# The Interpersonal Guilt Rating Scale 15 Item Self-Report Version (IGRS-15s): Exploring the Factor Structure and Psychometric Properties in a Sample of American Post 9/11 Active-Duty and Veteran Military Personnel

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## ABSTRACT

Guilt is associated with posttraumatic stress disorder (PTSD), depression, and suicidality, all of which are prevalent problems among active-duty and veteran United States military personnel. Most research studying these associations utilize trauma-related guilt conceptualizations. However, researchers have developed and begun testing the Interpersonal Guilt Rating Scale-15 Item Self-Report Version (IGRS-15s), which has shown strong psychometric properties in samples of Italian and English-speaking civilians. The present study evaluated the IGRS-15s in a sample of 229 American Post 9/11 combat veterans to understand its utility in this community. We hypothesized and found a four-factor structure in congruence with prior studies of English-speaking samples. As hypothesized, the IGRS-15s was strongly correlated to other measures of guilt and PTSD and was moderately correlated to a measure of depression. Overall, the measure showed good internal consistency and displayed convergent associations with other measures of guilt. As such, the IGRS-15s may be a useful, brief, self-report tool for assessing guilt in military-affiliated communities.

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Guilt is an element of two common psychological consequences of trauma: depression and posttraumatic stress disorder (PTSD; American Psychological Association, 2013), and may be an especially relevant concept in active and veteran United States (US) military personnel. According to data from the US Department of Veterans Affairs (VA), 20% of those who fought in Iraq and/or Afghanistan may meet criteria for PTSD (Na, Schnurr, & Pietrzak, 2023). Further, a recent meta-analysis showed that 23% of active-duty personnel and 20% of veterans met criteria for depression among the participants in the studies reviewed (Moradi et al., 2021). There is also a plethora of research linking PTSD, depression, and suicidality (Bryan et al., 2015; Chu et al., 2017). Moreover, guilt has been directly associated with suicidal thoughts and behaviors (Bryan et al., 2015; McCue et al., 2021). Suicide rates among military-affiliated communities remain elevated even after the conclusion of combat operations in Iraq and Afghanistan. Those with a history of US military service are 1.5 times more likely than those who never served to die by suicide (Na, Schnurr, & Pietrzak, 2023). Given the critical importance of preventative measures in this area, more tools to assess and understand the cognitions underlying suicidogenic processes are needed.

In both clinical practice and research, guilt is most often operationalized and assessed using the Trauma-Related Guilt Inventory (TRGI; Kubany et el., 1996), which accounts for traumatic experiences as part of the measure. Trauma-related guilt arises from violating personal tenets of morality or beliefs about how one should or should not have behaved in relation to a traumatic situation (Kubany et al., 1996). The strong psychometrics and consistent associations with psychological sequelae of trauma such as PTSD and depression (Kip et al., 2022; Kubany et al., 1996; Lacerenza, Joseph, & Cassisi, 2020; Popiel & Zawadski, 2015), make the TRGI a useful measure to assess the psychological impact of guilt following exposure to traumatic events, including those frequently experienced in military contexts.

However, trauma-related guilt is not the only way to conceptualize guilt experiences that may be implicated in psychological well-being and functioning. While the TGRI conceptualizes guilt as a conflict between one's own values and one's actions (during trauma), interpersonal measures of guilt emphasize the balance between maintaining one's sense of self and managing duty to family and friends (Gazzillo et al., 2017). The essential conflict interpersonal guilt measures is between one's own values and the needs or values of others, a subtle but important difference from the focus of the TGRI. Thus, interpersonal guilt has prosocial features in that it incentivizes positive interpersonal relations (closeness, respect for others' values and needs), shaping behavior to ensure these relationships remain strong (Baumeister, Stillwell, & Heatherton, 1994; Gazzillo et al., 2017; Tangney, 1995). However, these prosocial aspects may become maladaptive when guilt is elicited in the context of trauma, as individuals may have unrealistic expectations of their capacity for idealized behavior in the face of overwhelming emotion (Gazzillo et al., 2017). Accordingly, researchers have recently developed a measure of guilt that assesses the construct in terms of how it presents interpersonally. The Interpersonal Guilt Rating Scale 15-Item Self-Report Version (IGRS-15s; Gazzillo et al., 2018), was developed based on the Control-Mastery Theory (CMT) of interpersonal guilt, which describes how emotional attachment systems are associated with the development of feelings of guilt (Gazzillo, 2016).

Currently, the IGRS-15s has been evaluated in samples of Italian university students and community members, as well as in a sample of English-speaking individuals from the US, United Kingdom (UK; 80% of the sample), Ireland, and Canada. In Italian samples, the measure displayed a three-factor structure partly in congruence with the CMT (Faccini et al., 2020; Gazzillo et al., 2018). Factors that emerged in these analyses were survivor guilt, omnipotence guilt, and self-hate. Many items loading on the survivor guilt subscale focused on comparing the self to others; for example, "I feel uncomfortable feeling better off than other people." Self-hate items focused on negative self-thoughts such as, "I do not deserve to be happy." One of the factors, omnipotence guilt, combined the theory's constructs of disloyalty/separation guilt and responsibility guilt into a single factor after rotation. Omnipotence (disloyalty/separation) items focused on family relations asking questions such as, "I feel I should visit my parents as often as they wish." Omnipotence (responsibility) items, on the other hand, centered around caretaking with items like, "I feel it is my responsibility to fix other people's problems." The researchers proposed that Italian respondents were unable to clearly differentiate the source of their guilt. Specifically, they were not able to identify whether their guilt was due to the feeling that they need to care for others or whether they felt becoming independent would harm others (Faccini et al., 2020). However, the final CMT construct of burdening guilt did not emerge as a factor after analyzing the data. In the English-speaking civilian sample, however, a four-factor structure emerged (Leonardi et al., 2022). Those who took the English version of the IGRS-15s differentiated from disloyalty/separation guilt, which emanates from thoughts that separating from loved ones would harm them, and responsibility guilt, which is based on thoughts that placing one's needs ahead of the needs of loved ones is selfish. While it is unclear exactly why this differentiation occurred, cultural or linguistic differences between Italian and English-speaking samples may help us understand this phenomenon.

