The Relationship between Moral Injury Appraisals, Trauma Exposure, and Mental Health in Refugees

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Abstract

Background

Refugees are often exposed to multiple traumatic experiences, leading to elevated rates of psychological disorders. There is emerging evidence that appraisals of traumatic events as violating deeply held moral beliefs and frameworks (i.e., moral injury) impact negatively on refugee mental health. Despite this, no research has systematically investigated moral injury appraisals in refugees.

Method

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Participants were 222 refugees from diverse backgrounds who had recently resettled in Australia. They completed measures of mental health in Arabic, Farsi, Tamil, or English through an online survey. This study first investigated the factor structure of the Moral Injury Appraisals Scale (MIAS), and then examined the relationship between the moral injury factors and key predictor (age, gender, trauma exposure) and outcome (Post-traumatic stress disorder [PTSD] symptom clusters, anger, depression) variables.

Results

Confirmatory factor analyses of the MIAS supported a two-factor model, comprising a Moral Injury-Other factor (i.e., interpreting the violation as being enacted by others) and a Moral Injury-Self factor (i.e., interpreting the violation as being enacted by oneself). Structural equation modelling analyses indicated that both factors were predicted by higher trauma exposure, and both predicted more severe anger and depression. Notably, while Moral Injury-Other was associated with more severe posttraumatic stress disorder, Moral Injury-Self was associated with lower levels of intrusions.

Conclusion

These results suggest that there may be sub-types of moral injury appraisals that are associated with different mental health outcomes. These findings have potential implications for designing treatments that address the psychological impact of the refugee experience.

Introduction

Refugees are typically exposed to multiple traumatic events (Porter & Haslam, 2005; Silove, Sinnerbrink, Field, Manicavasagar, & Steel, 1997), and accordingly elevated rates of posttraumatic stress disorder (PTSD) have been documented in forcibly-displaced and conflict-affected groups (Steel et al., 2009). While PTSD has traditionally been conceptualized as a fear-based disorder (Foa et al., 1989; Mahan & Ressler, 2012; Steel et al., 2009), many refugees are exposed to events which elicit strong emotional reactions, where life threat or physical safety may not be the primary concern (Silove et al., 2009; Stein, 1981; Stotz, et al., 2015; Wilson et al., 2006). For example, a refugee may leave family members behind when fleeing persecution, leading to feelings of guilt and sadness; or be forced to watch as sacred religious objects are defiled, eliciting feelings of anger. In such cases, distress may arise from cognitive appraisals of these events as violating basic moral expectations, rather than appraisals about the life-threatening aspects of the event.

Models of PTSD have proposed that the way a traumatic event is appraised has an important role in the development and maintenance of PTSD symptoms (Ehlers and Clark, 2000; Foa & Rothbaum, 1998). This has been supported by studies that have showed the association between negative appraisals and higher psychopathology, such as PTSD and depression in non-refugees (Beck et al., 2004; Bryant & Guthrie, 2005; Bryant, Salmon, Sinclair, & Davidson, 2007; LoSavio, Dillon, & Resick, 2017; O'Donnell, Elliott, Wolfgang & Creamer, 2007; Spinhoven, Penninx, Krempeniou, van Hemert, & Elzinga, 2015). While these appraisals may reflect rapid data-driven processes as well as conscious, elaborate processes (Halligan, Michael, Clark, & Ehlers, 2003), research has shown that reductions in conscious negative appraisals in treatment have been associated with reduced symptoms (Cooper, Zoellner, Roy-Byrne, Mavissakalian, & Feeny, 2017; Gobin et al., 2017; Kleim,

Ehlers, & Glucksman, 2012). Therefore, understanding these appraisals will have important treatment implications; however, little is known about how particular appraisals of traumatic events relate to different psychological responses in refugees.

One potential framework that may be useful for understanding this aspect of refugee experience is moral injury. Moral injury has been described as ‘the lasting psychological, biological, spiritual, behavioral, and social impact of perpetrating, failing to prevent, or bearing witness to acts that transgress deeply held moral beliefs and expectations’ (Litz et al., 2009, p. 697). This construct was borne out of the military context, and was developed to describe the reactions of servicemen to the moral and ethical challenges of warfare (i.e., killing). When behaviors are unable to be incorporated into the soldier’s existing moral framework, this can lead to ongoing distress with significant negative long-term consequences for mental health (Drescher et al., 2011; Gray et al., 2012; Litz et al., 2009; Nash et al., 2013).

