



## War exposure, altruism and the recalibration of welfare tradeoffs towards threatening social categories

Jonathan Hall<sup>a,\*</sup>, Dennis T. Kahn<sup>b</sup>, Eric Skoog<sup>a</sup>, Magnus Öberg<sup>a</sup>

<sup>a</sup> Dept. of Peace and Conflict Research, Uppsala University, Sweden

<sup>b</sup> Baruch Ivcher School of Psychology, Interdisciplinary Center, Israel

### ARTICLE INFO

#### Keywords:

War exposure  
Threat perceptions  
Welfare tradeoff ratio  
Altruism

### ABSTRACT

How does war shape human altruism? Some find warfare increases generosity within groups only. Others maintain that war's prosocial effects extend to outgroup members as well. To make sense of these disparate findings, we offer a theoretical framework that highlights the role of threat sensitivity in altruism. Refugees from Syria and Iraq ( $N = 1521$ ) completed a welfare tradeoff task and threat perceptions scale where the other's group identity, gender and age were experimentally varied. We found that individuals belonging to social categories associated with more threat (outgroup members, males, and younger individuals) were afforded less altruism compared to individuals belonging to non-threatening social categories (ingroup members, females and the elderly). War exposure enhanced bias against threatening social categories through increased threat-sensitivity. Our results have implications for understanding how warfare shapes altruism and welfare tradeoffs in light of cross-cutting social categories and for policies promoting post-conflict cooperation.

The view that warfare in our ancestral past shaped human nature has received much attention in recent years. According to this perspective, our cooperative tendencies co-evolved with intergroup competition and warfare, endowing humans with a coalitional psychology of parochial altruism and tribalism (Bernhard, Fischbacher, & Fehr, 2006). However, the conditions under which the experience of war violence actually promotes or reduces altruism, and the psychological mechanisms by which it does so, have received surprisingly little attention in the growing literature on war and social cooperation (see Bauer et al., 2016 for a review). Similarly, calls for more research into inputs to decision-making about welfare tradeoffs, and the conditions that moderate them, arise from the psychological literature on welfare tradeoffs (Delton & Robertson, 2016). We contend that the effect of war on altruism will depend on two factors: (i) the social categories to which the target of the altruistic exchange belongs and (ii) perceived threat associated with these categories. We use an evolutionary social psychological approach – combining the threat management and welfare tradeoff perspectives – in order to elaborate our hypotheses, and report a large-scale survey experiment carried out in a naturalistic setting among refugees from the wars in Syria and Iraq designed to test them. Going beyond the recent emphasis in the literature and in public discourse on “tribalism” and parochial altruism, our research demonstrates how humans respond

differently to multiple cross-cutting social categories as they adapt to the experience of war.

### 1. The threat management approach

According to the evolutionary threat-management approach (Neuberg, Kenrick, & Schaller, 2011; Neuberg & Schaller, 2016; Schaller & Neuberg, 2012), social cognition has evolved in response to challenges faced by humans in their ancestral environment. Living in close proximity to others leaves the individual vulnerable to threats such as interpersonal violence, theft, and infectious disease. Accordingly, individuals who were more successful at identifying those who posed such threats were more likely to survive and reproduce. Natural selection is likely to have created learning mechanisms that assess cues to those who posed a potential threat as well as affective and behavioral responses that mitigated such threats (Neuberg & Schaller, 2016). Such selection pressures are also likely to have given rise to a “better safe than sorry”-approach when it comes to the assessment of threat cues associated with social categories, since the cost of failing to detect a significant threat is greater than the cost of misattributing threat to a non-threatening individual. While such processing of social information may be adaptive in terms of survival, it also results in stereotyping and prejudice associated

\* Corresponding author.

E-mail address: [jonathan.hall@pcr.uu.se](mailto:jonathan.hall@pcr.uu.se) (J. Hall).

<https://doi.org/10.1016/j.jesp.2021.104101>

Received 29 June 2020; Received in revised form 22 December 2020; Accepted 6 January 2021

Available online 17 January 2021

0022-1031/© 2021 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

with different social categories (Neuberg & Schaller, 2016).

