A latent profile analysis of moral injury appraisals in refugees

Joel Hoffman, Belinda Liddell, Richard A. Bryant and Angela Nickerson

School of Psychology, UNSW Australia, Sydney, Australia

ABSTRACT

Background: Refugees often exhibit reactions to traumatic events that may be conceptualized as moral injury (i.e. the impact of events that violate important moral values). There have been two types of moral injury appraisals found in refugees: transgressions by others and transgressions by oneself.

Objective: To examine whether these types of moral injury appraisals co-occur or whether one form is usually predominant. Additionally, to investigate what types of events (trauma, living difficulties) and outcomes (PTSD, depression, anger, suicidality) were associated with each moral injury appraisal profile.

Method: Participants included 221 refugees and asylum seekers residing in Australia. Data was collected online, and via pen and paper. A latent profile analysis was used to identify profiles of moral injury appraisals.

Results: Results indicated a three-profile solution: Moral Injury-Other (MI-O; 37.8%), Moral Injury Other + Self (MI-OS; 35.2%), and no moral injury (No-Mi; 26.9%). MI-O and MI-OS were predicted by both trauma experience and living difficulties. MI-O and MI-OS were also associated with greater psychopathology across all outcome variables compared to No-Mi. MI-OS was also associated with greater anger and depression, compared to the MI-O profile.

Conclusions: The association between the moral injury appraisal profiles and traumatic events, living difficulties and psychopathology, will have important clinical implications.

Un análisis de perfil latente de las valoraciones del daño moral en refugiados

Antecedentes: Los refugiados frecuentemente muestran reacciones a eventos traumáticos que pueden ser conceptualizadas como daño moral (por ejemplo, el impacto de los eventos que violan valores morales importantes). Existen dos tipos de valoraciones de daño moral encontradas en los refugiados: transgresiones realizadas por otros, y transgresiones realizadas por uno mismo.

Objetivo: Evaluar si estos tipos de valoraciones de daño moral suceden en simultáneo, o si un tipo es frecuentemente el predominante. Asimismo, investigar qué tipos de eventos (trauma, dificultades de vida) y consecuencias (trastorno de estrés postraumático, depresión, ira, suicidialidad) se asocian con cada perfil de valoración del daño moral.

Métodos: Los participantes fueron 221 refugiados y solicitantes de asilo residentes en Australia. Se recolectó la información en línea, y mediante lápiz y papel. Se empleó un análisis de perfil latente para identificar los perfiles de las valoraciones de daño moral.

Resultados: Los resultados mostraban una solución de tres perfiles: Daño Moral – Otros (DM-O; 37.8%), Daño Moral – Otros + Uno Mismo (DM-OM; 35.2%), y sin daño moral (Sin-DM; 26.9%). El DM-O y el DM-OM podían ser predichos tanto por una experiencia traumática como por las dificultades de vida. El DM-O y el DM-OM también estaban asociados con mayor psicopatología en todas las variables evaluadas como consecuencias, en comparación con el grupo Sin-DM. El DM-OM también se asoció con mayor ira y depresión, en comparación con el perfil de DM-O.

Conclusiones: La asociación entre los perfiles de valoración del daño moral y eventos traumáticos, dificultades de vida y psicopatología tendrán consecuencias clínicas importantes.

 proyectos y evaluación de la psicopatología. Los refugiados frecuentemente muestran reacciones a eventos traumáticos que pueden ser conceptualizadas como daño moral (por ejemplo, el impacto de los eventos que violan valores morales importantes). Existen dos tipos de valoraciones de daño moral encontradas en los refugiados: transgresiones realizadas por otros, y transgresiones realizadas por uno mismo. La asociación entre los perfiles de valoración del daño moral y eventos traumáticos, dificultades de vida y psicopatología tendrán consecuencias clínicas importantes.
1. Background

Refugees frequently experience traumatic events that are characterized by interpersonal violence, such as torture and human rights violations (Hooberman, Rosenfeld, Lhewa, Rasmussen, & Keller, 2007; Thabet, Abed, & Vostanis, 2004). Accordingly, refugees report elevated rates of psychological disorders such as posttraumatic stress disorder (PTSD; Fazel, Wheeler, & Danesh, 2005), as well as high levels of comorbid depression and suicidal ideation (Ferrada-Noli, Asberg, Ormstad, Lundin, & Sundbom, 1998; Steel et al., 2009). Research suggests that the sequelae of these experiences can result in complex responses, including negative social-based emotions such as anger, guilt, shame and loss (Carlson & Rosser-Hogan, 1994; Hinton, Rasmussen, Nou, Pollack, & Good, 2009; Silove, 1999; Stotz, Elbert, Müller, & Schauer, 2015), which go beyond traditional posttraumatic fear-based models (Herman, 1992; Litz et al., 2009; Silove, 1999). Despite this, little is known about potential mechanisms that link traumatic events experienced by refugees to these non-fear reactions.