Refugees also often face fundamental challenges to moral frameworks; therefore, moral injury may be a helpful construct for understanding the impact of these experiences on mental health. Similar to individuals in the military who are deployed in active duty, refugees live and work in places where there is ongoing instability, unrest and violence, and often must make choices that have impacts on whether people live or die. Both groups are also often exposed to multiple traumatic events, with evidence showing there is a dose-dependent relationship between traumatic experiences and increased psychopathology in both military and refugee samples (Clancy et al., 2006; Mollica et al., 1998; Mollica, McInnes, Poole, & Tor, 1998). Additionally, strong moral frameworks are a distinct aspect of military and refugee experiences. For example, the military cultivates a ‘warrior ethos’ instilled through training (Litz et al., 2009, pg. 3), whereas refugees flee situations where they feel threatened

for political, racial, religious and moral reasons (UN General Assembly, 1951). This may make both groups particularly susceptible to moral injury.

We propose that there are two types of moral injury that may arise from the refugee experience similar to what is experienced in the military but with different contexts: moral injury appraisals about the actions of others (MI-Other) and moral injury appraisals about one's own actions (MI-Self). When a transgressive act by another is evaluated as a violation of one's deeply held beliefs, a MI-Other appraisal is made. For example, torture or sexual assault are interpersonal acts where the perpetrator may be viewed as committing not only a physical violation, but a moral violation as well (Ekblad et al., 2002; Miller, 2009; Silove et al., 2009). The only research conducted examining moral injury in refugees to date has focused on MI-Other appraisals. In a study of tortured refugees, participants who appraised traumatic events committed by others as transgressing important moral frameworks reported higher levels of PTSD, anger, and depression, as well as lower mental health-related quality of life (Nickerson et al., 2015).

Conversely, when an action originating from the self is evaluated as violating one's deeply held beliefs, a MI-Self appraisal is made. Refugees may have been forced to act in ways that are inconsistent with their moral beliefs to ensure their own and others' safety in contexts of oppression and persecution. For example, torture survivors may feel shame at being forced to betray others, or for committing humiliating or morally repugnant acts (Wilson et al., 2006). While the mental health impact of MI-Self has not been previously investigated with refugees, there is evidence that greater trauma exposure is associated with higher levels of shame and guilt in refugees (Stotz et al., 2015), and that forced perpetration leads to worse psychosocial adjustment in child soldiers (Betancourt et al., 2010). There is a

need, however, for research that specifically examines the differential mental health impact of MI-Other and MI-Self appraisals in refugees.

A major obstacle preventing the progression of research investigating moral injury in refugees is a lack of optimal measurement of the construct. Three previous studies have examined the factor structure of morally injurious experiences in the military, with two separate scales. Investigation of Currier and colleagues' (2015) Moral Injury Questionnaire (MIQ) found a single factor over six items that reflected different emotional outcomes relating to moral injury (e.g. feeling guilt, shame, betrayed). Nash et al. (2013) investigated the Morally Injurious Events Scale (MIES), identifying two factors: transgressions (which included MI-Other and MI-Self related items) and betrayal (related to institutional betrayal within the military). This scale was further validated by Bryan et al. (2015), who found evidence for three factors over two military samples: transgressions by others (including MI-Other items), transgressions by self (including MI-Self items), and betrayal. Moreover Bryan and colleagues (2015) found that each factor had distinct associations with psychopathology, such that transgressions by others and betrayal were both associated with higher PTSD, while there was no association between transgressions by the self and PTSD. Additionally, elevated anger was associated with transgressions by self and betrayal but not transgressions by others. Therefore, different types of moral injury may be associated with distinct psychological outcomes.

For this study, we developed the Moral Injury Appraisals Scale (MIAS), an 11-item measure indexing the extent to which an individual had experienced events that transgressed their basic morals and values. This scale was an expanded version of the six-item scale used in a previous study with tortured refugees (Nickerson et al., 2015), which comprised items derived from the MIES (Nash et al., 2013). While the earlier version of the scale only

indexed MI-Other appraisals, the MIAS also included five items measuring MI-Self appraisals. Further, the MIAS included two items relating to betrayal, in keeping with evidence from the military that betrayal is an important aspect of moral injury (Bryan et al., 2015; Nash et al., 2013). However, items from the MIES and the MIQ focus on institutional betrayal (e.g. “I feel betrayed by leaders I once trusted,”), thus reflecting moral injury appraisals that are other-oriented, with no items indexing appraisals that one has betrayed others. As this type of appraisal has clinical relevance in refugees (e.g. feeling you betrayed community members by leaving behind a loved one), we included two betrayal items in the MIAS in this study: one that was related to betrayal by others and one related to betrayal by self.