## 2. Social categorization and threat

Easily identifiable, quickly processed and hard-to-fake social cues have presumably been especially prevalent when quickly assessing the level of threat posed by the other. Men and young individuals have historically been more likely to be perpetrators of violence (e.g., Van Vugt, 2009; Goldstein, 2003; Britt, 2019). Accordingly, men and young individuals tend to be perceived as more threatening than women and the elderly. Further, due to the long history of intergroup and inter-tribal conflict and competition over resources, humans are more prone to perceive members of outgroups as threatening (Neuberg et al., 2011). The tendencies to perceive males, young individuals and outgroup members as more threatening are apparent from findings from the emotion recognition literature. We are better at detecting anger in male (Becker, Kenrick, Neuberg, Blackwell, & Smith, 2007) as well as young faces (Ebner & Johnson, 2009) and angry facial expressions facilitates the identification of a face as male (Zebrowitz, Kikuchi, & Fellous, 2010). Further, white perceivers are especially slow to unlearn fearful responses to faces of black strangers (Olsson, Ebert, Banaji, & Phelps, 2005) and this effect appears to be specific to male faces (Navarrete et al., 2009). Based on this reasoning, we hypothesize that outgroup members will be perceived as more threatening than ingroup members, males will be perceived as more threatening than females and younger individuals more threatening than older individuals.

## 3. Threat and altruism

We define altruism as a motivational stance with the ultimate goal of increasing another's welfare, even if this is at the expense of one's own welfare (Batson, 2010). We suggest that perceptions of threat should reduce such altruistic motivations. Benefitting someone that poses a threat does not make sense from an evolutionary fitness perspective, unless benefitting the other could keep him/her from harming you. In a situation where no indications are given that generosity would prevent hostile behavior from the other, benefitting a threatening individual would essentially increase his/her ability to cause you harm. On this basis, we hypothesize that social categories associated with more threat (e.g., outgroup members, males and young individuals) will be met with lower degrees of altruism compared to social categories associated with less threat (ingroup members, females and the elderly). Since we base this hypothesis on the differing levels of threat associated with different social categories, we also hypothesize that the effects of group membership, gender and age on altruism will be mediated by perceptions of threat.

We use welfare tradeoffs as a measure of altruism. Evolutionary logic stipulates that natural selection should favor behavior that promotes one's own welfare, at least to the extent that this benefits survival and reproduction. In spite of this, humans, and many other animals, will at times favor the welfare of others over that of their own. The welfare tradeoff ratio perspective studies the internal regulatory variables that affect the ratio between promoting one's own welfare relative to that of others (Cosmides & Tooby, 2013). Certain variables, such as kinship and expected reciprocity, follow a clear evolutionary logic according to which the higher the degree of kinship and expected reciprocity associated with another individual, the greater the values placed on another's welfare relative to one's own. Humans' complex mental capabilities, however, extend beyond these fundamental cues for valuing others' welfare and take into account the social context, the interest of the wider group and cues that can quickly increase knowledge about the other when making welfare tradeoffs (Delton & Robertson, 2016). Understanding these cues can provide important social psychological insights about the conditions under which we are willing to place the welfare of others first as well as the mechanisms underlying anti-social behavior and attitudes, such as prejudice and discrimination.

## 4. War exposure, threat and altruism

The experience of traumatic events often leads to hypervigilance, an enhanced state of threat sensitivity and preoccupation with the potential for danger (Yehuda et al., 2015). Extended exposure to war violence has been shown to increase generalized perceptions of threat (e.g., Canetti, Hall, Rapaport, & Wayne, 2013) and leave a neural footprint in the form of exaggerated amygdala responses to threatening stimuli among traumatized individuals (Rauch et al., 2000). Due to the hypervigilance and threat sensitivity associated with the experience of traumatic events, we expect war exposure to enhance and intensify the differentiation between threatening and non-threatening social categories in determining altruistic responses. Stated differently, the use of social cues to assess who poses a potential threat (Neuberg & Schaller, 2016) is expected to be augmented by war exposure. The increased threat sensitivity and hypervigilance is therefore expected to sharpen the distinction between ingroup and outgroup, male and female and young people and the elderly in terms of threat perceptions and altruism and strengthen the mediating role of threat in the relationship between social categorization and altruism.

In order to illustrate this, consider the dilemma of deciding whether or not to pick up a hitchhiker on a desolate highway. The driver in such a situation needs to make a quick decision about whether or not to help the hitchhiker based on the limited information that can be gathered about the hitchhiker's identity and intentions. The most salient and immediately available information about the hitchhiker consists of his/her belongingness to primary, easily processed social categories, such as gender, age and race/ethnicity. We suggest that outgroup status, male gender and young age will signal a higher degree of potential threat and engender a less altruistic response (less likelihood to pick up the hitchhiker), compared to if the hitchhiker was an ingroup member, female and/or elderly individual. Further, having experienced a past traumatic event would according to the above reasoning strengthen these tendencies by making a person hypervigilant and more sensitive to social cues of impending threat when deciding whether they should help the hitchhiker.

