

Personal Growth Initiative as a Resilience Factor Against Death Ideation in OIF, OEF,  
and OND Veterans

by

Dominika Borowa, M.A.

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Approved

Christine Robitschek, Ph.D.  
Chair of Committee

Kelly Cukrowicz, Ph.D.

Andrew Littlefield, Ph.D.

Brandy Piña-Watson, Ph.D.

Mark A. Sheridan, Ph.D.  
Dean of the Graduate School

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## TABLE OF CONTENTS

ACKNOWLEDGMENTS.....	ii
TABLE OF CONTENTS.....	iii
ABSTRACT.....	vii
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
I. CHAPTER ONE.....	1
Introduction.....	1
Perceived burdensomeness and thwarted belongingness.....	2
Resilience to death and suicidal ideation: Protective factors.....	3
Personal Growth Initiative (PGI).....	4
PGI, perceived burdensomeness, and thwarted belongingness .....	5
Hypotheses.....	8
II. CHAPTER TWO.....	11
Method.....	11
Participants.....	11
Measures.....	13
Personal growth initiative.....	13
Thwarted belongingness and perceived burdensomeness.....	14
Death ideation.....	16
Depression.....	17
Posttraumatic stress.....	19

Demographics questionnaire.....	19
Procedure.....	20
Data Analysis.....	22
Excess zeros in death ideation.....	22
Rescaling of perceived burdensomeness variable.....	24
Hypothesis testing.....	25
III. CHAPTER THREE.....	27
Results.....	27
Missing data.....	27
Data screening and preliminary analyses.....	28
Hypothesis testing.....	32
Moderated mediation with perceived burdensomeness as mediator.....	34
Moderated mediation with thwarted belongingness as mediator.....	38
Analyses without covariates.....	43
IV. CHAPTER FOUR.....	46
Discussion.....	46
Limitations & future directions.....	53
Conclusion.....	54
REFERENCES.....	56
APPENDICES	

APPENDIX A: Extended Literature Review.....	65
Interpersonal-Psychological Theory of Suicidal Behavior.....	66
Targeting perceived burdensomeness and thwarted belongingness.....	67
Perceived burdensomeness and thwarted belongingness in veterans.....	68
Resilience to death and suicidal ideation: Protective factors.....	71
Personal Growth Initiative (PGI).....	74
PGI and mental health.....	74
PGI and death ideation.....	75
PGI, perceived burdensomeness, and thwarted belongingness..	76
Targeting perceptions of burdensomeness and thwarted belongingness in treatment.....	79
Current Study.....	81
APPENDIX B: Personal Growth Initiative Scale – II.....	87
APPENDIX C: Interpersonal Needs Questionnaire.....	89
APPENDIX D: Geriatric Suicide Ideation Scale.....	91
APPENDIX E: Patient Health Questionnaire – 9.....	93
APPENDIX F: PTSD Checklist for DSM – 5.....	94
APPENDIX G: Demographics questionnaire.....	96
APPENDIX H: TechAnnounce Study Information.....	101
APPENDIX I: Facebook Study Information.....	102
APPENDIX J: Division 19 E-mail Listserv Study Information.....	103
APPENDIX K: Flyer with Study Information.....	104
APPENDIX L: E-mail sent to Directors of Military and Veterans Programs....	106

APPENDIX M: E-mail sent to Veterans from Military and Veterans Programs  
Directors.....107

APPENDIX N: Study Description on Amazon’s MTurk.....108

APPENDIX O: Information Sheet for Non-Amazon’s MTurk Participants.....109

APPENDIX P: Information Sheet for Amazon’s MTurk Participants.....111

APPENDIX Q: Debriefing Sheet for Non-Amazon’s MTurk Participants.....113

APPENDIX R: Debriefing Sheet for Amazon’s MTurk Participants.....114

APPENDIX S: External Link for Gift Card Drawing.....115

## **ABSTRACT**

According to the interpersonal psychological theory of suicidal behavior, states of perceived burdensomeness and thwarted belongingness directly predict death ideation. Personal Growth Initiative (PGI) has been shown to protect against perceived burdensomeness, thwarted belongingness, and active suicidal ideation. The current study examined relationships between PGI, perceptions of burdensomeness, thwarted belongingness, and death ideation in OIF/OEF/OND veterans, a group that is at greater risk for suicide as compared to non-veterans in the general population. Due to overdispersion and zero-inflation in death ideation, a zero-inflated negative binomial regression was employed to account for excess zeros in the dependent variable and to identify individuals who are non-ideators vs. potential ideators.

Participants were 318 OIF/OEF/OND veterans from the community and the local university population. Consistent with hypotheses 1, 2, and 5, PGI was negatively associated with death ideation, perceived burdensomeness, and thwarted belongingness. Two moderated mediation analyses were conducted, with perceived burdensomeness serving as the mediator in the first model (hypotheses 3 and 4) and thwarted belongingness serving as the mediator in the second model (hypotheses 6 and 7). PGI served as both the independent variable and moderator in both models, and death ideation served as the dependent variable. Perceived burdensomeness was found to partially mediate the relationship between PGI and death ideation (H3), and PGI was simultaneously found to moderate the mediating relationship of perceived burdensomeness and death ideation, with higher levels of PGI associated with a decreased relationship between perceived burdensomeness and death ideation and lower

levels of PGI associated with an increased relationship between perceived burdensomeness and death ideation (H4), offering support for the first moderated mediation model. For the second moderated mediation model, thwarted belongingness was found to partially mediate the relationship between PGI and death ideation (H6), but PGI did not moderate the mediating relationship of thwarted belongingness and death ideation, contrary to hypothesis 7. Results suggest that veterans with stronger PGI skills may be less likely to perceive themselves as burdens on others and less likely to experience thwarted belongingness, which in turn may result in less death ideation. For those veterans who have strong PGI skills and who perceive themselves to be a burden on others, PGI may serve as an additional protective factor against the effects of perceived burdensomeness on death ideation.

Results of the logit model suggest that elevated scores on thwarted belongingness, perceived burdensomeness, and PTSD measures are associated with a greater probability that veterans are experiencing death ideation even if it is not reported. Elevated scores on PGI are associated with a lower probability that veterans are experiencing death ideation when it is not reported. Assessment of perceived burdensomeness, thwarted belongingness, PTSD symptoms, and PGI may be helpful in identifying veterans who have thoughts about death even when these thoughts remain unreported. Implications of study findings are discussed and directions for future research suggested.

**LIST OF TABLES**

1. Pearson’s Correlations, Means (M), Standard Deviations (SD), and Internal Reliability Estimates ( $\alpha$ ) for Study Variables.....33
2. Biserial Correlations for Study Variables.....33
3. Zero-Inflated Negative Binomial Regression Results with Perceived Burdensomeness as Mediator, PGI as Independent Variable and Moderator, and Death Ideation as Dependent Variable.....35
4. Conditional Indirect Effect at  $PGI \pm 1$  SD When Perceived Burdensomeness is Mediator and Death Ideation is Dependent Variable.....38
5. Zero-Inflated Negative Binomial Regression Results with Thwarted Belongingness as Mediator, PGI as Independent Variable and Moderator, and Death Ideation as Dependent Variable.....40

## LIST OF FIGURES

1. Hypothesized moderated mediation model with PGI as independent variable and moderator, perceived burdensomeness as the mediator, and the interaction effect of PGI and perceived burdensomeness on death ideation.....	9
2. Hypothesized moderated mediation model with PGI as independent variable and moderator, thwarted belongingness as the mediator, and the interaction effect of PGI and thwarted belongingness on death ideation.....	10
3. Moderated mediation using PGI as the independent variable and moderator, perceived burdensomeness as the mediator, and death ideation as the dependent variable (statistical model).....	34
4. Plot of the conditional indirect effect of PGI on death ideation via perceived burdensomeness at different values of PGI.....	38
5. Moderated mediation using PGI as the independent variable and moderator, thwarted belongingness as the mediator, and death ideation as the dependent variable (statistical model).....	39
6. Mediation model with PGI as independent variable, thwarted belongingness as mediator, and death ideation as dependent variable (conceptual model).....	42
7. Mediation model with PGI as independent variable, thwarted belongingness as mediator, and death ideation as dependent variable (statistical model).....	43

## **CHAPTER I**

### **INTRODUCTION**

Since the start of combat operations in Iraq and Afghanistan, suicide rates in the United States (U.S.) Army reached their highest point in history (Carden, 2009). Male veterans are twice as likely to die by suicide as male nonveterans in the U.S. general population (Kaplan, Huguet, McFarland, & Newson, 2007), and suicide risk for veterans aged 17-24 is almost four times higher than that of the general population (Gibbons, Brown, & Hur, 2012). To facilitate treatment and prevent suicidal behavior in military veterans, it is important to first identify factors that influence passive suicidal ideation, or death ideation (i.e., thoughts such as, “I wish I was dead”; Van Orden et al., 2010). According to the Interpersonal-Psychological Theory of Suicidal Behavior (IPTS; Joiner, 2005; Van Orden et al., 2010), states of perceived burdensomeness and thwarted belongingness directly predict death ideation. Personal Growth Initiative (PGI; Robitschek, 1998, 1999), one’s intentional engagement in the process of positive personal change, has been identified as a factor protecting against perceived burdensomeness and thwarted belongingness (Brown et al., 2015), as well as active suicidal ideation (Ciavaglia, Robitschek, & Cukrowicz, 2014) with active suicidal ideation referring to thoughts such as, “I want to kill myself” (Van Orden et al., 2010). These potential protective effects of PGI have not yet been assessed in veterans. The aim of this study was to determine the extent to which PGI may serve to protect Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND) veterans from perceived burdensomeness, thwarted belongingness, and death ideation.

### **Perceived burdensomeness and thwarted belongingness**

The IPTS identifies two constructs that are related to death ideation: Perceived burdensomeness and thwarted belongingness. *Perceived burdensomeness* refers to feeling as if one's death is more valuable to others than one's life, and *thwarted belongingness* is defined as feeling as if one is hopelessly alienated and unable to connect with society (Joiner & Silva, 2012). According to the theory, perceived burdensomeness and thwarted belongingness are proximal and sufficient causes of death ideation, such that the presence of either of these states will predict death ideation. Anestis, Bryan, Cornette, & Joiner (2009) have suggested that directly addressing thwarted belongingness and perceived burdensomeness may be the most viable method by which to ameliorate suicide risk. Thus, this study focused on the independent causal paths between perceived burdensomeness and death ideation and thwarted belongingness and death ideation.

There is evidence for experiences of both perceived burdensomeness and thwarted belongingness in OEF and OIF military veterans (Brenner et al., 2008). Feelings of perceived burdensomeness to the family or society include a loss of identity or purpose and feelings of not making meaningful contributions in life (Brenner et al., 2008). Veterans often report feeling an immense connection with other military personnel and military culture not only while on active duty but also post-discharge; this is in stark contrast to veteran reports of feeling disconnected from civilian life, which coincides with a desire to want to further *separate* oneself from civilian society (Brenner et al., 2008), resulting in feelings of thwarted belongingness. Research yields mixed findings regarding the extent to which the presence of perceived burdensomeness or thwarted belongingness predict death ideation or active suicidal ideation in veterans.

In research assessing these states in veterans within Veterans Health Administration (VHA) inpatient psychiatric settings, thwarted belongingness but not perceived burdensomeness predicted death ideation (O'Connor et al., 2016), and perceived burdensomeness but not thwarted belongingness (Monteith, Menefee, Pettit, Leopoulos, & Vincent, 2013) predicted active suicidal ideation, contrary to propositions of the IPTS (Van Orden et al., 2010). Among veterans seeking services in the VHA, diagnosed with a depressive disorder (Pfeiffer et al., 2014), perceived burdensomeness uniquely predicted death ideation, whereas thwarted belongingness did not. In a separate study assessing suicide risk among veterans recruited from outside the VHA (Rogers, Kelliher-Rabon, Hagan, Hirsch, & Joiner, 2017), both perceived burdensomeness and thwarted belongingness were unique predictors of suicide risk, as evidenced by suicidal thoughts, communication of suicidal intent, past attempts, and expectation of making future attempts. In light of these discrepant findings, more research is needed to better understand the relationships of burdensomeness and belongingness with death ideation among veterans, particularly in the context of the IPTS model.

### **Resilience to death and suicidal ideation: Protective factors**

Protective factors, or *resilience to death and suicidal ideation*, are abilities, perceptions, or sets of beliefs that buffer against the development of death and suicidal ideation in the face of risk factors or stressors (Johnson, Gooding, Wood, & Tarrier, 2010; Osman et al., 2004). It is important to study interactions of resilience and risk factors and their influence on death and active suicidal ideation within the framework of a theoretical model of suicidal behavior such as the IPTS (Johnson, Wood, Gooding, Taylor, & Tarrier, 2011). To date, limited research exists on resilience factors that protect

individuals from developing perceptions of burdensomeness or thwarted belongingness and, in turn, death ideation; the aim of this study, therefore, was to propose PGI (Robitschek, 1998, 1999) as a resilience factor for veterans of OIF, OEF, and OND.

### **Personal Growth Initiative (PGI)**

PGI is a person's intentional engagement in the process of positive personal change that is behavioral, cognitive, or affective (Robitschek, 1998, 1999). PGI is a skillset, consisting of four parts: Readiness for Change, Planfulness, Using Resources, and Intentional Behavior (Robitschek et al., 2012). Readiness for Change refers to one's understanding of why and what one wants to change, as well as whether or not one is ready to take the first step to make the change happen. Planfulness is a person's understanding of the steps required to make the change happen; it also consists of one's ability to create a strategy for personal improvement. Using Resources refers to the capacity one has to seek information, people, services, or other forms of support outside of oneself that will facilitate a positive personal change. The fourth skill, Intentional Behavior, refers to the intentional actions, or steps, taken to change a specific aspect of one's self. The first two components of PGI, Readiness for Change and Planfulness, reflect cognitive processes, whereas the latter two, Using Resources and Intentional Behavior, reflect behavioral elements of the PGI process.

PGI has been found to moderate the effects of depression on active suicidal ideation in a sample of adults seeking outpatient therapy services (Ciavaglia et al., 2014). Namely, higher PGI levels were shown to protect against depressive symptoms in predicting active suicidal ideation; this protective effect became stronger for individuals with higher levels of depression. Though PGI manifests as a resilience factor buffering

against active suicidal ideation, PGI's relationship with death ideation, and the mechanisms by which PGI may protect individuals from death ideation, are unknown.

PGI was also found to mediate the relationships of hope with perceived burdensomeness and thwarted belongingness, suggesting that it is a more proximal protective factor for belongingness and burdensomeness than is hope (Brown et al., 2015). Importantly, the model proposed in this study (Brown et al., 2015) did not include death ideation, limiting our understanding of PGI's role in the IPTS model. Furthermore, neither of the above mentioned studies (Brown et al., 2015; Ciavaglia et al., 2014) assessed PGI's relation to perceived burdensomeness, thwarted belongingness, and death ideation in a veteran population. A goal of the current study was to assess PGI's interactions with perceived burdensomeness, thwarted belongingness, and death ideation in a sample of OIF, OEF, and OND veterans.

**PGI, perceived burdensomeness, and thwarted belongingness.** The above findings suggest that PGI may indirectly reduce death ideation by directly reducing perceptions of burdensomeness and thwarted belongingness. In other words, perceptions of burdensomeness and thwarted belongingness may mediate the relationship between PGI and death ideation.

Individuals who perceive themselves to be a burden on others may experience a loss of sense of purpose in life; they may feel that they are no longer contributing to the lives of others. Engagement in activities that enhance veterans' beliefs that they are making valuable contributions may help decrease perceptions of burdensomeness (Brenner et al., 2008). Individuals with more developed PGI skills are more likely to engage in activities that result in personal growth (e.g., furthering their education or

exploring new careers post-discharge, acquiring new hobbies). People with higher levels of PGI also engage in environmental exploration that may lead to a more crystalized vocational identity (Robitschek & Cook, 1999). Thus, veterans with more developed PGI skills may feel that, although their identity post-discharge may be changed or different than while they were on active duty, they still have control over shaping their identity and growing as individuals in a way that is meaningful to them. Thus, we predicted that perceptions of burdensomeness would mediate the relationship between PGI and death ideation, such that veterans with higher levels of PGI would perceive themselves to be less of a burden on others, which would result in less death ideation.

So far, PGI has been described as a protective factor that may directly reduce the extent to which veterans perceive themselves to be a burden on, or disconnected from, others. This does not imply that individuals with developed PGI skills (i.e., high PGI) are immune to feelings of perceived burdensomeness. Indeed, even those veterans with strong PGI skills may at times feel as if they are burdening or unable to connect with close others. However, it is plausible that more developed PGI skills may protect veterans who perceive themselves as burdens on society and close others from death ideation. PGI has been found to afford protection from active suicidal ideation in a population of individuals with depression (Ciavaglia et al., 2014); in consequence, PGI may be considered a resilience factor for death ideation. PGI has not yet been examined as a buffer of the deleterious effects of perceptions of burdensomeness on death ideation; however, based on its potential to act as a resilience factor as defined by Johnson et al. (2011), we predicted that PGI would moderate the relationship between perceived burdensomeness and death ideation, such that higher levels of PGI would serve to reduce

the extent to which perceived burdensomeness predicts death ideation.

With regard to belongingness, veterans who experience thwarted belongingness may have difficulties re-integrating with civilian society (Brenner et al., 2008). To decrease feelings of thwarted belongingness, it is important for veterans to feel as if they are a part of the civilian world. To achieve this, counselors may encourage veterans to utilize behavioral activation to seek out positive, healthy, reinforcing activities that involve social interaction to increase feelings of belongingness (Sherman, Zanotti, & Jones, 2005; Turner, Beidel, & Frueh, 2005). People with more developed PGI skills tend to explore their environments, engage in reflective coping (Robitschek & Cook, 1999), and function well in society and social relationships (Robitschek & Keyes, 2009). In light of this, individuals with more developed PGI skills may be more successful at engaging in healthy activities that promote personal growth and involve social interaction. Veterans with more developed PGI skills may feel more comfortable connecting with non-military others, such as family and friends, despite the unique experiences they have had that set them apart from the general, non-military population. Therefore, we predicted that thwarted belongingness would mediate the relationship between PGI and death ideation, such that veterans with higher levels of PGI would experience less thwarted belongingness, which would then result in less death ideation.

Once again, even veterans with strong PGI skills may experience thwarted belongingness. Given PGI's potential to serve as a resilience factor against death ideation, we predicted that PGI would moderate the relationship between thwarted belongingness and death ideation, such that higher levels of PGI would serve to reduce the extent to which thwarted belongingness predicts death ideation.

The current research strived to increase our understanding of PGI's role in OIF, OEF, and OND veterans' experiences of perceived burdensomeness, thwarted belongingness, and death ideation. Verification of the proposed hypotheses would suggest that PGI serves to reduce perceptions of burdensomeness and thwarted belongingness, and in turn death ideation, or acts as a buffer against the deleterious effects of perceived burdensomeness and thwarted belongingness on death ideation. Such findings may suggest that strengthening veterans' PGI skills may play an important role in protecting this population from death ideation.

### **Hypotheses**

Based on the negative correlation between PGI and active suicidal ideation (Ciavaglia et al., 2014), we predicted that PGI would be negatively correlated with death ideation (H1). Based on the negative relationship of PGI with burdensomeness (Brown et al., 2015), we predicted that PGI would be negatively correlated with perceived burdensomeness (H2). In agreement with the previously outlined findings, we proposed a moderated mediation model, in which we hypothesized that the relationship between PGI and death ideation would be at least partially mediated by perceived burdensomeness, such that a significant amount of the variance in death ideation would be explained by the indirect effect of PGI through perceived burdensomeness (H3). Further, we hypothesized that the mediating relationship of perceived burdensomeness and death ideation would be moderated by PGI, with higher levels of PGI associated with a decreased relationship between perceived burdensomeness and death ideation, and lower levels of PGI associated with an increased relationship (H4; see Figure 1).