In the initial publication of the IGRS-15s, Gazzillo and colleagues (2018) revised the initial solution of a four-factor structure because of modest fit in confirmatory factor analysis (CFA), high intercorrelations between factors (*r*s from .50 to .80), and relatively low internal consistencies for each factor with Cronbach's alphas for survivor guilt = .76, omnipotence (separation/disloyalty) = .56, omnipotence (responsibility) = .64, and self-hate = .68. After condensing to a three-factor model, intercorrelations reduced, internal consistencies improved, and model fit achieved parsimony (Gazzillo et al., 2018). However, in the English-speaking study, the four-factor model achieved an excellent fit in confirmatory factor analysis, more modest factor intercorrelations (*r*s from .22 to .69), and all scale internal consistencies were between .72 and .76 leading to the decision to retain this model in the English-speaking version of the IGRS-15s (Leonardi et al., 2022).

The IGRS-15s has shown good test-retest reliability (*r* = .74), as well as significant correlations with measures of shame, self-esteem (negatively), and trauma history (Faccini et al., 2020; Gazzillo et al., 2018). Additionally, the survivor, omnipotence, and self-hate factors have been directly associated with fear and negatively related to attachment (Gazzillo et al., 2018; Leonardi et al., 2022). In describing the factors of the IGRS-15s, researchers proposed that survivor and omnipotence assess the degree to which a person fears losing or having hurt a loved one, while self-hate assesses the degree to which an individual feels unlovable based on their thoughts, behaviors, and traits (Gazzillo et al., 2018).

While there is an abundance of research into how trauma-related guilt impacts those with a history of US military service, there is relatively scant literature exploring how, or if, an interpersonal conceptualization of guilt is relevant in these communities. Given that trauma-related measures assess for elements of the traumatic experience as part of the assessment, it is reasonable to default to these measures in communities prone to traumatic experiences. However, some researchers have used scales that assess some aspects of interpersonal guilt, such as the Personal Feelings Questionnaire Second Edition (PFQ-2; Harder & Zalma, 1990) and have found relationships between guilt, PTSD, and suicidality (Bryan et al., 2013) in concordance with findings using trauma-related measures. Nevertheless, despite its demonstrated validity in civilian samples, no research to date has explored the measure's utility in samples of active and veteran US military personnel. There are several reasons to believe that it may be a particularly useful tool to evaluate how guilt influences thoughts and behaviors in this population. First, two of its main factors: survivor guilt (Hendin & Haas, 1991: Murray, 2018) and responsibility guilt (Norman et al., 2014; Opp & Samson, 1989), have been shown to be fundamental elements of trauma-related guilt in combat veterans (Ross, 2013). Second, responsibility and high risk of exposure to life and death situations are defining features of military culture and service (Hall, 2012). As such, members of military communities are more likely to experience survivor and omnipotence guilt as well as distal feelings of self-hate associated with these feelings of guilt than those with no history of service.

The IGRS-15s warrants further review as a potential way to understand and treat posttraumatic psychological conditions associated with guilt, such as PTSD and depression, among US military personnel and veterans. The aim of the present study was to evaluate the factor structure and psychometric properties of the IGRS-15s in a sample of active-duty and veteran US military personnel as previous evaluations have shown measures may perform unexpectedly across cultural contexts (Guada, Land, & Hand, 2011). The present study tested the following hypotheses about the IGRS-15s in a sample of current and former US military personnel with a history of at least one combat deployment to Iraq or Afghanistan after September 11, 2001 (9/11).

## STUDY HYPOTHESES

Our study included five hypotheses. Each of the following paragraphs identify a single hypothesis identified and addressed.

The IGRS-15s will display a four-factor structure of survivor guilt, omnipotence (disloyalty/separation) guilt, omnipotence (responsibility) guilt, and self-hate guilt in principal axis factor analysis. While this sample was different in many ways from the English-speaking sample in the Leonardi et al. (2022) study, we reasoned that it was even less like the Italian sample in Gazzillo et al. (2018). As such, we hypothesized that the model would most likely resemble the four-factor structure of the former study.

The IGRS-15s and each of its factors will correlate to trauma-related guilt indicating concurrent validity. Interpersonal guilt, while different from trauma-related guilt, shares important elements including negative self-appraisals. Of particular importance in military-affiliated communities are that both interpersonal and trauma-related guilt share elements of responsibility and duty to others.

The IGRS-15s and each of its factors will correlate with PTSD severity and depression symptoms supporting criterion validity. Guilt is an element of both PTSD and depression. Measures of trauma-related guilt are frequently

associated with both PTSD and depression (Bryan et al., 2015; Chu et al., 2017; Moradi et al., 2021).

Controlling for time since traumatic experience and combat intensity, each IGRS-15s factor will be associated with PTSD severity, depression, and trauma-related guilt. Treatments for PTSD note that most people recover from traumatic experiences naturally over time (Resick, Monson, & Chard, 2016). As such, time since potentially traumatic event was included as a covariate. Further, combat intensity has been shown to influence PTSD severity and elements of traumatic combat experiences are directly assessed in the TRGI. To differentiate the unique contributions of guilt, rather than those of combat intensity, we included combat intensity as a covariate in the analyses testing hypotheses 1 through 3.

Receiver operating characteristic (ROC) curve analysis will generate a specific cutoff score on the IGRS-15s that will be associated with clinically relevant levels of PTSD and depression. Large clinical organizations such as military treatment facilities (MTFs), veterans administration hospitals, and insurance-based community organizations often find it useful to triage clients into more person-specific treatment avenues. To this end, it may be useful to establish cutoffs that would indicate a cutoff on the IGRS-15s that may indicate a level of severity that should be addressed in trauma treatment.