A conceptual framework that may be helpful for understanding the link between traumatic events and these complex negative reactions is moral injury, which has been investigated primarily in a military context. Moral injury refers to ‘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). For refugees these events may include leaving behind a loved one while fleeing for safety, being tortured, or watching while important religious artefacts are defiled. Just as cognitive models of PTSD suggest that a strong fear reaction to a traumatic event is based on how that event is appraised (Ehlers & Clark, 2000), so appraisals of traumatic events as violating moral frameworks may result in distinct outcomes such as anger, guilt, shame, depression and suicidality (Drescher et al., 2011; Farnsworth, 2019; Grey, Schorr, et al., 2012; Litz et al., 2009; Nash et al., 2013). In this context, it is important to distinguish the construct of moral injury by the event (potentially morally injurious experiences; PMIEs), the outcome (PTSD, depression, suicidality) and the mechanism (the appraisal of an event violating an important moral framework).

Appraisals that events have violated important moral beliefs have been found to be associated with greater depression, PTSD, anger, guilt and shame in a military sample, above and beyond trauma exposure (Lancaster & Erbes, 2017). Similarly, moral injury appraisals have been found associated with PTSD, anger and depression above and beyond trauma exposure in a refugee sample (Hoffman, Liddell, Bryant, & Nickerson, 2018). Therefore, understanding how the mechanism by which moral injury links these outcomes to traumatic experiences is crucial for designing effective interventions.

Studies in military populations have identified three ways that traumatic events may be appraised as moral violations: transgressions by oneself, transgressions by others and betrayal by others (Bryan et al., 2015; Nash et al., 2013). Hoffman et al. (2018) found support for two ways that traumatic events could be appraised as moral violations in a diverse refugee population: transgression by others (MI-Other) and transgressions by oneself (MI-Self). In both populations, PTSD symptoms were associated with MI-Other but not MI-Self appraisals (Bryan et al., 2015; Hoffman et al., 2018), indicating that perceived moral violations enacted by the self are less likely to be associated with PTSD. In contrast, results have been less consistent across military samples for symptoms such as anger, depression and suicidal ideation (Bryan et al., 2015; Bryan, Bryan, Morrow, Etienne, & Ray-Sannerud, 2014). However, both MI-Other and MI-Self appraisals have been found associated with increased anger and depression symptoms in refugee samples (Hoffman et al., 2018; Nickerson et al., 2015). Accordingly, there is emerging evidence that moral injury represents a salient construct for conceptualizing the psychological impact of refugee trauma.

Across the literature, what remains unclear is whether different forms of moral injury appraisals can co-occur, and what impact this co-occurrence has on psychological symptoms. For example, a refugee may watch as a loved one is murdered. They may appraise that the murderer has committed a MI-Other violation, appraise that they committed a MI-Self violation by not doing more to protect their family, or make both appraisals simultaneously. To date, however, it is unknown (a) whether different types of moral injury appraisals co-occur or whether one is usually predominant, and (b) if different types do co-occur, whether experiencing one type of moral injury appraisal, compared to both MI-Self and MI-Other appraisals, is differentially associated with psychological outcomes. Understanding these questions will help us identify specific clinical presentations and
guide treatment for refugees exposed to interpersonal violations.

In addition, it may also be useful to understand what types of events (potentially morally injurious experiences; PMIEs) are associated with particular moral injury appraisal profiles. Hoffman et al. (2018) found that trauma related to separation from family and community were associated with both MI-Other and MI-Self appraisals, with MI-Self appraisals additionally associated with having been close to death. These results highlight the importance of investigating PMIEs outside of a trauma framework such as post-migration living difficulties (PMLDs), which have been linked to refugee psychopathology (Nickerson, Bryant, Rosebrock, & Litz, 2014).

Understanding the scope of PMIEs in refugees, and how they relate to moral injury appraisal profiles is important for informing clinical practice with these populations.

This study implemented a Latent Profile Analysis (LPA) to identify profiles of moral injury appraisals in a diverse group of refugees. Based on the factor structure of moral injury appraisals types in military (Bryan et al., 2015; Nash et al., 2013) and refugee populations (Hoffman et al., 2018) we hypothesized four distinct appraisal profiles: MI-Other, MI-Self, MI-Other + Self and No-MI. In relation to PMIEs, we predicted that trauma experiences and post-migration living difficulties would predict the moral injury appraisal profiles relative to the No-MI profile. Based on results from refugee and military populations which indicate associations between MI-Other appraisals and PTSD, but not MI-Self appraisals (Bryan et al., 2015; Hoffman et al., 2018; Nickerson et al., 2015), we predicted that the MI-Other profile and would be associated with increased PTSD symptoms, but not the MI-Self profile. As the co-occurrence of MI appraisal types and symptoms has not yet been investigated, no specific hypotheses were made about the association between this profile and PTSD symptoms. We predicted all MI profiles would be associated with increased anger and depression relative to the No-MI profile, in line with previous studies of moral injury appraisals in refugees (Hoffman et al., 2018; Nickerson et al., 2015). Finally, based on results from Bryan et al. (2014) in a military sample, we predicted that greater suicidal ideation would be associated with the MI-Other + Self profile and the MI-Self profile.