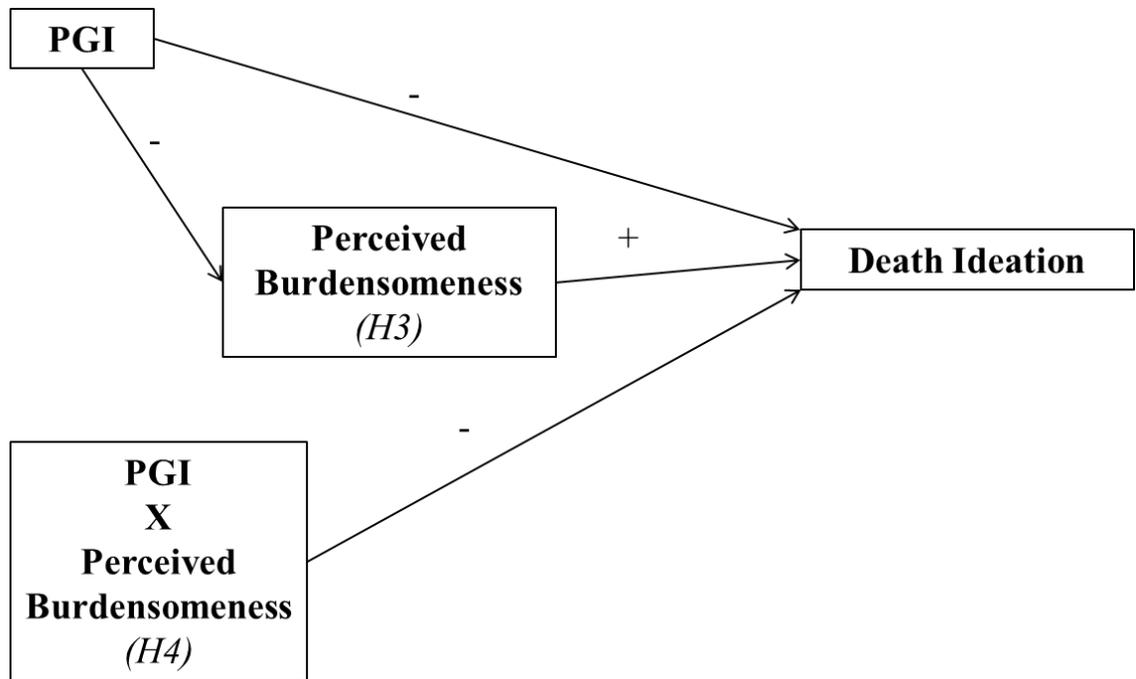
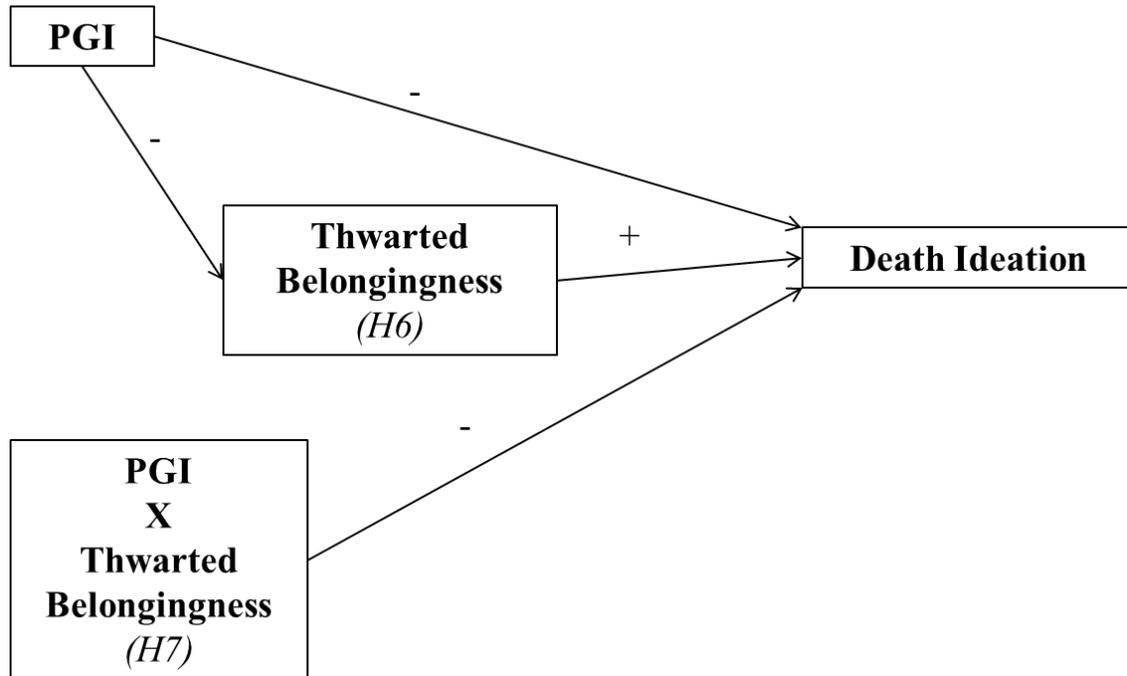


Figure 1. Hypothesized moderated mediation model with PGI as independent variable and moderator, perceived burdensomeness as the mediator, and the interaction effect of PGI and perceived burdensomeness on death ideation.

Based on the negative relationship of PGI with thwarted belongingness (Brown et al., 2015), we predicted that PGI would be negatively correlated with thwarted belongingness (H5). Next, similarly to the first moderated mediation model, we hypothesized that the relationship between PGI and death ideation would be at least partially mediated by thwarted belongingness, such that a significant amount of the variance in death ideation would be explained by the indirect effect of PGI through thwarted belongingness (H6), and we hypothesized that the mediating relationship of thwarted belongingness and death ideation would be moderated by PGI, with higher levels of PGI associated with a decreased relationship between thwarted belongingness and death ideation, and lower levels of PGI associated with an increased relationship (H7; see Figure 2).



*Figure 2.* Hypothesized moderated mediation model with PGI as independent variable and moderator, thwarted belongingness as the mediator, and the interaction effect of PGI and thwarted belongingness on death ideation.

Based on previous research, depressive and PTSD symptoms have been identified as significant predictors of passive and active suicidal ideation in OEF/OIF veterans (Braden, Overholser, Fisher, & Ridley, 2015; Bryan & Corso, 2011; Gradus, Smith, & Vogt, 2015; Haller, Angkaw, Hendricks, & Norman, 2015; Kimbrel et al., 2014; Kimbrel et al., 2015; Lemaire & Graham, 2011; Maguen et al., 2011; Monteith et al., 2013; Pfeiffer et al., 2014; Pietrzak et al., 2010; Suris, Link-Malcolm, & North, 2011; Wisco et al., 2014; Youssef et al., 2013). In order to account for the potential effects of depressive and PTSD symptoms on death ideation in OEF, OIF, and OND veterans, depressive and PTSD symptoms were included as covariates in the current study.

## CHAPTER II

### METHOD

Prior to data collection, an Institutional Review Board (IRB) proposal was submitted to and approved by Texas Tech University, confirming that data collection procedures were in accordance with ethical, professional, and university guidelines. This study involved the use of online survey instruments, and information gathered during the study was de-identified; because participants were not directly connected with their responses, and because this research did not target special populations, this study qualified for Exempt Review.

#### **Participants**

Data consisted of 330 complete cases. Of these, 12 cases were not included in the analyses due to having incorrectly responded to the manipulation check item. Thus, participants were 318 military veterans deployed as part of OIF, OEF, and/or OND. The majority of participants identified as male (77.6%), 21.1% identified as female, 0.6% identified as transgender, and 0.6% identified as “agender”. The mean age was 34.4 (*SD* = 7.35). Participant ethnicities were as follows: 79.6% White, non-Hispanic, 7.2% Hispanic, 4.7% Black, 4.4% Bi-racial/Multi-racial, 3.1% Asian or Pacific Islander, 0.6% Other, and 0.3% American Indian/Alaskan Native. Sexual orientations of the participants were: 91.5% heterosexual, 3.1% bisexual, 2.2% gay, 2.2% lesbian, 0.6% Other, and 0.3% Questioning. Participants reported relationship statuses as follows: 58.2% married, 18.2% single, 11.9% dating, 10.4% divorced 3.8% engaged, and 2.2% partnered (the sum of these percentages is greater than 100% due to the fact that participants were able to select more than one option). The majority of respondents (71.4%) reported being part of the

middle to upper middle socioeconomic class.

The majority of the participants were representatives of the Army (47.8%), followed by the Marine Corps (16.7%), Air Force (13.8%), Navy (12.9%), Army Reserve (11.6%), Army National Guard (10.7%), Air National Guard (2.5%), Marine Corps Reserve (2.2%), Air Force Reserve (1.9%), Navy Reserve (1.6%), and Coast Guard (0.3%), and Coast Guard Reserve (0.3%). The majority of participants were deployed as part of Operation Enduring Freedom (62.9%), followed by Operation Iraqi Freedom (57.5%), and Operation New Dawn (10.1%). On average, participants were deployed for 18.65 ( $SD = 19.09$ ) months, with an average of 13.52 ( $SD = 10.84$ ) months spent in a combat zone. In this sample, 8.5% of participants reported having been diagnosed with a military service-related traumatic brain injury, and 17.9% reported having experienced a military service-related concussion. A total of 35.5% participants scored above the cut-off that suggests clinically significant PTSD symptoms (Weathers et al., 2013).

The number of participants required to detect a significant interaction of PGI with perceived burdensomeness/thwarted belongingness in predicting death ideation was obtained using the power analysis program G\*Power 3 (Faul, Erdfelder, Lang & Buchner, 2007) for change in R-square in a hierarchical linear regression. With six total predictors (PTSD symptoms, depressive symptoms, PGI as an independent variable, perceived burdensomeness or thwarted belongingness as a mediator, PGI as a moderator, and the interaction of PGIxPerceivedBurdensomeness or PGIxThwartedBelongingness) and four tested predictors (PGI as an independent variable, perceived burdensomeness or thwarted belongingness as a mediator, PGI as a moderator, and the interaction of PGIxPerceivedBurdensomeness or PGIxThwartedBelongingness), alpha level of 0.05, a

power of 0.80, and an effect size of 0.04, the obtained number of participants required was 304. The presence of moderated mediation was a corollary of the hypothesized PGIXPerceivedBurdensomeness/ThwartedBelongingness interaction. A formal power analysis for moderated mediation was not conducted, given these methods are underdeveloped (except in the context of a binary moderator that is independent of the overall mediation model; see Thoemmes, MacKinnon, & Reiser, 2010).

The first 10 participants who completed the survey via Amazon's Mechanical Turk (MTurk) were awarded \$0.20 for completing the survey. Due to limited responses at this compensation level, the participation award was raised to \$0.40 for the remainder of the study. Remaining participants (i.e., individuals not recruited via Amazon's MTurk) were given the opportunity to register for a drawing to win one of five \$10 gift cards to Amazon.com as compensation for their participation.

## **Measures**

**Personal growth initiative.** The Personal Growth Initiative Scale-II (Robitschek et al., 2012; see Appendix B) contains 16 items and consists of four subscales: Readiness for Change, Planfulness, Using Resources, and Intentional Behavior. Items are answered on a 6-point Likert scale ranging from 0 (*Disagree Strongly*) to 5 (*Agree Strongly*). Item scores on each subscale are averaged to obtain subscale scores, and the four subscale scores are averaged to obtain the total scale score. Higher and lower scores indicate higher or lower levels of personal growth initiative, respectively. The scale has acceptable estimates of test-retest reliability among college students, as follows: 1-week,  $r = .82$ ; 2-week,  $r = .67$ ; 4-week,  $r = .70$ ; and 6-week,  $r = .62$  (Robitschek et al., 2012). Cronbach's alpha estimates for each subscale range from .73 to .91 for each test-retest

interval, and alpha estimates for the total scale score range from .90 to .94 which indicates good internal consistency (Robitschek et al., 2012). In a sample of military members and veterans, Cronbach alpha estimates were as follows: .83 (Readiness for Change), .89 (Planfulness), .83 (Using Resources), .89 (Intentional Behavior), and .93 (Total Scale) (Borowa, Robitschek, Harmon, & Shigemoto, 2016). Convergent validity was supported by positive correlations of Personal Growth Initiative Scale – II scores with the original Personal Growth Initiative Scale (Robitschek, 1998, 1999), assertiveness, instrumentality, expressiveness, and internal locus of control (Robitschek et al., 2012). The Personal Growth Initiative – II total and subscale scores were not significantly related to social desirability (Robitschek et al., 2012), providing support for discriminant validity. Research also provides confirmatory evidence for the four-factor structure of the scale across multiple samples, including samples of college students and adults from ethnic minority and majority groups (Robitschek et al., 2012; Shigemoto, Thoen, Robitschek, & Ashton, 2015). Notably, the four-factor structure was not supported in a sample of adult patients receiving treatment for depressive disorders in a partial hospital program (Robitschek, Yang, & Villalba, 2015), suggesting that individuals experiencing greater distress may be unable to clearly distinguish between the components of PGI. In the current sample, the Cronbach's alpha estimate for the scale was .96.

**Thwarted belongingness and perceived burdensomeness.** The Interpersonal Needs Questionnaire (Van Orden, Cukrowicz, Witte, & Joiner, 2012; see Appendix C) comprises 15 items and is designed to assess thwarted belongingness (9 items) and perceived burdensomeness (6 items). Items are answered on a 7-point scale ranging from

1 (*not at all true for me*) to 7 (*very true for me*). Items 7, 8, 10, 13, 14, and 15 are reverse coded. Total scores for thwarted belongingness and perceived burdensomeness are obtained by averaging the item responses within each of these subscales; higher scores indicate greater experiences of not feeling connected to others and perceptions that one is a burden to others. This scale has been found to have acceptable internal consistency estimates for perceived burdensomeness ( $\alpha = .89$ ) and thwarted belongingness ( $\alpha = .85$ ) in a sample of military veterans (Monteith et al., 2013). Results were supportive of convergent validity for thwarted belongingness in samples of young and older adults, as this subscale correlated with measures of loneliness, social support, self-liking, and relatedness in the expected directions. In the sample of younger adults, results were not supportive of discriminant validity for thwarted belongingness, as significant negative correlations were found between thwarted belongingness and constructs that are conceptually similar to and correlate negatively with perceived burdensomeness (i.e., competence, autonomy, responsibility to family, and self-competence); in the sample of older adults, thwarted belongingness was observed to have a discriminant relationship with one of the constructs predicted to be associated with perceived burdensomeness (i.e., death ideation; Van Orden et al., 2012), suggesting acceptable discriminant validity in this population. Notably, limited evidence for divergent validity of the belongingness subscale may suggest that the need to belong affects many psychological experiences and that, as a result, there are few psychological constructs with which it is unassociated (Van Orden et al., 2012). With regard to perceived burdensomeness, results were supportive of both convergent and discriminant validity in younger adults (Van Orden et al., 2012). Evidence for concurrent validity has been found in a clinical sample of adults, with

greater odds of suicidal ideation being associated with higher levels of both thwarted belongingness and perceived burdensomeness (Van Orden et al., 2012). Greater odds of reporting suicidal ideation one month later were associated with higher levels of both thwarted belongingness and perceived burdensomeness, providing evidence of the scale's predictive validity (Van Orden et al., 2012). Cronbach's alpha estimates in the current sample were .96 and .90 for perceived burdensomeness and thwarted belongingness, respectively.

**Death ideation.** The Geriatric Suicide Ideation Scale (Heisel & Flett, 2006; see Appendix D) contains 31 items that assess suicide ideation, death ideation, loss of personal and social worth, and perceived meaning in life. Each item is answered on a 5-point scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). The 31 items may be summed for a total scale score, or they can be divided into four subscale scores (Suicide Ideation, Death Ideation, Loss of Personal and Social Worth, and Perceived Meaning in Life). For the purpose of this study, the Death Ideation subscale score was used for analyses. Total scale scores are obtained by summing the ratings from the 31 items; the total score ranges from 31 to 155, with higher scores indicating greater suicidal ideation. The Death Ideation subscale score is obtained by summing the ratings from items in this subscale; the subscale score ranges from 1 to 25, with higher scores indicating greater death ideation. The scale's Cronbach coefficient alphas ranged from 0.82 to .93 (Heisel & Flett, 2006) in samples of older adults, suggesting that the scale and its subscales had strong internal consistency in this population. Test-retest reliability was strong for the total scale ( $r = 0.86$ ,  $p < 0.001$ ) and Suicide Ideation, Death Ideation, Loss of Personal and Social Worth, and Perceived Meaning in Life subscales, respectively ( $r = 0.78$ m

0.76, 0.77, and 0.75; all  $p < 0.001$ ; Heisel & Flett, 2006). Construct validity of the GSIS was supported (Heisel & Flett, 2006), with the GSIS total and subscale scores correlating positively with the Scale for Suicide Ideation (Beck, Kovacs, & Weissman, 1979). Strong positive associations of the GSIS scores with measures of depression (Geriatric Depression Scale; Yesavage, et al., 1983), social hopelessness (Social Hopelessness Questionnaire; Flett, Hewitt, heisel, Davidson, & Gayle, unpublished manuscript), and poor perceived health, as well as negative associations with measures of psychological well-being (Psychological Well-Being Scale; Ryff, 1989) and life satisfaction (Satisfaction with life scale; Diener, Emmons, Larsen, & Griffin, 1985) provide evidence for convergent and discriminant validity (Heisel & Flett, 2006). Notably, to our knowledge, the GSIS has not been used with a veteran sample to date; consequently, evidence of reliability and validity of the scale in this population is lacking. Although this scale has not been utilized with a veteran population, it is the only known scale that includes a subscale assessing death ideation and was, thus, deemed appropriate for this study. The Cronbach's alpha estimate for the death ideation subscale was .92 in the current sample.

**Depression.** The Patient Health Questionnaire-9 (Kroenke, Spitzer, & Williams, 2001; see Appendix E) contains 9 items that correspond to the nine diagnostic criteria for depressive disorders as outlined by the DSM-IV-TR (American Psychiatric Association, 2000). Each item is answered on a 4-point scale that ranges from 0 (*Not at all*) to 3 (*Nearly every day*). Total scores are obtained by summing all items, with the total score ranging from 0 to 27 and higher scores indicating more severe depression. Cut-off scores of 5, 10, 15, and 20 represent mild, moderate, moderately severe, or severe depression,

respectively. The scale has demonstrated good test-retest reliability ( $r = 0.84$ ; Kroenke et al., 2001) and good internal consistency with Cronbach's alpha estimates of 0.89 and 0.86 in samples of primary care and obstetrics-gynecology clinic patients, respectively. The Cronbach's alpha estimate in a sample of student veterans was 0.93 (Rudd, Goulding, & Bryan, 2011). Criterion validity of the scale was assessed by the Structured Clinical Interview for DSM-III-R (Spitzer, Williams, Gibbon, & First, 1992) conducted by clinical psychologists. Results indicated a sensitivity of 88% and specificity of 88% for major depression. Convergent validity was found with high negative correlations between the Patient Health Questionnaire-9 and the Short-Form General Health Survey (Stewart, Hays, & Ware, 1988). Higher scores on the Patient Health Questionnaire-9 were also associated with greater symptom-related difficulty, number of sick days, and increased health care utilization (Kroenke et al., 2001). Notably, due to the potential overlap of item 6 ("Feeling bad about yourself — or that you are a failure or have let yourself or your family down") on this scale with items assessing perceived burdensomeness on the Interpersonal Needs Questionnaire (Van Orden et al., 2012), as well as the content of item 9 ("Thoughts that you would be better off dead or of hurting yourself in some way") overlapping with death ideation as assessed by the Geriatric Suicide Ideation Scale (Heisel & Flett, 2006), items 6 and 9 were omitted when calculating participants' total scale scores prior to conducting the main analyses in this study (Tables 2 and 4). To facilitate scale score interpretation and comparison with other research studies, however, participant mean scores on the scale are provided based on all 9 items (see Table 1). Cronbach's alpha estimates for the current sample were .91 for the scale including all 9 items and .90 for the scale with items 6 and 9 omitted.