# METHODS

## PARTICIPANTS

The current study was conducted using data collected as part of a larger study testing two models of suicide risk in 229 active (27.5%, *n* = 63) and veteran (72.5%, *n* = 166) US military personnel who had deployed to Iraq or Afghanistan after September 11th, 2001 (9/11). Detailed demographic descriptions are provided in Table 1 below. The average age of the sample was 40.1 years (*SD* = 7.9) and consisted of mostly male (83.4%, *n* = 191) participants, generally reflecting the gender distribution (82.8% male, 17.2% female) of the 2020 US Department of Defense (DoD) census of active and reserve military personnel. The sample was mostly white (69.0%, *n* = 158) and included fewer Latinx (9.6%, *n* = 22) and Black (7.4%, *n* = 17) individuals than in the DoD census. Most respondents served either in the Army (38.0%, *n* = 87) or the Marines (39.6%, *n* = 90), with few respondents having deployed as members of the Air Force (12.2%, *n* = 28) or the Navy (9.6%, *n* = 22). These service branch distributions were expected based on previous research with this Post 9/11 cohort noting that 66% of these deployments were staffed by Army personnel, 15% by Marines, 13% by airmen, and 5% by sailors (Bonds et al., 2010). Participants had higher ranks than may be expected in the population as only 36% (*n* = 82) reported being E-5 or below, 19.4% (*n* = 44) reported being E-6 to E-9, and 44.4% (*n* = 103) reported having served as officers.

| | % TOTAL SAMPLE (*n*) | 2020 DoD DATA |
|---|---|---|
| Race/Ethnicity | | |
| Asian | 4.4% (10) | 4.8% |
| Black | 7.4% (17) | 17.2% |
| Latino | 9.6% (22) | 17.2% |
| White | 69.0% (158) | 68.9% |
| Other | 9.6% (22) | 9.1% |
| Gender | | |
| Female | 16.6% (38) | 17.2% |
| Male | 83.4% (191) | 82.8% |
| Branch | | |
| Air Force | 12.3% (28) | 24.7% |
| Army | 38.0% (87) | 36.1% |
| Marines | 39.3% (90) | 13.6% |
| Navy | 9.6% (22) | 25.6% |
| Duty status | | |
| Active | 27.5% (63) | – |
| Veteran | 72.5% (166) | – |

**Table 1** Personal and Military Demographic Data of Sample (N = 229) and Normative DoD Demographics.

*Note.* Two respondents did not provide answers regarding their branch of service at the time of their deployment to combat, therefore branch results total to 227 rather than 229. Department of Defense (DoD) race data does not include ethnicity, but a noteworthy portion of the DOD endorsed being ethnically Latino, as a result, the DoD data add up to more than 100%.

## MEASURES

### Combat Intensity

The Walter Reed Army Institute of Research Combat Experiences Scale (CES; Guyker et al., 2013) is a 36-item self-report measure. In accordance with the recommendations of Guyker and colleagues (2013), only the first 33 items were presented to participants in the current study. The CES is a 5-point Likert style questionnaire, asking respondents how frequently they experienced events such as, "I called in fire on the enemy" and "I was directly responsible for the death of an enemy combatant." Respondents selected from 0 for "Never" to 5 for "10 or more times." Scores are summed for a total score on the measure with higher scores indicating

greater combat intensity. In the present study, the CES obtained good internal consistency as Cronbach's α = .96.

### Guilt

The TRGI (Kubany et al., 1996) is a 32-item self-report measure that evaluates guilt as it relates to traumatic experiences. The TRGI presents respondents with questions such as "I experience intense guilt that relates to what happened," using a 5-point Likert style rating system ranging from 0 ("never true) to 4 ("always true"). While the measure has three subscales (guilt cognitions, distress, and global guilt), only guilt cognitions and global guilt are summed to generate total TRGI scores, as the distress subscale measures general psychiatric distress rather than strictly guilt-related distress (Cunningham et al., 2017). The 26 items from the global guilt and guilt cognitions subscales were presented to participants in this study and together displayed excellent internal consistency with Cronbach's α = .96.

The IGRS-15s (Gazzillo et al., 2018) is a 15-item self-report measure of interpersonal guilt. As previously discussed, the IRGS-15 consists of three subscales: omnipotent guilt, survivor guilt, and self-hate. Scores on each subscale are summed to generate a total score ranging from 15–75 with higher scores indicating greater levels of interpersonal guilt. The IGRS-15s asks respondents to rate items on a Likert-style scale with scores ranging from 1 (not at all representative) to 5 (completely representative). The IGRS-15s has shown divergent validity from positive affect factors and convergent validity with negative affect factors as identified by the Affective Neuroscience Personality Scales (ANPS; Davis, Panksepp, & Normansell, 2003). Additionally, the IGRS-15s displays concurrent validity with the Interpersonal Guilt Questionnaire-67 (IGQ-67; O'Connor et al., 1997) and with the Fear of Punishment/Need for Reparation Scales (FPNRS; Caprara et al., 1990). In the current sample, the total score of the IGRS-15s obtained good internal consistency with Cronbach's α = .86.

## PTSD SYMPTOM SEVERITY

The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5; Blevins et al., 2015) is a self-report, Likert-style measure. The measure presents respondents with questions such as "In the past month how much have you been bothered by loss of interest in activities you used to enjoy?" Respondents select from "Not at all" with a corresponding score of 0 to "Extremely" with a score of 4 on each of the 20 items on the measure. Scores are summed for a total score with possible scores ranging from 0–80 with higher scores indicating more severe PTSD symptoms. Studies of the clinical applicability of the measure have revealed that scores of 31–33 are associated with PTSD diagnosis (Bovin et al., 2016). The measure aligns well with the four-factor structure of PTSD as identified in the DSM-5, differentiating well between re-experiencing, avoidance, cognitive distortions, and hyperarousal symptoms. The PCL-5 displayed excellent internal consistency in the current study with Cronbach's α = .97.