2. Methods

2.1. Participants

Participants included 221 refugees and asylum seekers (102 = male [46.2%], 109 = female [49.3%], 10 = unspecified [4.5%]) residing in Australia. The average age of participants was 38.42 years (SD = 14.00), with an age range of 18.38 to 76.24 years. Participants were eligible for the study if they met the following criteria: a) over 18 years of age, b) a refugee and asylum seeker that arrived in Australia after January 2011, c) able to complete the questionnaires in Arabic, Farsi, Tamil or English. The proportion that completed for each language was: Arabic (n = 63, 28.5%), Farsi (n = 62, 28.1%), Tamil (n = 65, 29.4%), and English (n = 31, 14%). Participants’ country of origin was Sri Lanka (n = 66, 29.9%), Iran (n = 64, 29%), Iraq (n = 61, 27.6%), with all remaining countries under 5%. Participants’ marital status was married (n = 126, 57.0%), single (n = 61, 27.6%), separated/divorced (n = 14, 6.3%), cohabiting/defacto (n = 7, 3.2%), widowed (n = 6, 2.7%), in a relationship (n = 6, 2.7%) and not answered (n = 1, 0.5%). Their highest level of education achieved was high school (n = 92, 41.6%), university (n = 60, 27.1%), vocational training/apprenticeship (n = 27, 12.2%), primary school, (n = 27, 12.2%), little to no education (n = 10, 4.5%) and not answered (n = 5, 2.3%).

2.2. Measures

According to ‘World Health Organization’ (n.d) gold standards, all questionnaires were translated into each study language and blind back translated. The translators and the research team then worked together to rectify any discrepancies.

2.2.1. Moral injury appraisals scale

The Moral Injury Appraisals Scale (MIAS; Hoffman et al., 2018) is a 9-item measure with two subscales, assessing distress related to the appraisal of a moral violation. It is an expanded version of the Moral Injury Scale (Nickerson et al., 2015). The MIAS was based on the Moral Injury Events Scale (MIES; Nash et al., 2013). It was adapted for refugee populations through extensive interviews with cultural representatives from each language group (i.e. Arabic, Farsi and Tamil) to ensure consistency in meaning. The Moral Injury-Other subscale contains five items assessing if participants are troubled by moral violations committed by others (e.g. ‘I am troubled by morally wrong things done by other people’). The Moral Injury-Self subscale contains four items assessing if participants are troubled by moral violations that they committed (e.g. ‘I am troubled because I did things that were morally wrong’; Table 2). The items are rated on a 4-point Likert scale where participants indicate the extent to which they agree with the statement (1 = not at all, 4 = very much). Higher scores indicate more moral injury-related appraisals. The scale has been used previously in a refugee population, in which a confirmatory factory analyses yielded good fit statistics for the 9-item scale, including good internal consistency for the two subscales (Hoffman et al., 2018).
2.2.2. Harvard trauma questionnaire
The Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992) measures exposure to traumatic events and PTSD-related symptoms that are specific to refugee populations. In this study, we used Part 1 of the HTQ, which includes a 16-item scale that indexes types of potentially traumatic events commonly experienced by refugees. Each item measures whether a trauma event was experienced, witnessed, or learned about. This study only examined items that were directly experienced. The measure has shown validity and reliability across cultural groups (Mollica et al., 1992), and has been used with refugee populations (Steel et al., 2009).

2.2.3. Post-migration living difficulties checklist
The Post-Migration Living Difficulties Checklist (PMLD; Silove, Sinnerbrink, Field, Manicavasagar, & Steel, 1997; Steel, Silove, Bird, McGorry, & Mohan, 1999) is a 23-item scale that indexes post-migration living difficulties for asylum seekers and refugees. The items were adapted to the Australian context based on a sample of refugees, asylum seekers and migrants by Steel et al. (1999). This list was updated for this study to include 32 items which reflect current post-migration living difficulties for asylum seekers and refugees in Australia (see Table 4) in consultation with an expert panel of service providers working with individuals from a refugee background in Australia. Examples of these updated items include difficulties such as: ‘not being allowed to apply for a permanent visa’; ‘difficulty accessing legal advice or support’; ‘being fearful about being sent to an Australian detention centre or offshore processing facility (e.g. Manus Island, Nauru)’. Each item is rated on a 5-point Likert scale (1 = was not a problem/did not happen, 5 = a very serious problem). Items were also dichotomized with a response of 3 (a moderately serious problem) and above indicating that the living difficulty was experienced. The PMLD has been used previously with Australian refugee populations (Schweitzer, Melville, Steel, & Lacherez, 2006; Steel et al., 1999).

2.2.4. Posttraumatic diagnostic scale
The Posttraumatic Diagnostic Scale-5 (PDS-5; Foa et al., 2016) is a 20-item scale that assesses PTSD symptoms. Participants were asked to rate how often they have experienced each symptom over the previous two weeks. Each item is rated on a 4-point Likert scale (1 = not at all or only one time, 4 = five or more times a week/almost always). A mean score was calculated with higher scores indicating greater PTSD symptom severity. This scale has shown good reliability and validity (Foa et al., 2016), and has been previously used in refugee populations (Schnyder et al., 2015).

2.2.5. Patient health questionnaire-9
The Patient Health Questionnaire (PHQ-9) contains 9 items assessing depression symptoms (Spitzer, Kroenke, & Williams, 1999), using a 4-point Likert scale (1 = not at all, 4 = nearly every day). Item 9 assesses suicidal ideation (‘Thoughts that you would be better off dead or hurting yourself in some way’). A mean score was calculated from items 1–8 with higher scores indicating greater depressive symptoms. Item 9 was analysed separately, with a higher score indicating greater suicidal ideation. The PHQ-9 has shown good reliability and validity (Kroenke, Spitzer, & Williams, 2001) and has been used previously in refugee samples (Feyera, Mihretie, Bedaso, Gedle, & Kumera, 2015).

