which an individual is grateful (Seligman, Steen, Park, & Peterson, 2005).

There is no intervention that currently exists to directly enhance grit, and this may be a reflection of the relative young age of the construct. However, there are several experimental interventions that increase strengths related to grit, such as perseverance on tasks and reducing ego depletion (Baumeister, Gailliot, DeWall, & Oaten, 2006). Muraven, Baumeister, and Tice (1999) had individuals monitor and try to improve their posture, affect, or dietary intake, which all involved aspects of ego depletion. Compared to a control group, individuals who engaged in any of the ego-depleting activities showed increases in ego strength in other domains (e.g. in a hand grip test). Such interventions could be integrated into other psychoeducation classes within Rudd et al.'s (1996) intervention, such as in the “emotion regulation” and “impulsivity and anger control” classes by having individuals work to increase their ego strength by regulating emotions or impulse control. Ultimately, when considering a clinical intervention, our data suggest that the optimal intervention would focus on increasing both grit and gratitude.

There are several limitations that should be acknowledged in the present study and addressed in future research. First, all of the caveats with the use of a relatively young, undergraduate college sample are applicable. Replications are needed, particularly with community samples, and older adults with and without life difficulties and emotional disturbances. Second, since actual suicidal behaviors are rare in a college population, we used thoughts of suicide rather than behavioral outcomes. Although thoughts and behaviors are strongly related, they are conceptually and clinically distinct. Our findings suggest that grit and gratitude may protect against thoughts of suicide, which theoretically, might protect against engaging in suicidal gestures and behaviors. However, this is a hypothesis that awaits empirical examination. Moreover, although the use of a suicide crisis plan is a crucial necessity for suicide research, informing participants that we might contact the counseling center if they disclose suicidality may have led them to avoid reporting or under report their current levels of suicidal ideations. Third, we used only self-report measures of suicide ideations, which may not be as reliable as interview methodologies. Finally, the 1 month follow-up time period is relatively short and future studies with longer follow-up periods are needed.

Despite these limitations, the present study had several notable strengths. This was the first empirical investigation of the joint

effects of gratitude and grit on suicide risk. Additionally, we identified a mechanism through which these constructs influence suicide ideation—meaning in life, which offers an explicit test of dominant theories of why people commit suicide (Baumeister, 1991; Joiner, 2005; Joiner, Van Orden, Witte, Selby, Ribeiro et al., 2009). Methodologically, this study used a prospective sample of diverse students, thus enhancing our confidence in the direction of effects and its generalizability. Our models also controlled for depressive symptoms, showing that grit and gratitude are relevant protective factors against suicide risk, above and beyond the significant risk associated with depression.

In sum, our findings contribute to various literatures, spanning social, personality, clinical, and counseling psychology, and psychiatry. First, our findings provide evidence for increased meaning in life as a protective factor in suicide. Second, our findings provide initial support for two specific psychological strengths, grit and gratitude, that predict resilience to suicidal ideation, indirectly through increased meaning in life. These findings contribute to the overall risk and protective factor literature by illuminating the value of studying interactive rather than isolated factors, with an emphasis on potential explanatory mechanisms.

Acknowledgment

Todd Kashdan was funded by the Center for Consciousness and Transformation at George Mason University.

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