**Posttraumatic stress.** The PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013; see Appendix F) contains 20 items that correspond to PTSD symptoms outlined in the Diagnostic and Statistical Manual of Mental Disorders (5<sup>th</sup> Ed.; DSM-5; American Psychiatric Association, 2013). Each item is a severity rating indicating the degree of distress associated with each symptom on a 5-point scale, ranging from 0 (*Not at all*) to 4 (*Extremely*). Total scores are obtained by summing all items, with the total score ranging from 0 to 80 and higher scores indicating more severe posttraumatic stress symptoms. The authors provide a preliminary cut-point of 33 as a reasonable value suggestive of clinically significant posttraumatic stress symptoms (Weathers et al., 2013). The scale has demonstrated good test-retest reliability ( $r = 0.84$ ) and internal consistency ( $\alpha = .96$ ) in a sample of veterans utilizing Veterans Affairs healthcare services (Bovin et al., 2015). Criterion validity of the scale was assessed by the PTSD Checklist for DSM-IV (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993). Results indicated a sensitivity of 88% and specificity of 69% for posttraumatic stress as assessed by the total severity score on the PCL-5 (Bovin et al., 2015). Evidence for convergent validity was found with high positive correlations between the PCL-5 and PCL-C (Weathers et al., 1993), as well as the depression and generalized anxiety subscales of the Patient Health Questionnaire (PHQ; Spitzer, Kroenke, & Williams, 1999) in a sample of veterans (Bovin et al., 2015). Weak correlations between the PCL-5 and alcohol abuse and psychopathy subscales of the PHQ (Spitzer, Kroenke, & Williams, 1999) provided evidence for discriminant validity (Bovin et al., 2015). Cronbach's alpha estimate for the current sample was .97.

**Demographics questionnaire.** A demographics survey (see Appendix G) assessed for participants' age, gender, sexual orientation, ethnicity, relationship status,

socioeconomic status, current military status, military service branch(es), deployment (i.e., number of times deployed and total months deployed), combat theatres deployed to, and whether one has experienced a military service-related traumatic brain injury or concussion. Questions #16-18 were validity questions used to ensure that individuals completing the survey were veterans (Lynn & Morgan, 2016).

### **Procedure**

Participants were recruited from several sources. Information about the study was posted via an electronic university announcement system for students, faculty, and staff at Texas Tech University (i.e., TechAnnounce; see Appendix H); a social media website (i.e., Facebook; see Appendix I); and the American Psychological Association's Society for Military Psychology (Division 19) e-mail listserv (see Appendix J). Flyers with study information and a QR code directing interested individuals to the online survey were posted in the Military & Veterans Program office at TTU and a local American Legion (see Appendix K). Additionally, the investigator and study research assistants contacted directors of 158 Military & Veterans Programs at universities in the U.S. via e-mail, requesting that information about the study be distributed to veterans affiliated with these programs (see Appendix L). With each of these recruitment methods, snowball sampling was employed to gather data from a broad sample of participants (i.e., different military branches, wide age range, and varying numbers of deployments). Finally, the survey was posted on Amazon's Mechanical Turk (MTurk; see Appendix M). Amazon's MTurk allows researchers to post human intelligence tasks (HITs) to be completed by individuals registered on the site. Individuals were credited \$0.40 for their participation in the survey. Of the 318 participants, 195 completed the survey using Amazon's MTurk, 26 learned

about the study via TechAnnounce, 11 were referred by the TTU Military & Veterans Program director, 9 were referred by a friend, 3 were referred by Military & Veterans Program directors outside of TTU, 3 accessed the link via facebook, 2 learned about the survey via the Division 19 e-mail listserv, and 1 participant learned about the survey from a professor. Sixty-eight participants did not report how they learned about the survey.

Data collection was anonymous. Prior to beginning the online survey, participants were informed of their rights and presented with information about the study (see Appendices N and O); at this point, participants had the opportunity to decide if they wished to participate in the study. Individuals who agreed to participate in the study were presented with the demographics questionnaire, followed by measures displayed in a randomized order to minimize order effects. Based on recommendations offered by Lynn and Morgan (2016) on using MTurk to recruit military veterans, the demographics questionnaire included three validity questions (see Appendix G) that were administered to ensure that the target population (i.e., veterans) was being reached and to increase the potential for high-quality data. For each of the validity questions, a response option of “I am not a Veteran” was offered. If a participant marked this option, or if the item was answered incorrectly, the survey came to an end. Additionally, an instructional manipulation check (Oppenheimer, Meyvis, & Davidenko, 2009) was embedded within the Geriatric Suicide Ideation Scale (Heisel & Flett, 2006) to identify careless responding.

Upon completion of the survey, participants were presented with a debriefing page that explained the purpose of the study and provided participants with the investigators’ contact information (see Appendices P and Q). Although asking

individuals about suicide-related topics has not been found to increase suicide risk (Cukrowicz, Smith, & Poindexter, 2010), participants were provided with information for accessing mental health services should they need this information in the future. Participants interested in entering the gift card drawing were then able to click on a website link that re-directed them to a separate webpage where they were asked to provide a name and e-mail address (see Appendix R). Use of an external website link allowed for responses and identifying information to be collected separately, ensuring anonymity. A random number generator was used to select winners of the drawing, and participants were notified via e-mail if they won. Because individuals completing the survey via Amazon's MTurk were compensated for their time, they were not given the opportunity to participate in the gift card drawing.

### **Data Analysis**

**Excess zeros in death ideation.** It is not uncommon for problems of excess zeros to occur in outcome measures of death or suicidal ideation when data is collected in community samples, in which individuals may experience low suicide risk. One approach to handling excess zeros in the dependent variable is through the use of zero-inflated modeling, such as zero-inflated Poisson (ZIP) or zero-inflated negative binomial (ZINB) regression, which is specifically designed to address the problem of excess zeros in the outcome variable (Elhai, Calhoun, & Ford, 2008). In addition to estimating a Poisson regression or negative binomial regression, zero-inflated models simultaneously estimate a binary logistic regression which accounts for two types of zero groups: Individuals who are "Always Zero" (with a score of 0 on the dependent count variable) and individuals who are "Not Always Zero" (with a possible score of 0 or any positive integer on the

dependent count variable; Elhai et al., 2008). As described by Cukrowicz, Jahn, Graham, Poindexter, and Williams (2013), in the present study, one type of zero may occur when an individual denies death ideation and has minimal psychological distress; this individual would be considered a *non-ideator* (i.e., “Always Zero”). The other zero type may occur when an individual denies death ideation but does report other risk factors for death ideation, such as perceived burdensomeness or thwarted belongingness; this individual would be considered a *potential ideator* (i.e., “Not Always Zero”), despite not having endorsed death ideation. The binary logistic regression in the model would provide estimates of the likelihood of a participant being a non-ideator or potential ideator, whereas the negative binomial or Poisson regression would provide estimates of the continuous relationship between the predictor variables (e.g., thwarted belongingness, perceived burdensomeness) and death ideation, while controlling for the effect of excess zeros on the estimation of death ideation (Cukrowicz et al., 2013). ZINB regression is recommended for overdispersed data (i.e., data exhibiting variance greater than the mean) with zero-inflation, whereas ZIP regression is recommended for non-overdispersed data (i.e., data that does not exhibit variance that is much greater than the mean; Elhai et al., 2008) with zero-inflation. Due to overdispersion and zero-inflation (44.7% zero values in death ideation) occurring in this dataset, ZINB regression was performed.

To verify the appropriateness of the ZINB regression for this data, Poisson and negative binomial regressions were also performed. Model fit was assessed based on the Akaike information criterion (AIC; Akaike, 1973; Bozdogan, 2000) and Bayesian information criterion (BIC; Schwarz, 1978; Wasserman, 2000), both of which combine data fit with model parsimony and are commonly used for model comparison. Lower

values on these measures indicate better model fit. Based on these results, for both moderated mediation models, the negative binomial model demonstrated better fit than the Poisson model, offering evidence for overdispersion occurring; the ZINB model demonstrated better fit than the negative binomial model, offering evidence for zero-inflation and supporting ZINB regression as the appropriate model for this data.

**Rescaling of perceived burdensomeness variable.** High endorsement of zeros (53.8%) was also identified as a problem in perceived burdensomeness, the mediator in the first moderated mediation model proposed. To determine whether it may be more appropriate to treat perceived burdensomeness as a non-continuous variable, the data were examined with separate models in which perceived burdensomeness was specified as continuous, ordinal, or dichotomous. In the model specifying perceived burdensomeness as ordinal, participants were categorized into groups of 0 (no endorsement of perceived burdensomeness, with total scores on the variable = 1), 1 (some endorsement of perceived burdensomeness, with total scores on the variable > 1 and < 4), or 2 (high endorsement of perceived burdensomeness, with total scores on the variable  $\geq 4$ ). In the model specifying perceived burdensomeness as dichotomous, participants were categorized into groups of 0 (no endorsement of perceived burdensomeness, with total scores on the variable = 1) or 1 (endorsement of perceived burdensomeness, with total scores on the variable > 1). Model fit was assessed based on AIC and BIC. Based on these results, the model with perceived burdensomeness specified as a dichotomous variable demonstrated better fit than models treating perceived burdensomeness as ordinal or continuous. Thus, the model in which perceived burdensomeness was specified as dichotomous was retained and used in the remaining

analyses. To account for the two different scales used between the independent variable (PGI; continuous) and mediator (perceived burdensomeness; dichotomous), the method outlined by McKinnon and Dwyer (1993) was used to adjust the regression coefficients to be on the same scale and to enable the standard decomposition of the total effect into direct and indirect effects to hold.

**Hypothesis testing.** Data were analyzed in two ways. Hypotheses 1, 2, and 5 were tested using bivariate correlation. Hypotheses 3, 4, 6, and 7 (moderated mediation models) were tested based on the MODMED approach, using MODMED code (Stride, Gardner, Catley, & Thomas, 2015) for Mplus (Muthén & Muthén, 1998-2012). Moderated mediation Model 1 (Preacher, Rucker, & Hayes, 2007) was used. Advancing this approach, we estimated the moderated mediation model using ZINB regression to simultaneously obtain estimates of the likelihood of a participant being a non-ideator or potential ideator, and to test the moderated mediation models while controlling for the effect of excess zeros on the estimation of death ideation.

For Hypotheses 1, 2, and 5, the strength and direction ( $r$ ) of the relationships of PGI with death ideation, perceived burdensomeness, and thwarted belongingness were examined, respectively, with  $p < .05$  indicating a significant relationship.

For hypotheses 3, 4, 6, and 7, PGI was identified as the independent variable and as the moderator in both models. Perceived burdensomeness (hypothesis 3) and thwarted belongingness (hypothesis 6) were identified as mediators in their respective analyses, and death ideation was identified as the outcome variable in both models. Moderation of the indirect effect was explored at a range of values of PGI (1 SD below the mean, at the mean, 1 SD above the mean). Depressive and PTSD symptoms were included as

covariates in both models to ensure that predictors of interest in our models accounted for variance in death ideation beyond the variance accounted for by depressive and PTSD symptoms.

## CHAPTER III

### RESULTS

#### Missing data

Prior to data analysis, data were screened for patterns of missing values. There exist three mechanisms of missingness that address relationships between the variables in the data set and values that are missing in the data set: Missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR; Enders, 2010). Data that are MCAR require that missing data on a given variable  $Y$  are unrelated to other variables in the data set and are also unrelated to other values of variable  $Y$  (Enders, 2010). Data that are MAR suggest that cases with missing values on a variable  $Y$  are conditional upon one or more *other* variables in the data set, whereas MNAR refers to data in which cases with a missing value on variable  $Y$  are a function of variable  $Y$  (Meyers, Gamst, & Guarino, 2013). The MCAR mechanism is most preferable, though this assumption is frequently not achieved in practice (Allison, 2002).

Little's MCAR test (Little, 1988) was used to assess the MCAR mechanism. This test yields a test statistic that, if equal to or greater than an alpha level of .05, suggests data are MCAR (Meyers, et al., 2013). If the test statistic is at an alpha level of less than .05, then missing data may be either MAR or MNAR. Little's MCAR test revealed chi-square = 4820.38 ( $df = 4162$ ,  $p < .000$ ), suggesting data in this study were not MCAR. Approximately 0.7% of values in the data set were missing. Scales with less than 1% of missing values included the GSIS (0.3%), PCL-5 (0.8%), and PGIS-II (0.9%). For both the PHQ-9 and INQ scales, 1.2% of values were missing. Independent samples  $t$ -tests comparing participants with complete and incomplete response sets yielded no significant

differences ( $p > .05$ ) in means on variables examined in the model (i.e., PGI, perceived burdensomeness, thwarted belongingness, death ideation, depression, and PTSD) or on demographic variables, including age, gender, race, socioeconomic status, military branch, and combat theatre(s) deployed to.

Most traditional approaches to handling missing data (e.g., listwise deletion, single imputation) assume the MCAR mechanism and result in substantial bias in parameter estimates when this assumption is not achieved (Enders, 2013). Single imputation methods (e.g., mean substitution) have been criticized because they tend to produce biased estimates and underestimate standard errors, even if the MCAR mechanism is confirmed; as a result, it is recommended that state-of-the-art imputation procedures, such as multiple imputation (MI) or full-information maximum likelihood (FIML), be used to handle missing data (Graham, 2009; Enders, 2013). In this study, MI using Mplus (Muthén & Muthén, 1998-2012) was used. All data were imputed at the item-level. The imputation model included all items from the PHQ-9, PCL-5, PGIS-II, INQ, and GSIS measures, and all variables were specified as categorical. The imputation was set to 10,000 iterations. To reduce autocorrelation with datasets close to one another (Enders, 2010), thinning was set to 1,000, instructing Mplus to save every 1,000<sup>th</sup> data set during imputation. Twenty imputed data sets were saved, a number considered sufficient to obtain desired power for a valid statistical analysis (Enders, 2010; Graham, Olchowski, & Gilreath, 2007).

### **Data screening and preliminary analyses**

Data were initially screened using IBM SPSS Statistics Version 23 and methods described by Cohen, Cohen, West, and Aiken (2013). The data were first examined to

determine whether basic assumptions required to complete regression analyses were met. A residual plot was examined to assess the assumption of linearity, which states that there is a linear relationship between the dependent variable and the optimal linear combination of predictor variables; linear relationships between death ideation and its predictors (perceived burdensomeness, thwarted belongingness, and PGI) were observed, with no discernable curve in the plot. No polynomial regressions or nonlinear transformations were needed to interpret the data. Next, the residual plot was examined to assess the assumption of homoscedasticity, which states that there are equal variances for residuals across each value of the independent variables. No discernable “megaphone” pattern was identified in the plot, suggesting that heteroscedasticity was not evidenced, and variable transformations were not needed. Next, the correlation matrix of independent variables, variance inflation factor (VIF), and tolerance values were examined to rule out multicollinearity. The VIF did not exceed 10 (ranging from 1.49 to 3.33), tolerance values were greater than 0.10 (ranging from .30 to .67), and bivariate correlations of independent variables did not exceed .90, indicating that multicollinearity was not an issue.

Finally, histograms, P-P Plots, and Q-Q Plots were examined to test the assumption of normality of errors, which states that errors are normally distributed across each value of the independent variables. Additionally, the Kolmogorov-Smirnov (Massey, 1951) and Shapiro-Wilk (Shapiro & Wilk, 1965) tests were used to assess normality. Visual examination of histograms and P-P and Q-Q Plots suggested that the PGI, PTSD, depression, perceived burdensomeness, and death ideation variables may not be normally distributed. The Kolmogorov-Smirnov and Shapiro-Wilk tests were

significant ( $p < .05$ ) across all variables, providing further evidence for a non-normal distribution among these variables. Based on examination of histograms and statistics for skewness and kurtosis, PGI was negatively skewed with kurtosis in the normal range (Skewness =  $-.74$ , SE =  $.14$ ; Kurtosis =  $.41$ , SE =  $.27$ ); PTSD was positively skewed with kurtosis in the normal range (Skewness =  $.69$ , SE =  $.14$ ; Kurtosis =  $-.44$ , SE =  $.27$ ); depression was positively skewed with kurtosis in the normal range (Skewness =  $.77$ , SE =  $.14$ ; Kurtosis =  $-.27$ , SE =  $.27$ ); perceived burdensomeness was positively skewed with positive kurtosis (Skewness =  $1.79$ , SE =  $.14$ ; Kurtosis =  $2.26$ , SE =  $.27$ ); thwarted belongingness exhibited skewness and kurtosis in the normal range (Skewness =  $.26$ , SE =  $.14$ ; Kurtosis =  $-.78$ , SE =  $.27$ ); and death ideation was positively skewed with positive kurtosis (Skewness =  $1.34$ , SE =  $.14$ ; Kurtosis =  $.87$ , SE =  $.27$ ). To account for the moderately negatively skewed distributions in PTSD and depression, square root transformations were conducted; due to moderate positive skewness in PGI, PGI was first reflected and then a square root transformation performed (Tabachnick & Fidell, 2001). Due to severe skewness among perceived burdensomeness and death ideation, inverse transformations were conducted (Tabachnick & Fidell, 2001). Skewness and kurtosis were substantial in both perceived burdensomeness and death ideation even after applying inverse transformations. At this point, due to significant zero-inflation in the dependent variable, ZINB regression was deemed more appropriate than linear regression for this analysis (refer to discussion of this in Data Analysis section for more details).

Data were assessed for potential outliers by examining histograms, box plots, normal probability plots, studentized residuals, studentized deleted residuals, and standardized scores. Influential data points and high leverage points were tested for using

Cook's Distance (Cook & Weisberg, 1982) and the Mahalanobis Distance tests (Stevens, 1984), respectively. No univariate outliers or influential data points were identified. Two multivariate outliers were identified. To determine whether the two outlying cases significantly impacted assumptions of regression and analysis results (potentially warranting listwise deletion), regression assumptions were tested and analyses conducted with the outliers included in the data set as well as omitted. Assumptions of regression and results did not appear to be impacted by these two outlying cases (i.e., no significant differences were found when the cases were omitted), and the decision was made to not employ listwise deletion for these two cases.

Sample mean scores for each of the measures used were compared to mean scores found in similar samples in past research to determine if any significant differences exist. The total PGI score for this sample indicated that participants reported lower levels of PGI ( $M = 3.49$ ,  $SD = 1.00$ ) than other research with student service members and veterans ( $M = 3.76$ ,  $SD = .83$ ; Borowa et al., 2016) and a non-clinical college sample ( $M = 3.69$ ,  $SD = .72$ ; Robitschek et al., 2012) would suggest. Total perceived burdensomeness ( $M = 1.79$ ,  $SD = 1.31$ ) and thwarted belongingness ( $M = 3.26$ ,  $SD = 1.44$ ) scores suggest participants reported lower perceived burdensomeness and comparable thwarted belongingness levels when compared to mean scores on a measure assessing these states in veterans in a non-clinical sample (Rogers et al., 2017). Scores on death ideation ( $M = 8.54$ ,  $SD = 4.70$ ) in this sample were higher than scores of older adults recruited from the community in the original validation study of the Geriatric Suicide Ideation Scale ( $M = 6.6$ ,  $SD = 3.7$ ; Heisel & Flett, 2004). No studies utilizing this scale with a veteran population were found. Total scores on the measure of PTSD

symptoms in this sample ( $M = 24.93$ ,  $SD = 19.74$ ) suggested lower levels of posttraumatic stress than has been found in a sample of veterans ( $M = 36.97$ ,  $SD = 21.16$ ; Bovin et al., 2015). Total depressive symptom scores in this sample ( $M = 7.75$ ,  $SD = 6.73$ ) were higher than scores in a sample of student veterans (Rudd et al., 2011).

### **Hypothesis testing**

Correlations among study variables, means, standard deviations, and internal reliability estimates are shown in Tables 1 and 2. Consistent with hypotheses 1, 2, and 5, significant negative correlations were found between PGI and death ideation, perceived burdensomeness, and thwarted belongingness, respectively.