2.2.6. Dimensions of anger reactions-5
The Dimensions of Anger Reactions-5 (DAR-5) is a 5-item scale that measures posttraumatic anger (Forbes et al., 2014) over the past four weeks. The items are rated on a 5-point Likert scale (1 = none or almost none of the time, 5 = all or almost all of the time). A mean score was calculated with higher scores indicating greater anger severity. The DAR-5 has shown good reliability and validity (Forbes et al., 2014).

2.3. Procedure
Recruitment for the study was conducted through the study website and through flyers distributed to refugee agencies. Participants expressed interest by completing an online questionnaire that assessed their eligibility. Eligible participants were given access to either an electronic version of the survey (n = 142, 64.3%), or mailed pen and paper versions (n = 79, 35.7%). The online version was completed on Key Survey-Version 8.6 software. All records were de-identified to protect anonymity, and the project was approved by the UNSW Australia, Human Research Ethics Committee (HCI14106).

2.4. Data analysis
A missing values analysis indicated that missing data was less than 10% for all responses, except for PTSD symptoms (12.7%). Therefore, multiple imputation (Rubin, 1996) was used for analyses involving PTSD symptom outcomes. For these analyses, ten datasets were generated from the posterior distribution of the missing values, using random draws. This amount is considered robust with this level of missing data (White, Royston, & Wood, 2011).

Three stages of analysis were performed using MPlus-Version 7.4. In the first stage, a latent profile analysis was used to identify latent subgroups within the sample, using the 9-item scores from the MIAS as continuous indicators. A maximum likelihood estimator was
implemented. Model fit was assessed for a 1-profile model and increased through a 7-profile model based on goodness of fit parameters. In order to assess the relative fit of models, goodness of fit was determined according to recommended guidelines (Nylund, Asparouhov, & Muthén, 2007). Interpretability and parsimony were also considered when determining the optimal model.

In the second stage, exploratory factor analyses (EFA) were implemented to identify sub-categories of both traumatic experiences (from the HTQ) and post-migration stressors (from the PMLD) that could be used to predict profile membership. For both EFAs, an oblique rotation was used, and a weighted least squares estimator for categorical outcomes. The number of factors derived was based on: a) eigenvalues greater than 1, b) examination of scree plots, and c) theoretically relevant interpretation of factors. Factor scores were then generated using a maximum a posteriori method.

In the final stage, associations between moral injury profiles and key predictor and outcome variables were examined. All ten imputed datasets were used in the conditional model estimation, with parameter estimates averaged over datasets. In the conditional model, each latent profile was then regressed onto the factor scores of the HTQ, PMLD, age, and sex. Profiles were then compared to assess which variables distinguished between latent profiles as significant predictors. Relevant outcome variables (PTSD, depression, anger and suicidal ideation) were treated as distal outcomes of the latent profiles. Profile difference point estimates and standard errors were then combined over the 10 datasets using Rubin’s (2004) method. Z-scores were then calculated to test the significance of the combined profile difference estimates.

### 3. Results

#### 3.1. Latent profile analysis of the MIAS

The goodness of fit indices are presented for 1 to 7-profile models in Table 1. All latent profiles showed better fit than a unitary solution. The three-profile model was chosen on the basis of providing superior model fit, as the LMR-LRT indicated significant improvement compared to the two-profile model, with the AIC, BIC, and SS-BIC values lower than the two-profile model. While the AIC, BIC, and SS-BIC continued to decrease through the seven profiles, and the B-LRT continued to indicate significant improvement through all seven models, the three-profile solution was retained for parsimony. These classes can be described as: 1) No moral injury (No-MI) in which participants reported low MI-Other and low MI-Self (n = 59, 26.9%), 2) Moral Injury-Other (MI-O) in which participants reported high MI-Other and low MI-Self (n = 83, 37.8%), 3) Moral Injury-Other + Self (MI-OS) in which participants reported high MI-Other and high MI-Self (n = 78, 35.2%). The probability for most likely profile membership were .96, .99, and .99, for profiles 1–3 respectively. Mean item responses are shown in Table 2 and represented in Figure 1.

#### 3.2. Exploratory factor analyses on the HTQ and LDC

Participants in this sample had directly experienced a mean of 3.02 types of traumatic events (SD = 3.44) and 9.53 types of living difficulties (SD = 7.07). Three factors were identified for trauma types (Table 3): 1) deprivation/lack of basic needs, 2) exposure to abuse/

### Table 1. Goodness-of-fit indices for unconditional latent profile models.

| Model  | Log-Likelihood | AIC   | BIC   | SS-BIC | Entropy | LMR-LRT | B-LRT |
|--------|----------------|-------|-------|--------|---------|---------|-------|
| 1 Profile | -2933.81       | 5903.62| 5964.71| 5907.67| 0.97    | <.001   | 0.001 |
| 2 Profile | -2403.39       | 4862.77| 4957.79| 4869.06| 0.97    | <.001   | 0.001 |
| 3 Profile | -2196.74       | 4469.45| 4598.41| 4477.99| 0.96    | 0.001   | <.001 |
| 4 Profile | -2037.65       | 4171.3  | 4334.19| 4182.08| 0.96    | 0.324   | <.001 |
| 5 Profile | -1965.8        | 4047.6  | 4244.43| 4060.63| 0.97    | 0.163   | <.001 |
| 6 Profile | -1944.78       | 4025.57| 4256.34| 4040.84| 0.97    | 0.591   | <.001 |
| 7 Profile | -1906.15       | 3968.29| 4233  | 3985.81| 0.94    | 0.380   | <.001 |

AIC = Akaike information criterion; BIC = Bayesian information criterion; SS-BIC = sample size-adjusted Bayesian information criterion; LMR-LRT = Lo-Mendell-Rubin-likelihood ratio; B-LRT = bootstrap-likelihood ratio test of model fit.