## 5. Previous research on war exposure and altruism

A growing literature has supported the surprising finding that exposure to war violence *increases* prosocial tendencies (Bauer et al., 2016; Bauer, Cassar, Chytilová, & Henrich, 2014). In most of these studies however, no differentiation is made between altruism towards in- and outgroup members. In the few studies in which such a differentiation is made, the prosocial effects of war exposure typically appear mainly in relation to fellow ingroup members (e.g. Bauer et al., 2014; Cecchi, Leuvel, & Voors, 2016; Mironova & Whitt, 2018). A few recent studies have, however, documented prosocial effects of war exposure towards at least some categories of outgroup members. In their study of the Ivorian refugee crisis in Liberia, Hartman and Morse (2018) find that those who experienced more war violence were more likely to host refugees, even those belonging to other ethnic and religious groups. Specifically, they found that those exposed to more violence were more likely to host families with health problems, that were hungry or starving, or had fled direct violence (Hartman & Morse, 2018). While these individuals did belong to other ethnic and religious groups, they were likely to have been perceived as belonging to non-threatening outgroup subcategories (i.e., individuals suffering from health problems, starvation or victims of direct violence). Degree of hostility of intergroup relations further influences the direction of the relationship between target group membership and altruism. Specifically, the more hostile the relationship between the groups, the more exposure leads to a negative emotional stance towards the target, which in turn has a destructive effect on outgroup altruism (Hall & Kahn, 2020).

Results from these studies are compatible with the hypothesis that exposure exacerbates the differentiation between threatening and non-

threatening social categories. Exposure would according to this reasoning increase altruism towards non-threatening social categories, such as ingroup members, but also potentially non-threatening outgroup members as well. Degree of threat associated with different social categories, however, was in these previous studies either overlooked (e.g., [Hartman & Morse, 2018](#)) or inferred rather than demonstrated (e.g., [Hall & Kahn, 2020](#)). This constitutes an important knowledge gap in the endeavor to understand the effect of war exposure on altruism. Previous studies that differentiate between different social categories have further focused mainly on the ingroup/outgroup distinction and largely ignored the effect of other primary social categories, such as age and gender. We address these knowledge gaps in the present paper and highlight the role of cross-cutting social categories and threat sensitivity as inputs to decision-making about altruism. We further integrate and test a comprehensive model, based on previous findings, describing the process of how exposure to traumatic events during war-time affects altruism. Our theoretical model could account for the seemingly contradictory results found regarding the effects warfare has on altruism. Individual-level war exposure would, according to this reasoning, potentially increase altruism towards non-threatening social categories, such as fellow ingroup members ([Bauer et al., 2014, 2016](#); [Cecchi et al., 2016](#)) and deprived families belonging to a non-rival outgroup ([Hartman & Morse, 2018](#)). On the other hand, exposure to war violence would be expected to decrease altruism towards threatening social categories, such as young males or individuals belonging to a rival outgroup in an ongoing violent conflict.

## 6. The present research

We carried out a survey experiment in a naturalistic field setting with a large sample of refugees from Syria and Iraq residing in Turkey in order to test our hypotheses. Studies among individuals with a high degree of war exposure are relatively rare due to the inherent difficulty in gaining access to such populations and the logistical barriers to data collection. Nonetheless, in order to study the effects of war exposure, reaching populations directly affected by war is of central importance. The conflicts in Syria and Iraq are two of the most grueling armed conflicts in the world today and affect even countries far removed from the conflict zone itself. Since 2011, Syria and Iraq have suffered the majority of the world's battle-related fatalities ([Pettersson & Eck 2018](#)) and the violent struggles in these areas have generated massive displacement of civilian populations. In Syria, where the brunt of the violence is taking place, more than half the population has been displaced, with 6.6 million internally displaced and 5.6 million refugees residing in other countries ([UNHCR, 2018](#)). The reverberations of these conflicts can be felt around the world due to the stream of refugees emanating from these conflict zones. Studying refugees from these conflicts is important due to their unique tragic experiences during the war and their future role in reconstructing their own societies and integrating into host societies.

