An evolutionary theory of moral injury with insight from Turkana warriors

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ABSTRACT

Clinicians in Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies are rethinking whether Post-traumatic Stress Disorder (PTSD) is caused solely by exposure to life-threatening experiences, or also by moral injury—witnessing or participating in acts that violate moral beliefs. However, while there are evolutionary hypotheses explaining PTSD as a response to physical danger, the evolutionary roots of moral injury lack an explanation. We posit that a subset of symptoms of combat-related PTSD is associated with moral injury and that these symptoms evolved in tandem with human’s norm-psychology. We can examine this hypothesis by comparing societies with different moral beliefs about warfare, norm enforcement mechanisms, and spheres of moral concern. To illustrate the utility of this framework, we describe combat trauma, war norms, and norm enforcement among Turkana pastoralist warriors in Kenya who participate in highly lethal raids of neighboring ethnic groups. We previously showed that depressive PTSD symptoms in Turkana warriors are more strongly associated with experiencing moral violations in combat, and that Turkana warriors with comparably high evolutionary mismatch with modern society. Another hypothesis is that PTSD symptoms were useful during our evolutionary history, but the real mismatch is between the symptoms and their use in modern society (Konner, 2007).

1. Introduction

Post-traumatic stress disorder (PTSD) is one of the major tragedies of warfare in the United States, affecting an estimated 10–20% of veterans from the Iraq and Afghanistan wars (Hoge et al., 2004, Tanielian & Jaycox 2008). An individual can be diagnosed with PTSD based on experiencing a traumatic event and, at least six months after the event, experiencing, with sufficient severity, a subset of twenty symptoms: hypervigilance, enhanced startle response, frequent unwanted memories of the event, nightmares, flashbacks, emotional distress or physical reactions when reminded of the event, low concentration, detachment, irritability, loss of interest, negative beliefs, negative feelings, emotional numbing, avoiding memories or external reminders of the event, selective amnesia, blame of oneself or others, recklessness, and insomnia (see American Psychiatric Association 2013 for details).

Some evolutionary theories of Posttraumatic Stress Disorder (PTSD) posit that these symptoms are part of a genetically-evolved response to a dangerous life-threatening situation designed to help individuals avoid, learn about, or respond to future traumatic events (Cantor, 2005, 2009; Silove, 1998; Syme & Hagen, 2020). This sometimes contributes to an implicit assumption that PTSD is culturally-universal aspect of the human condition, a view also shared by non-evolutionary clinical researchers (Kienzler, 2008). Other views are that PTSD is a socially constructed disorder reflecting the social and political values of American or western society at a particular time (Finley, 2012; Summerfield, 1999; Young, 1997) or even that its symptoms are unique to large-scale societies that lack traditional systems of support (Finley, 2012; Summerfield, 1999; Young, 1997) or even that its symptoms are unique to large-scale societies that lack traditional systems of support (Junger, 2016), which might suggest PTSD symptoms are the result of an evolutionary mismatch with modern society. Another hypothesis is that PTSD symptoms were useful during our evolutionary history, but the real mismatch is between the symptoms and their use in modern society (Konner, 2007).

Many of the evolutionary theories of PTSD implicitly assume that it is a fear-based response to physical dangers and draw parallels to fear responses in non-human animals (Cantor, 2005, 2009; Konner, 2007; Silove, 1998). While that may be so, clinicians are increasingly
recognizing that not all combat trauma stems from the physical dangers of war. Trauma can also result from perpetrating, failing to prevent, or witnessing harm to opponents, fellow combatants, or civilians during combat in what is being called “moral injury” (Litz et al., 2009, Nash et al., 2010, Drescher et al., 2011, Shay 2014, Currier, Holland, Drescher, & Foy, 2015, Frankfurt & Frazier 2016).

A few lines of evidence have fueled this shift in conception. United States veterans of the wars in Iraq and Afghanistan who have killed in combat have greater risk of developing PTSD than their comrades with similar combat exposure (Maguen et al., 2009, 2011; Maguen & Burkman, 2013). Even drone pilots, who carry out their lethal missions thousands of miles from the battlefield, experience combat-related PTSD at high rates (Chappelle 2014). Additionally, patients suffering from combat-related PTSD who express guilt, shame, and moral misgivings about their experiences (Litz et al., 2009), are less responsive to treatment than patients whose PTSD comes from other types of trauma (Kitchiner et al. 2008, Bisson, Roberts, Andrew, Cooper, & Lewis, 2013). Some military scholars have argued that most people have a strong psychological aversion to killing that militaries need to overcome through training, but that the incongruence between their learned behavior and their psychological predispositions lead to mental distress (Grossman, 1996). Others have argued that severity of combat trauma may be related to the public’s support for the war (Gartner, 2010; Young, 1997).

Since moral injury does not result from fear or the physical dangers of combat (in fact killing the enemy may be a way of overcoming fear and avoiding physical danger), it does not fit easily into the prevailing evolutionary narrative of PTSD as a collection of mechanisms for avoiding physical danger. We propose an evolutionary theory of moral injury and explore this theory with evidence from Turkana warriors of northwest Kenya. Specifically, we hypothesize that moral injury evolved as a potentially adaptive response to moral danger: the danger of committing acts that violate one’s moral beliefs or the moral expectations of one’s community. Our theory also suggests that moral injury, unlike PTSD symptoms with non-human analogs, would be unique to humans.

Humans have evolved a psychology for norm acquisition that helps us learn about and adopt local moral norms, where “moral norms” are defined as “behavioral standards shared and enforced by a community” (Chudek & Henrich, 2011). The ability to adopt moral norms is important to our survival since violating societal expectations often results in real consequences, including ostracism, denial of aid, punishment by physical violence, fines, incarceration, or death. The threat of this social sanctioning promotes compliance with moral norms (Fehr & Gachter, 2000, 2002; Ostrom, 2000) and, as a result, our norm-psychology has enabled humans to cooperate in large-scale cooperative endeavors, including war (Zefferman & Mathew, 2015). To limit the social damage from committing norm violations humans have evolved mechanisms that credibly signal to their community that they will not commit these violations again (O’Connor 2016, Okamoto and Matsumura 2000). The psychosocial behaviors associated with credibly expressing remorse may include guilt and shame (Breggin, 2015; Fessier, 2004; Gilbert, 2003; Keltner & Harker, 1998) and co-occurring syndromes like depression (Allen & Badcock, 2003; Nesse, 2005; Nettle, 2004; Watson & Andrews, 2002). Parsing the differences between these hypotheses is beyond the scope of this paper, but all of them propose some form of social signaling, solving social dilemmas, or avoiding social risks. We propose that when moral violations are extreme, these mechanisms that evolved for credible social signaling can trigger the debilitating response that characterizes traumatic moral injury.