### Table 2. Moral injury items means and standard deviations by latent profiles.

| Item                                                                 | Profile 1 No-MI | Profile 2 MI-Other | Profile 3 MI-Others + Self |
|----------------------------------------------------------------------|-----------------|--------------------|---------------------------|
| I am troubled by morally wrong things done by other people            | 1.90 (0.10)     | 3.52 (0.08)        | 3.41 (0.10)               |
| I am troubled because I saw other people do things that were morally wrong | 1.63 (0.10)     | 3.27 (0.09)        | 3.47 (0.09)               |
| I am troubled because I heard about other people doing things that were morally wrong | 1.76 (0.11)     | 3.49 (0.07)        | 3.40 (0.10)               |
| I am troubled because other people have acted against important moral rules | 1.71 (0.10)     | 3.51 (0.07)        | 3.42 (0.10)               |
| I am troubled because I did things that were morally wrong            | 1.35 (0.07)     | 1.49 (0.10)        | 3.27 (0.12)               |
| I am troubled because I acted against important moral rules          | 1.24 (0.06)     | 1.14 (0.04)        | 3.27 (0.12)               |
| I am troubled by morally wrong things I have done                    | 1.26 (0.09)     | 1.21 (0.06)        | 3.41 (0.11)               |
| I went against my own morals by failing to do something I should have done | 1.24 (0.07)     | 1.22 (0.06)        | 2.89 (0.11)               |
| I am troubled because I acted in ways that went against my own moral code or values | 1.27 (0.10)     | 1.21 (0.06)        | 3.39 (0.08)               |

MI = Moral Injury.
pain, and 3) witness to conflict and killing. Five factors were identified for post-migration living difficulties (Table 4): 1) community/social difficulties, 2) immigration/settlement issues, 3) separation from family, 4) daily living and financial difficulties, and 5) lack of community/stimulation.

3.3. Association between moral injury profiles, traumatic experiences and living difficulties

All predictor estimates of class membership are in Table 5. Compared to the No-MI profile, individuals in the MI-O profile were more likely to have experienced immigration/settlement related concerns, and more likely to be older. Individuals in the MI-OS profile were less likely to have experienced deprivation/lack of basic needs, less likely to have experienced witness to conflict/killing, more likely to have experienced exposure to abuse, and more likely to have experienced hardships related to daily functioning/living.

3.4. Association between moral injury profiles and psychological symptoms

PTSD symptoms, depression, anger and suicidal ideation were compared as distal outcomes of profile membership. Compared to the No-MI profile, individuals in the MI-O profile had significantly greater PTSD symptoms ($\beta = 0.52, SE = 0.12, p < .001$), depression ($\beta = 0.38, SE = 0.13, p = .002$), anger ($\beta = 0.37, SE = 0.13, p = .005$) and suicidal ideation ($\beta = 0.34, SE = 0.15, p = .027$). Individuals in the MI-OS profile also had significantly greater PTSD symptoms ($\beta = 0.57, SE = 0.12, p < .001$), depression

Figure 1. Means of moral injury item responses for each latent profile.

Table 3. Factor pattern matrix loading on trauma events.

| Factor loadings | Factor 1: Deprivation/lack of basic needs | Factor 2: Exposure to abuse/pain | Factor 3: Witness to conflict/killing |
|-----------------|------------------------------------------|---------------------------------|--------------------------------------|
| Lack of food or water | .687                                      | -.001                           | .253                                 |
| Ill health without access to medical care | .671                                      | .285                            | .002                                 |
| Lack of shelter | .813                                      | .011                            | .162                                 |
| Imprisonment | .035                                      | .290                            | .482                                 |
| Serious injury | .049                                      | .602                            | .206                                 |
| Combat situation | .114                                      | .050                            | .615                                 |
| Brain washing | .097                                      | .467                            | .175                                 |
| Rape or sexual abuse | -.082                                     | .446                            | .291                                 |
| Forced isolation from others | -.094                                     | .888                            | .067                                 |
| Being close to death | .145                                      | .765                            | -.026                                |
| Forced separation from family members | -.013                                     | 1.027                           | -.143                                |
| Murder of family or friend | -.203                                     | -.027                           | 1.030                                |
| Unnatural death of family or friend | -.000                                     | -.165                           | 1.067                                |
| Murder of stranger or strangers | -.333                                     | .029                            | .905                                 |
| Lost or kidnapped | -.004                                     | .459                            | .405                                 |
| Torture | .092                                      | .498                            | .283                                 |
Table 4. Factor pattern matrix loading on living difficulties.