## 7. Method

### 7.1. Participants

#### 7.1.1. Participant recruitment

Sample size was determined using G\*Power ([Faul, Erdfelder, Lang, & Buchner, 2007](#)). Previous research using similar experimental manipulations indicated that the effect size in the population was small ( $f = 0.10$ ; [Hall & Kahn, 2020](#)). The results of the power analysis on the estimated effect size ( $f = 0.10$ ) indicated that the desired sample size for the 4-way analysis with 0.80 power, was  $N = 1634$  participants. The sample consisted of 1521 Syrian and Iraqi refugees residing in Turkey. We performed a sensitivity power analysis ([Faul et al., 2007](#)) assuming an alpha significance criterion of 0.05. With a sample of 1521 participants, the analysis had 80% power to detect a minimum effect size of  $f =$

0.10. No data was collected after data analysis was initiated. In order to gain access to this population, a team of local assistants, themselves refugees from Syria and Iraq, were recruited and trained to administer the study. The use of local assistants in the administration of the study helped to ensure that the study was carried out with cultural sensitivity and in a context of interpersonal trust. We acknowledge the important contribution and immense work effort invested by these local research assistants, without whom the research would not have been possible to carry out. Building on trust networks established through the fieldwork, we opted for community-based sampling, whereby existing participants recruit future participants from among their social networks, a sampling procedure often used to identify otherwise hidden populations. The same procedure for participant recruitment was carried out in Konya, Yalova, Istanbul, Ankara and Eskisehir until we reached a large and diverse sample of 2078 participants. The initial data included 2078 participants. Out of these, 1803 (87%) were Sunni Muslim Arabs. The study material was adjusted to Sunni Arab participants and the "Shia Arab" experimental treatment was defined as an outgroup treatment, while the "Sunni Arab" treatment was defined as an ingroup treatment. In order to enable comparison of responses to in- and outgroup members, we restricted the sample to Sunni Arab participants. In accordance with our ethics approval, we further excluded 117 participants who stated that their age was under 18. An additional 165 participants indicated that they had participated in an earlier round of a similar study ([Hall, Skoog, & Karakus, 2020](#)) and were therefore excluded from the final sample. To ensure that this exclusion did not introduce a bias in the analyses, we reran the main analyses from the study including the participants that had participated in this previous study. There were no substantial differences in the results when including these participants. We report these analyses in the supplementary material.

#### 7.1.2. Demographic characteristics

The sample was stratified by gender and country of origin. The gender distribution in the sample was 52% females and 48% males. The sample was skewed towards younger participants, with the median age being 25–34 years. Forty-nine percent each were from Syria and Iraq (29 missing values). The sample was further skewed towards highly educated individuals, with 87% indicating >9 years of schooling and 52% having 12 or more years of schooling. Similarly, the overall level of self-reported socioeconomic status was somewhat above average, with mean socioeconomic status in the country of origin ( $M = 6.35$ ,  $SD = 2.19$ ) and in the host country ( $M = 6.61$ ,  $SD = 2.44$ ) being above the midpoint of a scale from 0 to 10. Out of the Syrian refugees, a majority came from the Aleppo governorate (59%) and a smaller portion came from the Damascus (17%) and Homs (6%) governorates. The rest of the participants were divided evenly between the different Syrian governorates (< 5% per governorate). Among the Iraqi participants, the majority came from the Saladin (34%) and Baghdad (23%) governorates. A smaller portion came from the Nineveh (17%) and Basra (11%) governorates, with other governorates each being represented by <5% of the sample. A majority of the sample (69%) described the character of their settlement of origin as urban rather than rural. Most of the sample (88%) left Syria or Iraq after 2012. All measures, manipulations, and exclusions in the study are disclosed.

## 7.2. Measures

### 7.2.1. War exposure

Exposure to traumatic events was assessed using Part I of the Harvard Trauma Questionnaire (HTQ, [Mollica et al., 1992](#)). The version of the HTQ used in the study contained a checklist of 16 traumatic life events, determined to be relevant for Syrian and Iraqi refugees. These included lack of food or water, ill health without medical care, lack of shelter, imprisonment, physical abuse, serious injury, combat situation, indiscriminate shelling or bombing, being close to death, forced evacuation, forced separation from family, murder of family or friend, unnatural

death of family or friend, murder of stranger or strangers, kidnapping and torture. It is important to note that our use of terms such as “war exposure” and “exposure to traumatic events” refer to objectively experiencing the event rather than the subjective response to the event. Exposure to traumatic events during war-time entails the experience of highly stressful events that are potentially traumatic for the affected individual. There is however considerable variation in the degree to which individuals experience these events as traumatic or experience subsequent posttraumatic stress, which is not the focus here. Participants were asked to indicate whether they had experienced any of these potentially traumatic war-time events before arriving in Turkey. They were not limited in the number of events they could choose.