### Depression

The Physical Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) is a 9-item Likert style scale that asks respondents how severely they have experienced symptoms of depression over the past 2 weeks. The nine items on the measure directly correspond to the DSM-5 symptoms of depression. Respondents are asked to rate how frequently they have felt symptoms of depression from 0 (not at all) to 3 (nearly every day). Total scores on the measure are summed from the nine items, resulting in a range from 0 to 27. Scores above 20 are qualitatively interpreted as "severe depression," scores from 5 to 9 can be qualitatively described as "mild depression," and scores from "10 to 15" can qualitatively be described as moderate depression. In subsequent analyses of the PHQ-9, researchers have found scores above 9 to be associated with major depressive disorder (MDD) diagnosis (Chagas et al., 2013; Urtasun et al., 2019). In this administration of the PHQ-9, it displayed good internal consistency with Cronbach's α = .91.

## PROCEDURE

This study was pre-registered with AsPredicted.org (#123559). After receiving Institutional Review Board (IRB) approval (#2203240094) from Alliant International University's IRB committee. Participants were recruited via multiple posts in online communities for active and veteran military personnel (e.g., Student Veterans of America, Iraq and Afghanistan Veterans of America, Marine Reconnaissance Foundation, and West Point alumni) on social media platforms (LinkedIn and Facebook). Twelve posts were made over a 2-month period on LinkedIn and Facebook. Posts garnered 1,883 reactions and 15 reposts on LinkedIn, and 17 likes, 7 comments, and 5 reposts on Facebook, but it was not possible to track response rates across these media. Qualtrics online survey software was used to gather anonymous responses from participants. The survey began after respondents provided informed consent and affirmed their eligibility to participate in the survey. Given the online data collection method, robust validity checks were used, including the use of items to assess military knowledge as recommended by Forkus and colleagues (2022), and atypicality, attention, and

consistency checks in accordance with best practices in online surveys (Abu Rus et al., 2020). Any respondent failing at least two of eight validity checks was not included in the final analysis. In total, 68 (23.7%) out of the initial 297 respondents who completed the survey were not included in the analysis due to failed validity checks or incomplete responses.

### DATA ANALYSIS

There is some debate regarding appropriate sample sizes in exploratory factor analysis with suggestions ranging from 3 participants per item evaluated to 20 participants per item evaluated (Mundfrom et al., 2005). However, more recent Monte-Carlo analyses suggest that when participant to item ratio exceeds six to one, the results of these analyses stabilize (Mundfrom et al., 2005). Assuming communalities from .4 to .7, a priori analysis suggested a minimum sample of 105 to analyze the 15 items on the IGRS-15s. To evaluate the factor structure of the IGRS-15s we used SPSS version 27 to conduct a principal axis factor analysis with an oblique (oblimin) rotation as factors within the scale were expected to be correlated based on both CMT and previous explorations of the IGRS-15s (Faccini et al., 2020; Gazzillo et al., 2018; Leonardi et al, 2022). To confirm the factor solution, we conducted scree-plot analysis and ran concurrent parallel analysis in which we compared mean eigenvalues of 100 datasets using 15 variables and 229 cases to the eigenvalues of each rotated factor described in principal axis factor analysis as described by O'Connor (2000). Finally, we conducted a confirmatory factor analysis to evaluate the fit of the four factor solution uncovered by the exploratory factor analysis. While some argue that conducting confirmatory factor analyses on the same sample as exploratory analyses is maximizing on chance and prone to overfitting (Lorenzo-Seva, 2022), others note it may be appropriate to do so after exploring factor structures in some samples (Choi, 2017). In evaluating the results of the four-factor model in confirmatory factor analysis, Chi Square divided by Degrees of Freedom (CMIN/DF) is considered adequate if < 3, Comparative Fit Index (CFI) is adequate if > .90, Tucker-Lewis Index (TLI; adequate if > .90), and Root Mean Square Error Approximation (RMSEA) which is considered adequate if < .08 (Dimitrov, 2012; Kline, 1998).

After a factor solution emerged, we checked associations with other measures of guilt, PTSD, and depression to establish convergent validity. To determine the sources of convergence between factors and measures of trauma-related guilt, PTSD, and depression, we conducted multiple regression analyses while controlling for time passed since traumatic experience and combat intensity to separately analyze the impacts of interpersonal guilt and trauma-related guilt. Finally, we used guidelines developed from research on the PCL-5 (Blevins et al., 2015) and PHQ-9 (Chagas et al., 2013; Kroenke et al., 2001; Urtasun et al., 2019) to dichotomize respondents into clinically relevant categories. For PTSD, we used a score of 33 as recommended by Blevins et al. (2015). For depression, we used a cutoff score of 10, which is associated with categorically "moderate" depression (Kroenke et al., 2001). After dichotomizing responses, we conducted receiver operating characteristic (ROC) curve analysis to determine whether certain scores on the IGRS-15s were associated with clinically significant responses on measures of depression and PTSD.

## RESULTS

### PRELIMINARY ANALYSIS

Table 2 (below) shows the results of the exploratory factor analysis conducted in the present study's sample of Post 9/11 veterans. For comparison, the results of Leonardi and colleagues (2022) for an English-speaking civilian sample are provided in parentheses. Individual item means ranged from scores of 2.18 (for item 1) to 3.28 (for item 15) with standard deviations ranging from 1.12 (for item 1) to 1.35 (for item 7). All item distributions were normal with no items displaying skewness of more than two or kurtosis values greater than seven, each of which can be cause for concern (Byrne & Van de Vijver, 2010). Bartlett's test of sphericity was significant ($\chi^2$ [105] = 1201.2, $p$ < .001) and the Keyser-Meyer- Olkin (KMO) test of sampling adequacy was .847, indicating that principal axis factor analysis was an appropriate method to evaluate the data.