While moral injury could arise in any normative situation, we posit that moral injury will be strongly associated with warfare because actions in warfare are particularly prone to moral ambiguity. Humans are the only known species that engages in large-scale warfare with unrelated individuals and this is largely the result of our ability to learn and comply with culturally evolved norms (Zefferman & Mathew, 2015). However, acquiring and implementing complex norms is not free of errors. Individuals might learn different variations of the norm from the other members of their community or can make mistakes in implementing normative rules. Norms governing warfare may also change within individuals’ lifetimes and they may not accurately update their knowledge about norms they internalized when younger. Furthermore, societies often have strong moral norms against the killing of people within the society, while permitting, promoting, or obligating the killing of outsiders, especially during war. Thus, the act of killing can either be a grave offense or highly commendable depending on the target and the nuances of the situation. Additionally, while stolen goods can be returned, killing is irreversible. On the battlefield, soldiers often need to make quick, high-stakes decisions with incomplete information. Moral errors regarding killing in the warzone are thus less ambiguous or reversible. Killing seems an especially salient morally injurious event in the trauma experiences of American combat veterans (Maguen et al., 2009, 2011; Maguen & Burkman, 2013).

When mechanisms signaling society’s acceptance of morally relevant behaviors break down, we expect moral injury to be more severe. We propose that this situation arises in modern expeditionary militaries where there is stark separation between the warzone and civilian life. Soldiers raised in a civilian society with little threat of external violence are likely to internalize the beliefs that, for example, killing is immoral in all cases and killers are to be avoided. When they later kill on a distant battlefield, they may violate those internalized beliefs even if the killing is officially sanctioned by their government. When the killing is committed outside the officially sanctioned rules of war, such as killing non-combatants, the moral violation is likely even worse. When the soldiers return from the battlefield, they may find that their loved ones, friends, and other members of civilian society respond with disapproval to stories involving their participation in killing or death. These social cues from community members reinforce the belief that their killing is immoral and, according to our theory, these soldiers would become more susceptible to levels of guilt and shame consistent with moral injury. Moral injury may, therefore, be particularly salient in societies with expeditionary warfare. Modern expeditionary warfare is a relatively new invention. The ancient Greeks had an expeditionary military, and perhaps provide some of the earliest evidence of moral injury (Shay, 2003; Shay, 2010).

We expect that combat-related moral injury will be lower in small-scale societies than in large industrialized militaries. While soldiers in modern militaries have a deep separation between their civilian life (where their killing is seen, at best, as a necessary evil) and the battlefield where killing is often required by the mission or by higher authority, warriors of small-scale societies are either defending their communities or returning from battle with other warriors who remain the center of their social lives. Warriors in small-scale societies are likely to have plenty of opportunity to discuss the events of battle and build community consensus around their actions. Warriors in small-scale societies may also receive extensive praise and even celebrations, especially after successful battles. Warriors thus repeatedly receive signals from their community that what they have done is normative and commendable. By contrast, large societies do not always affirm that the greater community endorses soldiers’ potentially immoral battlefield conduct, even if the soldiers are vaguely thanked for their service. In the American military, for example, there is no formal ceremony acknowledging the moral ambiguity of having killed in battle and no military honors given for killing the enemy, unless such killing is incidental to other acts of bravery, self-sacrifice, or accomplishing a difficult mission. Even if there were military honors, they are likely little substitute for the more widespread endorsement stemming informally from the community. Because members of small-scale societies are in a position to receive more signals about the moral permissibility of their actions by those who are more closely tied to their social well-being, they may be less likely to suffer the symptoms of moral injury.

Modern hierarchical military organization also strips soldiers of
their moral autonomy. In egalitarian small-scale societies, leaders lack the power to coerce other warriors to violate their moral beliefs. It is up to individual warriors to decide whether to join a battle, kill once engaged with the enemy, or commit other acts of violence. Warriors may be punished by their peers for cowardice in battle or moral violations. However, punishment is not dictated by the leader, but by the consensus of other warriors or community members. In contrast, military personnel are obliged to follow lawful orders and are sometimes ordered to follow unlawful ones. They can even be ordered to participate in wars that they personally disagree with and in wars that have high community disapproval. For example, during the American war in Vietnam popular opinion turned against the war and the soldiers who fought in it, even as those soldiers were ordered to fight and kill and die (Gartner, 2010). The effect of this turn of sentiment on Vietnam veterans’ combat trauma has been widely discussed (Konner, 2007). In small-scale societies without coercive political institutions, warriors are less likely to participate in deadly intergroup violence without widespread community support.

Although not explicitly addressing moral injury, existing literature on violence-induced trauma is consistent with our theory. High rates of PTSD, anxiety disorders, and depression have been documented among children formerly associated with armed forces and armed groups (Betancourt, Agnew-Blais, Gilman, Williams, & Ellis, 2010; Derluyn, Broekaert, Schuyten, & De Temmerman, 2004; Kohrt et al., 2008). (Betancourt, Agnew-Blais, Gilman, Williams, & Ellis, 2010; Derluyn, Broekaert, Schuyten, & De Temmerman, 2004; Kohrt et al., 2008). Betancourt et al. (2010) show a relationship for former child soldiers in Sierra Leone between exposure to war-related events and negative psychosocial outcomes such as depression, anxiety, and hostility is mediated by perceptions of discrimination, lack of acceptance by family or community, and stigmatizing events such as surviving rape or perpetrating wounding or killing. These findings are consistent with the idea that mental health consequences of exposure to combat can be caused by perceived social costs from having experienced or committed norm violations. Additionally, the availability of social support and commitment to one’s beliefs appear to reduce symptoms of psychological trauma in torture survivors. For instance, a study of former South African political prisoners who were detained and tortured during apartheid found that negative social support was a key predictor of PTSD, depression and anxiety (Halvorsen & Kagge, 2010). Basoğlu et al. (1997) found that activist torture survivors had lower levels of psychopathology than non-activist survivors, even though activist survivors experienced more severe torture This suggests that personally held moral beliefs may help protect individuals from the negative mental health outcomes of traumatic experiences.

We predict that, within societies, violations of moral norms that are strongly enforced and are communally held is more likely to result in moral injury than violations of norms that are loosely enforced, or are individually held. The social costs of the latter violations are higher, and if the symptoms of moral injury evolved to mitigate the social cost of committing norm violations, then we expect this to be the case. The distinction between individual beliefs and communal norms is reflected in the difference between two prominent definitions of moral injury. Litz et al. (2009) state that moral injury results from:

“perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations.”

Nash et al. (2010) define moral injury as:

“changes in biological, psychological, social, or spiritual functioning resulting from witnessing or perpetrating acts or failures to act that transgress deeply held, communally shared moral beliefs and expectations.” (emphasis ours).

Litz et al. (2009)’s definition suggests that the moral beliefs of relevance are individually held. Nash et al. (2010)’s definition additionally requires that the moral beliefs and expectations be communally shared. Measuring both individual beliefs and communal expectations are necessary for advancing moral injury research. Although when there is strong congruence between individual beliefs and communal expectations this could be difficult to measure, our theory makes specific predictions about how they will be different. Our approach thus highlights why measuring variation within societies in moral beliefs and patterns of social sanctioning associated with those beliefs is critical to gain traction on moral injury. This approach could also contribute to research into evolutionary explanations of shame, which may be more related to Nash et al. (2010)’s definition, and guilt, which may be more related to Litz et al. (2009)’s.