Previous studies of war exposure using the HTQ have often used a cumulative index, counting the number of traumatic events the individual has been exposed to. We believe, however, that a latent class analysis approach is a more appropriate choice for analyzing this type of data. To align our analyses with the common treatment of exposure as a continuous variable, however, we have included additional analyses, treating exposure as a continuous variable, in the supplementary material. These analyses produce the same main results as the analysis treating war exposure as a categorical variable, based on LCA. To clarify the reasoning behind the latent class analysis approach, it is important to note a number of issues. Clearly, having experienced any of these traumatic events implies having some level of war exposure. It is not clear, however, that indicating more types of events implies a greater degree of war exposure, or simply exposure to a greater variety of traumatic events. Treating the variable as continuous would for example imply that someone who has been evacuated, had ill health without medical care and experienced lack of food (3 events) has been more exposed than someone who has been kidnapped and tortured (2 events). And it is not clear whether someone who has been exposed to 9 separate types of traumatic events should be seen as more exposed than someone who has experienced 7 types of traumatic events. For these reasons, we used latent class analysis (LCA) to divide our sample into two categories based on meaningful clustering of different participants’ responses to the exposure measure. LCA avoids the arbitrary cutoff points involved in

simple dichotomous measures, but avoids the problems with the continuous approach mentioned above.

LCA classifies individuals into mutually exclusive and exhaustive types, or latent classes, based on their pattern of answers on a set of categorical variables, such as the ones used in the HTQ (Hagenaars & McCutcheon, 2002). Using LCA, we divided the participants into two latent classes (see details of the latent class analysis in the supplementary material). We termed these classes “low exposure” and “high exposure”, although it should be noted that the term “low exposure” is only in relation to other individuals in this sample, which had an overall high level of war exposure (see Fig. 1). The “low exposure” class consisted of 1066 individuals (70%) and the “high exposure” class consisted of 455 individuals (30%). Among Syrian refugees, the percentage in the “high exposure” class was 26%, whereas among Iraqi refugees, the percentage in this class was 35%.

### 7.2.2. Welfare tradeoff task

To assess altruism, the participants were given the welfare tradeoff task (Kirkpatrick, Delton, de Wit, & Robertson, 2015) – assessing the degree to which they value their own welfare relative to the welfare of another individual. The task involved a series of decisions regarding the allocation of money to oneself and a target individual. At first, the participants faced a choice between either accepting a relatively large monetary reward for themselves or giving a modest sum of money to the target individual. In each of the consecutive decisions (13 decisions in total), the monetary reward for themselves became progressively lower, while the sum for the other remained fixed, with the final decisions involving a choice between losing a small sum of money for themselves or providing a modest sum of money to the target individual. The welfare tradeoff ratio (WTR) was determined by identifying the average sum at which the participants switched to providing a reward to the target individual rather than to themselves (the “switchpoint”) and then dividing this sum by the sum allocated to the target individual. The resulting WTR ranges between  $-1.67$  and  $2.67$ , with higher values indicating placing greater value on the welfare of the target individual relative to one’s own; or in other words, a greater degree of altruism. a