The current study aimed to examine the factor structure of the MIAS and investigate the association between moral injury appraisals and mental health outcomes. Consistent with Bryan et al., (2015) the MIAS has two subscales relating to appraisals of transgression, namely MI-Self and MI-Other. In regards to betrayal, as it did not make theoretical sense that the competing directions of the two betrayal items would load onto a single factor, they were split to load separately on MI-Other and MI-Self factors. Nickerson et al. (2011) found that MI-Other appraisals predicted higher levels of all PTSD symptom clusters, anger and depression. As MI-Self has not yet been investigated in refugees, we relied on studies in military samples (Bryan et al., 2015; Fontana et al., 1992) which have suggested that transgressions by self are associated with higher levels of depression and anger. In regards of PTSD, the DSM-5 symptom cluster negative alterations in cognitions and mood (Cluster D) encapsulates non fear-related emotions (i.e. anger, guilt, shame). As feelings of guilt and shame have been thought to strongly associated with MI-Self appraisals (Jinkerson, 2016), the association between this appraisal type and symptom cluster D, may be stronger than the

association between MI-Self and other PTSD symptom clusters which are more related to fear and arousal responses. This is supported by Fontana and colleagues (1992) who found that traumas involving personal responsibility in military combat settings were more associated with feelings of guilt, but less associated with intrusion and hyperarousal symptoms, compared to traumas of low personal responsibility. Additionally, Bryan and colleagues (2015) found lack of an association between transgressions by self and PTSD symptoms according to DSM-IV criteria, which does not include negative alterations in cognitions and mood.

Therefore, we hypothesized a two-factor solution for the MIAS: MI-Self and MI-Other. We hypothesized that increased MI-Other appraisals would predict higher levels of all PTSD symptom clusters, anger and depression, and that MI-Self appraisals would also be associated with higher levels of depression and anger. Finally, we hypothesized that MI-Self would be associated with the PTSD symptom cluster negative alterations in cognitions and mood (cluster D), but not with intrusions (cluster B), avoidance (cluster C) or alterations in arousal and reactivity (Cluster E).

Materials and Methods

Participants

Participants were 222 refugees and asylum-seekers residing in Australia. To be eligible for the study participants had to: a) be over 18 years of age, b) be a refugee or asylum seeker, and c) have arrived in Australia since January 2011. Participants also had to be able to complete the survey in one of the available languages (Tamil, Arabic, Farsi, and English) which were representative of over 75% of refugees and asylum-seeker arrivals in Australia since 2012 (Department of Immigration and Border Protection, 2013). Participants in this study had a mean age of 38.07 years ($SD = 12.91$, range 18 to 76), and comprised 102 men

(45.9%) and 110 women (49.6%), with 10 (4.5%) not specified. Participants completed the study in one of four languages (Arabic n=64 [28.8%], Farsi n=62 [27.9%], Tamil n=65 [29.3%], and English n=31 [14%]), and were from 16 different countries (Sri Lanka n=66 [29.7%]; Iran n=64 [28.8%]; Iraq n=63 [28.4%]; Other n=29 [13.1%]).

Measures

All measures used in the study were previously translated into the study languages and back-translated according to gold-standard World Health Organization (n.d.) recommendations.

Moral Injury Appraisals Scale

The Moral Injury Appraisals Scale (MIAS) is an eleven-item measure adapted from the Moral Injury Events Scale (Nash et al., 2013). It represents an expanded version of the Moral Injury Scale (Nickerson et al., 2015), encompassing MI-Other and MI-Self dimensions of moral injury. The MI-Other subscale encompasses six items measuring the extent to which the individual is distressed by others having committed acts that violate their morals (e.g. ‘I am troubled by morally wrong things done by other people’). The MI-Self subscale encompasses five items measuring the extent to which an individual is distressed by having committed acts that violate their own morals (e.g. ‘I am troubled because I acted against important rules’). All items are rated on a 4-point Likert scale in terms of how much participants agree with each of the statements (1 = not at all, to 4 = very much), with higher scores indicating greater distress associated with moral injury appraisals.

Harvard Trauma Questionnaire

The Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992) is a 16-item scale that measures traumatic events commonly experienced by refugees (Steel et al., 2009). We considered trauma exposure to represent any event that was experienced and/or witnessed. A

total count was then derived to reflect a trauma exposure with higher scores indicating exposure to more types of trauma events.

Posttraumatic Diagnostic Scale

The Posttraumatic Diagnostic Scale-5 (PDS-5; Foa et al., 2015), is a 20 item self-report scale with items corresponding to each of the four PTSD symptom clusters outlined in the DSM-5: intrusion symptoms (5 items), avoidance (2 items), negative alterations in cognitions and mood (7 items), and alterations in arousal and reactivity (6 items). The PDS-5 requires participants to rate how often symptoms have occurred over the past two weeks on a 4-point Likert scale (1 = not at all or only one time, to 4 = five or more times a week/almost always). In the current study, we calculated sum scores for each symptom cluster with higher scores indicating more severe symptomology.