Table 1. *Pearson's Correlations, Means (M), Standard Deviations (SD), and Internal Reliability Estimates ( $\alpha$ ) for Study Variables*

Variable	1	2	3	4	5	6
<b>1. PGI</b>						
<b>2. Depression</b>	-.50*					
<b>3. PTSD</b>	-.40*	.82*				
<b>4. PB</b>	-.44*	.59*	.57*			
<b>5. TB</b>	-.56*	.67*	.61*	.58*		
<b>6. Death Ideation</b>	-.42*	.54*	.53*	.75*	.56*	
<b>M</b>	3.49	7.75	24.93	1.79	3.26	8.54
<b>(SD)</b>	(1.00)	(6.73)	(19.74)	(1.31)	(1.44)	(4.70)
<b><math>\alpha</math></b>	.96	.90	.97	.96	.90	.92

*Note.* PGI = personal growth initiative; PTSD = posttraumatic stress disorder symptoms; PB = perceived burdensomeness; TB = thwarted belongingness. Depression mean scores and standard deviations provided in this table were calculated based on all 9 items in the scale.

\*  $p < .001$

Table 2. *Biserial Correlations for Study Variables*

Variable	PB	Death Ideation
<b>1. PB</b>	--	.70*
<b>2. Depression</b>	.57*	.47*
<b>3. PTSD</b>	.57*	.53*
<b>4. TB</b>	.65*	.56*
<b>5. PGI</b>	-.52*	-.42*

*Note.* PGI = personal growth initiative; PTSD = posttraumatic stress disorder symptoms; PB = perceived burdensomeness; TB = thwarted belongingness. Depression mean scores and standard deviations provided in this table were calculated based on all 9 items in the scale.

\*  $p < .001$

**Moderated mediation with perceived burdensomeness as mediator.** Results of the first moderated mediation model (hypotheses 3 and 4) are presented in Figure 3 and Table 3.

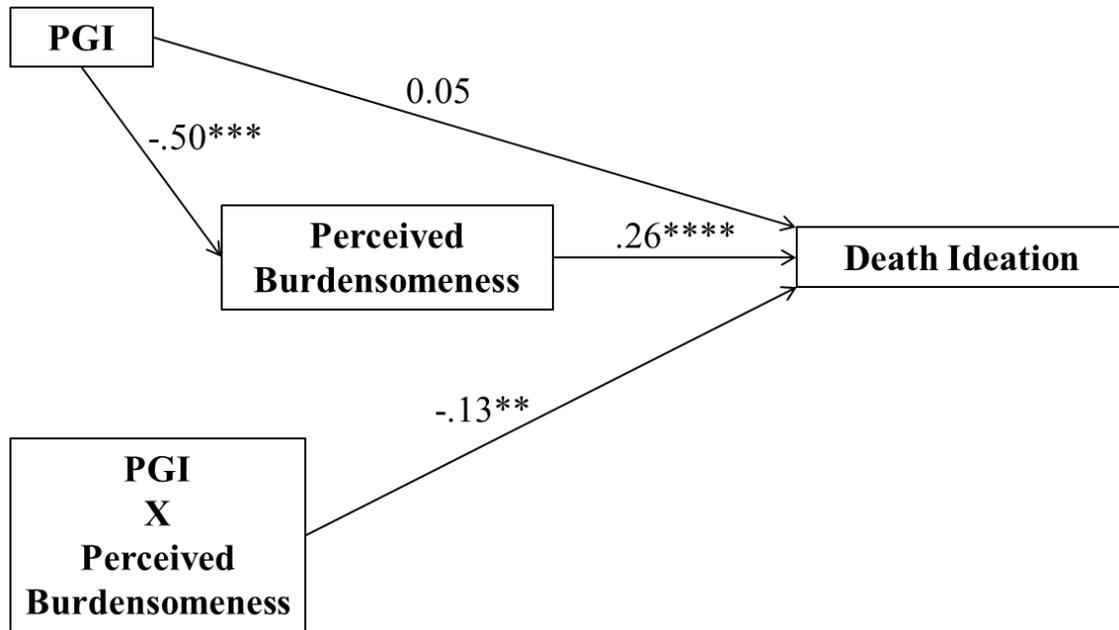


Figure 3. Moderated mediation using PGI as the independent variable and moderator, perceived burdensomeness as the mediator, and death ideation as the dependent variable (statistical model).  $*p < .05$ ;  $**p < .01$ ;  $***p < .001$

Table 3. Zero-Inflated Negative Binomial Regression Results with Perceived Burdensomeness as Mediator, PGI as Independent Variable and Moderator, and Death Ideation as Dependent Variable

Negative binomial regression	Estimate	Robust SE	Est./SE	p	IRR
Dependent Variable Model					
Predictor					
Depression	-.01	.02	-.36	.72	
PTSD	.01	.00	3.36	.00**	1.01
PGI	.05	.03	1.87	.06	
Perceived burdensomeness	.26	.04	7.44	.00***	2.05
PGIxPerceived burdensomeness	-.13	.05	-2.86	.00**	0.69
Constant	.74	.14	5.47	.00***	
Mediator Variable Model					
Predictor					
PGI	-.50	.06	-9.04	.00***	
Logistic regression for zero inflation					Odds Ratio
Predictor					
Depression	.03	.05	.60	.55	
PTSD	-.03	.01	-2.28	.02*	0.97
PGI	.06	.06	1.15	.25	
Perceived Burdensomeness	-.45	.07	-6.55	.00***	0.64
PGIxPerceived Burdensomeness	.15	.12	1.24	.22	
Constant	.74	.28	2.63	.00**	

Note. Depression estimates in this table are based on 7-item PHQ-9 scale.

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

To verify the appropriateness of the ZINB regression for this data, Poisson and negative binomial regressions were performed, and the models were compared using AIC and BIC. The negative binomial model ( $AIC = 1714.56$ ;  $BIC = 1748.42$ ) demonstrated better fit than the Poisson model ( $AIC = 2051.35$ ;  $BIC = 2081.45$ ), suggesting that overdispersion was occurring. The dispersion parameter (the estimate of the natural log of the over-dispersion coefficient, alpha) was greater than zero ( $\alpha = 1.21$ ), providing

further evidence that data are overdispersed and the negative binomial model is more appropriate than Poisson. The ZINB model ( $AIC = 1636.86$ ;  $BIC = 1693.29$ ) demonstrated better fit than the negative binomial model ( $AIC = 1714.56$ ;  $BIC = 1748.42$ ), suggesting that zero-inflation is occurring and the ZINB model is appropriate for this data. Because high endorsement of zeros was also identified as a problem in perceived burdensomeness, data were examined with separate models in which perceived burdensomeness was specified as continuous, ordinal, or dichotomous. The model specifying perceived burdensomeness as a dichotomous variable ( $AIC = 1636.86$ ;  $BIC = 1693.29$ ) demonstrated better fit than models specifying perceived burdensomeness as ordinal ( $AIC = 1855.30$ ;  $BIC = 1915.50$ ) or continuous ( $AIC = 7393.25$ ;  $BIC = 7476.02$ ). Thus, the model in which perceived burdensomeness was specified as dichotomous was retained and used in the following analyses.

In the negative binomial model, main effects of perceived burdensomeness (estimate = .26,  $p < .001$ ), the interaction of PGI and perceived burdensomeness (estimate = -.13,  $p < .01$ ), and PTSD (estimate = .01,  $p < .01$ ) were statistically significant, whereas the main effects of PGI (estimate = .05,  $p = .06$ ) and depression (estimate = -.01,  $p = .72$ ) were not. This suggests that with the endorsement of perceived burdensomeness, the expected log count of death ideation severity increases by .26. For each one-unit increase in PTSD, the expected log count of death ideation severity increases by .01. For individuals who endorsed perceived burdensomeness, for every 1-unit increase in PGI, the expected log count of death ideation severity decreases by .13. Further, individuals who endorsed perceived burdensomeness are expected to have a rate 2.05 times greater for death ideation, as compared to individuals who do not endorse perceived

burdensomeness, while holding the other variables in the model constant. If a participant were to experience a 1-unit increase in PTSD symptoms, the rate for death ideation would be expected to increase by a factor of 1.01, while holding other variables constants. For veterans who endorsed perceived burdensomeness, for every 1-unit increase in PGI, the rate for death ideation would be expected to decrease by a factor of .69.

In the binary logistic regression for zero-inflation, main effects of perceived burdensomeness (estimate =  $-.45$ ,  $p < .001$ ) and PTSD (estimate =  $-.03$ ,  $p = .02$ ) were statistically significant; main effects of PGI (estimate =  $.06$ ,  $p = .25$ ), the interaction of PGI and perceived burdensomeness (estimate =  $.15$ ,  $p = .22$ ), and depression (estimate =  $.03$ ,  $p = .55$ ) were not. This suggests that with the endorsement of perceived burdensomeness, the log odds of membership to the excess zero-generating process decreases by .45 (i.e., the odds of an individual being a non-ideator decrease by approximately 36%). For each 1-unit increase in PTSD, the log odds of membership to the excess zero-generating process decreases by .03 (with odds of an individual being a non-ideator decreasing by approximately 3%).

The mediation portion of the analysis indicated that PGI predicted perceived burdensomeness (estimate =  $-.50$ ,  $SE = .06$ ,  $p < .001$ ), while in turn burdensomeness predicted death ideation (estimate =  $.26$ ,  $SE = .04$ ,  $p < .001$ ). As hypothesized (hypothesis 3), a significant indirect effect of PGI on death ideation through perceived burdensomeness was observed (estimate =  $-.13$ ,  $SE = .02$ ,  $p < .001$ ). Additionally, results revealed a significant moderation effect (estimate =  $-.13$ ,  $SE = .05$ ,  $p < .01$ ), suggesting that PGI may moderate the impact of perceived burdensomeness on death ideation,

confirming hypothesis 4. To test the proposed conditional indirect effect, significance tests were conducted and revealed that perceived burdensomeness mediated the effect of PGI on death ideation when PGI was low (-1 SD), at the mean, and high (+1 SD; Table 4). This is depicted in Figure 4.

Table 4. *Conditional Indirect Effect at PGI ± 1 SD When Perceived Burdensomeness is Mediator and Death Ideation is Dependent Variable*

Value of PGI	Indirect effects	SE	Est./SE	p	95 % CI
-1 SD	-.19	.03	-5.75	.00***	[-0.25, -0.14]
Mean	-.13	.02	-5.74	.00***	[-0.16, -0.09]
1 SD	-.06	.03	-1.97	.05*	[-0.12, -0.01]

Note. \* $p \leq .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

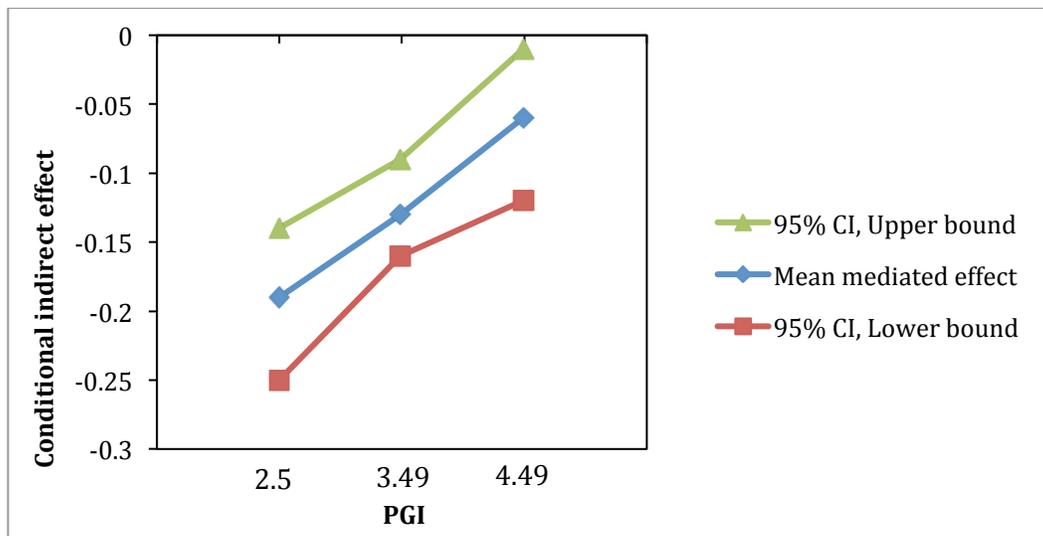


Figure 4. Plot of the conditional indirect effect of PGI on death ideation via perceived burdensomeness at different values of PGI.

**Moderated mediation with thwarted belongingness as mediator.** Results of the second moderated mediation model (hypotheses 6 and 7) are presented in Figure 5 and Table 5.

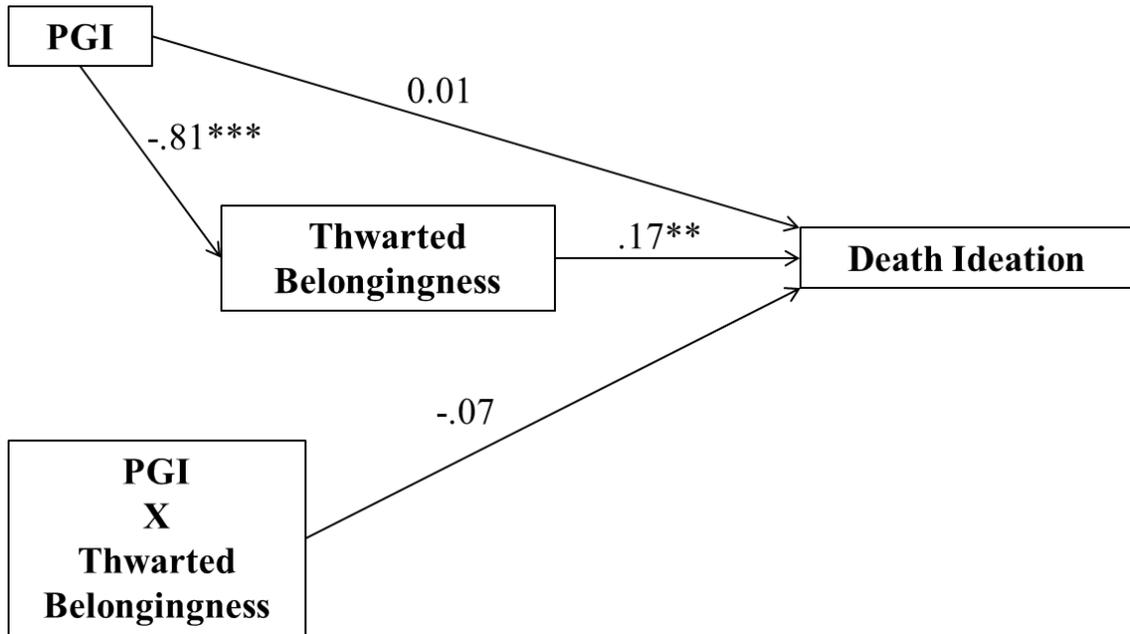


Figure 5. Moderated mediation using PGI as the independent variable and moderator, thwarted belongingness as the mediator, and death ideation as the dependent variable (statistical model).

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

Table 5. Zero-Inflated Negative Binomial Regression Results with Thwarted Belongingness as Mediator, PGI as Independent Variable and Moderator, and Death Ideation as Dependent Variable

Negative binomial regression	Robust				IRR
	Estimate	SE	Est./SE	<i>p</i>	
Dependent Variable Model					
Predictor					
Depression	-.01	.02	-.72	.47	
PTSD	.02	.00	3.42	.00**	1.02
PGI	.01	.07	.11	.91	
Thwarted Belongingness	.17	.06	2.98	.00**	1.19
PGIxThwarted Belongingness	-.07	.04	-1.88	.06	
Mediator Variable Model					
Predictor					
PGI	-.81	.08	-10.82	.00***	
Logistic regression for zero inflation					Odds Ratio
Predictor					
Depression	.05	.05	.99	.32	
PTSD	-.03	.01	-2.57	.01*	0.97
PGI	.43	.20	2.15	.03*	1.54
Thwarted Belongingness	-.56	.18	-3.18	.00**	0.57
PGIxThwarted Belongingness	.26	.16	1.70	.09	

Note. Depression estimates in this table are based on 7-item PHQ-9 scale.

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

Once again, to verify the appropriateness of the ZINB regression for the data, Poisson and negative binomial regressions were conducted, and the models were compared using AIC and BIC. The negative binomial model ( $AIC = 4242.89$ ;  $BIC = 4288.04$ ) demonstrated better fit than the Poisson model ( $AIC = 4691.78$ ;  $BIC = 4733.17$ ), suggesting that overdispersion was occurring. The dispersion parameter (the estimate of the natural log of the over-dispersion coefficient, alpha) was greater than zero ( $\alpha = 1.45$ ), providing further evidence that data are overdispersed and the negative binomial model is

more appropriate than Poisson. The ZINB model ( $AIC = 2303.61$ ;  $BIC = 2363.80$ ) demonstrated better fit than the negative binomial model ( $AIC = 4242.89$ ;  $BIC = 4288.04$ ), suggesting that the ZINB model is more appropriate for this data.

In the negative binomial model, the main effects of thwarted belongingness (estimate = .17,  $p < .01$ ;) and PTSD (estimate = .02,  $p < .01$ ) were statistically significant. Main effects of PGI (estimate = .01,  $p = .91$ ), the interaction of PGI and thwarted belongingness (estimate = -.07,  $p = .06$ ), and depression (estimate = -.01,  $p = .47$ ) were not statistically significant. This suggests that for each 1-unit increase in thwarted belongingness, the expected log count of death severity increases by .17, and for each 1-unit increase in PTSD, the expected log count of death ideation severity increases by .02. For each 1-unit increase in thwarted belongingness, veterans are expected to have a rate 1.19 times greater for death ideation, while holding the other variables in the model constant. If a veteran were to experience a 1-unit increase in PTSD symptoms, the rate for death ideation would be expected to increase by a factor of 1.02, while holding other variables constants.

In the binary logistic regression for zero-inflation, main effects of thwarted belongingness (estimate = -.56,  $p = .02$ ), PGI (estimate = .43,  $p = .03$ ), and PTSD (estimate = -.03,  $p = .01$ ) were statistically significant, whereas main effects of the interaction of PGI and thwarted belongingness (estimate = .26,  $p = .09$ ), and depression (estimate = .05,  $p = .32$ ) were not. This suggests that for each one-unit increase in thwarted belongingness, the log odds of membership to the excess zero-generating process decreases by .56 (i.e., odds of an individual being a non-ideator decrease by approximately 43%). For each 1-unit increase in PGI, the log odds of membership to the

excess zero-generating process increases by .43 (with odds of an individual being a non-ideator increasing by approximately 54%), and each 1-unit increase in PTSD conditionally reduces the odds of an individual being a non-ideator by .032 (approximately 3%).

The mediation portion of the analysis indicated that PGI was significantly associated with thwarted belongingness (estimate =  $-.81$ ,  $SE = .08$ ,  $p < .001$ ), while in turn thwarted belongingness was significantly associated with death ideation (estimate =  $.17$ ,  $SE = .06$ ,  $p < .01$ ). As hypothesized, a significant indirect effect of PGI on death ideation through thwarted belongingness was observed (estimate =  $-.14$ ,  $SE = .05$ ,  $p < .01$ ), confirming hypothesis 6. Contrary to hypothesis 7, results did not reveal a significant moderation effect (estimate =  $-.06$ ,  $SE = .04$ ,  $p = .06$ ). Consequently, the interaction term (PGI $\times$ Thwarted Belongingness) was removed from the model, and a simple mediation model was tested, with PGI as the independent variable, thwarted belongingness as the mediator, and death ideation as the dependent variable (see Figure 6). Depression and PTSD continued to be controlled for in this model. Results of the mediation analysis are presented in Figure 7.

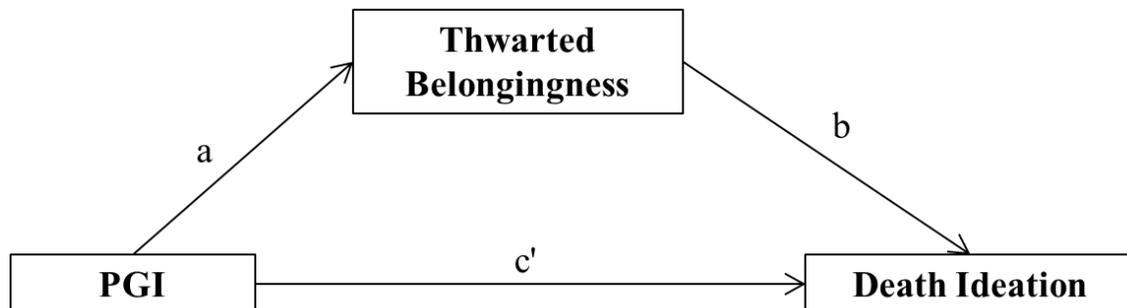


Figure 6. Mediation model with PGI as independent variable, thwarted belongingness as mediator, and death ideation as dependent variable (conceptual model).