Communalities ranged from .40 (for item 14) to .76 (for item 8) reflecting that all items were adequately accounted for by the factor solution. As noted, multiple methods of analysis were used to determine the factor solution. First, KMO principal axis factor analysis yielded a four-factor solution as depicted in Table 2 (below). Second, parallel analysis confirmed the four-factor solution as the eigenvalues described by the model exceeded the mean eigenvalues that emerged in the Monte-Carlo simulation (O'Connor, 2000). Third, a Scree-plot analysis also showed a four-factor solution with a significant reduction in the slope of the eigenvalue line after the fourth factor. Finally, confirmatory factor analysis of the four-factor solution revealed a good fit to the data. Fit indices displayed strong properties with CMIN/DF = 1.61, p < .001, TLI = .94, CFI = .96, and RMSEA = .05.

| FACTOR | ITEM # | TEXT | SURVIVOR GUILT | SELF-HATE | OMNIPOTENCE (D/S) | OMNIPOTENCE (R) |
|---|---|---|---|---|---|---|
| Survivor guilt | 7 | The idea of being envied makes me uncomfortable | **.61 (.53)** | .17 (.10) | .22 (.11) | .22 (.27) |
| | 2 | I feel uncomfortable feeling better off than other people | **.64 (.57)** | .37 (.25) | .27 (.11) | .21 (.27) |
| | 4 | I feel uncomfortable when I believe I am better than others | **.67 (.65)** | .37 (.19) | .26 (.14) | .36 (.38) |
| | 12 | I conceal or minimize my successes out of concern for making less successful people feel bad | **.60 (.57)** | .34 (.30) | .25 (.25) | .43 (.43) |
| | 15 | I feel uncomfortable when I receive better treatment that others | **.71 (.66)** | .17 (.27) | .18 (.32) | .27 (.35) |
| Self-hate | 1 | I believe that if other people really know me, they would want nothing to do with me | .32 (.26) | **.78 (.84)** | .25 (.10) | .21 (.24) |
| | 11 | I do not deserve to be happy | .37 (.33) | **.80 (.69)** | .38 (.13) | .28 (.33) |
| | 6 | I believe I have tricked others into liking me | .21 (.20) | **.70 (.68)** | .32 (.11) | .38 (.34) |
| Omnipotence (disloyalty/ separation) | 13 | I would feel bad if I doubted about the values and beliefs of my family | .33 (.16) | .30 (.08) | **.38 (.61)** | .07 (.23) |
| | 8 | I feel I should visit my parents as often as they wish | .22 (.20) | .21 (.03) | **.89 (.69)** | .27 (.31) |
| | 14 | I think I should not separate from loved ones because this would be hurtful, disloyal, or make them feel abandoned | .39 (.29) | .34 (.15) | **.39 (.62)** | .27 (.31) |
| | 10 | I tend to put aside my interests, needs, and passions to take care of other people | .30 (.20) | .44 (.15) | **.68 (.72)** | .31 (.36) |
| Omnipotence (responsibility) | 9 | I feel overly responsible for other people's wellbeing | .42 (.43) | .32 (.32) | .40 (.46) | **.77 (.77)** |
| | 3 | I feel it is my responsibility to fix other people's problems | .35 (.37) | .32 (.27) | .26 (.27) | **.73 (.70)** |
| | 5 | I feel selfish and insensitive if I am not the person who takes care of other people | .52 (.51) | .58 (.39) | .30 (.26) | **.62 (.59)** |

**Table 2** Item Composition and Factor Structure of the Four-Factor IGRS-15s in a Study of English-Speaking Civilians (Leonardi et al., 2022) and in the Current Sample of US Active Duty and Veteran Military Members (N = 229).

*Note*. Omnipotence (D/S) = Omnipotence (Disloyalty/Separation) subscale of IGRS-15s; Omnipotence I = Omnipotence (Responsibility) subscale of the IGRS-15s. Loadings in bold are loaded highest onto that subscale/factor. Loadings listed first, i.e., *.NN*, are item loadings found in the current study. Loadings listed second and in parentheses, i.e. (*.NN*), are item loadings from Leonardi et al., (2022).

## FACTOR STRUCTURE

As Table 3 displays, the results of the present analysis do not lead to the decision to condense Omnipotence to a single factor and reduce the structure from four factors to three in congruence with the findings of Leonardi and colleagues (2022). Subscale intercorrelations were more modest in the present sample, ranging from $r$ = .44 to $r$ = .47. Further, each of the four subscales displayed uniformly better internal consistencies in the current sample than it had in previous studies of Italian citizens.

Therefore, hypothesis 1 was supported. In accordance with previous studies of English-speaking samples (Leonardi et al., 2022), a four-factor solution emerged in which the single factor of omnipotence from the Gazzillo et al. (2018) study was separated into two distinct subscales based on its components: omnipotence (disloyalty/separation) and omnipotence (responsibility). Of note, Tucker Congruence Coefficients, a measure of metric invariance, displayed strong associations between the analyses in this study and those of other English-speaking respondents in Leonardi and colleagues' (2022) research. Congruence coefficients were $r_c$ = .89, $p$ < .001 for the self-hate factor, $r_c$ = .96, $p$ < .001 for the survivor guilt factor, $r_c$ = .75, $p$ < .001 for the omnipotence

(disloyalty/separation) factor, and $r_c$ = .98, $p$ < .001 for the omnipotence responsibility factor.

In total, the factor solution accounted for 50.4% of the variance in the items. Survivor guilt accounted for 31.5%, self-hate accounted for 7.8%, omnipotence (disloyalty/separation) accounted for 6.4%, and omnipotence (responsibility) accounted for 4.7% of the variance in items on the measure. Of note, item 5 (caretaking of others is morally critical) and Item 14 (separating from loved ones harms them) loaded on multiple factors, while item 13 (doubting values and beliefs of family) loaded on omnipotence (disloyalty/separation) as expected (.380) but failed to load on any factor greater than .40.