Patient Health Questionnaire-9

The Patient Health Questionnaire (PHQ-9) is a nine-item, self-report questionnaire that assesses depression symptoms (Spitzer et al., 1999). The scale requires participants to indicate to what extent they have been bothered by symptoms of depression over the last two weeks. Symptoms are rated on a 4-point Likert scale (1 = not at all, to 4 = nearly every day), and a total sum score was derived to represent depression symptom severity, with higher scores indicating worse symptomology.

Dimensions of Anger Reactions-5

The Dimensions of Anger Reactions-5 (DAR-5) is a modified version of the original DAR scale (Novaco, 1975) and has been validated as a reliable screening tool of posttraumatic anger (Forbes et al., 2014). Each of the five items address a different dimension of anger experienced over the last 4 weeks, including frequency, intensity, duration, aggression, and interference with social functioning. Each item is rated on a 5-point Likert

scale (1 = none or almost none of the time, to 5 = all or almost all of the time). For the current study, a total sum score was derived, with higher scores indicating worse symptomology.

Procedure

Participants were recruited via advertisements placed at refugee services and through the study website. Potential participants were screened for eligibility, and then received an electronic link to the study in their preferred language. Written informed consent was obtained. The study was conducted online using the Key Survey-Version 8.6 software platform. Paper and pencil versions were also mailed to participants ($n = 80$ [36%]) who were unable to access the internet. The project was approved by the University of New South Wales, Human Research Ethics Committee (HC14106) and in accordance with the Helsinki Declaration of 1975, as revised in 2008.

Data Analysis

A missing values analysis was conducted, and Little's MCAR test (Little, 1988) revealed that variables were missing completely at random $\chi^2(6) = 3.667, p = .722$. For each variable, missing data was less than 10% of overall responses, except for the trauma variable (11.3% missing). Therefore, multiple imputation (Rubin, 1996) of the trauma variable was used to ensure that power to detect study effects was not reduced due to missing data. Consistent with contemporary guidelines, we generated 20 datasets (Bodner, 2008; Graham, Olchowski, & Gilreath, 2007), a number that has also been found to be reliable in estimating model fit in structural equation modelling with even high rates (30-40%) of missing data (Enders & Mansolf, 2016). Therefore, a robust maximum likelihood estimator (MLR) of covariance matrices was used during subsequent analyses, resulting in robust standard errors and chi-square test statistics.

Data was analyzed in two stages using Mplus-Version 7.4. In the first stage using a confirmatory factor analysis, an over-identified, two-factor model of moral injury was tested, where items 1-5 of the MIAS loaded onto a *Moral Injury-Other* factor (MI-Other), and items 6-11 loaded onto a *Moral Injury-Self* factor (MI-Self). The second stage of analysis involved structural equation modelling, investigating the association between the two moral injury factors, and key predictor and outcome variables. In the over-identified model, predicted outcomes (represented by observed variables) including the PTSD symptom clusters (intrusions, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity), anger, and depression, were regressed on the moral injury latent factors. The moral injury latent factors were also regressed onto exogenous predictor variables (also represented by observed variables) including: age, gender and trauma exposure. All PTSD symptom cluster variables, anger, and depression were also regressed on the trauma exposure variable to account for the associations between these variables unrelated to moral injury. The residuals of the two latent factors were also permitted to correlate. For both stages, goodness of fit was assessed as recommended by Hu & Bentler (1999), using both absolute and incremental fit indices.

Finally, exploratory analyses were conducted to investigate the association between moral injury appraisals and exposure to specific types of trauma. Mean scores for each appraisal subscale (MI-Other and MI-Self) were generated. T-tests were conducted to compare means between those who had and had not experienced each of the 16 trauma types indexed in the HTQ. Bonferroni corrections were applied for multiple comparisons.

Results

Trauma Exposure

Participants in this sample experienced a mean of 4.64 types of traumatic events ($SD=4.26$). The proportion of the sample that either experienced or witnessed each type of trauma event can be seen in Table 1.

Measurement Model

Initially, a confirmatory factor analysis of a two factor model of moral injury resulted in adequate fit: $\chi^2(43) = 93.721, p < .001$, RMSEA = .073, 90%CI (.053, .093), CFI = .961, TLI = .950, SRMR = 0.066. Standardized factor loadings revealed that most of items loaded well (i.e., >0.8) on their respective factors, with the exception of Item 5 (“I feel betrayed by people I trusted”) and Item 6 (“I betrayed people who trusted me.”) which evidenced weaker factor loadings (Item 5 = .42; Item 7 = .48). Following this, we removed these two items from the scale. The resulting model evidenced improved fit: $\chi^2(26) = 42.862, p = .02$, RMSEA = .054, 90%CI (.022, .082) CFI = .983, TLI = .977, SRMR = 0.037, with all statistics being within the bounds of the recommended cut-offs with the exception of χ^2 which was approaching .05. Thus, this measurement model was retained. Results indicated that the items were again loading well (i.e., > 0.8) onto each factor (Table 2). The correlation between factors was .391 and the final measurement model can be seen in Figure 1.