Figure 7. Mediation model with PGI as independent variable, thwarted belongingness as mediator, and death ideation as dependent variable (statistical model).

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

The relationships between PGI and thwarted belongingness (path a; estimate =  $-.81$ ,  $SE = .08$ ,  $p < .001$ ), thwarted belongingness and death ideation (path b; estimate =  $.18$ ,  $SE = .06$ ,  $p < .01$ ) and PGI and death ideation (path c; estimate =  $-.15$ ,  $SE = .05$ ,  $p < .01$ ; 95% CI =  $[-0.23 -0.06]$ ) were significant. When thwarted belongingness was controlled for, PGI was not significantly associated with death ideation (path c'; estimate =  $-.06$ ,  $SE = .06$ ,  $p = .35$ ). Results of the Sobel test suggest that the association between PGI and death ideation was significantly mediated by thwarted belongingness ( $z = -2.88$ ,  $p < .001$ ). These results suggest that thwarted belongingness partially mediated the relationship between PGI and death ideation.

#### Analyses without covariates

In the final stage of analyses, the above noted models were tested without the presence of one or both covariates (i.e., depression and/or PTSD).

For the first moderated mediation model (hypotheses 3 and 4; perceived burdensomeness as mediator), results suggested that the model with PTSD entered as a covariate ( $AIC = 1633.49$ ;  $BIC = 1682.40$ ) demonstrated better fit than models with both

PTSD and depression ( $AIC = 1636.86$ ;  $BIC = 1693.29$ ), depression alone ( $AIC = 1651.50$ ;  $BIC = 1700.41$ ), and neither PTSD nor depression ( $AIC = 1660.68$ ;  $BIC = 1702.06$ ).

Despite these findings, path coefficients and correlations of the models that included both PTSD and depression as covariates were very similar to the models that controlled for only PTSD, only depression, and neither PTSD nor depression. There was no significant difference in the moderation paths between models, and the conditional indirect effect showed the same pattern of significance for all models. Again, perceived burdensomeness mediated the effect of PGI on death ideation when PGI was low (-1 SD), average, and high (+1SD). Interestingly, in the model in which only depression was controlled for, depression was significantly associated with death ideation (estimate = .03,  $SE = .01$ ,  $p < .01$ ), whereas depression was not a unique predictor of death ideation when both depression and PTSD were specified as covariates in the model (estimate = -.01,  $SE = .02$ ,  $p = .83$ ).

For the second moderated mediation model (hypotheses 6 and 7; thwarted belongingness as mediator), results revealed once again that the model with PTSD alone entered as a covariate ( $AIC = 2301.24$ ;  $BIC = 2353.91$ ) demonstrated better fit than models with both PTSD and depression ( $AIC = 2303.46$ ;  $BIC = 2363.65$ ), depression alone ( $AIC = 2319.43$ ;  $BIC = 2372.09$ ), and neither PTSD nor depression ( $AIC = 2321.71$ ;  $BIC = 2366.86$ ). Again, path coefficients and correlations of the models that included both PTSD and depression as covariates were very similar to the models that controlled for only PTSD, only depression, and neither PTSD nor depression. There was no significant difference in the moderation paths between models. Again, in the model that controlled for depression only, depression was significantly associated with death

ideation (estimate = .03,  $SE = .01$ ,  $p = .03$ ), and it was not a unique predictor of death ideation when both depression and PTSD were specified as covariates in the model (estimate = -.01,  $SE = .02$ ,  $p = .47$ ).

For the simple mediation model, results again suggested that the model with PTSD entered as a covariate ( $AIC = 2304.82$ ;  $BIC = 2349.96$ ) demonstrated better fit than models with both PTSD and depression ( $AIC = 2307.43$ ;  $BIC = 2360.10$ ), depression alone ( $AIC = 2321.23$ ;  $BIC = 2366.38$ ), and neither PTSD nor depression ( $AIC = 2323.59$ ;  $BIC = 2361.21$ ). Similarly to the previous findings, there were no significant differences in model results when both PTSD and depression were controlled for, as compared to when only PTSD, only depression, and neither PTSD nor depression, were controlled for. Again, in the model that controlled for depression only, depression was found to be significantly associated with death ideation (estimate = .03,  $SE = .01$ ,  $p = .03$ ), which was not the case when both PTSD and depression were included as covariates in the analysis (estimate = -.01,  $SE = .02$ ,  $p = .63$ ).

## **CHAPTER IV**

### **DISCUSSION**

The aim of this study was to explore the relationships between PGI, perceived burdensomeness, thwarted belongingness, and death ideation in a sample of OIF/OEF/OND veterans in the context of the IPTS model (Joiner, 2005; Van Orden et al., 2010). Due to overdispersion and zero-inflation in death ideation, a ZINB regression was employed and found to offer the best fit to the data. In addition to testing our hypotheses while accounting for excess zeros in death ideation, use of the ZINB model allowed for identification of individuals who are non-ideators (i.e., veterans who did not report death ideation and who also did not endorse risk factors for death ideation, such as perceived burdensomeness and thwarted belongingness) and potential ideators (i.e., veterans who did not report death ideation but who did endorse these known suicide risk factors). Significant negative associations were identified between PGI and death ideation (H1), perceived burdensomeness (H2), and thwarted belongingness (H5). This suggests that veterans with high levels of PGI experience lower levels of perceived burdensomeness, thwarted belongingness, and death ideation. This is in line with previous findings of PGI being negatively related to perceived burdensomeness and thwarted belongingness (Brown et al., 2015) and active suicidal ideation (Ciavaglia et al., 2014). The current study extended these findings by verifying similar relationships between these constructs in recent veterans, and by exploring and identifying greater complexity for the role of PGI in the IPTS model.

Perceived burdensomeness was found to partially mediate the relationship between PGI and death ideation (H3), and PGI was simultaneously found to moderate the mediating relationship of perceived burdensomeness and death ideation. Higher levels of

PGI were associated with a weaker relationship between perceived burdensomeness and death ideation, and lower levels of PGI were associated with a stronger relationship between perceived burdensomeness and death ideation (H4), offering support for the first moderated mediation model. This suggests that veterans with more developed PGI skills not only may be less likely to perceive themselves as burdens on close others and society, which in turn may result in less death ideation, but even when this perceived burden does occur, it will be less likely to manifest in death ideation for people with more developed PGI skills. To illustrate this idea, let us consider three fictitious characters, Veterans Jane, Dave, and Joe, who were recently discharged from the military and who viewed their work and dedication to serving the country as meaningful contributions to society and their purpose in life. Veterans Jane and Joe have developed strong PGI skills over the course of their lives, whereas Veteran Dave does not have as clear of an understanding of the personal growth process.

Because individuals with greater PGI skills are more likely to engage in activities that promote personal growth, we may expect Veteran Jane to engage in activities that further her education or help her to navigate new career paths post-discharge. In fact, Veteran Jane may perceive being discharged from the military as an opportunity to develop new skills, shape her post-military identity in a way that is meaningful to her, and make new and important contributions in her community or family. As a result, she may not feel as if she is a burden on others or on society, which may protect her from experiencing death ideation.

Veterans who do not have a clear understanding of the personal growth process may have differing experiences following discharge. Veteran Dave, for example, may

feel as if his sense of purpose in life and the contributions he has made have suddenly been lost. He may lack the skills he needs to pursue the growth experiences necessary for a successful transition to civilian life and establishing a new career. All of this may contribute to Veteran Dave feeling as if he is a burden on his family or, more broadly, society, which may put him at risk of developing death ideation.

Veteran Joe, despite having strong PGI skills, also is having a difficult time reintegrating with civilian society, which causes him to feel like a burden on others. Although this transition may be difficult for Veteran Joe, his awareness that he possesses the skills to continue to grow and adapt helps him to maintain optimism that he will eventually reintegrate to civilian life successfully. He can continue to believe that he can make meaningful contributions to society and the lives of his loved ones, despite current experiences of perceived burdensomeness, which may protect him from developing death ideation. In other words, veterans with greater PGI skills are not immune to experiencing perceptions of burdensomeness and death ideation. However, for those veterans who experience both high PGI and perceptions of burdensomeness, PGI may serve as an additional buffer against the effects of perceived burdensomeness on death ideation.

For the second moderated mediation model proposed in this study, thwarted belongingness was found to partially mediate the relationship between PGI and death ideation (H6); however, PGI was not found to moderate the mediating relationship of thwarted belongingness and death ideation, contrary to hypothesis 7. This suggests that veterans with more developed PGI skills may experience lower levels of thwarted belongingness and, in turn, less death ideation. Yet PGI may not offer the same buffer against the negative effects of thwarted belongingness on death ideation as may be

expected with perceived burdensomeness. Continuing with our examples, Veterans Jane, Joe, and Dave greatly value the bond they had with their unit members, and they feel a strong sense of connection with other veterans in light of shared common experiences, values, and time spent immersed in military culture. Based on previous research, we know that people with strong PGI skills are likely to explore their environments (Robitschek & Cook, 1999) and function well in society and social relationships (Robitschek & Keyes, 2009). As a result, we may find that Veteran Jane is more successful at engaging in healthy activities that promote personal growth and that involve social interaction. She may feel more comfortable connecting with non-military others, such as family and friends, even though her military experiences may set her apart from civilians, resulting in a greater sense of belongingness. She may experience a stronger sense of connection with her family, community, and civilian life, which may reduce feelings of thwarted belongingness and, in turn, death ideation.

In contrast to Veteran Jane, Veteran Dave may experience the transition from service to civilian society as a culture shock. He may find it difficult to communicate his experiences to family members or friends, and he may be less likely to engage in activities that involve interaction with civilians. Perhaps Veteran Dave has a strong desire to hold on to the military and veteran culture that is important to him, as opposed to integrating with civilian life, which may result in thwarted belongingness and potentially death ideation.

Finally, let us consider Veteran Joe, who has a solid understanding of the personal growth process and who may be experiencing thwarted belongingness and thoughts of death despite his efforts to engage with non-military others. One reason why Veteran Joe

may develop death ideation may be that, despite strong PGI skills and ability to socially engage with civilian others, he may feel he has less control over how much he is accepted by others or whether he can truly belong to the civilian world following his experiences in the military. In the context of perceived burdensomeness, Veteran Joe may feel that his experience of transitioning to civilian life and feeling like a burden on others is temporary and that he will be able to make meaningful contributions to society in the long-run. In the case of thwarted belongingness, Veteran Joe may feel that he exhibits less control over actually integrating with civilian others in the long-run, potentially because military culture and values have become a central part of his identity that feels fixed; the sense of not belonging and feeling as if this is unchangeable may then result in death ideation.

In both moderated mediation models, depressive and PTSD symptoms were entered as covariates. PTSD symptoms, but not depressive symptoms, were found to be significantly associated with death ideation. Interestingly, when only depressive symptoms were controlled for, a significant negative association between depressive symptoms and death ideation was identified. This may be due to the fact that there is significant overlap between symptoms of depression and PTSD (e.g., sleep problems, irritability, difficulty with concentration, loss of interest). It is plausible that the measure used to assess PTSD symptoms captured the depressive symptoms being reported by participants, and this measure alone was a better predictor of death ideation.

The logit models of this analysis found that perceived burdensomeness, thwarted belongingness, PTSD symptoms, and PGI were found to predict excess zeros in death ideation. Findings suggest that elevated scores on thwarted belongingness, perceived burdensomeness, and PTSD measures are associated with a greater probability that

veterans are experiencing death ideation even if it is not reported. Elevated scores on PGI were found to be associated with a lower probability that veterans not endorsing death ideation belong to the group of potential ideators. This is noteworthy and suggests that assessment of perceived burdensomeness, thwarted belongingness, PTSD symptoms, and PGI may be helpful in identifying veterans who have thoughts about death even when these thoughts are not reported.

Protective factors, or resilience to death and suicidal ideation, are defined as abilities, perceptions, or sets of beliefs that buffer an individual from the development of death and suicidal ideation in the face of risk factors (Johnson et al., 2010; Osman et al., 2004). The buffering hypothesis (Johnson et al., 2011; Osman et al., 2004) suggests that constructs must meet three criteria to be considered resilience factors to death and/or suicidal ideation: (1) Resilience is defined as a separate dimension from risk, which moderates the impact of a risk factor (e.g., perceived burdensomeness or thwarted belongingness) on the outcome variable (e.g., death ideation); (2) Resilience factors are bipolar dimensions, with an inverse that can be understood as being protective (e.g., low PGI may be a risk factor for death ideation, whereas high PGI may be protective); and (3) Resilience factors are internal psychological constructs, such as an individual's personal resources, skills, or beliefs that may buffer that individual from adversity. Overall, results of the current study suggest that PGI may serve as a resilience factor against death ideation in OIF/OEF/OND veterans. Veterans with strong PGI skills may experience a greater sense of meaningful contribution to others (low perceived burdensomeness) and enhanced connectedness with others (reduced thwarted belongingness); this, in turn, may protect them from developing thoughts of death. In the case of veterans exhibiting strong

PGI skills and perceptions of burdensomeness, PGI may serve as an additional buffer against the effects of perceived burdensomeness on death ideation.

Anestis and colleagues (2009) have suggested that targeting perceptions of burdensomeness and thwarted belongingness may be the first important step in reducing suicide risk. Based on our findings, PGI may serve an important role in protecting veterans from death ideation. An important clinical implication of this research is that recent veterans may benefit from treatment or programs that not only target mental health concerns such as depression or PTSD, or states of perceived burdensomeness and thwarted belongingness, but also promote and strengthen personal resources that may function as resilience factors. An intervention that may be beneficial for veterans and also easy to implement is Intentional Growth Training (IGT; Thoen & Robitschek, 2013). IGT teaches about and aims to strengthen PGI skills. This brief intervention provides individuals with a structured and personalized action plan for making a positive personal change, and it could be included as a supplement to individual or group therapy. IGT may be particularly appealing to veterans due to its brevity, structure, and focus on personal strengths and improvement. Based on the negative association of PGI with perceived burdensomeness, thwarted belongingness, and death ideation, it is plausible that IGT may not only strengthen veterans' understanding of the personal growth process, but also reduce perceptions of burdensomeness, thwarted belongingness, and death ideation. To appropriately test hypotheses related to IGT's effectiveness in promoting PGI and offering protection from states associated with death ideation, longitudinal research employing an experimental design is warranted. If future research supports these findings, incorporation of PGI skills training in therapy or educational programs tailored

to veterans may be beneficial.

### **Limitations & future directions**

One limitation of the current study was its cross-sectional nature despite having tested several causal pathways between variables. Longitudinal data are needed to more appropriately test mediation and moderated mediation hypotheses. Further, an experimental design in which PGI skills are taught with the aim of strengthening this skillset among veterans will be important to better understand the role of PGI in the context of the IPTS theory. This study assessed death ideation with the Geriatric Suicide Ideation Scale (Heisel & Flett, 2006), which contains a subscale assessing death ideation. Although this 5-item subscale may be a stronger measurement tool than 1- or 2-item measures of death ideation, it is noteworthy that the Geriatric Suicide Ideation Scale was developed for a geriatric population and is not commonly used among young or middle-aged adults. Further investigation of this scale's utility in a veteran and young and/or middle-aged adult population is warranted. Additionally, due to low endorsement of perceived burdensomeness in this population, it is plausible that the Interpersonal Needs Questionnaire (Van Orden et al., 2012) did not adequately capture recent Veterans' experiences of perceived burdensomeness. In future research, rephrasing items that assess perceptions of burdensomeness to more appropriately reflect Veterans' experiences may be helpful.

A strength of the current study was implementation of advanced statistical methods to account for the non-normative distribution and zero-inflation in the outcome variable. Continued use of zero-inflated statistical models in studies that manifest with excess zero responses in the dependent variable (e.g., death or suicidal ideation) is

recommended. An additional step that may help increase the variability of responses on measures assessing death or suicidal ideation is data collection from a broader range of participants in the community.

Because this study focused on a community sample of veterans, these findings may not be generalizable to clinical samples of veterans who may be at an increased risk for experiencing perceptions of burdensomeness, thwarted belongingness, and death ideation. Testing this study's hypotheses with recent veterans in a clinical setting may yield potentially very meaningful results. Finally, due to the unique stressors faced by veterans who are reintegrating into civilian life (Kang & Bullman, 2008) and additional negative life events that may occur during this adjustment period (King, King, Fairbank, Keane, & Adams, 1998), it may be important to conduct similar research on veterans who were recently discharged (i.e., in the past 12-24 months) from the military. Because this study did not assess length of time since discharge, it is not possible to draw conclusions about PGI's role in the IPTS model in veterans who are currently transitioning into civilian life. Perhaps data collection of this nature may be possible in primary care mental health integration settings or in specialty clinics for OIF/OEF/OND veterans, where recent veterans are routinely seen following discharge. Detection of veterans' strengths and potential suicide risk factors in the early stages of this transition may be essential to preventing mental health concerns and death ideation, and in appropriately identifying treatment recommendations.

## **Conclusion**

Despite the need for further research and this study's limitations, the current research offers unique contributions to the study of PGI's potential to serve as a resilience

factor against death ideation in OIF/OEF/OND veterans. Findings suggest that intentional personal growth efforts are negatively related to two primary risk factors for death ideation, as outlined in the first assumption of the IPTS model (Van Orden et al., 2010): Perceived burdensomeness and thwarted belongingness. Strong PGI skills may serve to further protect veterans from death ideation, even in the presence of perceptions of burdensomeness. Continued research in this domain will clarify the role of PGI in the IPTS model and its impact on OIF/OEF/OND veterans.

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## **APPENDIX A**

### **Extended Literature Review**

Since the start of combat operations in Iraq and Afghanistan, suicide rates in the United States (U.S.) Army reached their highest point in history (Carden, 2009), in contrast to historical trends of decreased military suicide rates during times of war (Bryan, Hernandez, Allison, & Clemans, 2013). Suicide is the second leading cause of death in the U. S. Armed Forces, with rates of 9 to 15 deaths by suicide per 100,000 people (Ritchie, Keppler, & Rothberg, 2003; U.S. Department of Defense, 2007). Male veterans are twice as likely to die by suicide as male nonveterans in the U.S. general population (Kaplan, Huguet, McFarland, & Newson, 2007), resulting in higher rates of suicide in the military and its veterans than in the general population for the first time since the Vietnam War (Pompili et al., 2013). To facilitate treatment and prevent suicidal behavior in military veterans, it is important to first identify factors that influence passive suicidal ideation, or death ideation (i.e., thoughts such as, “I wish I was dead”; Van Orden et al., 2010). According to the Interpersonal-Psychological Theory of Suicidal Behavior (IPTTS; Joiner, 2005; Van Orden et al., 2010), states of perceived burdensomeness and thwarted belongingness directly predict death ideation. Personal Growth Initiative (PGI; Robitschek, 1998, 1999), one’s intentional engagement in the process of positive personal change, has been identified as a factor protecting against perceived burdensomeness and thwarted belongingness (Brown et al., 2015), as well as active suicidal ideation (Ciavaglia, Robitschek, & Cukrowicz, 2014). These potential protective effects of PGI have not yet been assessed in military veterans. Thus, the aim of this study was to determine the extent to which PGI may serve to protect Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND)

veterans from perceived burdensomeness, thwarted belongingness, and death ideation.