| Difficulty                                                                 | F1    | F2    | F3    | F4    | F5    |
|---------------------------------------------------------------------------|-------|-------|-------|-------|-------|
| Difficulties communicating with other people                             | .444  | .174  | .079  | .275  | −.027 |
| Discrimination or conflict with other people in Australia                | .865  | .357  | −.052 | −.098 | .032  |
| Discrimination or conflict with other ethnic groups in Australia         | .813  | .333  | .011  | −.049 | .074  |
| Conflict within your community                                           | .630  | −.011 | .357  | .144  | −.025 |
| Conflict with your family and friends                                     | .677  | −.076 | .066  | .057  | .024  |
| Separation from your family                                              | .123  | .035  | .665  | .290  | .016  |
| Worry about family back home                                             | .229  | .029  | .664  | .310  | .033  |
| Being unable to return home in an emergency                              | −.025 | −.025 | .750  | .106  | .046  |
| Difficulties with the family reunion process                             | −.055 | .361  | .626  | −.033 | .090  |
| Not being allowed to work                                                 | −.298 | .477  | .194  | −.041 | .429  |
| Not being able to find work                                               | −.122 | .462  | .009  | .102  | .423  |
| Bad working conditions                                                    | .034  | .439  | .058  | .237  | .332  |
| Not being able to access English language training                        | .124  | .699  | −.236 | .232  | .220  |
| Practical difficulties with accessing or undertaking study               | .054  | .534  | .124  | .323  | .003  |
| Difficulties with immigration officials or understanding immigration procedures | .120  | .534  | .124  | .323  | .003  |
| Not being allowed to apply for a permanent visa                           | −.207 | .952  | .040  | .061  | −.043 |
| Difficulty accessing legal advice or support                              | .011  | .736  | .008  | .201  | .099  |
| Being fearful about being sent to Australian detention centre or an off-shore processing facility | −.294 | .928  | .080  | −.051 | .034  |
| Being fearful of being sent back to your country of origin in the future | −.294 | .785  | .211  | .003  | −.038 |
| Difficulties with the law, such as trouble with police or being fined     | .118  | .493  | .062  | .201  | −.044 |
| Not having access to Medicare                                            | .038  | .076  | .053  | .821  | .022  |
| Difficulties accessing treatment for health or mental health problems     | .135  | .346  | .037  | .474  | .060  |
| Not enough money to buy food, pay the rent and bills, or buy necessary clothes | −.106 | .034  | .018  | .701  | .363  |
| Difficulty accessing public transport, or not having enough money to use public transport | −.057 | .218  | −.077 | .623  | .334  |
| Difficulties obtaining financial assistance from Government or Charities  | −.003 | −.101 | .042  | .841  | .164  |
| Difficulties relating to housing                                          | .029  | .442  | −.035 | .168  | .315  |
| Isolation                                                                 | .364  | −.065 | .491  | .119  | .548  |
| Loneliness                                                                | .284  | .206  | .507  | −.035 | .429  |
| Boredom                                                                   | .065  | .256  | .314  | −.024 | .560  |
| Worry about how refugees and asylum-seekers are presented in the media    | .007  | .568  | .213  | .194  | −.018 |
| Worry about family members or friends in detention centres or offshore processing facilities | −.166 | .690  | −.093 | .075  | −.031 |
| Meeting financial obligations to family back home                         | .011  | .261  | .471  | .014  | −.317 |

F1 = Community related/social difficulties; F2 = Visa/settlement related concerns; F3 = Difficulties/worries due to being separated from family; F4 = Hardships related to daily living/finances; F5 = Lack of community/stimulation.

Table 5. Predictors of profile membership.

| MI-O vs No-MI                                                                 | Est   | SE   | Est/SE | p    |
|--------------------------------------------------------------------------------|-------|------|--------|------|
| HTQ-F1-Deprivation/lack of basic needs                                         | 0.03  | 0.36 | 0.07   | .943 |
| HTQ-F2-Exposure to abuse/pain                                                  | −0.59 | 0.56 | −1.04  | .297 |
| HTQ-F3-Witness to conflict/killing                                             | 0.38  | 0.59 | 0.69   | .494 |
| LDC-F1-Community related/social difficulties                                   | 0.28  | 0.27 | 1.02   | .306 |
| **LDC-F2-Visa/settlement related concerns**                                   | **0.89** | **0.35** | **2.53** | **.011** |
| **LDC-F3-Difficulties/worries of family separation**                          | **0.33** | **0.25** | **1.31** | **.191** |
| LDC-F4-Hardships of daily living/finances                                      | 0.17  | 0.32 | 0.53   | .598 |
| LDC-F5-Lack of community/stimulation                                           | −0.29 | 0.29 | −1.15  | .231 |
| **AGE**                                                                       | **0.03** | **0.02** | **2.03** | **.042** |
| **SEX**                                                                       | **0.21** | **0.43** | **0.48** | **.631** |