Structural Model

Next, structural equation modeling was used to investigate the association between the latent moral injury variables with theoretically important predictor (trauma exposure) and outcome (PTSD symptom clusters, depression, anger) variables. Age and gender were not included as covariates in this model because they showed relatively low correlations with all other variables ($<.16$). The model demonstrated good fit: $\chi^2(75) = 103.684, p = .016$, RMSEA = .042, CFI = .986, TLI = .978, SRMR = 0.026. All the statistics were within the bounds of the recommended cut-offs with the exception of χ^2 which was approaching .05, therefore the

model was retained. Effect sizes for the final model can be seen in Table 3. These are also illustrated in Figure 2, which presents significant paths with the exception of those between trauma exposure and outcome variables which were removed to aid interpretability of the figure.

The final model indicated that as trauma exposure increased, so did scores on the MI-Other and MI-Self factors (Figure 2). In addition, as MI-Other and MI-Self increased, so did symptoms of depression and anger. Finally, as MI-Other increased, so did PTSD symptoms. In contrast, there was a significant negative association between MI-Self and intrusion symptoms, such that high scores on MI-Self, were associated with lower levels of intrusive symptoms. Apart from this there were no other significant associations between MI-Self and PTSD symptom clusters. These results were all found while controlling for the (significant) direct effect of trauma exposure on outcome variables. We also used the final model to test for indirect effects, with significant results for trauma exposure on each of the outcomes via moral injury. Standardized total, direct, and indirect effects are displayed in Table 4.

Trauma Type and Moral Injury Appraisals

For specific types of trauma, exposure to forced isolation by others was significantly associated with greater MI-Other appraisals ($t(211) = -4.60, p < .001$), as was forced separation from family members ($t(212) = -3.14, p = .002$). MI-Self appraisals were significantly associated with exposure to forced isolation ($t(205) = -5.14, p < .001$), forced separation from family members ($t(215) = -4.81, p < .001$), and being close to death ($t(206) = -3.43, p = .001$). These associations remained significant after controlling for multiple comparisons. Results for all trauma variables can be seen in supplementary materials.

Discussion

This study represents the first investigation of Moral Injury-Other and Moral Injury-Self appraisals, and their association with mental health outcomes in traumatized refugees. Consistent with our hypothesis, findings supported a two-factor structure of the MIAS. This suggests that there are two distinct subtypes of moral injury appraisals that are salient for refugees, namely those related to moral violations by actions of others and by one's own actions. The identification of both moral injury factors is a novel finding, extending existing research with refugees that has been limited to examining MI-Other appraisals (Nickerson et al., 2015). This finding is broadly consistent with research conducted with military samples which have also typically identified separate factors relating to one's own and others' actions (Bryan et al., 2015; Currier et al., 2015; Nash et al., 2013). Taken together, these findings highlight the importance of distress relating to moral transgressions across a variety of trauma-affected populations, and provide the first evidence that MI-Self and MI-Other appraisals are salient for refugees.

It is notable that the two betrayal items that were initially included in the MIAS evidenced relatively low factor loadings, and were thus removed from the scale to improve model fit. This is inconsistent with previous research conducted with military samples that has highlighted the importance of betrayal-related experiences such as institutional betrayal and betrayal by fellow servicemen (Litz et al., 2009; Nash et al., 2013). One possible explanation for this finding is that the construct of betrayal is less relevant to the refugee context than for military samples. This is not in accordance with anecdotal reports from refugees which suggest that betrayal is a relatively common experience, such as feeling betrayed by the United Nations High Commissioner for Refugees (Hynes, 2009; Meffert et al., 2010). Accordingly, it is possible that betrayal may represent a component of moral injury for refugees that is distinct from, but related to MI-Self and MI-Other appraisals, as found

with active duty military/veterans (Bryan et al., 2015). A more comprehensive measurement of betrayal-related experiences with refugee samples is necessary to assess the relevance of this construct to the refugee experience of moral injury.

Findings from the current study support research by Nickerson et al. (2015) who found that MI-Other appraisals predicted outcomes such as PTSD, anger, depression and lower mental health quality of life amongst refugees. The current study builds on these findings to demonstrate that both MI-Other and MI-Self appraisals predict anger and depression in a diverse group of refugees consistent with what has been found in military samples (Bryan et al., 2015; Currier et al., 2015; Nash et al., 2013).