### **Interpersonal-Psychological Theory of Suicidal Behavior**

The IPTS strives to increase understanding of the process of suicidal behavior by defining constructs related to suicidal intent, desire, and behavior, and by examining the proximal causal pathway to suicide (Joiner, 2005; Van Orden et al., 2010). Three constructs central to suicidal behavior are defined: Perceived burdensomeness, thwarted belongingness, and acquired capability. *Perceived burdensomeness*, feeling as if one's death is more valuable to others than one's life, and *thwarted belongingness*, feeling as if one is hopelessly alienated and unable to connect with society (Joiner & Silva, 2012), are directly related to death ideation (i.e., thoughts such as, "I wish I was dead"). *Acquired capability* involves the dimensions of lowered fear of death and increased physical pain tolerance, and it is primarily related to the capability to engage in serious suicidal behavior (i.e., lethal or near-lethal attempts; Van Orden et al., 2010). Additionally, the theory outlines four testable assumptions that illustrate a proposed etiology of suicide. The first of these is that perceived burdensomeness and thwarted belongingness are proximal and sufficient causes of passive suicidal ideation, such that the presence of either of these states will predict death ideation (Van Orden et al., 2010). The second assumption states that the simultaneous presence of perceived burdensomeness and thwarted belongingness, as well as hopelessness about these two states, is a proximal and sufficient cause of active suicidal ideation (i.e., active desire for suicide, such as "I want to kill myself", rather than passive suicidal ideation; Van Orden et al., 2010). The theory proposes that the presence of both suicidal desire and a lowered fear of death, one component of acquired capability, results in suicidal intent, whereas the presence of both

suicidal desire and *both* components of acquired capability (i.e., reduced fear of suicide and elevated physical pain tolerance) results in lethal or near-lethal suicide attempts (Van Orden et al., 2010).

### **Targeting perceived burdensomeness and thwarted belongingness**

Many risk factors for suicide have been identified, including previous suicide attempts, family history of suicide, physical illness, mental disorders, unemployment, hopelessness, and impulsivity, among others (see Van Orden et al., 2010 for a review). Suicidal individuals do often times experience one or more of these factors; however, the majority of individuals experiencing the above mentioned risk factors do not experience suicidal ideation or exhibit suicidal behaviors (Joiner & Silva, 2012). In other words, these general risk factors are modest predictors of death and suicidal ideation; they do not directly predict death ideation, active suicidal ideation, or suicidal behavior unless they simultaneously generate perceptions of burdensomeness or thwarted belongingness (Jahn, Cukrowicz, Linton, & Prabhu, 2011).

Joiner and Silva (2012) explained that suicidal crises resolve largely as a function of increased connection to others (lowered thwarted belongingness) and a greater sense of meaningful contribution to others (reduced perceived burdensomeness). In other words, enhanced connectedness to others and reduced burdensomeness may be mechanisms of recovery in suicidal individuals (Joiner & Silva, 2012). Further, Anestis, Bryan, Cornette, & Joiner (2009) have suggested that directly addressing thwarted belongingness and perceived burdensomeness may be the most viable method by which to ameliorate suicide risk, as acquired capability for suicide may be a less malleable variable. Consequently, this study focused on the first assumption outlined by the IPTS; that is, the

independent causal paths between perceived burdensomeness and death ideation and thwarted belongingness and death ideation.

### **Perceived burdensomeness and thwarted belongingness in veterans**

In a qualitative analysis of OEF and OIF combat veterans' feelings post-deployment, Brenner et al. (2008) described palpable themes of perceived burdensomeness and thwarted belongingness unique to military veterans. Feelings of perceived burdensomeness include veterans' sense of burdensomeness to the family or society, a loss of identity or purpose in life, and difficulties reintegrating to civilian life (Brenner et al., 2008). Veterans reported feeling like a burden to their families, especially when they felt unable to financially support their partners, spouses, and children (Brenner et al., 2008). Moreover, the transition from serving one's country to reintegrating with it via continuing education or pursuing a past or new career may be a challenging process. Difficulties in successfully completing educational requirements and engaging in a new career may increase veterans' sense of burdensomeness on family and society (Selby et al., 2010). The loss of sense of identity may be related to a change, or decrease, in status upon return to civilian society, as well as veterans' reported inability to redefine the self post-discharge (Brenner et al., 2008), that may lead to perceptions of burdensomeness. Because some military members may experience a great positive contribution through their work and dedication to the military (Selby et al., 2010), they may feel like a significant contribution, or purpose, is suddenly lost upon discharge and that they are no longer able to contribute to society. In turn, feelings of not making a meaningful contribution to society may result in perceptions of burdensomeness. Lastly, veterans may be more likely to perceive themselves as a burden to loved ones and society as a result of acquired disabling physical injuries or mental illness (Hoge et al., 2004).

With regard to belongingness, veterans often report feeling an immense connection with other military personnel and the military culture, itself (i.e., shared understanding of values, common experiences, miseries, and joys; Brenner et al., 2008), not only while on active duty but also post-discharge. Perhaps because of this overwhelming connection with the military, veterans report feeling disconnected from civilian life, which coincides with a desire to want to further *separate* oneself from civilian society (Brenner et al., 2008). Although veterans sense a strong bond with other service members and veterans, they may find it difficult to communicate their unique or difficult experiences to family members and friends (Selby et al., 2010), resulting in a sense of “not fitting in” with, or not belonging to, civilian society. Additionally, veterans with combat exposure may experience increased hypervigilance and paranoid ideation (Orsillo, Roemer, Litz, Ehlich, & Friedman, 1998), or feelings of “survivor’s guilt” (Selby et al., 2010), that may further promote a sense of disconnection, or desire to isolate oneself from, civilians. The above findings suggest that veterans experience a sense of burdensomeness and thwarted belongingness, and that factors unique to the military experience shape ways in which perceptions of burdensomeness and thwarted belongingness manifest.

According to the IPTS (Joiner, 2005; Van Orden et al., 2010), the perception of burdensomeness and thwarted belongingness is predictive of death ideation. The question is, do these variables have the same predictive power for death ideation in a veteran population? Research studies aiming to answer this question yield mixed findings.

In one study (Bryan, Morrow, Anestis, & Joiner, 2010), the main effect of burdensomeness independently predicted past suicidal behaviors (ex. previous suicide

attempts, frequency of suicidal ideation, previous suicidal communication, and subjective likelihood of future suicide attempt) in military personnel; however, the main effect of belongingness did not independently predict past suicidal behaviors, suggesting that belongingness may be less robustly related to the desire for suicide (as evidenced by past suicidal behaviors) than perceived burdensomeness. In a later study (Bryan, Hernandez, Allison, & Clemans, 2013), thwarted belongingness and perceived burdensomeness were both found to have an association with suicide risk in a clinical sample of military personnel. However, both studies assessed suicide risk, as opposed to death ideation, specifically, and both studies examined service members, as opposed to veterans.

In research assessing burdensomeness and belongingness in veterans within Veterans Health Administration (VHA) inpatient psychiatric settings, thwarted belongingness but not perceived burdensomeness predicted death ideation (O'Connor et al., 2016), and perceived burdensomeness but not thwarted belongingness (Monteith, Menefee, Pettit, Leopoulos, & Vincent, 2013) predicted active suicidal ideation, contrary to propositions of the IPTS (Van Orden et al., 2010). Among veterans seeking services in the VHA, diagnosed with a depressive disorder (Pfeiffer et al., 2014), perceived burdensomeness uniquely predicted death ideation, whereas thwarted belongingness did not. In a separate study assessing suicide risk among veterans recruited from outside the VHA (Rogers, Kelliher-Rabon, Hagan, Hirsch, & Joiner, 2017), both perceived burdensomeness and thwarted belongingness were unique predictors of suicide risk, as evidenced by suicidal thoughts, communication of suicidal intent, past attempts, and expectation of making future attempts. In light of these discrepant findings, more research is needed to better understand the relationships of burdensomeness and

belongingness with death ideation among veterans, particularly in the context of the IPTS.

### **Resilience to death and suicidal ideation: Protective factors**

In light of high and growing rates of suicide in service members and veterans, considerable research has been dedicated to the understanding of risk factors for death ideation, active suicidal ideation, and suicidal behaviors in these populations. Less researched are protective factors that may either directly reduce or moderate the effects of risk factors on death ideation or active suicidal ideation (Bryan & Hernandez, 2013).

Protective factors have been defined as abilities, perceptions, or sets of beliefs which buffer individuals from the development of death and suicidal ideation in the face of risk factors or stressors; these factors are also referred to as “*resilience to suicidality*” (Johnson, Gooding, Wood, & Tarrier, 2010; Osman et al., 2004). The buffering hypothesis (Johnson et al., 2011) indicates that variables must meet three criteria to be considered resilience factors to death and/or suicidal ideation. First, resilience must be understood as a separate dimension to risk that moderates the impact of a risk factor (e.g., perceived burdensomeness or thwarted belongingness) on an outcome variable (i.e., death ideation). For example, a resilience factor should be active when individuals face high levels of risk, acting to reduce the risk of death ideation; however, when risk levels are low, a resilience factor may be expected to be dormant, not changing the strength of association between the risk factor and death ideation (Johnson, Wood, Gooding, Taylor, & Tarrier, 2011). In other words, a resilience factor is expected to moderate the relationship between suicide risk factors and death ideation.

Second, resilience factors may be understood as bipolar dimensions. Most risk

factors for death and suicidal ideation have an inverse which can be understood as being protective (e.g., low self-esteem may be a risk factor for suicidal ideation, whereas high self-esteem may be protective), and most protective factors for suicidal ideation also have an inverse that may be understood as amplifying the risk for suicidal ideation (e.g., high levels of positive self-appraisal conferring resilience for suicidal ideation, and low levels increasing this risk; Johnson et al., 2011). Though a bi-dimensional approach to the study of risk and resilience factors is useful, it may create confusion with regard to which factors should be classified as risk or resilience factors. For this reason, a third criterion (Johnson et al., 2011) is outlined to help differentiate between these.

The third characteristic of a resilience factor is that it must be viewed as an internal psychological construct, such as an ability of an individual to overcome difficulties, or a set of personal resources or beliefs that can buffer the individual from adversity (Johnson, Gooding, Wood, & Tarrier, 2010; Osman et al., 2004; Rutter, Freedenthal, & Osman, 2008). This final criterion results in a narrower scope of understanding resilience factors, as compared to risk factors. For instance, risk factors for suicidal ideation may be any factors that increase or decrease suicidal ideation; these may be internal (e.g., a sense of hopelessness; Beck, Brown, Berchick, Stewart, & Steer, 1990; Beck, Steer, Beck, & Newman, 1993; Beck, Brown, Steer, & Grisham, 2000), external (e.g., exposure to another individual's suicide attempt; Borowsky, Ireland, & Resnick, 2001), or demographic characteristics (e.g., age, gender; Beck et al., 2000). Resilience factors, on the other hand, must moderate the impact of risk factors on suicidal ideation, be understood as bipolar dimensions, and additionally be viewed as psychological constructs that can buffer an individual from adversity.

One literature review investigated constructs that were identified as suicide risk or protective factors in past research, aiming to determine which of these met all three criteria of the buffering hypothesis. Results yielded strong support for several psychological constructs that moderate the relationships between risk factors and suicidal ideation, with the most consistent evidence supporting a buffering effect for positivity of attributional style and high levels of agency (Johnson et al., 2011). Weaker evidence was found in support of moderating effects of problem solving ability, self-esteem, problem-solving confidence, general social support, family support, and significant other support; reasons for living and dispositional optimism were not found to be moderators in the relationship of risk factors and suicidal ideation (Johnson et al., 2011). Overall, these findings highlight the need for viewing resilience for suicidal ideation as factors moderating the relationships between suicide risk factors and suicidal ideation, as opposed to relying on correlational relationships between potential protective variables and the outcome of suicidal ideation. The authors also encourage researchers to assess resilience factors in the context of a theoretical model of suicidal behavior, as this would allow for an examination of interactions of resilience and risk factors and the influence of these on death and active suicidal ideation; the IPTS model is proposed as a useful model for this purpose (Johnson et al., 2011). To date, limited research exists on resilience factors that protect individuals from developing perceptions of burdensomeness or thwarted belongingness and, in turn, death ideation; the aim of this study, therefore, was to propose Personal Growth Initiative (PGI; Robitschek, 1998, 1999) as a resilience factor for veterans of OIF, OEF, and OND.

### **Personal Growth Initiative (PGI)**

PGI is a person's intentional and voluntary engagement in the process of positive personal change that is behavioral, cognitive, or affective (Robitschek, 1998, 1999). PGI is a multidimensional construct, consisting of four factors, or skillsets: Readiness for Change, Planfulness, Using Resources, and Intentional Behavior (Robitschek et al., 2012). Readiness for Change refers to one's understanding of why and what one wants to change, as well as whether or not one is ready to take the first step to make the change happen. Planfulness is a person's understanding of the steps required to make the change happen; it also consists of one's ability to create a strategy for personal improvement. Using Resources refers to the capacity one has to seek information, people, services, or other forms of support outside of oneself that will facilitate a positive personal change. The fourth skillset, Intentional Behavior, refers to the intentional actions, or steps, taken to change a specific aspect of one's self. The first two components of PGI, Readiness for Change and Planfulness, reflect cognitive processes, whereas the latter two, Using Resources and Intentional Behavior, reflect behavioral elements of the PGI process.

**PGI and mental health.** A compelling amount of research has examined the association between individuals' PGI levels and mental health and functioning. Individuals with more developed PGI skills are likely to report higher levels of psychological well-being (Robitschek, 1998; Robitschek & Kashubeck, 1999; Robitschek & Keyes, 2009), as compared to individuals with less developed PGI skills. Those with greater PGI also report less experiences of negative affect and more experiences of positive affect (Robitschek & Kashubeck, 1999). Individuals with higher levels of PGI report experiencing higher levels of social well-being, feeling happier, and having greater

life satisfaction (Robitschek & Keyes, 2009), suggesting that PGI may actually enhance a person's mental health.

Research has shown that high levels of PGI are associated with low levels of depression in community (Robitschek & Kashubeck, 1999) and clinical (Robitschek, Yang, & Villalba, 2015) samples. Randomized controlled trials have suggested that an intervention aiming to teach individuals PGI skills (Intentional Growth Training [IGT]; Thoen & Robitschek, 2013) protects them from developing more severe symptoms of depression (Harmon et al., 2016). In other words, there is mounting evidence suggesting that PGI is a protective factor against the magnitude or severity of depressive disorders.

**PGI and death ideation.** To date, one study has examined PGI in relation to depression and active suicidal ideation. Ciavaglia et al. (2014) assessed PGI levels in a sample of adults seeking outpatient therapy services and found that PGI moderated the effects of depressive symptoms on active suicidal ideation. Namely, higher PGI levels were shown to protect against depressive symptoms in predicting active suicidal ideation; this protective effect became stronger for individuals with higher levels of depression. Though PGI manifests as a resilience factor buffering against active suicidal ideation, PGI's relationship with death ideation, and the mechanisms by which PGI may protect individuals from death ideation, are unknown.

Another study examined the relationships of PGI with thwarted belongingness and perceptions of burdensomeness (Brown et al., 2015). In this study, PGI mediated the relationships of hope with perceived burdensomeness and thwarted belongingness, suggesting that PGI is a more proximal protective factor for thwarted belongingness and perceived burdensomeness than is hope. Accordingly, Brown et al. (2015) encouraged

clinicians to assess individuals' levels of PGI when assessing for protective factors against feelings of thwarted belongingness and perceptions of burdensomeness, as this may be relevant in understanding one's risk for death ideation or active suicidal ideation. Importantly, the model proposed in this study (Brown et al., 2015) did not include the variable of death ideation, limiting our understanding of PGI's role in the IPTS model. It is thus necessary to consider PGI's interactions with not only perceptions of burdensomeness and thwarted belongingness but also death ideation. Moreover, neither of the above mentioned studies (Brown et al., 2015; Ciavaglia et al., 2014) assessed PGI's relation to the three factors mentioned in a veteran population. A goal of the current study was to assess PGI's interactions with burdensomeness, belongingness, and death ideation in a sample of OIF, OEF, and OND veterans.

**PGI, perceived burdensomeness, and thwarted belongingness.** The combination of the above mentioned findings suggests that PGI may indirectly reduce death ideation by directly reducing perceptions of burdensomeness and thwarted belongingness. In other words, perceptions of burdensomeness and thwarted belongingness may mediate the relationship between PGI and death ideation.

Individuals who perceive themselves to be a burden on others may experience a loss of sense of purpose in life; they may feel that they are no longer contributing to the lives of others. For this reason, engagement in activities that enhance veterans' beliefs that they are making valuable contributions may help decrease perceptions of burdensomeness (Brenner et al., 2008). Individuals with more developed PGI skills are more likely to engage in activities that result in personal growth (e.g., furthering their education or exploring new careers post-discharge, acquiring new hobbies). Individuals

with higher levels of PGI also engage in environmental exploration that may lead to a more crystalized vocational identity (Robitschek & Cook, 1999). Thus, veterans with more developed PGI skills may feel that, although their identity post-discharge may be changed or different than while they were on active duty, they still have control over shaping their identity and growing as individuals in a way that is meaningful to them; this may include exploring the environment to re-define vocational identity. Therefore, they may experience a greater sense of purpose in life and a lesser sense of burdensomeness that, in turn, could result in less death ideation. That is, perceptions of burdensomeness may mediate the relationship between PGI and death ideation, such that an individual's level of PGI may influence the extent to which one perceives him- or herself as a burden on others, which may then influence the extent to which one experiences death ideation.

Likewise, veterans who experience thwarted belongingness may feel as if they are not able to connect with the rest of, and may have difficulties re-integrating with, civilian society (Brenner et al., 2008). To decrease feelings of thwarted belongingness, it is important for veterans to feel as if they are a part of the civilian world. To achieve this, counselors may encourage veterans to utilize behavioral activation to seek out positive, healthy, reinforcing activities that involve social interaction to increase feelings of belongingness (Sherman, Zanotti, & Jones, 2005; Turner, Beidel, & Frueh, 2005). People with more developed PGI skills tend to explore their environments, engage in reflective coping (Robitschek & Cook, 1999), and function well in society and social relationships (Robitschek & Keyes, 2009). In light of this, individuals with more developed PGI skills may be more successful at engaging in healthy activities that promote personal growth and that involve social interaction. For instance, a veteran with strong PGI skills may be

more likely to discuss with others feelings associated with deployment or war or interact with non-military individuals, resulting in a greater sense of belongingness. Veterans with more developed PGI skills may feel more comfortable connecting with non-military others, such as family and friends, despite the unique experiences they have had that set them apart from the general, non-military population. Therefore, veterans with greater PGI may experience stronger feelings of connectedness with their families, communities, and civilian life, reducing feelings of thwarted belongingness and, in turn, death ideation. This suggests that thwarted belongingness may mediate the relationship between PGI and death ideation, such that one's level of PGI may influence the extent to which one feels connected to others, which may then influence the extent to which one endorses death ideation. Respectively, an aim of the current study was to test the extent to which thwarted belongingness may mediate the relationship between PGI and death ideation in OIF, OEF, and OND veterans.

So far, PGI has been described as a protective factor that may directly reduce the extent to which veterans perceive themselves to be a burden on, or disconnected from, others, based on findings from Brown et al. (2015). This does not imply that individuals with developed PGI skills (i.e., high PGI) are immune to thwarted belongingness or perceived burdensomeness. Indeed, even those veterans with strong PGI skills may at times feel as if they are burdening close others or unable to connect with civilian society. However, it is plausible that more developed PGI skills may protect veterans who perceive themselves as burdens on, or feel disconnected from, society or close others from death ideation. PGI has been found to afford protection from active suicidal ideation in a population of depressed individuals (Ciavaglia et al., 2014); in consequence, PGI

may be considered a resilience factor for death ideation.

Resilience factors are defined as internal psychological constructs, such as sets of personal resources or beliefs that buffer individuals from adversity; they are understood as bipolar dimensions, and they moderate the impact of risk factors on death or active suicidal ideation (Johnson et al., 2010). PGI fits this definition: It is a psychological construct that describes one's skills in identifying and implementing positive personal change and is associated with positive mental health functioning (Robitschek, 1998; Robitschek & Kashubeck, 1999; Robitschek & Keyes, 2009), it is a bipolar dimension (i.e., high vs. low levels of PGI), and it has been shown to moderate the impact of a risk factor (i.e., depression; Ciavaglia et al., 2014) on active suicidal ideation. PGI has not, however, been examined as a resilience factor for perceptions of burdensomeness or thwarted belongingness as they predict death ideation. A final goal of this study was to determine to what extent PGI moderates the relationships of perceptions of burdensomeness and thwarted belongingness with death ideation.