Our theory suggests that important causal factors of moral injury stem from societal-level norms and institutions and that rethinking these institutions may be important to preventing or treating moral injury symptoms. Evidently, we cannot create entirely new communities and societies with different norms and institutions and randomly assign people, at birth, to live in them to later fight in a war. However, we can gain traction with a cross-cultural comparative method to examine moral beliefs, norms, sanctions, actions, violations, and symptoms of moral injury in other societies. Such a cross-cultural method has been useful for studying trauma broadly defined (Breslau, 2004; De Jong & Van Ommeren, 2002; Folmar & Palms, 2009; Hinton & Lewis-Fernández, 2011; Kaiser et al., 2015; Kohrt et al., 2011; Miller et al., 2009; Nicolas, Wheatley, & Guillaume, 2015; Osterman & De Jong, 2007; Van Ommeren et al., 1999) as well as for exploring evolutionary hypotheses (Barrett et al., 2016; Borgerhoff Mulder et al., 2009; Henrich et al., 2005; Scelza et al., 2020). The value here of studying small-scale societies is not because they are more reflective of some idealized “ancestral” state of humanity, but because they demonstrate how culturally evolved norms and institutions influence behavioral outcomes.

To illustrate the potential of this approach in moral injury research, we describe some results from a study on combat stress and moral injury with Turkana pastoral warriors in northwest Kenya. Elsewhere (Zefferman & Mathew 2020) we showed that Turkana warriors experience high rates of PTSD, with 28% of subjects reporting symptom severity scores that would qualify them for a provisional PTSD diagnosis. Comparing symptoms of our Turkana subjects with an existing dataset of treatment-seeking American combat veterans who served in Iraq and Afghanistan, we found that the PTSD profile of the two populations differ. The Turkana have similarly high levels of symptoms that facilitate learning from and reacting to future combat-related dangers. But they have lower rates of depressive PTSD symptoms that we posited are responses to the social risks of committing moral violations. Additionally, we found that in our Turkana sample, predictors measuring exposure to the dangers of combat (e.g. number of raids joined, being ambushed, shooting at or being shot by the enemy, hand-to-hand combat, suffering bullet wounds) were more strongly associated with learning-and-reacting than depressive symptoms of PTSD. Conversely, predictors measuring exposure to combat-related moral violations (e.g. failing to save the life of another Turkana, seeing enemy get shot or die, killing an enemy, destruction of property, killing of women or children, rape, kidnapping, and being socially sanctioned for combat-related actions) were more strongly associated with depressive than learning-and-reacting symptoms. In the current paper, we build on these findings, and examine in greater detail the differences between the norms, institutions and moral beliefs surrounding Turkana warfare versus western militaries that could shed light on the relatively high incidence of moral injury in soldiers in the west. In doing so, we illustrate the value of examining PTSD and moral injury beyond WEIRD militaries for understanding the evolutionary and cultural foundations of combat related trauma.

2. Study population

We conducted field interviews with Turkana pastoralist warriors in northwest Kenya near the South Sudanese border, an area primarily
occupied by the Kwatela, one of two dozen territorial subpopulations of the Turkana. Turkana pastoralists’ primary source of subsistence and wealth is livestock (cattle, goats, sheep, and camels), which they use for meat, milk and units of exchange. They are semi-nomadic, moving with the seasons to find vegetation and water suitable for their animals. One way Turkana men obtain livestock is by participating in raids of neighboring ethnic groups. Pastoralists from neighboring ethnic groups also raid the Turkana for animals.

The Kwatela primarily raid and are raided by Toposa pastoralists across the South Sudanese border, traveling 100 or more kilometers on foot per raid. Raids range from small “stealth” raids of a few individuals with the objective of taking livestock without detection to large “battle” raids of hundreds of warriors engaging in direct combat. To find food and water for their animals in the dry season, Kwatela and Toposa men routinely migrate close to their shared border where there is constant risk of being ambushed and raided. Attacks can occur in grazing areas, at encampments, at watering sites, or during migration. The men are, therefore, constantly vigilant for signs of enemy presence and need to be prepared to fight to defend their livestock, family, and community. Turkana have strong norms against raiding other Turkana (Mathew & Boyd, 2011), and such raids are exceptional.

Turkana warriors in our study area have a high degree of combat exposure. About half of adult men die in combat with about 60% of those deaths occurring in offensive combat and 40% in defensive combat (Mathew & Boyd, 2011). About a quarter (26%) of the men in our study had at least one visible bullet wound. Although some of the oldest men in our study raided with spears and clubs in their youth, firearms gained prominence by the late 1970s which likely increased the raiding’s lethality.

Turkana warriors in our study also have a high exposure to potentially morally injurious events, especially killing. 72% of the warriors in our sample reported killing in battle, which sometimes included killing women, children, and elders. Since the Kwatela occupy a border area of intense interethnic strife, these rates will be higher than for Turkana who live away from such areas and so have much fewer experiences of raids, or for the couple hundred thousand non-pastoral Turkana who live in towns and do not generally participate in raids.

Turkana warfare differs from industrialized warfare along dimensions that are relevant for measuring, preventing, and treating moral injury. First, since almost all adult men have participated in raids, warriors returning from combat are surrounded by fellow veterans with whom they can, and often do, discuss raiding.

Second, participation in warfare is almost universally encouraged and praised. Warriors who successfully bring home animals are celebrated by their families and a warrior who kills in battle gains a special status in their community.

Third, there is little distinction between civilian life and the battlefield. Although there are times of relative peace and times of the year when raiding is rare, warriors and their families are often at risk of raids. Since the entire community is involved in raids, there is little disconnect between a warrior and his family members.

Fourth, there is little formal coercive hierarchy in raid organization. For large raids there are leaders who are chosen from the group, but their primary responsibility is to facilitate raid planning and coordinate actions during the raid. They do not have coercive authority and warriors are under no obligations to follow their decisions. However, warriors are informally sanctioned by their community through ostracism, denial of aid, corporal punishment and fines (Mathew & Boyd, 2011, 2014).

Fifth, while the Turkana have strong norms about conduct on the battlefield regarding cowardice, desertion, loot division, aiding of fellow combatants, and sanctioning of shirkers (Mathew, 2017; Mathew & Boyd, 2011, 2014), there are few norms regarding how the enemy should be treated or how much harm can be inflicted on enemy combatants and civilians in the course of battle.

Sixth, the Turkana have a number of rituals specifically for those who have killed in battle, which we will describe below.

3. Methods

We conducted semi-structured interviews over the course of four field seasons during a 14-month period with 218 Turkana warriors who had each participated in at least one violent raid (either offensively or defensively). We recruited participants by visiting local encampments, watering points and wedding locations, and by approaching men passing through a semi-permanent settlement where we lived with community members during the study. We requested interviews from any adult Turkana male we encountered and had a participation rate of more than 98%. Although most of our participants do not know their calendar age, they ranged from early to late adulthood (see the appendix for an overview of participants’ age distribution).