A surprising result in the current study was the differential association between MI-Other and MI-Self factors and PTSD symptom clusters. The finding that there was a positive association between MI-Other appraisals and PTSD symptoms is consistent with theoretical models that highlight the close relationship between PTSD symptoms and fear responses (Ehlers & Clark, 2000; Foa et al., 1989; Mahan & Ressler, 2012). It may be that events in which others actions are perceived as violating one's moral framework are more likely to also be those that involve life threat, and thus elicit greater fear reactions. Conversely, the lack of association between MI-Self appraisals and avoidance, alterations in arousal and reactivity, and negative alterations in cognitions and mood symptoms, may suggest that the appraisal that an individual has acted in a way that transgresses his or her own moral framework does not necessarily lead to particular symptoms of PTSD, which is consistent with some research in military samples (Bryan et al., 2015) but not others (Litz et al., 2009; Nash et al., 2013).

Additionally, in the current study, we found that MI-Self appraisals were associated with lower intrusion symptoms. Cognitive models of PTSD propose that intrusions are triggered by trauma-related stimuli due to poor elaboration of the memory during the trauma

experience (Ehlers & Clark, 2000), potentially from high levels of fear at the time of the trauma (Brewin et al., 1996). However, MI-Self appraisals may not be associated with strong fear reactions and subject to the same impairments in memory elaboration at the time of encoding. MI-Self appraisals may be associated with a greater perception of control over the event, with perceived control being thought to be associated with reduced fear responses (Foa et al., 1992). While this may suggest some protective elements of MI-Self on PTSD symptoms, it may have other detrimental outcomes, such as increased aggression, poor psychosocial adjustment and suicidality (Betancourt et al., 2010; Wainryb, 2011), consistent with the finding that MI-Self appraisals were associated with higher anger and depression. Understanding these distinctions will have important treatment implications. Existing treatments have been shown effective in reducing fear-based appraisals (Resick & Schnicke, 1992), but have been less effective in addressing morally-laden appraisals (Resick et al., 2008). This study suggests that moral injury appraisals, along with their outcomes, are not homogeneous, which will inform targets of treatment.

A second unexpected finding in this study was that MI-Self appraisals did not predict greater negative alterations in mood and cognitions (Cluster D) as hypothesized. This symptom cluster is newly constructed for the DSM-5 (Friedman, 2013) and comprises symptoms that appear to be conceptually related to moral injury, such as anger, guilt and shame. This cluster, however, has been controversial, as it is less consistently derived in factor analysis studies of PTSD symptoms, compared to the other three clusters (Friedman, Resick, Bryant, & Brewin, 2011). One proposal is that intrusions and arousal may represent a more biological fear-based response to trauma, whereas other symptoms may align more with culturally specific coping mechanisms (Marsella et al., 1996; McCall & Resick, 2003). While

sample size precluded the cross-cultural investigation of the associations examined in this study, this will be important to investigate further in moral injury research among refugees.

Another important consideration is that Cluster D of DSM-5 refers to exaggerated and distorted beliefs (American Psychiatric Association, 2013). However, in a moral injury context, appraisals may reflect an accurate interpretation of events. For example, a torture survivor may rightly appraise their physical abuse as a gross violation of moral beliefs. Interventions developed in military frameworks (Gray et al., 2012; Steinmetz and Grey, 2015), have tried to incorporate strategies that address accurate appraisals of traumatic events in their treatment of moral injury. In this framework, there have been attempts to distinguish moral pain from moral injury (Farnsworth, Drescher, Evans & Walser, 2017), in which moral pain reflects a natural response to a morally injurious event, and moral injury reflects a dysfunctional attempt to cope with moral pain. The MIAS indexed the appraisal of a morally injurious event and the extent to which the individual was distressed by this ("I am troubled by"). However, a limitation of the MIAS is that it does not distinguish between accurate or distorted appraisals. Nevertheless, results from this study, show that moral injury appraisals are associated with poor mental health outcomes, regardless of whether the appraisal is accurate or not. Future studies could investigate how appraisals can be distinguished as accurate or distorted, and if this distinction has a differential impact on psychopathology, which will then have intervention implications.

While the examination of the relationship between specific traumas and moral injury appraisal types is exploratory, some notable patterns emerged. Separation from community, whether that be family or isolation more broadly, was related to both types of moral injury appraisals. That separation may reflect an MI-Other appraisal through the removal of a moral right to social support and connectedness, but also an MI-Self appraisal through the inability

to protect or provide for members of the family/community, which may be perceived as a moral obligation. These types of traumas may also be particularly salient, as they can persist throughout the refugee experience, even years after settlement in a host country. Indeed research indicates that refugees often struggle with social exclusion and separation from family in host countries, and this can be a key predictor of mental health and wellbeing (Correa-Velez, Gifford, & Barnett, 2010; Rousseau, Mekki-Berrada, & Moreau, 2001). Post-migration living difficulties, which includes experiences of social isolation and loneliness, have also been found to contribute to refugee psychopathology (Nickerson, Bryant, Rosebrock, & Litz, 2014). Future studies will need to investigate further whether certain appraisal types are more strongly associated with particular forms of trauma exposure, and if moral injury appraisals can also occur outside of a trauma context such as in relation to post-migration living difficulties.