Table 4 presents the correlations between each IGRS-15s factor, the IGRS-15s and measures of trauma-related guilt, PTSD, and depression. As posited in hypotheses 2 and 3, IGRS-15s and its factors were significantly associated with TRGI scores PTSD severity, and depression scores. However, while all correlations met criteria for significance, the self-hate factor had stronger correlations to TGRI, PHQ-9 and PCL-5 than did other factors ($z$'s > 4.18, $p$ < .001).

Hypothesis 4 was partially supported. After controlling for time since traumatic experience and combat intensity, multiple regression results showed that only the self-hate subscale was significantly related to PHQ-9 (β = .467, $p$ < .001), PCL-5 (β = .408, $p$ < .001) and TRGI scores (β = .460, $p$ < .001). In these analyses, time since traumatic experiences was not associated with PCL-5, PHQ-9, or TRGI scores. However, combat intensity was an important predictor of these outcomes and uniquely accounted for 5.8% of the variance in PHQ-9 scores (β = .256, $p$ < .001), 13.5% of the variance in PCL-5 scores (β = .394, $p$ < .001), and 9.0% of the variance in TRGI scores (β = .321, $p$ < .001). By contrast, the self-hate subscale uniquely accounted for 14.3% of

| FACTOR | $\alpha^a$ | $\alpha^b$ | $\alpha^c$ | SURVIVOR | O (D/S) | O (R) | SELF-HATE |
|---|---|---|---|---|---|---|---|
| Survivor guilt | .76 | .75 | .78 | 1 | | | |
| Omnipotence (disloyalty) | .57 | .73 | .69 | .40 | 1 | | |
| Omnipotence (responsibility) | .64 | .72 | .72 | .44 | .40 | 1 | |
| Self-hate | .68 | .76 | .81 | .44 | .45 | .47 | 1 |

**Table 3** Internal Consistencies of Four-Factor Solution in Previous Study of Italian Citizens (Gazzillo et al., 2018), English-Speaking Civilians (Leonardi et al., 2022), and Subscale Intercorrelations in Current Sample of US Post 9/11 Veterans.

*Note*. O (D/S) = Omnipotence (Disloyalty/Separation); O (R) = Omnipotence (Responsibility). All correlations were significant at the $p$ < .001 level.

$\alpha^a$ = Cronbach's alpha for IGRS-15s in Gazzillo et al., 2018.

$\alpha^b$ = Cronbach's alpha for IGRS-15s in Leonardi et al., 2022.

$\alpha^c$ = Cronbach's alpha for IGRS-15s in the present study.

| | SELF-HATE | SURVIVOR | OMNI (D) | OMNI (R) | IGRS | TRGI | PCL-5 | PHQ-9 |
|---|---|---|---|---|---|---|---|---|
| Self-hate | 1.00 | | | | | | | |
| Survivor | .44 | 1.00 | | | | | | |
| Omni (D) | .45 | .40 | 1.00 | | | | | |
| Omni (R) | .47 | .44 | .40 | 1.00 | | | | |
| IGRS | .79 | .80 | .74 | .69 | 1.00 | | | |
| TRGI | .61 | .33 | .37 | .21 | .51 | 1.00 | | |
| PCL-5 | .59 | .33 | .31 | .26 | .50 | .69 | 1.00 | |
| PHQ-9 | .56 | .28 | .24 | .21 | .43 | .58 | .85 | 1.00 |

**Table 4** Correlations Between IGRS-15s Total and Factor Scores with Other Measures.

*Note*. All correlations were significant at the $p$ < .001 level. Omni (D) = Omnipotence (Disloyalty/Separation) subscale of the IGRS-15s; Omni (R) = Omnipotence (Responsibility) subscale of the IGRS-15s; IGRS = IGRS-15s total score; TRGI = Trauma-Related Guilt Inventory (TRGI; Kubany et al., 1996); PCL-5 = PTSD Checklist for DSM-5 (Blevins et al., 2015); PHQ-9 = Patient Health Questionnaire, 9-Item version (Kroenke et al., 2001).

the variance in depression scores, 10.9% of the variance in PTSD severity, and 13.8% of the variance in trauma-related guilt scores.

Given the correlations between PTSD severity, depression scores, and both types of guilt, we conducted multiple regression analyses to understand whether the TRGI and IGRS-15s measures the same or different elements of guilt by including both as predictors of PTSD severity and depression scores. Both interpersonal and trauma-related guilt accounted for unique variance in PTSD severity with IGRS-15s scores ($\beta = .203$, $p < .001$) explaining 3.0% of the variance, and TRGI scores ($\beta = .589$, $p < .001$) explaining 25.6% of the variance in PCL-5 scores. Similarly, both types of guilt accounted for unique variance in depression scores with IGRS-15s scores ($\beta = .176$, $p < .01$) explaining 2.3% of the variance, and with TRGI scores ($\beta = .494$, $p < .001$) explaining 17.9% of the variance in PHQ-9 scores.

### RECEIVER OPERATING CHARACTERISTIC CURVE ANALYSIS

As clinically significant scores exist on both the PCL-5 and the PHQ-9, we expected to find distinct scores on the IGRS-15s that aligned with clinically significant results on these measures in accordance with hypothesis 5. However, after running the analysis, we found a modest Area Under the Curve (AUC) of .71 and noted that scores of 41 on the IGRS were associated with a sensitivity of 69.2% (true positive rate) and a specificity of 61.6% (true negative rate) of scoring 33 or higher on the PCL-5. We also noted a modest AUC of .69 and found that scores of 41 on the IGRS-15s were associated with 64.4% sensitivity (true positive rate) and 60.6% specificity (true negative rate) of scoring 10 or higher (at least "moderate depression") on the PHQ-9. While these results are not impressive, the unexpectedly uniform result for both measures suggests that scores of 41 on the IGRS-15s have some relevance to symptoms of psychopathology. Given the results of hypothesis 4, we conducted another ROC analysis using the Self-Hate subscale alone to distinguish between those with clinically significant scores on the PCL-5 and PHQ-9. However, the results of the analysis were not meaningfully different than those for the entire IGRS-15s. Table 5 displays the distribution of PTSD severity and depression scores reported by participants, categorized by levels of severity.