The initial survey design was informed by a deep ethnographic understanding of warfare, moral norms and norm enforcement in this community accumulated through long-term research in northern Turkana since 2007. We developed questionnaires with the assistance of experienced bilingual ethnically-Turkana research assistants through an iterative process of translation, back-translation, and piloting of the questions (Brislin, 1986) with Turkana pastoralists outside of our study area. Survey questions regarding moral injury were conducted in tandem with questions regarding other aspects of combat stress, and we collected data on combat exposure, moral beliefs, potentially morally injurious events, moral injury symptoms, rituals, and institutions surrounding combat. The 56 interviews conducted during the first field season were less structured and were used to design and pilot many of the vignette questions presented below. Additional vignettes were added or removed for the third and fourth field seasons, which accounts for different reported sample sizes between questions. Interviews lasted between 45 min and almost six hours depending on the extent of the subject’s combat experience and how succinct the responses were. Longer interviews were sometimes conducted over multiple days.

While we did not compensate individuals for participating in our study, we provided benefits to the general community from which subjects were being recruited. These benefits included providing goats for a communal feast at the beginning and end of each field season, using a solar panel to power a light bulb and mobile phone charging near a communal watering point, transporting sick or injured community members to the nearest government clinic for medical care, and purchasing and facilitating deliveries of drinking water to remote areas during a major drought. While these benefits may have built good will with the community, they were in no way conditional on individuals’ participation in our research. We also lived, and built rapport, with community members during these field seasons and over the course of a decade of prior research in the region. The research protocol and amendments were approved by the Arizona State University Institutional Review Board.

All interviews were conducted in the local language with the help of bilingual research assistants who recorded interview answers with tablet computers and translated participant answers into English directly or from recordings. Since moral injury research has mostly been conducted in western societies in the context of warfare, and because of the significance of warfare in our study community, our surveys only addressed moral injury from warfare. The structured interview questions that were used in our interviews and reported in this paper are in the supplemental appendix in the Turkana language with English translations. Data analysis was conducted in R with the analysis script archived through the Open Science Framework at https://osf.io/c7ytv/. The data is also archived through the Open Science Framework with access available upon request from the authors to assure that additional analyses is within the scope of this study’s IRB guidelines.
focus here on beliefs about killing, since killing is of special relevance to knowing the extent to which individuals felt it was permissible to kill noncombatants during raids. While the clear majority of participants endorsed the view that it was permissible to kill men and younger males, there was substantial variation in whether it was permissible to kill women and the elderly (Fig. 1). Despite this variation, during the pilot, we determined that warriors made a distinction between their own personal moral code and that of the community about killing. This could be due to difficulty in translating difficult concepts, or because Turkana participants reason about moral beliefs and norms as objects of study and analysis differently than WEIRD researchers like ourselves.) The high degree of individual-level variation in attitudes regarding killing of females and the elderly of non-Turkana is unlike what occurs in a wide range of normative contexts in this population (Handley & Mathew, 2020). This suggests that norms and/or enforcement of norms about killing females and elderly members of the opponent side during raids are weak or non-existent in Turkana society. See Appendix Fig. S1 for correlation matrix of subjects’ response to each question.

We expect that this amount of variation in moral beliefs is less likely to be seen in western soldiers who are socialized in military systems with codified rules regarding treatment of noncombatants and civilians during combat. Since individual-level variation in moral beliefs is likely critical for assessing why some people develop moral injury while others do not, some hypotheses regarding moral injury can be more effectively tested in a population like the Turkana than in western soldiers.

We should note that the variation in moral beliefs regarding killing documented here is specific to treatment of non-Turkana in the context of a raid. The Turkana have strong norms forbidding the killing of other Turkana (Mathew & Boyd, 2011). Warriors are required to resolve interpersonal quarrels with other Turkana with sticks, not firearms, and while half of adult male mortality stems from warfare, less than 3% of adult male mortality is due to internal violence among the Turkana (Mathew & Boyd, 2011).

4. Results and discussion

4.1. Moral beliefs about killing in combat

We explored Turkana warriors’ moral beliefs about combat. We focus here on beliefs about killing, since killing is of special relevance to moral injury for American combat veterans (Litz et al., 2009; Maguen et al., 2009, 2011; Maguen & Burkman, 2013). From previous ethnographic research, we were aware that killing enemy combatants in battle was celebrated in our study population. However, we did not know the extent to which individuals felt it was permissible to kill noncombatants during raids. While the clear majority of participants endorsed the view that it was permissible to kill men and younger males, there was substantial variation in whether it was permissible to kill women and the elderly (Fig. 1). Despite this variation, during the pilot, we determined that warriors almost universally maintained that their personal moral beliefs about killing reflected the consensus view of their community. (In fact, during the pilot, we did not find evidence that participants made a distinction between their own personal moral code and that of the community about killing. This could be due to difficulty in translating difficult concepts, or because Turkana participants reason about moral beliefs and norms as objects of study and analysis differently than WEIRD researchers like ourselves.) The high degree of individual-level variation in attitudes regarding killing of females and the elderly of non-Turkana is unlike what occurs in a wide range of normative contexts in this population (Handley & Mathew, 2020). This suggests that norms and/or enforcement of norms about killing females and elderly members of the opponent side during raids are weak or non-existent in Turkana society. See Appendix Fig. S1 for correlation matrix of subjects’ response to each question.

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4.2. Moral violations committed in combat

Although 72.2% of the warriors in our sample reported having killed in battle and a sizable fraction endorse the permissibility of killing women and the elderly during a raid, actually killing someone other than an adult male is rare. 70.9% of warriors reported having killed an adult male in battle, but only 20.4% report killing members of other demographic groups. The lower rate could be because warriors are actively avoiding harming demographic groups other than adult males. It could also be because they have fewer opportunities to do so during the course of combat: some raids occur in grazing areas far from settlements, and some of these killings would have happened in defensive raids and so only male combatants from the opposing side would have been present. An even smaller number (3.7%) of the warriors in our sample reported a moral violation, which we define here as a warrior having killed an enemy individual during a raid from a demographic group which the warrior did not endorse the permissibility of killing (Fig. 2), suggesting that warriors who do not endorse killing a certain demographic group are able to avoid doing so during a raid. Due to an oversight in our questionnaire we failed to ask about whether participants had killed infants on a raid. However, we have no reason to suspect a different pattern than for other age groups. Since we measured only warriors’ current beliefs about killing, we do not know if their moral beliefs changed between killing and participating in our study. Regardless of the reasons, the low rate of moral violations indicates that moral violations are rare in the Turkana.