The current study had several limitations which should be noted. As there were a wide variety of cultural groups represented, not all measures had been validated for each group. In addition, the heterogeneity of the sample prohibited testing for measurement invariance across cultures for the MIAS. However, the finding that MIAS items were endorsed by participants from a range of ethnicities in this sample indicates that moral injury is a construct that may be relevant across a wide variety of cultures. Future studies should examine the extent to which this construct varies across cultural groups. Another limitation was that our study focused on conscious appraisals of morally injurious events. There may be unconscious, automatic processes that also play an important role in moral injury responses, which future research could investigate. Finally, in this study we did not include measures of non-fear emotional responses such as guilt and shame which precludes inferences about the association between MI-Other and MI-Self appraisals and specific emotional reactions.

Conclusion

In summary, this study demonstrated that moral injury appraisals contribute differentially to post-traumatic psychopathology, depending on whether the transgressive act is appraised as a violation by the actions of another, or by the actions of oneself. Therefore treatment will need to be tailored toward the distinct mechanisms underlying each type of appraisal in order to reduce the mental health impact of traumatic experiences in refugees.

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Tables

Table 1

Frequency of exposure to traumatic events by study participants (experienced and/or witnessed)

Trauma type	<i>n</i>	%
Lack of food or water	111	50.23
Being close to death	87	39.37

Ill health without access to medical care	87	39.37
Lack of shelter	86	38.91
Forced separation from family members	76	34.39
Serious injury	72	32.58
Combat situation	70	31.67
Forced isolation from others	67	30.32
Imprisonment	66	29.86
Torture	60	27.15
Unnatural death of family or friend	55	24.89
Brain washing	49	22.17
Lost or kidnapped	42	19.01
Murder of family or friend	37	16.74
Rape or sexual abuse	31	14.03
Murder of stranger or strangers	30	13.58

Table 2

Standardized factor loadings for MIAS scale with betrayal items removed

Factor	Item	Loading	SE	p-value
MI-Other	MIAS 1. I am troubled by morally wrong things done by other people	.847	.027	<.001
	MIAS 2. I am troubled because I saw other people do things that were morally wrong	.879	.032	<.001
	MIAS 3. I am troubled because I heard about other people doing things that were morally wrong	.883	.027	<.001
	MIAS 4. I am troubled because other people have acted against important moral rules	.916	.017	<.001
	MIAS 6. I am troubled because I did things that were morally wrong	.829	.037	<.001
	MIAS 8. I am troubled because I acted against important rules	.915	.025	<.001
MI-Self	MIAS 9. I am troubled by morally wrong things I have done	.903	.027	<.001
	MIAS 10. I went against my own morals by failing to do something I should have done	.859	.033	<.001
	MIAS 11. I am troubled because I acted in ways	.929	.019	<.001

that went against my own moral code or values

Note. MIAS = moral injury appraisals scale; SE = standard error; MI-Others = moral injury appraisals of violations by others; MI-Self = moral injury appraisals of violation by oneself.

Table 3

Standardized total, direct, and indirect effects from trauma exposure to PTSD symptom clusters, depression and anger.

	β	SE	95%CI	p
Trauma exposure to PTSD-B (Intrusion Symptoms)				
Total	0.506	0.056	(0.396, 0.616)	<.001
Direct	0.476	0.059	(0.360, 0.592)	<.001
Indirect	0.030	0.022	(-0.013, 0.074)	.173
MI-Other	0.055	0.022	(0.011, 0.098)	.014
MI-Self	-0.024	0.015	(-0.053, 0.005)	.103
Trauma exposure to PTSD-C (Avoidance Symptoms)				
Total	0.438	0.061	(0.318, 0.558)	<.001
Direct	0.378	0.063	(0.254, 0.503)	<.001
Indirect	0.060	0.021	(0.018, 0.102)	.005
MI-Other	0.049	0.021	(0.007, 0.090)	.022
MI-Self	0.011	0.014	(-0.017, 0.039)	.435
Trauma exposure to PTSD-D (Negative Alterations in Cognitions and Mood)				
Total	0.525	0.054	(0.420, 0.630)	<.001
Direct	0.462	0.059	(0.346, 0.578)	<.001
Indirect	0.063	0.024	(0.017, 0.109)	.008
MI-Other	0.047	0.021	(0.006, 0.087)	.024
MI-Self	0.016	0.014	(-0.011, 0.044)	.244
Trauma exposure to PTSD-E (Alterations in Arousal and Reactivity Symptoms)				