| PCL-5 SCORE | N (%) | PHQ-9 SCORE | N (%) |
|---|---|---|---|
| >60 | 26 (10.9%) | Severe (20–27) | 22 (9.6%) |
| 46–60 | 22 (9.2%) | Moderately Severe (15–19) | 32 (14.0%) |
| 31–45 | 54 (23.7%) | Moderate (10–14) | 53 (28.4%) |
| 16–30 | 45 (19.7%) | Mild (5–9) | 47 (20.5%) |
| 0–15 | 82 (36.2%) | None (0–4) | 75 (32.8%) |

**Table 5** Sample (N = 229) Distribution of PCL-5 and PHQ-9 Scores by Symptom Severity Level.

*Note*. PTSD Checklist for DSM-5 (PCL-5) Score ranges were derived from the mean (15.42) and standard deviations (14.72) noted in Blevins and colleagues' (2015) analysis of the PCL-5. PHQ-9 severity categories were generated based on those described by Kroenke (2001).

## DISCUSSION

In deciding to keep the four-factor structure of the IGRS-15s in the current sample, we noted several differences between this study and prior research. In a sample of Italian civilians, Gazzillo and colleagues (2018) also found a four-factor structure to the IGRS-15s but found weak psychometric properties when applying their data to the factor structure in factor analysis. The researchers noted high subscale intercorrelations, low subscale internal consistencies, and only modest model fit in confirmatory factor analysis. Therefore, the authors revised the model into a three-factor solution, which provided stronger psychometric results including improved reliability (Gazzillo et al., 2018). The factor intercorrelations in Gazzillo and colleagues' (2018) four-factor model were higher than those obtained in this sample. This suggests that in the Gazzillo sample the four-factor model created constructs that were too congruous, potentially creating item loading issues.

However, in the current study's sample, factor intercorrelations were more modest and did not suggest issues with item loading. In addition, factor internal consistencies in this study's four-factor solution were stronger than in the IGRS-15s' initial investigation, suggesting greater coherence between items in each construct. Finally, multiple sources of analysis (KMO principal axis factor, Scree-plot, and parallel analysis) verified that the four-factor model for our sample was appropriate. In a prior study of English-speaking respondents, the IGRS-15s displayed similar results to those found in the current study with a four-factor structure and all items loading onto expected factors (Leonardi et al., 2022). There was also considerable agreement in item-factor construction between the studies as shown by Tucker Congruence Coefficients ranging from .75 for the omnipotence (disloyalty/separation) subscale to .98 for the omnipotence (responsibility) subscale.

Unlike previous studies of Italian citizens, respondents in our sample clearly differentiated between the disloyalty/separation and responsibility forms of omnipotence guilt as they had in Leonardi and colleagues' (2022) research.

However, it may be too simplistic to conclude that English-speaking individuals or US military personnel and veterans more clearly differentiated between omnipotence (disloyalty/separation) and omnipotence (responsibility) than previous samples. Most (4 out of 5) of the items on the omnipotence (disloyalty/separation) subscale are focused on questions about the family while the items on the omnipotence (responsibility) scale do not distinguish whether the responsibility in question is to the family or others. Given the impetus placed on leadership and personal responsibility in US military training and culture (Hall et al., 2012; Wong et al., 2003), current and former military personnel may be more likely to assume the omnipotence (responsibility) questions are asking about work. The Italian civilians in the previous studies, on the other hand, may have been as likely to conclude that the questions referred to their responsibilities to their families as they were to refer to work, which may have resulted in the convergence of these factors in that population. Another possibility is that due to the training and culture of the US military. Omnipotence (responsibility) items—which had been crafted to elicit pathological aspects of guilt—were uprooted from their original intent by the positive reframing of responsibility to others in military contexts.

Despite using quite dissimilar samples (earlier studies were performed using samples of predominantly Italian college students or citizens of the UK), the measure performed in the current study quite similarly to previous explorations of the IGRS-15s. Every item continued to load on its factor (or subfactor in the case of omnipotence in the three-factor model). Feeling selfish if one does not take care of others (as presented in item 5) did not clearly load onto any one factor in this sample. Rather, it loaded on every factor except survivor guilt. However, in accordance with previous findings (Leonardi et al., 2022), it loaded most strongly onto omnipotence (responsibility).

A single factor, self-hate contributed greatly to the IGRS-15s' associations with PTSD severity, depression scores, and levels of trauma-related guilt. Of note, self-hate was more closely related to both PTSD severity and depression scores than it was to the other guilt subscales within the IGRS-15s. While it may be the case that the self-hate scale's associations with other constructs are due to guilt, it may also be the case that self-hate elicits more than a respondent's levels of guilt. For example, items on the self-hate scale: "I do not deserve to be happy," "I believe I have tricked others into liking me," and "I believe if people really knew me they would want nothing to do with me," may be more closely related to disparaging self-thoughts about intrinsic qualities than they are to guilt and appraisals. The self-hate scale may be more clearly associated with guilt by adding a few words to each item. For example, amending item 1 to "If people knew my secrets/misdeeds/actions, then they would want nothing to do with me" may tie the item to specific thoughts or actions. Doing so may enable the item to differentiate between guilt and depression more clearly.

When both the IGRS-15s and the TRGI are entered as predictors of PTSD severity and depression scores, each guilt measure contributes uniquely to the variance in outcomes. However, when the self-hate scale is removed from the IGRS-15s and the same analysis is conducted, only the TRGI contributes to variance in PTSD severity and depression scores. One possible explanation for these results is that the measures evaluate distinct types of guilt. Another possible explanation could be that self-hate is highly confounded with depression and may be better understood as a measure of depression than guilt as seen in the strong association between the scale and pathologies.