Since the data on whether and whom subjects have killed is based on self-reports, there may be a concern about the accuracy of the responses. While this is true for self-reports for any study, there are a few ways that we were able to cross-check some of these reports. First, we started each interview with a complete raid history and, for each raid, asked whether the warrior had killed a member of every demographic group and, if they had, asked about the circumstances of the killing. To deceive, participants would have to invent stories for each person they had killed on each raid. Second, at the beginning of each interview we collected participants’ names and then asked if they had a “warrior name.” Warrior names are often given to Turkana when they have killed during raid and the name itself describes the circumstances of the killing (for example a name might translate to something like “killed
two enemies in a stream bed” or “killed a woman in her kraal”). Although these names were kept in a separate data file for participant privacy, during the interview we remembered whether a warrior had a name and if it matched up to their accounts of their raids. Since warrior names are commonly known, we could verify them with the participant’s contemporaries. Third, participants who had killed and undergone ritual scarring, as described below, could show us their ritual scars. Fourth, Turkana who are prolific killers on raids, called EKAGUMAN or EKEWASAN, are well-known. When someone claimed to have killed many people on raids, their EKAGUMAN or EKEWASAN status was either already known to us or we would ask other Turkana, after the interview, about the warriors’ reputation. Fifth, our initial interview questions, which were mostly demographic, helped to identify and exclude individuals who were prone to lying or exaggerating. This happened twice during our pilot study, but not in the findings reported here. None of these checks could entirely prevent inaccurate reports, especially false negatives. However, they gave us more confidence in our results than a context-free survey.

It is also possible that participants who killed in battle, especially those who killed females and the elderly, were less likely to admit to morally ambiguous killings in our survey. While the social consequences of these types of killings seemed to be low or non-existent in the participants’ community, individual shame or guilt may have prevented some participants from answering truthfully. Although we make an effort to be morally neutral about these topics, it is plausible that subjects suspect that we, or our research assistants, may not hold these moral beliefs. However, this is likely a small effect, because we do not observe that subjects are reticent to discuss their participation in cattle raids or disclose killings of adult male combatants even though subjects may intuit that these cultural practices and moral beliefs are less prevalent among market-integrated Turkana like the research assistants or among researchers.

While there are few moral violations regarding killing enemy individuals in the warzone, Turkana warriors may have experienced many other types of moral violations. In the course of combat, there are several actions and outcomes that could cause a warrior to experience remorse. Warriors could intentionally or inadvertently endanger their fellow combatants by retreating too early, lagging behind others, or running away from the battlefield. They may have survived a raid in which many died. There are instances in which warriors have accidentally fired upon other Turkana. Fairly often, they find themselves in situations in which they cannot share their ammunition or water supply with another warrior who is in need. Warriors have described situations that were emotionally painful for them because they had to deliberate and decide that they could not transport an injured friend back home from the battlefield. They describe situations in which they encouraged or pressured a friend or family member to go on a raid that cost the person his life. They are often explicitly chastised and blamed by the family of the killed warrior for this.

Given their moral landscape we expect that Turkana warriors are less likely to develop moral injury from acts of killing in the warzone, are equally likely to experience moral injury from failing their fellow combatants, and are more likely to experience moral injury for having encouraged someone to join a raid that cost the person his life. This difference between the Turkana and western militaries highlights how a larger sample of societies, where moral beliefs and practices vary, can help illuminate the various pathways to moral injury.

### 4.3. Moral autonomy regarding killing

Turkana warriors seem to have more moral autonomy than soldiers in western militaries. Turkana have no commanders, and raid leaders serve mainly a coordination role as opposed to a coercive role. Joining a raid is an individual warrior’s choice, though he may be subject to encouragement and peer pressure from members of his age-group (cohorts of men born within a five to six-year period who are closely bonded and stay together during raids). Warriors can often come up with a good excuse, such as taking care of family members or animals, for not participating in a raid. We have also seen younger boys successfully hide from their age-mates during recruitment for a raid in which they did not want to participate. They may also choose not to own a firearm, which excuses them from going on a raid (although it leaves them more vulnerable to attacks by other ethnic groups). Men who are particularly disinclined to join raids can move further away from the ethnic border where peer pressure to go on raids is lower. We interviewed warriors who told stories about sparing the lives of old women during raids and successfully arguing with their companions that they should not be killed. In contrast, military members in industrial societies often have little choice in whether to obey orders to participate in a specific war, battle, or missions. They may even be compelled to fire on civilians against their strongly held moral beliefs (Shay 2014).

During the pilot, we questioned warriors about the meetings before large raids where ad hoc representatives of participating age-groups would agree on the plan for a large raid. We learned that sometimes participants would disagree about whom the raiders should and should not kill during the raid. In every case that we heard about, the warriors said that the raid leader ultimately decided that who warriors could kill would be left to each warrior’s own conscience. This scenario inspired the first vignette detailed in Fig. 3. In this vignette the raid leader,
EDAPAL is the leader for a large raid. Before going on the raid, many Turkana warriors gathered to discuss the raid. EKALALE said: “On this raid, let us kill any of the enemy, including the elderly, the women and the small children.” EWOI disagreed and said: “we should kill only the men, but we should not kill the elderly, the women and the small children.”

What should EDAPAL decide?

| Warriors should kill any enemy (39%) | Warriors should kill only men (57%) | 4% |

ESINYEN, ERUPE and EBEI are on a raid. Just before reaching the enemy, they come across a small boy alone in the bush. The boy is old enough to walk and talk, but not old enough to watch animals. ESINYEN says: “We should let the boy go.” ERUPE says: “We should kill the boy because he might one day become an enemy warrior.” EBEI says: “We should kidnap the boy to prevent him from warning the enemy.”

What should they do?

| Kidnap the boy (45%) | Let the boy go | Kill the boy (50%) | 6% |

EDAPAL decides whether the warriors can kill any of the enemy or whether they should kill only men. This difference is consistent with participants’ beliefs about which demographic groups are permissible to kill. Most warriors who advocated for killing all demographic groups in the vignette said that it was permissible to kill all ten demographic groups shown in Fig. 1 ($\mu = 9.3$, $sd = 1.7$, $n = 39$), and those who advocated killing only men said, on average, that it was permissible to kill fewer demographic groups ($\mu = 5.7$, $sd = 2.5$, $n = 58$).

What is striking is that, even though leaving the decision up to each warrior was the only resolution we heard about, only 4.0% of 101 warriors endorsed this compromise position. The rest said that the raid leader should favor one side or the other. This suggests that there is disagreement about how killing in raids should be conducted, but that Turkana institutions ultimately appease those with less compunction about killing while allowing others to avoid moral violations.

The second vignette in Fig. 3 was inspired by a dilemma that also came up during the pilot. A participant told one of us about a time when he and the other members of his small raiding party came across a small child. The other members of the party wanted to kill the boy because, if they let him go, he could warn others about the warriors’ location. Killing the child is the most expedient way of avoiding this danger and 49.5% of 101 participants endorsed this as the solution to this dilemma. However, the participant successfully argued that they should kidnap the boy to spare his life. The other warriors agreed as long as the warrior took responsibility for the boy. Kidnapping has its own challenges because kidnapped children move slowly at a time when warriors wish to move swiftly to avoid the enemy; they cry when the warriors want to avoid detection; and they try to escape at any opportunity and might warn others. Although most kidnapped children stay obedient out of fear of reprisal, there is a real danger that a kidnapped child can give away the raider’s position. In our study, 44.6% of 101 participants advocated for kidnapping.