Total	0.464	0.059	(0.349, 0.579)	<.001
Direct	0.390	0.063	(0.267, 0.513)	<.001
Indirect	0.074	0.025	(0.024, 0.123)	.003
MI-Other	0.056	0.022	(0.013, 0.100)	.012
MI-Self	0.017	0.015	(-0.012, 0.046)	.249
Trauma exposure to anger				
Total	0.384	0.063	(0.259, 0.508)	<.001
Direct	0.313	0.067	(0.182, 0.444)	<.001
Indirect	0.070	0.023	(0.025, 0.116)	.003
MI-Other	0.033	0.018	(-0.003, 0.068)	.072
MI-Self	0.038	0.021	(-0.003, 0.078)	.068
Trauma exposure to depression				
Total	0.454	0.056	(0.344, 0.564)	<.001
Direct	0.389	0.061	(0.270, 0.509)	<.001
Indirect	0.064	0.025	(0.016, 0.113)	.009
MI-Other	0.031	0.018	(-0.004, 0.067)	.087
MI-Self	0.033	0.019	(-0.004, 0.070)	.077

Note. β = standardized Beta coefficients; SE = standard error; $95\%CI$ = 95% confidence interval; p = significance; MI-Others = moral injury appraisals of violations by others; MI-Self = moral injury appraisals of violation by oneself.

Table 4

Beta coefficients for measurement model and structural model

	β	SE	$95\% CI$	p
Measurement model				
<i>On MI-Other</i>				
MIAS1	0.847	0.027	(0.794, 0.900)	<.001
MIAS2	0.879	0.032	(0.817, 0.914)	<.001
MIAS3	0.883	0.027	(0.829, 0.936)	<.001
MIAS4	0.916	0.017	(0.882, 0.950)	<.001
<i>On MI-Self</i>				
MIAS6	0.829	0.037	(0.757, 0.900)	<.001
MIAS8	0.915	0.025	(0.866, 0.965)	<.001

MIAS9	0.903	0.027	(0.849, 0.956)	<.001
MIAS10	0.859	0.033	(0.794, 0.924)	<.001
MIAS11	0.929	0.019	(0.893, 0.966)	<.001
Structural model				
<i>On Trauma</i>				
MI-Other	0.224	0.071	(0.085, 0.362)	.002
MI-Self	0.184	0.068	(0.051, 0.317)	.007
PTSD-B	0.476	0.059	(0.360, 0.592)	<.001
PTSD-C	0.378	0.063	(0.254, 0.503)	<.001
PTSD-D	0.462	0.059	(0.346, 0.578)	<.001
PTSD-E	0.390	0.063	(0.267, 0.513)	<.001
Anger	0.313	0.067	(0.182, 0.444)	<.001
Depression	0.389	0.061	(0.270, 0.509)	<.001
<i>On MI-Other</i>				
PTSD-B	0.245	0.065	(0.118, 0.372)	<.001
PTSD-C	0.218	0.070	(0.081, 0.356)	.002
PTSD-D	0.209	0.063	(0.085, 0.334)	.001
PTSD-E	0.253	0.065	(0.125, 0.381)	<.001
Anger	0.147	0.071	(0.008, 0.286)	.038
Depression	0.140	0.067	(0.009, 0.270)	.036
<i>On MI-Self</i>				
PTSD-B	-0.131	0.065	(-0.259, -0.004)	.043
PTSD-C	0.061	0.074	(-0.084, 0.207)	.409
PTSD-D	0.089	0.067	(-0.043, 0.221)	.186
PTSD-E	0.094	0.072	(-0.047, 0.234)	.191
Anger	0.205	0.081	(0.045, 0.365)	.012
Depression	0.181	0.075	(0.035, 0.328)	.015

Note. β = standardized Beta coefficients; *SE* = standard error; 95%*CI*=95% confidence interval; *p* = significance; MI-Others = moral injury appraisals of violations by others; MI-Self = moral injury appraisals of violation by oneself; MIAS=Moral Injury Appraisals Scale; PTSD-B=Intrusion symptoms; PTSD-C=Avoidance symptoms; PTSD-D=Negative alterations in cognition and mood; PTSD-E=Alterations in arousal and reactivity symptoms.

Figures

Figure 1. Moral injury measurement model

Figure 2. Moral injury structural model with standardized Beta coefficients and non-significant paths removed. Direct effects of trauma exposure on outcome measures are excluded from the figure.

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