**MI-O** vs **No-MI**

| HTQ-F1-Deprivation/lack of basic needs                                         | −1.13 | 0.42 | −2.67  | .008 |
| HTQ-F2-Exposure to abuse/pain                                                  | 1.37  | 0.57 | 2.40   | .016 |
| HTQ-F3-Witness to conflict/killing                                             | −0.54 | 0.54 | −1.00  | .317 |
| LDC-F1-Community related/social difficulties                                   | 0.36  | 0.28 | 1.27   | .206 |
| LDC-F2-Visa/settlement related concerns                                       | 0.57  | 0.35 | 1.61   | .107 |
| LDC-F3-Difficulties/worries of family separation                              | 0.25  | 0.31 | 0.78   | .423 |
| LDC-F4-Hardships of daily living/finances                                      | 0.75  | 0.33 | 2.28   | .023 |
| LDC-F5-Lack of community/stimulation                                           | −0.13 | 0.29 | −0.45  | .650 |
| **AGE**                                                                       | **0.04** | **0.02** | **5.50** | **.013** |
| **SEX**                                                                       | **0.75** | **0.47** | **1.59** | **.113** |

**MI-O** vs **MI-O**

| HTQ-F1-Deprivation/lack of basic needs                                         | −1.15 | 0.39 | −2.97  | .003 |
| HTQ-F2-Exposure to abuse/pain                                                  | 1.95  | 0.50 | 3.94   | .001 |
| HTQ-F3-Witness to conflict/killing                                             | −0.92 | 0.42 | −2.18  | .029 |
| LDC-F1-Community related/social difficulties                                   | 0.08  | 0.24 | 0.35   | .729 |
| LDC-F2-Visa/settlement related concerns                                       | −0.30 | 0.13 | −1.00  | .316 |
| LDC-F3-Difficulties/worries of family separation                              | −0.08 | 0.29 | −0.27  | .786 |
| LDC-F4-Hardships of daily living/finances                                      | **0.58** | **0.27** | **2.15** | **.032** |
| LDC-F5-Lack of community/stimulation                                           | 0.21  | 0.29 | 0.71   | .476 |
| **AGE**                                                                       | **0.00** | **0.02** | **0.50** | **.621** |
| **SEX**                                                                       | **0.38** | **1.42** | **1.57** | **.157** |

Est = Standardized estimate; SE = Standard Error; p = significance; MI-O = Moral Injury-Other; MI-OS = Moral Injury- Other + Self; No-MI = No Moral Injury; HTQ = Harvard Trauma Questionnaire; LDC = Post-migration living difficulties.
\[(β = 0.66, SE = 0.13, p < .001), \text{anger (β = 0.67, SE = 0.12, p < .001) and suicidal ideation (β = 0.30, SE = 0.15, p = .043) compared to the No-MI profile. Compared to the MI-O profile, individuals in the MI-OS profile had significantly greater anger (β = 0.30, SE = 0.14, p = .035) and depression (β = 0.27, SE = 0.13, p = .029). There were no significant differences in PTSD symptoms or suicidal ideation between the MI-O and MI-OS profiles.}

4. Conclusions

To our knowledge, this is the first study to investigate the co-occurrence of different types of moral injury appraisals in refugees. A latent profile analysis identified three latent profiles (MI-O, MI-OS and No-MI), rather than four as hypothesized. Results indicate that moral injury appraisals are a relatively common experience, with 73% of refugees belonging to the MI-O, or MI-OS profile. Contrary to our hypothesis, we did not find a Moral Injury-Self profile, indicating that MI-Other appraisals were a consistent feature in this sample of refugees. This differs from studies of military samples, which indicated a higher prevalence of MI-Self transgressions (Bryan et al., 2015; Held et al., 2017). This may reflect a distinctive aspect of moral injury in refugee contexts, as experiencing transgressive acts by others is likely an inherent aspect of persecution from which refugees flee and may naturally elicit MI-Other appraisals. As treatments for moral injury in military samples have primarily focused on MI-Self appraisals, these findings indicate the importance of designing interventions that can effectively target MI-Other appraisals in refugees.

The second aim of this study was to explore which types of events predict different moral injury appraisal profiles. The mean types of trauma experienced in this sample (M = 3.02) is relatively low compared to other estimates of trauma prevalence in Australian refugees (Steel et al., 2009). This may be due to only including traumas in the analyses that were directly experienced. This was to ensure robust associations between trauma exposure and moral injury profiles, as well as to aid interpretability of results. The finding that trauma events related to exposure to abuse (e.g. serious injury, forced isolation, torture, rape) distinguished the MI-OS group from the other profiles was somewhat unexpected, as in these events, the individual is generally considered the victim of the trauma, not the agent. However, these interpersonal violations are often inflicted with the intent to degrade, shame, and disrupt individual and community identity (Barudy, 1989; Başoğlu, Livanou, & Crnobarić, 2007; Miller, 2009; Silove, 1999; Stotz et al., 2015), and thus may lead the individual to appraise that they have transgressed important moral rules themselves. This is consistent with findings from studies conducted with survivors of sexual assault and intimate partner violence who often experience feelings of guilt and shame (Beck et al., 2011; Vidal & Petrak, 2007). This is a distinction from research into moral injury in military settings where transgressions by self have been associated with events where the soldier is the agent or perpetrator of harm (Currier, Holland, Drescher, & Foy, 2015; Litz et al., 2009; Vargas, Hanson, Kraus, Drescher, & Foy, 2013). As such, treatment for moral injury in military settings has included interventions that take into account accurate appraisals regarding transgressive acts (Grey, Schorr, et al., 2012; Purcell, Burkman, Keyser, Fucella, & Maguen, 2018; Steinmetz & Gray, 2015). In contrast, the association between MI-Self and events where refugees are recipients of abuse indicates that interventions for moral injury in refugees may also need to address cognitive distortions regarding responsibility and the insidious nature of the interpersonal violations. It also may underline the importance of understanding the appraisal mechanism, as disparate events may result in similar appraisals, or conversely, the same events may be appraised differently depending on the person’s context and moral framework.