Since killing can be avoided if there is only one warrior on a raid willing to take responsibility for the child, this type of institution would allow Turkana warriors to avoid committing or witnessing moral violations even when the majority of his raiding partners support committing them. Kidnapped children may be allowed to escape after the Turkana have gotten far enough out of enemy territory to avoid detection and tracking. Kidnapped children might be used for household and herding labor, but they tend to be returned as part of peace-negotiations or because the captor feels sorry for them.

4.4. Raid leadership institutions

Turkana leadership institutions might also help protect them from moral injury. Moral injury in western militaries can result from soldiers feeling betrayed by their leadership (Drescher et al., 2011; Litz et al., 2009). This betrayal is possible, in part, because western military leaders have command authority over those they lead and are backed up by the coercive power of the chain of command and the military legal system. The leaders are, in turn, expected to adhere to moral principles of leadership. While the Turkana have designated leaders for large raids, these leaders do not have command authority or coercive power. Their main role is coordination and individual warriors choose whether or not to participate in any raid.

However, leaders do have responsibilities to other members during the raid. During the pilot, we asked about the actions that raid leaders might take that might result in feelings of betrayal. A common response was that warriors feel betrayed when a leader breaks the instructions given to him by a diviner. Diviner instructions are normally given directly to the leader of a large raid and can involve elaborate rituals and behavioral restrictions that, if followed, are supposed to lead to a successful raid. There are many variants of specific diviner instructions, but instructions to avoid killing or eating wild animals during a raid is fairly common. This inspired two vignettes (Fig. 4) that offer slightly different scenarios. In the first, a warrior named MARAKA breaks the diviner’s instructions by killing an antelope and eating it with other warriors. In the second, it is the raid leader, ELAR, who kills the antelope and eats it with other warriors.

For each scenario we asked whether the instruction-breakers would be punished for this action. Punishment, for a Turkana warrior, can involve a severe beating, being compelled to kill his most prized bull to be eaten by other warriors, and/or distributing his animals to age-mates or the families of warriors who died during the raid where he failed to heed the diviner’s instructions. If raid leaders had coercive power over others, we would expect that they would be less likely than other warriors to be punished for breaking a norm. Instead, almost the same percentage of warriors endorsed punishment for ELAR (38.6%) and MARAKA (41.6%), suggesting that the raid leader has no special status. They are judged just like other warriors. Moral injury caused by leadership betrayals is likely to be rare in the Turkana. Warriors make their own decisions about joining raids, and raid leaders are held to direct, and often brutal, account by those they lead.

4.5. Sanctions for killing of civilians

Finally, since there was wide variation in individual moral beliefs about whom warriors could kill in battle (Fig. 1), we created vignettes to determine if there was sanctioning around violations of those beliefs. In the first, the raid leader decides in a pre-raid meeting, that warriors should not kill elderly people. We asked if a warrior who purposefully kills an old woman would be punished (Fig. 5). Only 15.8% of warriors said that he would. When asked about a warrior who accidentally kills an old woman, only 2.0% of participants said that he would be punished. This indicates that the intention behind the action matters. However, it is still unclear whether it is the killing of the old woman or...
the violation of the raid leader’s decision that provokes the punishment endorsed by the 15.8% of warriors in the first question. We asked, then about a scenario where a warrior does not kill an old woman even though the raid leader says that everyone should be killed. In this scenario 16.8% of warriors said that he would be punished. This suggests that going against the raid leader’s decision is as important a determinant of punishment as whether the action results in killing or not. However, 2.0% of warriors said that the violator would be punished in all three scenarios and these warriors were the only ones endorsing punishment in both the first and last scenarios. This indicates that most of the warriors endorsing punishment are doing so from a position of their own moral beliefs about killing.

In the end, the question is whether punishment actually happens in this scenario. None of the warriors we asked could think of an instance where someone was punished for killing, or failing to kill, someone from another ethnic group during a raid. This could be because, as we discussed before, raid leaders rarely make definitive decisions about who should and should not be killed. But also, since meting punishment for norm violations on raids for the Turkana is a collective enterprise, it is unlikely to happen if a minority of warriors supports it (Mathew, 2017). Age-mates must first come to a consensus about whether someone should be punished for their actions during a raid. If only 15% of people in a group endorse punishment, punishment is unlikely to be administered. This lack of enforcement for killing non-males suggests that there are little to no mechanisms to create or maintain a moral norm against killing non-Turkana in battle.

4.6. Measuring moral injury symptoms cross-culturally

A current challenge for studying moral injury is a lack of consensus in measuring moral injury symptoms independent of specific events. The Moral Injury Events Scale (Nash et al., 2013) only asks about potentially morally injurious events. The Moral Injury Questionnaire – Military Version (MIQ-M) (Currier et al., 2015) – has 20 questions, with

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**Fig. 4.** Leaders receive the same punishment for breaking the diviner’s instructions as other warriors. This suggests that leaders are not any more able to escape retribution for moral violations than non-leaders.

**Fig. 5.** Few warriors say that those who violate the raid leader’s decisions about who to or not to kill will be punished. Other than 2% of warriors who endorsed punishment for all three vignettes, no warriors both endorsed punishment in the first and last vignette. Since it takes a consensus to communally punish, it is likely that such punishment is rare.
After returning from a raid, did you ever feel betrayed or disappointed by members of your community who did not fight?

|        |        
|--------|--------|
| 24%    | 76%    |

Have you ever felt guilt over failing to save the life of someone during a raid?

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Have you ever felt guilt for surviving a raid when others did not survive?

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Has seeing death in battle changed you?

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Have you come to realize during battle that you enjoy violence?

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Fig. 6. Turkana answers to questions similar to select questions from the Moral Injury Questionnaire - Military Version. Turkana feel guilt about other Turkana who have died, suggesting that this might be a greater source of moral injury than killing enemies in combat. 14 being labeled as “causes,” which ask about potentially morally injurious events, and six being labeled as “effects” most of which also include specific potentially morally injurious events in their definition. Since we were interested in the symptoms of moral injury, we asked five of the six “effects” questions from the MIQ – M (Fig. 6). We did not ask the question about whether the Turkana felt betrayed by their political leaders as Turkana do not traditionally have political leaders. (While government-appointed “chiefs” and elected officials interface between the community and Kenyan national institutions, they do not have a role in local cultural practices such as raids). We found that 24% felt betrayed by community members who did not fight. However, we are not sure that their stated reasons for feeling betrayed were intended by the question. For example, some of the warriors said they felt betrayed because they were accused of being responsible for the deaths of an age-mate by the age-mate’s family members. Similarly, 37.7% felt guilt over failing to save the life of someone during a raid and 63.0% said that they felt guilt for surviving a raid that others did not. These findings together suggest that feeling guilt over the death of comrades may be more universal and more difficult to avoid than moral injury over killing innocents. Notably, age-mates who come home alive from a raid are blamed by the family members of those who did not. Some warriors reported giving animals to the families of their deceased age-mates after such shaming.