### **Targeting perceptions of burdensomeness and thwarted belongingness in treatment**

Directly addressing thwarted belongingness and perceived burdensomeness may be the most effective method by which to reduce suicide risk (Anestis et al., 2009). Joiner & Silva (2012) have suggested that enhancing connectedness to others (lowering thwarted belongingness) and reducing perceptions of burdensomeness may be mechanisms of recovery in suicidal individuals. In light of veterans' challenges related to the transition to civilian society and new careers, in particular, Brenner et al. (2008) have suggested implementation of educational programs that enhance vocational rehabilitation to facilitate re-integration with civilian life. This may lower veterans' perceptions of

burdensomeness on family and significant others and may increase their sense of belonging within the community. As a result of OIF/OEF veterans feeling as if they do not “fit in” with civilian society, they may also benefit from treatment that is designed to promote social interactions with nonmilitary members in their communities (Sherman, Zanotti, & Jones, 2005). Treatment in which progress is tracked and steps are outlined to facilitate veterans’ reaching goals of building and maintaining healthy relationships and effectively managing interpersonal problems are also recommended (Brenner et al., 2008).

One beneficial intervention for veterans struggling with perceptions of burdensomeness and thwarted belongingness may be Intentional Growth Training (IGT; Thoen & Robitschek, 2013). IGT is a group-delivered intervention that teaches about PGI skills. During the intervention, participants select a goal for themselves and identify steps to achieve this goal; they then initiate steps to move closer toward reaching the goal and reflect on their experiences in the same group setting a week later. IGT may be a favorable intervention for veterans, as it provides participants with a structured and individualized action plan for making a positive personal change. IGT may be used as a supplement in individual or group therapy; for instance, it may be used to help veterans explore their career identity and engage in new career paths, or to develop healthy relationships. Once veterans are able to identify something that they would like to change, the IGT instructors may assist them in identifying steps to accomplish this goal. A part of IGT also requires participants to reflect on past efforts at personal growth; this encourages use of personal strengths and past successes in making a positive personal change. IGT may be particularly appealing to veterans due to its brevity, structure, and

focus on personal improvement. To determine whether IGT may be an effective treatment for veterans, it is first necessary to understand PGI's role in veterans' experiences of perceived burdensomeness, thwarted belongingness, and death ideation. Verification of PGI's ability to serve to reduce perceptions of burdensomeness and thwarted belongingness, or to act as a buffer against the deleterious effects of perceived burdensomeness and thwarted belongingness on death ideation, may suggest that it would be advantageous to administer IGT to veterans with the aim of strengthening PGI skills. This may ultimately reduce perceptions of burdensomeness and thwarted belongingness and, in turn, death ideation among OIF, OEF, and OND veterans. The current research may thus be fundamental in increasing our understanding of PGI's protective role against death ideation in this population, and also the potential protective effects that IGT may afford if the research hypotheses are confirmed.

### **Current Study**

Increasing rates of suicide in the U.S. Armed Forces (U.S. Department of Defense, 2007) have stimulated substantial research aimed at identifying risk factors associated with death ideation, active suicidal ideation, and suicidal behavior. Many risk factors have been identified (Van Orden et al., 2010), but not all of these directly predict whether or not one will experience death ideation. Consistent with the IPTS (Joiner, 2005; Van Orden et al., 2010), states of perceived burdensomeness and thwarted belongingness directly predict death ideation. To reduce death ideation, it is important to identify resilience factors which may protect against what are considered to be the strongest predictors of death ideation (Johnson et al., 2011), such as perceptions of burdensomeness or thwarted belongingness. Unfortunately, little research has been

dedicated to such resilience factors. PGI has been found to buffer against the deleterious effects of depressive symptoms on active suicidal ideation (Ciavaglia et al., 2014) and to protect against thwarted belongingness and perceived burdensomeness (Brown et al., 2015), although these protective effects have not been tested in a veteran population. Moreover, PGI has not been examined in relation to both death ideation and perceptions of burdensomeness and thwarted belongingness; to better understand PGI's role in the IPTS model, it is important to examine it in relation to all three of these variables.

The present study examined the extent to which PGI serves to protect OIF, OEF, and OND veterans from perceived burdensomeness and thwarted belongingness and, in turn, death ideation. Based on the above outlined theory and research, PGI's hypothesized roles in the IPTS model are as follows:

*Hypothesis 1:* Based on past research that has found a negative correlation between PGI and active suicidal ideation (Ciavaglia et al., 2014), we predicted that PGI will be negatively correlated with death ideation.

*Hypothesis 2:* One study has found a negative relationship of PGI with perceived burdensomeness (Brown et al., 2015); based on this, we predicted that PGI will be negatively correlated with perceived burdensomeness.

*Hypothesis 3:* Perceived burdensomeness is a proximal and sufficient cause of death ideation (Van Orden et al., 2010). PGI is negatively associated with active suicidal ideation (Ciavaglia et al., 2014) and perceived burdensomeness (Brown et al., 2015). Moreover, individuals with more developed PGI skills are more likely to explore their environments and achieve a more crystallized vocational identity (Robitschek & Cook, 1999), which may result in enhanced feelings of making a contribution to society and

lowered perceptions of burdensomeness. We hypothesized that the relationship between PGI and death ideation would be at least partially mediated by perceived burdensomeness, such that a significant amount of the variance in death ideation would be explained by the indirect effect of PGI through perceived burdensomeness.

*Hypothesis 4:* PGI has been found to buffer against the detrimental effects of depressive symptoms on active suicidal ideation (Ciavaglia et al., 2014) and may be considered a resilience factor for death ideation. PGI has not yet been examined as a resilience factor for perceptions of burdensomeness or thwarted belongingness as they predict death ideation. Based on its potential to act as a resilience factor as defined by Johnson et al. (2011), we hypothesized that the mediating relationship of perceived burdensomeness and death ideation would be moderated by PGI, with higher levels of PGI associated with a decreased relationship between perceived burdensomeness and death ideation, and lower levels of PGI associated with an increased relationship; see Figure 1.

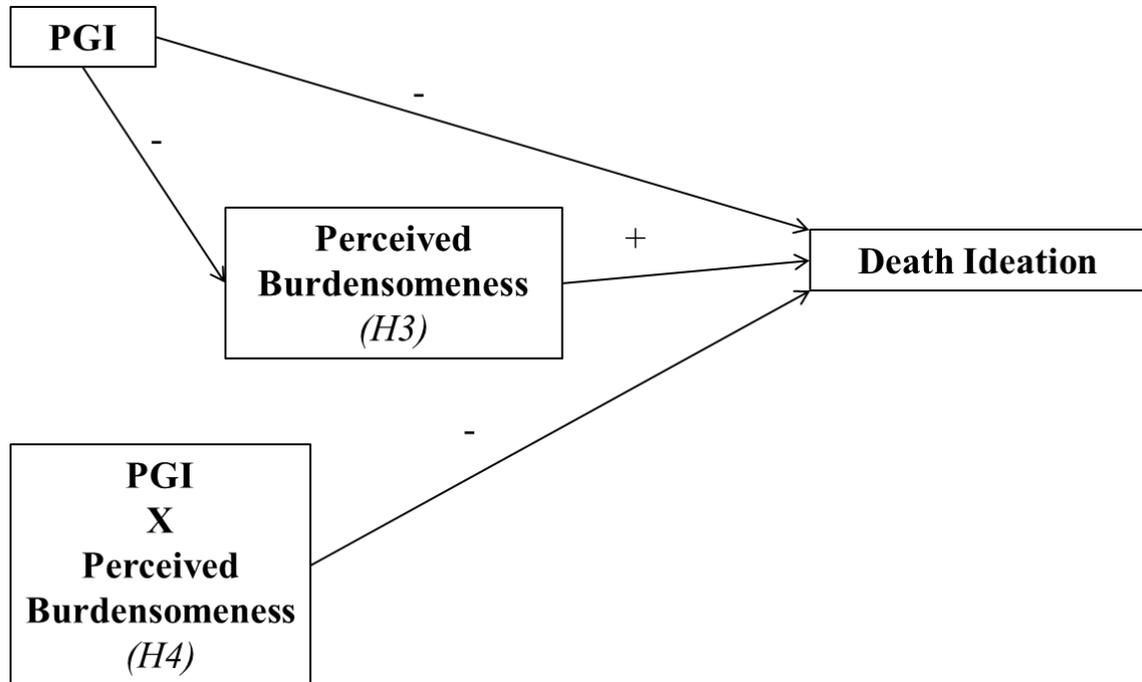


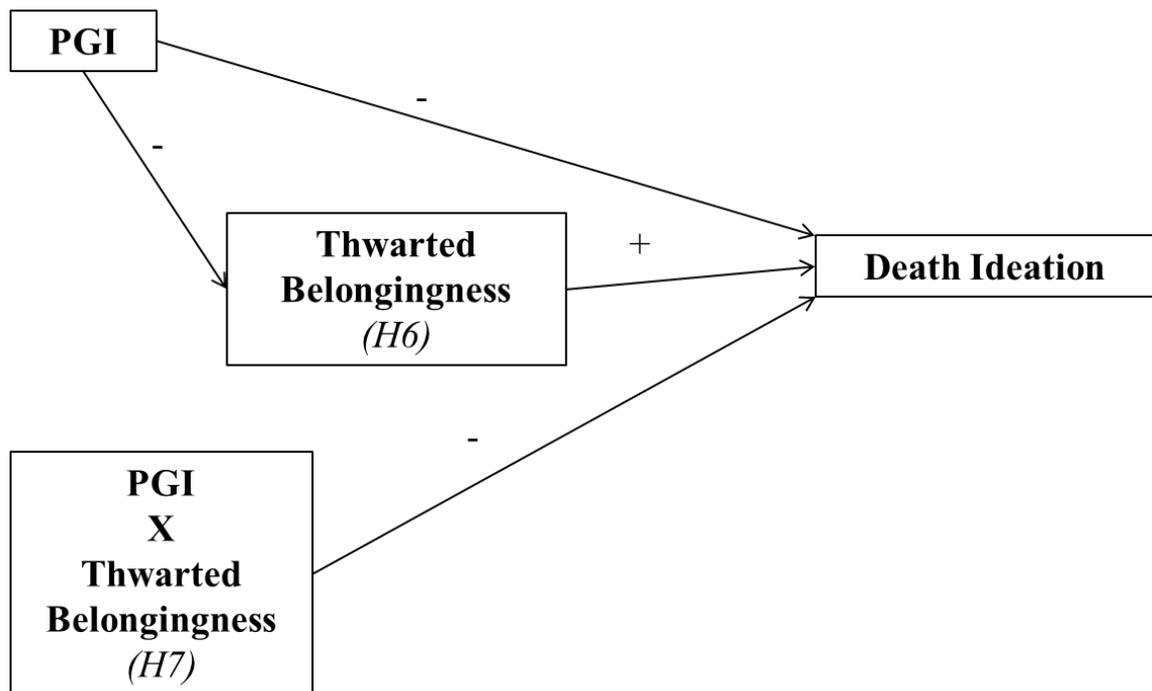
Figure 1. Hypothesized moderated mediation model with PGI as independent variable and moderator, perceived burdensomeness as the mediator, and the interaction effect of PGI and perceived burdensomeness on death ideation.

*Hypothesis 5:* In the study conducted by Brown and colleagues (2015), PGI was negatively correlated with thwarted belongingness; thus, we predicted that PGI will be negatively correlated with thwarted belongingness.

*Hypothesis 6:* Thwarted belongingness is a proximal and sufficient cause of death ideation (Van Orden et al., 2010). PGI is negatively associated with active suicidal ideation (Ciavaglia et al., 2014) and thwarted belongingness (Brown et al., 2015). Furthermore, individuals with more developed PGI skills may be more successful at engaging in health activities that promote personal growth and involve social interaction (Robitschek & Cook, 1999; Robitschek & Keyes, 2009); this may result in stronger feelings of connectedness with families, communities, and civilian life, reducing feelings of thwarted belongingness and, in turn, death ideation. We hypothesized that the

relationship between PGI and death ideation would be at least partially mediated by thwarted belongingness, such that a significant amount of the variance in death ideation would be explained by the indirect effect of PGI through thwarted belongingness

*Hypothesis 7:* Similarly, we hypothesized that the mediating relationship of thwarted belongingness and death ideation would be moderated by PGI, with higher levels of PGI associated with a decreased relationship between thwarted belongingness and death ideation, and lower levels of PGI associated with an increased relationship; see Figure 2.



*Figure 2.* Hypothesized moderated mediation model with PGI as independent variable and moderator, thwarted belongingness as the mediator, and the interaction effect of PGI and thwarted belongingness on death ideation.

Based on previous research, depressive and PTSD symptoms have been identified as significant predictors of passive and active suicidal ideation in OEF/OIF veterans (Braden, Overholser, Fisher, & Ridley, 2015; Bryan & Corso, 2011; Gradus, Smith, &

Vogt, 2015; Haller, Angkaw, Hendricks, & Norman, 2015; Kimbrel et al., 2014; Kimbrel et al., 2015; Lemaire & Graham, 2011; Maguen et al., 2011; Monteith et al., 2013; Pfeiffer et al., 2014; Pietrzak et al., 2010; Suris, Link-Malcolm, & North, 2011; Wisco et al., 2014; Youssef et al., 2013). In order to account for the potential effects of depressive and PTSD symptoms on death ideation in OEF, OIF, and OND veterans, these two variables were included as covariates in the current study.

## APPENDIX B

### Personal Growth Initiative Scale-II

For each statement, please mark how much you agree or disagree with that statement. Use the following scale:

0 = Disagree Strongly      1 = Disagree Somewhat      2 = Disagree a Little

3 = Agree a Little      4 = Agree Somewhat      5 = Agree Strongly

1. I set realistic goals for what I want to change about myself.  
0            1            2            3            4            5
2. I can tell when I am ready to make specific changes in myself.  
0            1            2            3            4            5
3. I know how to make a realistic plan in order to change myself.  
0            1            2            3            4            5
4. I take every opportunity to grow as it comes up.  
0            1            2            3            4            5
5. When I try to change myself, I make a realistic plan for my personal growth.  
0            1            2            3            4            5
6. I ask for help when I try to change myself.  
0            1            2            3            4            5
7. I actively work to improve myself.  
0            1            2            3            4            5
8. I figure out what I need to change about myself.  
0            1            2            3            4            5
9. I am constantly trying to grow as a person.

0                    1                    2                    3                    4                    5

10. I know how to set realistic goals to make changes in myself.

0                    1                    2                    3                    4                    5

11. I know when I need to make a specific change in myself.

0                    1                    2                    3                    4                    5

12. I use resources when I try to grow.

0                    1                    2                    3                    4                    5

13. I know steps I can take to make intentional changes in myself.

0                    1                    2                    3                    4                    5

14. I actively seek out help when I try to change myself.

0                    1                    2                    3                    4                    5

15. I look for opportunities to grow as a person.

0                    1                    2                    3                    4                    5

16. I know when it's time to change specific things about myself.

0                    1                    2                    3                    4                    5

## APPENDIX C

### Interpersonal Needs Questionnaire

The following questions ask you to think about yourself and other people. Please respond to each question by using your own current beliefs and experiences, NOT what you think is true in general, or what might be true for other people. Please base your responses on how you've been feeling recently. Use the rating scale to find the number that best matches how you feel and circle that number. There are no right or wrong answers: we are interested in what you think and feel.

- | 1                         | 2 | 3 | 4                       | 5 | 6 | 7   |
|---------------------------|---|---|-------------------------|---|---|---|
| Not at all<br>true for me |   |   | Somewhat<br>true for me |   |   | Very True<br>for me   |
| _____ 1                   |   |   |                         |   |   | These days, the people in my life would be better off if I were gone    |
| _____ 2                   |   |   |                         |   |   | These days, the people in my life would be happier without me           |
| _____ 3                   |   |   |                         |   |   | These days, I think I am a burden on society                            |
| _____ 4                   |   |   |                         |   |   | These days, I think my death would be a relief to the people in my life |
| _____ 5                   |   |   |                         |   |   | These days, I think the people in my life wish they could be rid of me  |
| _____ 6                   |   |   |                         |   |   | These days, I think I make things worse for the people in my life       |
| _____ 7                   |   |   |                         |   |   | These days, other people care about me                                  |
| _____ 8                   |   |   |                         |   |   | These days, I feel like I belong  |
| _____ 9                   |   |   |                         |   |   | These days, I rarely interact with people who care about me             |
| _____ 10                  |   |   |                         |   |   | These days, I am fortunate to have many caring and supportive friends   |
| _____ 11                  |   |   |                         |   |   | These days, I feel disconnected from other people                       |
| _____ 12                  |   |   |                         |   |   | These days, I often feel like an outsider in social gatherings          |
| _____ 13                  |   |   |                         |   |   | These days, I feel that there are people I can turn to in times of need |
| _____ 14                  |   |   |                         |   |   | These days, I am close to other people                                  |

\_\_\_\_\_15 These days, I have at least one satisfying interaction every day

## APPENDIX D

### Geriatric Suicide Ideation Scale

Listed below are a number of statements concerning your feelings and beliefs about your life. Please read each statement carefully, and decide whether you agree or disagree with it, and to what extent, as indicated below. Please be completely honest in your responses, and try to respond to every statement. Please choose only one number for each statement.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

- \_\_\_\_\_ Life is extremely valuable to me.
- \_\_\_\_\_ Sometimes my life feels so hard that I just want to escape.
- \_\_\_\_\_ I welcome the thought of drifting off to sleep and never waking up.
- \_\_\_\_\_ I want to end my life.
- \_\_\_\_\_ I feel that I am needed in this world.
- \_\_\_\_\_ I feel like I am a constant burden to my family.
- \_\_\_\_\_ I often wish that I would pass away in my sleep.
- \_\_\_\_\_ I can see no sense in carrying on with this empty existence.
- \_\_\_\_\_ I feel that my life is meaningful.
- \_\_\_\_\_ I never thought that my life would turn out this poorly.
- \_\_\_\_\_ At times I think that if things get much worse for me, I will end my life.
- \_\_\_\_\_ I have recently been thinking a great deal about specific ways of killing myself.
- \_\_\_\_\_ I have come to accept my life with all of its ups and downs.
- \_\_\_\_\_ I frequently feel useless.
- \_\_\_\_\_ I am looking forward to my eternal rest.
- \_\_\_\_\_ There are times when I feel like I am wasting away.
- \_\_\_\_\_ I have seriously considered suicide more than once earlier in my life.
- \_\_\_\_\_ I find joy and beauty in life.
- \_\_\_\_\_ I generally feel pretty worthless.
- \_\_\_\_\_ I am preoccupied with wishing that my life were over soon.

- \_\_\_\_\_ I frequently think that my family will be better off when I am dead.
- \_\_\_\_\_ I am certain that I have something to live for.
- \_\_\_\_\_ There is nothing further that I can do to help myself or anyone else.
- \_\_\_\_\_ I often wish that someone could give me a pill to make me go to sleep and never wake up.
- \_\_\_\_\_ I might do something to end it all if I could only muster the energy to do so.
- \_\_\_\_\_ I have tried ending my life in the past.
- \_\_\_\_\_ I feel that my life still has dignity.
- \_\_\_\_\_ Lately it seems that my health is really going downhill.
- \_\_\_\_\_ I feel that there is nothing left for me in this world.
- \_\_\_\_\_ I long for the peaceful slumber of death.
- \_\_\_\_\_ I believe that others need me.