In terms of validity, the IGRS-15s was related to other measures of guilt, PTSD, and depression in the current study. The association between the IGRS-15s and trauma-related guilt as measured by the TRGI (Kubany et al., 1996) was strong, but not extreme. This suggests that while both constructs measure a similar phenomenon, they do not evaluate an identical concept. The divergence between the two guilt scales was not unexpected, as the TRGI focuses on guilt cognitions that emerge because of trauma, while the IGRS-15s seeks to establish how guilt impacts relationships with others. Though there is significant overlap between the two measures, the data showed that they are clearly distinct. It also may be that the temporal placement of guilt in the questionnaires—related to past trauma for TRGI and related to present relationships with the IGRS-15s—is an important component that distinguishes the two scales from one another. Another possibility, especially given the strong relationship between the self-hate scale of the IGRS-15s, PTSD severity, and depression symptoms is that the IGRS-15s focuses on more pernicious negative self-appraisals than the TRGI. Due to this and the temporal placement of guilt in the questionnaires, it may be that the TRGI captures elements of guilt that are tied to a specific event (military trauma in this case), while the IGRS-15s uncovers a respondent's guilt or feelings of guilt involving interactions with close others.

While the IGRS-15s performed nearly as it had in previous studies, some differences emerged in addition to item 5 cross-loading on three factors. Regression analysis showed that most of the IGRS-15s' association with psychopathologies (PTSD and depression symptoms) was due to the self-hate factor alone. While previous studies have found that self-hate is associated with personality pathology, no associations were made between specific pathologies and the subscale (Faccini et al., 2020; Gazzillo

et al., 2018; Leonardi et al., 2022). The results of the present analysis also revealed that self-hate accounted for the IGRS-15s' association with the frequently utilized TRGI. Since the self-hate subscale accounts for most of the variance in explorations of the IGRS-15s' validity, it may be that the other items contribute little to the explanation of psychopathologies involving guilt. More research may be needed to identify whether the results of this study are unique or whether the self-hate items alone are responsible for the IGRS-15s' relationship to measures of PTSD, depression, and trauma-related guilt. If the self-hate scale is indeed the primary link to other measures of guilt, PTSD, and depression, the IGRS-15s may be amended to improve its utility and applicability in military-affiliated communities.

The ROC curve analysis, which had been intended to identify scores on the IGRS-15s that were associated with clinically significant levels of PTSD and depression, provided lackluster results. While scores of 41 on the IGRS-15s were associated with clinically significant scores on measures of PTSD and depression, low sensitivity and specificity values limit confidence in this result. Given the high number of false positives and false negatives in finding clinically significant scores on PTSD and depression, it appears that this analysis provides limited accuracy and should be applied with caution in practice. It is possible that the relatively modest correlations between the IGRS-15s and scales of PTSD and depression impacted the IGRS-15s' ability to accurately distinguish between clinically significant and non-significant results on these measures of psychopathology.

## LIMITATIONS

This study was limited by numerous factors. First, it employed an online survey methodology that is subject to many issues. Self-report measures such as online surveys are subject to over or under-reporting, social desirability, misunderstood questions/processes, inadequate attention, and self-preservative responses. We attempted to mitigate the problems associated with this recruitment method with robust validity checks, but we cannot be certain of their efficacy in all cases. Second, this sample had a higher proportion of Marines and fewer personnel who served in the Army and was underrepresentative of Black and Latinx military members and overrepresentative of high-ranking personnel. As such, the sample's characteristics may limit the study's generalizability. Third, the findings regarding PTSD severity based on the PCL-5 depend upon the respondent's definition of trauma, as participants were asked to recall the traumatic experience that most impacted them today. It is possible that the "most traumatic experience" respondents were asked to consider during the survey would not have met the DSM-5 (American Psychological Association, 2013) Criterion A for PTSD diagnosis. However, some have noted the limitations of that criterion and that allowing individualized cutoffs for posttraumatic symptoms based on personal trauma meaning may be a more reliable way to define trauma and therefore appropriate in research (Dalenberg et al., 2017). Finally, this study only queried respondents for their binary (male of female) sex assigned at birth and expressed at the time of their active service. Limited sex and gender options may have influenced responses or the nature of those who participated in the study (Cameron & Stinson, 2019).

Future research with the IGRS-15s is needed that addresses these issues. In addition, future studies may benefit from inclusion of potential contributory factors for interpersonal guilt. For example, personality traits, such as agreeableness and neuroticism have been linked to guilt (Muris & Meesters, 2014). It is possible that interpersonal guilt, as defined by the IGRS-15s, is also associated with agreeableness, neuroticism, and with core self-evaluations such as self-esteem, and self-efficacy. Future research may explore whether the findings of this study were due to the unique contributions of interpersonal guilt, or rather it is general neuroticism or other personality and core self-evaluations that are related to interpersonal guilt that contribute to findings such as those noted in this research. Future studies may compare the three-factor structure found in the Italian sample to the four-factor structure that emerged in English-language samples using confirmatory factor analysis. However, the IGRS-15s is readily available in its English-language version (Leonardi et al., 2022) and its factor structure has been explored in both civilian and military cultural contexts.

This research is the first to evaluate the IGRS-15s in US military personnel and veterans. The scale took on slightly different characteristics than it had in previous studies of Italian citizens (Faccini et al., 2020; Gazzillo et al., 2018), but displayed similar results to studies of other English-speaking respondents (Leonardi et al., 2022). Additionally, the IGRS-15s was strongly, but not extremely, correlated with the TRGI, a prominent measure of guilt often used in US military affiliated communities. This suggests that the two conceptualizations of guilt have key similarities, but also important differences. Since guilt is a defining characteristic of two common and troubling psychiatric morbidities associated with military service and combat deployment (McCue et al., 2021; Na, Schnurr, & Pietrzak, 2023), it is important that we broaden our understanding of guilt and how it impacts the wellbeing of service members and veterans. The IGRS-15s can be a succinct and useful

tool in helping clinicians and researchers understand the different ways that guilt can present in these communities, ultimately leading to improved mental health services for these individuals.

## COMPETING INTERESTS

The authors have no competing interests to declare.

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