Many of the participants found the fourth question, whether seeing death in battle changed them, confusing. Participants were unsure of what types of changes we were asking about and the MIQ-M does not provide guidance. Perhaps the meaning is self-evident to military veterans with pre-formed notions about how seeing death is supposed to change someone. However, for cross-cultural research, it would be more useful if this question were more specific about the types of changes the instrument is designed to detect.

Finally, despite (or perhaps because of) a lifestyle where raiding and death is common, few participants (10.5%) professed discovering an enjoyment of violence in battle. Many of the older warriors we interviewed would express nostalgia for their raiding days, but their nostalgia focused more on comradeship and the joys of returning with animals, than on the violent aspects of their raids. This is despite the fact that killing in battle is a celebrated part of Turkana society. In the next section, we suggest that rituals that signal the social endorsement of raiding, may help overcome the aversion to violence and killing, and may serve to reduce moral injury from killing in the Turkana.

4.7. Rituals of healing, support and endorsement for warriors who have killed

Compared to western soldiers Turkana cultural practices create far more opportunities for warriors to reaffirm to themselves that they have not violated a communally held moral belief, and find support if they have.

Turkana warriors are surrounded by other warriors who have fought and sacrificed in battle. Almost all men in our research area have participated in raiding – either raiding another group or defending the Turkana. In addition, Turkana warriors receive a lot of endorsement from the folks who remained behind. Their safe return is celebrated through song, dance and feast. The young look up to them, the old bless them, and the women praise them. When a warrior acquires sufficient animals on a raid, family members may perform a ceremony called EKENY for him. EKENY varies somewhat because of different family traditions, but during a typical EKENY ritual a warrior stays to the east of his family compound with his captured animals. One of the parents throws water onto him from inside the compound before he can enter with the animals. The next morning, an older male relative (ideally the warrior’s father) will kill a white bull that the warrior captured on the raid (if the warrior did not capture a white bull one may be taken from the family herd or exchanged with neighbors). If a bull is unavailable, a he-goat may be used. Their mother will smear the warrior and his siblings with white ochre and the bull’s meat will be cooked on a fire with tobacco. The contents of the bull’s stomach are smeared on the warrior, then on his brothers, then on any other male relatives who are there, and then on the warrior’s age-mates. Sometimes the contents are smeared on the warrior’s gun, which is then fired to the east. The warrior’s father then cuts some skin of the bull and ties it to the warrior’s wrist. Other members of the family are given additional skin to wear. The warrior is served the meat of the bull first, which he spits to the east. Then everyone can eat. The order and exact steps seem to vary between families, but this ceremony is a signal that a family supports the warrior’s raiding.

Turkana warriors identified three rituals specifically designated for those who have killed enemies in combat. These communal rituals are clear signals from the community that their community endorses and supports their act of killing. For all three rituals, the only participants are other men who have killed in combat and who may have traveled from a great distance to participate. Two of these rituals are also thought to protect or heal an individual from possible symptoms of trauma associated with killing.

The first of these, AKIGER, is a painful ritual that creates a visible pattern of scars over large parts of the body. The warrior’s skin is repeatedly pulled away from the body with a small hook and sliced with razor and the resulting scars, approximately a half-centimeter in diameter, form a dimpled pattern whose purpose is to signal a warrior’s prowess in killing to others. Men can add more scars as they kill on subsequent raids. Other warriors and members of the community hold men who have killed in combat and who may have traveled from a great distance to participate. Two of these rituals are also thought to protect or heal an individual from possible symptoms of trauma associated with killing.

Another ritual, AKIPUR, is a purification ritual that many of the study participants regarded as mandatory the first time a warrior has killed an enemy in combat and can also be performed for subsequent killings. Only men who have already killed in battle attend or participate in the AKIPUR ceremony. During the ritual, a goat is slaughtered
and the warrior who recently killed is stripped and smeared with its stomach contents. The warrior’s head is shaved with a razor and then rubbed with a mixture of oil and red clay that eventually hardens into something like a cap. The warrior is not supposed to wash his scalp until his hair grows back and the clay “disappears into the wind.” The consequence of not going through AKIPUR, according to our participants, is slowly wasting away until the warrior either participates in the ritual or dies. AKIPUR is a costly ritual since it involves the gathering of enough men to perform it, the sacrifice of a valuable goat, and the donation of clothing to the warrior who has killed. Therefore, it is a strong signal of community support, especially from other warriors. 87% of warriors who reported killing in an offensive raid, say they participated in AKIPUR.

The third ritual for those who have killed, NGITEBUS, is said to protect a warrior from the ghosts of enemies they have slain. Our participants reported that NGITEBUS is optional, however it is often performed in conjunction with AKIPUR. During NGITEBUS, when a warrior strips off his clothes he gives them to the other gathered men. He will never wear those clothes again. He is then laid next to a goat that has been roasting on the fire. The goat is cut open, while still on the fire, and the goat’s hot stomach contents erupt onto the warrior’s naked body. The warrior is then washed and given new clothing by the gathered men. Sometimes, after the ceremony, the warrior is led around the community by an older warrior who re-introduces him to people he has known all his life and tells him the names of common objects, “as if he were a child.” While NGITEBUS is optional, it can be performed, preemptively, immediately after a raid, or any time a warrior is haunted by an enemy’s ghost (which occurs during sleep), even decades after the original battle. One warrior we interviewed estimated that, due to repeated hauntings, he underwent NGITEBUS eleven times over the past twenty years. Other warriors need many fewer. Hauntings may be a cross-culturally common manifestation of trauma (Hinton, Field, Nickerson, Bryant, & Simon, 2013), and moral injury. However, NGITEBUS, which was undergone by 91% of Turkana who said they killed on a raid, is another unambiguous signal of community support for those suffering trauma.

Because these rituals are elaborate and costly for members of the community, involving the sacrifice of animals, the gift of clothing, and the participation by many other men who may come from a great distance, we posit that they interact with a norm psychology by signaling the participation by many other men who may come from a great distance. We posit that they interact with a norm psychology by signaling the participation by many other men who may come from a great distance. We posit that they interact with a norm psychology by signaling the participation by many other men who may come from a great distance. We posit that they interact with a norm psychology by signaling the participation by many other men who may come from a great distance.