**APPENDIX E**

**Patient Health Questionnaire-9**

**Over the last 2 weeks, how often have you been bothered by any of the following problems?**

*(Use “ ” to indicate your answer”*

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving .around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

**Column totals**    \_\_\_ + \_\_\_ + \_\_\_ + \_\_\_  
 = **Total Score** \_\_\_\_\_

**APPENDIX F**

**PTSD Checklist for DSM-5**

**Instructions:** Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

In the past month, how much were you bothered by:	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2. Repeated, disturbing dreams of the stressful	0	1	2	3	4
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0	1	2	3	4
4. Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing,	0	1	2	3	4
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	0	1	2	3	4
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8. Trouble remembering important parts of the stressful experience?	0	1	2	3	4
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me,	0	1	2	3	4
10. Blaming yourself or someone else for the stressful experience or what happened after it?	0	1	2	3	4
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0	1	2	3	4
12. Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13. Feeling distant or cut off from other people?	0	1	2	3	4
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15. Irritable behavior, angry outbursts, or acting	0	1	2	3	4

16. Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17. Being "super alert" or watchful or on guard?	0	1	2	3	4
18. Feeling jumpy or easily startled?	0	1	2	3	4
19. Having difficulty concentrating?	0	1	2	3	4
20. Trouble falling or staying asleep?	0	1	2	3	4

## APPENDIX G

### Demographics Questionnaire

1. How old are you?
  
2. I identify as:
  - Female
  - Male
  - Transgender (Male → Female)
  - Transgender (Female → Male)
  - Other, please describe: \_\_\_\_\_
  
3. My sexual orientation is:
  - Heterosexual
  - Lesbian
  - Gay
  - Bisexual
  - Questioning
  - Other, please describe: \_\_\_\_\_
  
2. What is your current religious affiliation?
  - Buddhist
  - Christian/Catholic
  - Christian/Protestant
  - Christian/Other
  - Hindu
  - Jewish
  - Mormon/Latter-Day Saints
  - Muslim
  - Don't believe in God or not religious (Atheist)
  - Don't care, undecided, or believe one cannot know (Agnostic)
  - Other, please describe: \_\_\_\_\_
  
4. My race/ethnicity is: (select all that apply)
  - American Indian or Alaskan Native
  - Asian or Pacific Islander
  - Black
  - Hispanic
  - White, non-Hispanic American
  - Other, please describe: \_\_\_\_\_
  
5. Relationship status:
  - Single
  - Dating

- Engaged
- Married
- Partnered
- Widowed
- Other, please describe: \_\_\_\_\_

6. How many children do you have?

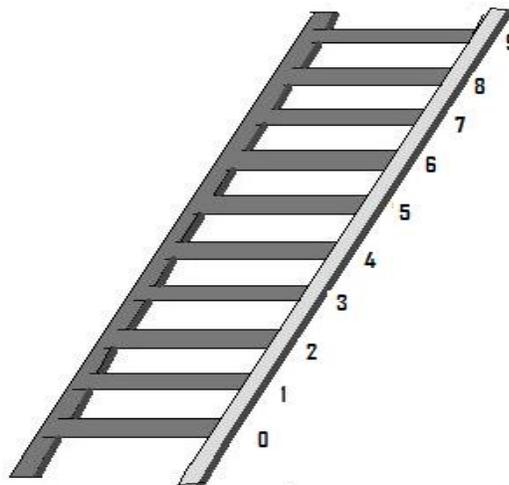
7. What state do you currently live in?

Alabama	AL	Maine	ME	Oklahoma	OK
Alaska	AK	Maryland	MD	Oregon	OR
Arizona	AZ	Massachusetts	MA	Pennsylvania	PA
Arkansas	AR	Michigan	MI	Rhode Island	RI
California	CA	Minnesota	MN	South Carolina	SC
Colorado	CO	Mississippi	MS	South Dakota	SD
Connecticut	CT	Missouri	MO	Tennessee	TN
Delaware	DE	Montana	MT	Texas	TX
District of Columbia	DC	Nebraska	NE	Utah	UT
Georgia	GA	Nevada	NV	Vermont	VT
Hawaii	HI	New Hampshire	NH	Virginia	VA
Idaho	ID	New Jersey	NJ	Washington	WA
Illinois	IL	New Mexico	NM	West Virginia	WV
Indiana	IN	New York	NY	Wisconsin	WI
Iowa	IA	North Carolina	NC	Wyoming	WY
Kansas	KS	North Dakota	ND		
Kentucky	KY	Ohio	OH		
Louisiana	LA				

8. Are you currently a student?
- Yes
  - No
9. If you are in school, what is your classification?
- Vocational/Technical School Student
  - College Freshman
  - College Sophomore
  - College Junior
  - College Senior
  - Graduate Student
  - Other, please describe: \_\_\_\_\_

10. What is your employment status?
- Employed, full-time
  - Employed, part-time
  - Unemployed, looking for employment
  - Unemployed, not looking for employment
  - Other, please describe: \_\_\_\_\_

11. Think of this ladder as representing where people stand in society financially. At the top of the ladder are the people who are best off—those who have the most money and best jobs. At the bottom are the people who are the worst off—who have the least money and the worst jobs. The higher you are on the ladder, the closer you are to the people at the very top, and the lower you are, the closer you are to the bottom. Where would you put yourself on the ladder? Please write the number between 0 and 9 in this blank:



12. Which service branch have you been a part of? (select all that apply)
- Air Force
  - Air Force Reserve
  - Air National Guard
  - Army
  - Army Reserve
  - Army National Guard
  - Coast Guard
  - Coast Guard Reserve
  - Marine Corps
  - Marine Corps Reserve
  - Navy
  - Navy Reserve
13. How many times have you been deployed? (If you have not been deployed, write "0".) \_\_\_\_\_
14. I have been deployed for a total of \_\_\_\_\_ months. (If you have not been deployed, write "0".)
15. Which combat theatres have you been deployed to? (select all that apply)
- Operation Enduring Freedom (OEF)
  - Operation Iraqi Freedom (OIF)
  - Operation New Dawn (OND)
  - Operation Freedom's Sentinel (OFS)
  - Other, please specify: \_\_\_\_\_
  - I am not a Veteran
16. Please select which of the following criteria you meet for status as a Veteran.
- 180 or more consecutive days, any part of which occurred during the period beginning September 11, 2001 and ending on a future date prescribed by Presidential proclamation or law as the last date of Operation Iraqi Freedom, OR
  - Between August 2, 1990 and January 2, 1992, OR
  - 180 or more consecutive days, any part of which occurred after January 31, 1955 and before October 15, 1976.
  - In a war, campaign or expedition for which a campaign badge has been authorized or between April 28, 1952 and July 1, 1955, OR
  - Other
  - I am not a Veteran
17. What is the acronym for the locations where finals physicals are taken prior to shipping off for basic training? (4 letters)
- \_\_\_\_\_ [Correct answer: MEPS]
  - I am not a Veteran

18. What is the acronym for the generic term the military uses for various job fields?  
(3 letters)

- \_\_\_\_\_ [Correct answer: MOS]
- I am not a Veteran

## **APPENDIX H**

### **TechAnnounce Study Information**

#### OIF/OEF/OND Veterans Needed for Online Study

We are looking for Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND) Veterans to take part in an online study which looks at personal growth and strength after military experience. Participants have the chance to win a \$10 gift card. Your participation will be confidential and voluntary.

Please follow this link to begin the study:

[https://ttupsych.az1.qualtrics.com/jfe/form/SV\\_9NCckHyNkZ2uJM1](https://ttupsych.az1.qualtrics.com/jfe/form/SV_9NCckHyNkZ2uJM1)

You can only take part in this study once. If you have questions or want to learn more, please contact Dominika Borowa at [dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu)

Dr. Christine Robitschek ([chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu)) is the supervisor for this study. This study has been approved by the Texas Tech University Institutional Review Board for the Protection of Human Subjects.

## **APPENDIX I**

### **Facebook Study Information**

#### OIF/OEF/OND Veterans Needed for Online Study

We are looking for Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND) Veterans to take part in an online study which looks at personal growth and psychological health after military experience. Participants have the chance to win a \$10 gift card. Your participation will be confidential and voluntary.

Please follow this link to begin the study:

[https://ttupsych.az1.qualtrics.com/jfe/form/SV\\_9NCckHyNkZ2uJM1](https://ttupsych.az1.qualtrics.com/jfe/form/SV_9NCckHyNkZ2uJM1)

You can only take part in this study once. If you have questions or want to learn more, please contact Dominika Borowa at [dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu)

Dr. Christine Robitschek ([chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu)) is the supervisor for this study. This study has been approved by the Texas Tech University Institutional Review Board for the Protection of Human Subjects.

## APPENDIX J

### Division 19 E-mail Listserv Study Information

#### OIF/OEF/OND Veterans Needed for Online Study

We are looking for Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND) Veterans to take part in an online study which looks at personal growth and psychological health after military experience. Participants have the chance to win a \$10 gift card. Your participation will be confidential and voluntary.

Please follow this link to begin the study:

[https://ttupsych.az1.qualtrics.com/jfe/form/SV\\_9NCckHyNkZ2uJM1](https://ttupsych.az1.qualtrics.com/jfe/form/SV_9NCckHyNkZ2uJM1)

You can only take part in this study once. If you have questions or want to learn more, please contact Dominika Borowa at [dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu)

Dr. Christine Robitschek ([chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu)) is the supervisor for this study. This study has been approved by the Texas Tech University Institutional Review Board for the Protection of Human Subjects.

APPENDIX K

Flyer with Study Information

# OIF/OEF/OND Veterans Needed for Online Study

We are looking for Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND) Veterans to take part in an online study which looks at personal growth and psychological health after military experience. Participants have the chance to win a \$10 gift card. Your participation will be confidential and voluntary.

**To participate in the study, please scan the code:**



Or e-mail [dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu)

You can only take part in this study once. If you have questions or want to learn more, please contact Dominika Borowa at [dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu)

Dr. Christine Robitschek ([chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu)) is the supervisor for this study. This study has been approved by the Texas Tech University Institutional Review Board for the Protection of Human Subjects.

## APPENDIX L

### E-mail sent to Directors of Military and Veterans Programs

Dear \_\_\_\_\_,

My name is \_\_\_\_\_, and I am contacting you as part of a research team at Texas Tech University that is examining what keeps Veterans strong and resilient. Our goal is to understand what factors may protect OIF, OEF, and OND Veterans from experiencing psychological distress, in order to develop interventions that will ultimately build resilience in Veterans. We are contacting you as the director of the Military & Veterans program at \_\_\_\_\_ to see if you would be willing to pass along information about our study to Veterans on your campus.

This study is an online survey, takes approximately 10 minutes to complete, and is anonymous. By taking part in the study, participants have the chance to win a \$10 Amazon gift card (chances of winning are approximately 1:20). After the survey, participants will be asked for an e-mail address (on a different website) that we will use for a gift card drawing. We will not be able to match participants' e-mail addresses with other information they provide us. We do this in an effort to protect Veterans' privacy and make sure responses are anonymous. To access and participate in this study, please follow this link: [https://ttupsych.az1.qualtrics.com/SE/?SID=SV\\_9NCckHyNkZ2uJM1](https://ttupsych.az1.qualtrics.com/SE/?SID=SV_9NCckHyNkZ2uJM1)

By taking part in this study, Veterans will help us understand what helps them stay strong and resilient. Your help is very valuable to us, and we thank you for your time and commitment to helping us support Veterans.

If you have any questions about the study, please do not hesitate to contact the study leader, Dominika Borowa, at [dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu). Dominika is a doctoral candidate in the Counseling Psychology program at Texas Tech University. This study is supervised by Dr. Christine Robitschek ([chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu)) and has been approved by the Texas Tech University Institutional Review Board for the Protection of Human Subjects.

Thank you again for your time and for your commitment to supporting Veterans.

Best Regards,

\_\_\_\_\_

## APPENDIX M

### E-mail sent to Veterans from Military and Veterans Programs Directors

Dear Veteran,

You are invited to take part in an online study. In light of the high rates of suicide in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) Veterans, we want to learn **what keeps Veterans strong and resilient**. Our goal is to understand what factors may **protect** OIF and OEF Veterans from experiencing thoughts of suicide, in order to develop interventions that will ultimately build resilience in Veterans. We want to learn of your experiences, even if you have never experienced thoughts of suicide.

This survey takes about 10-15 minutes to finish and is completely anonymous.

By taking part in the study, you have the chance to win a \$10 Amazon gift card (chances of winning are at least 1:25). Gift cards will be awarded to the winners of a drawing that you may enter after finishing the survey. After the survey, you will be asked for an e-mail address or phone number (on a different website) that we will use for this drawing. We will not be able to match your e-mail address with other information you give us. This will keep your answers anonymous.

By taking part in this study, you will help us understand how to help Veterans stay strong. Your input is very valuable to us, and we thank you for your time and commitment to helping us support Veterans.

Please follow this link to begin the survey:

[https://ttupsych.az1.qualtrics.com/SE/?SID=SV\\_9NCckHyNkZ2uJM1](https://ttupsych.az1.qualtrics.com/SE/?SID=SV_9NCckHyNkZ2uJM1)

If you have any questions about the study you can reach me at [dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu). Please write “Veterans Study” in the Subject line.

Best Regards,  
Dominika Borowa, M.A.  
Doctoral Student  
Department of Psychology, TTU

This study is supervised by Dr. Christine Robitschek (Department of Psychology, TTU; [chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu)) and has been approved by the Texas Tech University Institutional Review Board for the Protection of Human Subjects.

## **APPENDIX N**

### **Study Description on Amazon's MTurk**

This is a research study in which we want to learn about Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND) Veterans' personal growth and psychological health following military experience.

## APPENDIX O

### Information Sheet for Non-Amazon's MTurk Participants

#### Who is doing this project, and what is it about?

We are asking you to participate in a research study in which we want to learn about Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND) Veterans **personal growth and psychological health following military experience**. Dominika Borowa, M.A. and Christine Robitschek, Ph.D., of the Department of Psychological Sciences at Texas Tech University are conducting this study. Ms. Borowa can be reached at [Dominika.borowa@ttu.edu](mailto:Dominika.borowa@ttu.edu), and Dr. Robitschek can be reached at [chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu).

#### Who can participate?

Veterans who have been deployed as part of OIF, OEF, or OND.

#### What do I do if I participate?

You will be asked to answer some questions about yourself. Although it is helpful for us if you answer every question, you may skip any question(s) that you do not feel comfortable answering. It is completely up to you to decide to do these surveys. We don't want you to feel forced to do them, and you won't be penalized if you don't do them. Also, you can decide to quit anytime without receiving any penalty. It is estimated that completing this study will take between 10 and 15 minutes.

#### What do I get out of this?

By taking part in the study, you have the chance to win a \$10 Amazon gift card (chances of winning are approximately 1:40). Gift cards will be awarded to the winners of a drawing that you may enter after finishing the survey. After the survey, you will be asked for an e-mail address (on a different website) that we will use for this drawing. We will not be able to match your e-mail address with other information you give us. This will keep your answers anonymous.

#### Who will see my answers?

No one but Ms. Dominika Borowa, Dr. Christine Robitschek, and the study's research assistants will see your answers. Your responses will be kept confidential. Your name will not be associated with the answers you give.

#### What if I have questions?

Ms. Dominika Borowa ([dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu)) and/or Dr. Christine Robitschek

([chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu)) will be happy to answer any questions you have about the study. For questions about your rights as a participant or about injuries caused by this research, contact the Texas Tech University Institutional Review Board for the Protection of Human Subjects, Office of Research Services via phone (8067422064), e-mail ([hrpp@ttu.edu](mailto:hrpp@ttu.edu)), or mail (Texas Tech University, Lubbock, Texas 79409).

**I'm ready to take the survey**

**I don't want to take the survey**

## APPENDIX P

### Information Sheet for Amazon's MTurk Participants

#### **Who is doing this project, and what is it about?**

We are asking you to participate in a research study in which we want to learn about Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and Operation New Dawn (OND) Veterans **personal growth and psychological health following military experience**. Dominika Borowa, M.A. and Christine Robitschek, Ph.D., of the Department of Psychological Sciences at Texas Tech University are conducting this study. Ms. Borowa can be reached at [Dominika.borowa@ttu.edu](mailto:Dominika.borowa@ttu.edu), and Dr. Robitschek can be reached at [chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu).

#### **Who can participate?**

Veterans who have been deployed as part of OIF, OEF, or OND.

#### **What do I do if I participate?**

You will be asked to answer some questions about yourself. Although it is helpful for us if you answer every question, you may skip any question(s) that you do not feel comfortable answering. It is completely up to you to decide to do these surveys. We don't want you to feel forced to do them, and you won't be penalized if you don't do them. Also, you can decide to quit anytime without receiving any penalty. It is estimated that completing this study will take between 10 and 15 minutes

#### **What do I get out of this?**

To thank you for your participation in this survey, you will receive compensation of 40¢ through your Mechanical Turk (MTurk) account if you are eligible to complete the survey.

#### **Who will see my answers?**

No one but Ms. Dominika Borowa, Dr. Christine Robitschek, and the study's research assistants will see your answers. Your responses will be kept confidential. Your name will not be associated with the answers you give. Please be aware that any work performed on Amazon MTurk can potentially be linked to information about you on your Amazon public profile page, depending on the settings you have for your Amazon profile. We will not be accessing any personally identifying information about you that you may have put on your Amazon public profile page. We will store your MTurk worker ID separately from the other information you provide to us.

**What if I have questions?**

Ms. Dominika Borowa ([dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu)) and/or Dr. Christine Robitschek ([chris.robitschek@ttu.edu](mailto:chris.robitschek@ttu.edu)) will be happy to answer any questions you have about the study. For questions about your rights as a participant or about injuries caused by this research, contact the Texas Tech University Institutional Review Board for the Protection of Human Subjects, Office of Research Services via phone (8067422064), e-mail ([hrpp@ttu.edu](mailto:hrpp@ttu.edu)), or mail (Texas Tech University, Lubbock, Texas 79409).

**I'm ready to take the survey**

**I don't want to take the survey**

## APPENDIX Q

### Debriefing Sheet for Non-Amazon's MTurk Participants

**Thank you for participating in our study!**

#### **Information about the Study**

The goal of this study was to see if higher levels of “Personal Growth Initiative” protect Veterans against psychological distress. Personal Growth Initiative (PGI) is your intentional effort to change and improve. We are trying to learn if PGI is related to thoughts of suicide in OEF, OIF, and OND Veterans.

Your participation will help us learn how military Veterans are impacted by distress and how we can help you stay strong and resilient. We value your contribution in helping us improve the lives of military Veterans.

If you want to know more about PGI, or if you want to see the results of this study, you may reach me at [dominika.borowa@ttu.edu](mailto:dominika.borowa@ttu.edu). Please be sure to put “Veterans Study” in the subject line of your e-mail so that your message isn't sent to a Junk folder.

**In order to participate in the \$10 Amazon gift card drawing, please click on this link:**  
[https://ttupsych.az1.qualtrics.com/SE/?SID=SV\\_6huK68QoVqTPE3P](https://ttupsych.az1.qualtrics.com/SE/?SID=SV_6huK68QoVqTPE3P)

**Thank you again for your participation!**

Christine Robitschek, PhD  
Department of Psychology  
Texas Tech University

Dominika Borowa, M.A.  
Doctoral Student  
Department of Psychology  
Texas Tech University

#### **Mental Health Resources**

If you or a Veteran you know is feeling upset or in crisis, the services below may be contacted.

Veterans Crisis Line:  
**Dial 800-273-TALK (800-273-8255), Press 1**  
**OR**  
**Send a text message to 838-255**

Hotline and text services available 24 hours per day, 7 days per week

## APPENDIX R

### Debriefing Sheet for Amazon's MTurk Participants

**Thank you for participating in our study!**

#### **Information about the Study**

The goal of this study was to see if higher levels of “Personal Growth Initiative” protect Veterans against thoughts of suicide. Personal Growth Initiative (PGI) is your intentional effort to change and improve. We are trying to learn if PGI is related to thoughts of suicide in OEF, OIF, and OND Veterans.

Your participation will help us learn how military Veterans are impacted by distress and how we can help you stay strong and resilient. We value your contribution in helping us improve the lives of military Veterans.

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**Thank you again for your participation!**

Christine Robitscheck, PhD  
Department of Psychology  
Texas Tech University

Dominika Borowa, M.A.  
Doctoral Student  
Department of Psychology  
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Hotline and text services available 24 hours per day, 7 days per week

## APPENDIX S

### External Link for Gift Card Drawing

**Would you like to be included in a drawing for a \$10 gift card from Amazon.com?  
Chances of winning are at least 1:20.**

The information you provide below will be stored separately from the survey responses you just gave. We will not match your name in any way to your survey responses. To be included in the drawing, you **MUST** answer the following questions so that we may contact you if you win. If you win and we are not successful in reaching you within one week, we will award the gift card to another participant.

What is your full name? \_\_\_\_\_

What is your e-mail address? \_\_\_\_\_