This study was also the first to show that moral injury appraisals are associated with events outside of a trauma framework, such as post-migration living difficulties. Specifically, individuals in the MI-O group experienced greater immigration/settlement stressors such as acquiring a visa, and worries about themselves or their family being sent to a detention centre. In this context, the violation may be appraised as a form of betrayal by the host country. Half of a sample of refugees based in Australia who had been placed in immigration detention centres, felt the government had deliberately deceived or lied to them about the visa process (Coffey, Kaplan, Sampson, & Tucci, 2010). In military research betrayal by leaders is an important factor of moral injury (Bryan et al., 2015; Litz et al., 2009; Nash et al., 2013). While appraisals of betrayal may conceptually fall within an MI-Other appraisal (e.g. ‘I am troubled by morally wrong things done by other people’), further research is required to comprehensively investigate betrayal in refugee samples. Additionally, the MI-OS profile was associated with daily living/financial hardships. While hardships such as not having enough food for your family may be appraised as a violation by others or by oneself, it could also be that the added psychological burden of those in the MI-OS profile makes it more difficult to navigate these settlement stressors, and therefore causality should not be assumed. Regardless, the finding that living difficulties were associated with appraisals of moral violations, is consistent with existing theories of morality which suggest moral judgements need only consist of the perception of an intentional moral agent and a moral patient who suffers (Gray, Young, & Waytz, 2012). According to this theory, MI-Other appraisals may occur when another is seen as an intentional moral agent that causes suffering, whereas in an MI-Self appraisal, the intentional moral agent is
viewed as oneself. The subjective nature of these judgments is thought to take pre-eminence over any objective measurement of suffering (Gray, Waytz, & Young, 2012); therefore, the nature or severity of the event may be less important than the salience of harm that the individual attributes to it. This reinforces the importance of appraisals in understanding the effect and breadth of PMIEs on psychological outcomes (Farnsworth, 2019). Therefore, these results suggest that non-traumatic events may also provide an important avenue for investigation.

The final aim of this study was to investigate the association between each moral injury appraisal type and mental health outcomes. Both moral injury groups reported greater PTSD, depression, anger, and suicidal ideation relative to the No-MI group. These findings are also consistent with previous studies in refugees (Hoffman et al., 2018; Nickerson et al., 2015) and military samples (Bryan et al., 2015; Currier, Holland, et al., 2015; Nash et al., 2013) that have demonstrated the added burden of moral injury, above and beyond the impact of trauma exposure. Results also suggest that the MI-OS profile may confer an additional burden, as it was associated with higher levels of anger and depression compared to the MI-O profile. This is also consistent with findings from a study conducted with a military sample where transgressions by the self were associated with higher levels of anger than transgressions by others (Bryan et al., 2015). These results show the increased burden of moral injury for refugees, and how these symptoms may be exacerbated or maintained by the post-migration environment.

While this study is the first to examine the profiles of moral injury appraisal types and how these are associated with particular events and outcomes, several limitations should be noted. Firstly, while this study showed that certain events predicted distinct moral injury appraisal profiles, it is still unclear what specific events give rise to different types of moral injury appraisals. Additionally, shame and guilt are thought to be key emotional responses related to moral injury appraisals. As these were not included in this study, it will be important to investigate how these latent groups are associated with these emotional outcomes as well. Furthermore, the outcome associated with each appraisal type may also reflect the moral rule that has been violated. For example, existing theories on morality propose that moral judgments occur in different domains (e.g. harm, fairness, ingroup, authority, purity; Haidt & Joseph, 2007; Shweder, Much, Mahapatra, & Park, 1997). These domains and their associated emotions are thought to differ between cultures. Therefore, moral domains may provide a future avenue of investigation for how appraisal type (MI-Self vs MI-Other) interacts with the moral domain of the appraisal, and what association this interaction has on psychopathology. As this study involved a wide variety of cultural groups, not all measures had been validated for each group. Furthermore, while the heterogeneity of the sample suggests that these profiles are consistent across the cultural groups in this sample, it should be noted that this sample was self-selected. Therefore, findings cannot be generalized to all refugees. Finally, while the sample size was not large enough to examine profile differences between cultural groups, this would be an important future area of research.

This is the first study to investigate how different types of moral injury appraisals co-occur in a diverse sample of refugees. Results suggested that nearly three quarters of participants experienced some form of moral injury appraisal. Each profile was associated with distinct trauma events and living difficulties. Both moral injury profiles were also associated with higher levels of psychopathology relative to the No-MI profile, with additionally higher levels of anger and depression in the MI-OS profile than the MI-O profile. These results will have important implications for understanding the different ways that moral injury appraisals may be expressed in a refugee population, and the events and outcomes associated with these profiles.

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ORCID

Joel Hoffman http://orcid.org/0000-0003-1064-4179
Belinda Liddell http://orcid.org/0000-0002-8036-5864
Richard A. Bryant http://orcid.org/0000-0002-9607-819X

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