Conducting a study on combat-induced trauma in a non-western society has led us to recognize some key challenges to cross-cultural research in moral injury. One of the largest challenges is that symptoms of moral injury are not clearly separated from exposure to potentially morally injurious events in current research. This conflation possibly is due to the fact that most of the research on moral injury is in WEIRD populations, and it is assumed that the relevant moral norms being violated are universally held and evident to the researchers. However, if societies have different moral norms and members of those societies have different moral beliefs, then we would expect that different types of acts would be morally injurious in those societies. We recommend an approach to cross-cultural research, where first the relevant moral beliefs and norms of a society are explicitly measured and described, and then moral injurious events be assessed as instances where moral violations occur. Then, the cross-cultural manifestation of moral injury would be a set of symptoms resulting from emotions like shame or guilt that are triggered by exposure to moral injurious events, i.e. culturally salient moral violations. For example, depressive symptoms in Turkana warriors are partly an outcome of exposure to combat-related moral violations (Zefferman & Mathew, 2020). The approach we propose

5. Conclusion

We have proposed that moral injury in warfare results from a norm-psychology that humans evolved to avoid the consequences of moral violations. By experiencing remorse and expressing it through shame and guilt, individuals who have inadvertently or intentionally violated norms can credibly signal to their community that they are less likely to commit the violation again. In its severe form this results in debilitating levels of guilt and shame that characterizes traumatic moral injury. In warfare, combatants cause grave harm to others by acts of commission (killing), as well as by acts of omission (failing to save a life). Specifically, in the context of killing in war, these actions are irreversible and, since many societies have context-dependent norms both for and against killing, it is easy to find oneself exposed to moral injury.

While our framework suggests that moral injury will be cross-culturally prevalent, western military systems have features that we expect will increase the incidence and severity of moral injury relative to small-scale societies. To illustrate this, we described certain cultural practices surrounding warfare among Turkana warriors that might reduce moral injury. There is little social disapproval in Turkana society for killing of enemy individuals, even women and children; leaders do not have coercive power and so warriors have more moral autonomy to follow their own or communally held beliefs; warriors are well-integrated with their larger community because almost all men have participated in raids, and many women and children have been raided; warriors do not spend long periods away from their community; there is extensive flow of information between warriors and their community regarding what transpired on raids; and warrior-hood norms are not distinct from communal norms upheld by non-warriors in the community. Warriors have multiple channels to perceive that their community endorses their acts, via praise, blessings, songs and stories that applaud their conduct. Lastly, the Turkana have communal rituals specifically for those who have killed enemies to restore and repair their psychological wellbeing.
would require moving away from thinking of moral injury as defined as a response to moral beliefs common in one particular society (western combat veterans) or assumed to be universally held.

An added complication to this approach is that the symptoms of moral injury, not just the causes, may vary between societies. A number of researchers have documented that different societies have different “idioms of distress,” responses to trauma that may differ in profound ways from western conceptions of PTSD (Hinton & Lewis-Fernández, 2010; Kaiser et al., 2015). Ultimately, if causes and symptoms both vary widely between societies, atheoretical cross-cultural comparisons are likely to be unfruitful. However, a causal theory of moral injury, such as the evolutionary theory we propose here, would help to make and test predictions about how causes and symptoms might both vary between societies. Our evolutionary theory suggests that a productive cross-cultural research program would document moral beliefs, moral norms, moral violations, sanctioning institutions, signaling institutions, and idioms of distress in each society to build a comprehensive picture of the determinants of moral injury across them.

However, this effort will not get very far if such a comparison is limited to members of just two types of societies, in this case Turkana warriors and American combat veterans. As we have shown in this paper, the Turkana and modern military institutions are different in many areas that are plausibly important to moral injury: for example, military organization, moral norms and beliefs, and signals of support. With only two societies, it is difficult to know which of these areas are important to preventing or treating moral injury and which are not. To understand the most important differences, a larger sample of societies would be helpful. For example, we might find that societies with more stringent moral norms and sanctioning institutions have more moral injury, but that the amount of coercive leadership in a society does not matter. Cross-cultural research is more powerful the more societies we can sample.

Finally, a major challenge for actually using the insights of cross-cultural research for preventing and treating moral injury in western societies is that many of the potentially important elements to resiliency may depend on societal-level properties and institutions that would be beyond the reach of an individual clinician to change, let alone assign to participants in a clinical trial. Nonetheless, our study suggests that smaller-scale interventions may be helpful for moral injury treatment and prevention. For example, group therapy programs already allow veterans to share their experiences with other veterans. This is somewhat analogous to Turkana warriors discussing their war experiences with each other. However, a key difference is that these sessions are set aside for therapy and not part of the casual everyday interaction between warriors in Turkana society (not to mention the many non-warriors who have been part of raids where the Turkana were attacked).

Our research so far suggests some lessons that may be helpful for moral injury prevention and treatment. For example, there are, to our knowledge, no ceremonies or rituals to help soldiers and combat veterans who have killed, or committed other morally injurious acts, in combat. Purification rituals may be important social signals of acceptance (Gabriel, 1988). We are not suggesting that western soldiers adopt the specific ceremonies the Turkana practice, and we are not suggesting that soldiers be awarded medals for killing. Rather, soldiers themselves would need to organically develop culturally-appropriate ceremonies that recognize the gravity of taking a human life, but also signals the acceptance of the necessity of the act from the military community, and ideally the community at large.

It might also be productive to examine existing military institutions for areas where soldiers could be given more moral autonomy. For Turkana warriors, joining a raid is voluntary, and there are institutions in place where warriors can make their own decisions about their moral conduct in battle. Furthermore, institutions are designed where some potentially morally injurious acts can be avoided even if the raid leader (or even most of the warriors on a raid) support committing them. It is not immediately clear to us how similar institutions could be adopted in the top-down command structure of a modern military. However, it may be a productive area of research.

While alleviating the debilitating symptoms of moral injury is desirable, it is worth recognizing that guilt can sometimes have desirable outcomes. Individuals who experience guilt more easily are more cooperative (Malti & Krettenauer, 2013), and the anticipation of guilt deters people from committing violations (Svensson, Weerman, Pauwels, Bruinsma, & Bernasco, 2013). While expressing guilt increases the chances of being judged as a wrongdoer (Jehle et al. 2009), it lowers the punishment that one is meted for the wrongdoing (Fischbacher & Uitkaj, 2013). Consequently, low levels of moral injury symptoms can facilitate reconciliation and repair. Individuals who commit moral violations and experience normal levels of guilt may have better social and health outcomes overall than those who commit moral violations and do not experience guilt at all.

Some level of moral injury may also be the byproduct of social institutions and moral norms that are desirable for society. For example, militaries of nation states typically have a set of legal and doctrinal restrictions about the conduct of war that are enforced by military courts, with violators potentially sentenced to jail. This sends a strong signal that violating these norms is morally wrong. While relaxing these restrictions and sanctions might decrease the incidence of moral injury symptoms, it might not be worth it if it leads to an increase in formally immoral behavior, such as killing civilians.

Similarly, the more expansive people's moral sphere is, the more likely it is that acts such as killing in warfare will violate personal and communally held moral beliefs. As societies become larger and more globalized our moral concerns have expanded to include more people. World religions that emerged in the last couple millennia for instance have expanded the moral sphere to include people from diverse ethnic and linguistic groups (Norenzayan et al., 2016). Trends like humanism promote including people in one's moral sphere regardless of their nationality or religion. While one could potentially reduce moral injury by promoting more parochial moral norms that disregard the wellbeing of outgroup members, this would have undesirable social consequences for humanity. Recognizing the positive and negative faces of moral injury will be critical for designing institutions that minimize its undesirable facets without compromising on the important role of guilt, moral norms, and social sanctioning for the functioning of human society.

Declaration of Competing Interest

None.

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