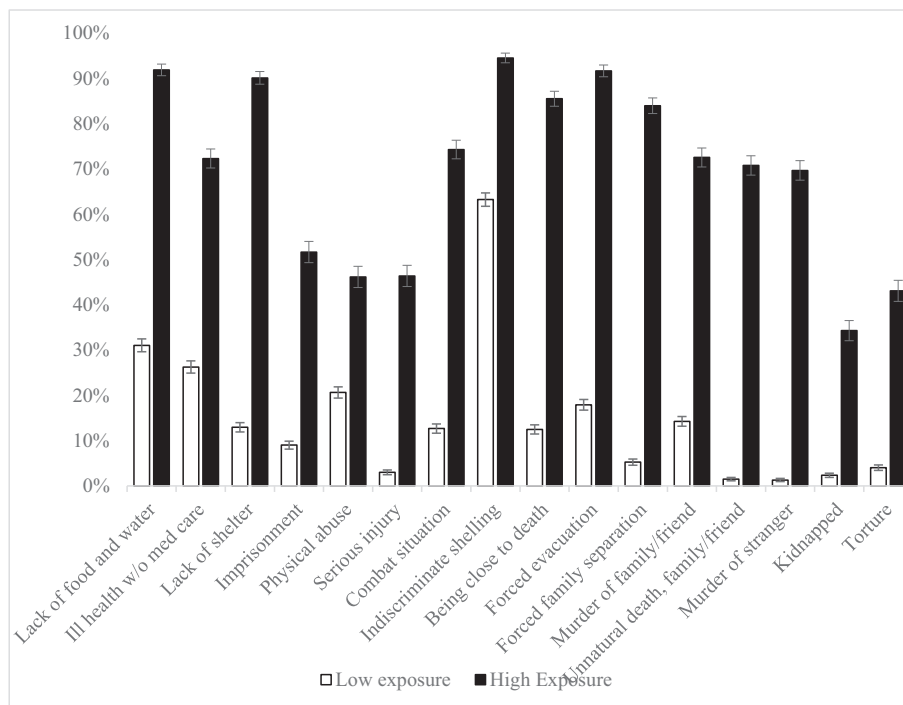


Fig. 1. Percentages of the sample that had experienced each of the traumatic events in the low and high exposure categories. Error bars represent standard errors of the mean.

WTR of one implies valuing the welfare of self and other equally, while a WTR of zero implies valuing only one's own welfare, i.e., complete selfishness. A WTR greater than one indicates valuing the welfare of the other more than one's own welfare, while a WTR less than zero indicates one is willing to pay to deprive the other of benefits, i.e., spitefulness.

7.2.3. Perception of threat

Following the welfare tradeoff task, the participants were again asked to imagine the same target individual and were asked to what degree they thought the individual poses a threat to their community in terms of values, jobs and economic opportunities, physical safety and spread of disease. The participants were asked to rate each of these aspects of threat separately on a scale from 1 (strongly disagree) to 9 (strongly agree). A principle component analysis of the threat items indicated the existence of a single threat component (see supplementary material for details). Consequently, a composite variable of the four threat items was created to measure the degree to which the target individual was perceived as threatening  $\alpha = 0.90$ .

7.3. Procedure

The study was administered inside the homes of the participants and the questionnaire was completed on tablet computers, individually and anonymously. The participants first completed a demographic questionnaire, were then given the welfare tradeoff task and finally the threat measure.

7.4. Experimental manipulation of social categories

The ethnoreligious group affiliation, gender and age of the target were experimentally varied using a 2 (group affiliation: Sunni Arab/Shia Arab) X 2 (sex: Male/Female) X 2 (age: 25 year-old/65 year-old) between-subjects experimental design. The participants were thus randomly allocated to one out of eight experimental conditions. In each experimental condition the target individual was presented as a refugee with a particular constellation of the different social categorizations (e. g., "Imagine a 25 year-old Shia Arab male refugee") and the participant was asked to make all decisions in relation to this target. Moreover, this experimental manipulation was aligned so that each participant was presented with the same target description when completing the welfare tradeoff task and when assessing threat perceptions. The refugee status of the target was kept constant across all experimental conditions to keep perceived degree of vulnerability and deprivation constant.

The measures reported here were part of a larger study, including a number of additional measures, the results of which are not reported in the present article. These measures assessed psychological responses to

traumatic events (i.e., PTSD, PTG) and attitudes towards transitional justice and are beyond the scope of the present article.

8. Results

8.1. Effects of war exposure and social categorization

To examine the effect of war exposure and social categorization of the target on threat and altruism, we carried out two 4-way ANOVAs, one with threat as the dependent variable and one with altruism as the dependent variable. We present the mean values for threat and altruism per social category of the target and by degree of exposure in Fig. 2 (for threat) and Fig. 3 (for altruism). Since all participants were Sunni Arabs, fellow Sunni Arabs constituted ingroup members, whereas Shia Arabs constituted outgroup members.

The figures are organized from left to right so that the further to the left, the more threat was predicted to be associated with the social category. Thus, on the far left we find young male outgroup members and on the far right we find elderly female ingroup members. Three patterns can clearly be seen in these figures.

First, the more threat that was predicted to be associated with the social category, the more threatening the individual is perceived to be and the less altruism is extended towards that individual. In other words, the further to the right in the figures, the lower the means for threat and the higher the means for altruism, creating the impression of a downwards slope for threat and an upwards slope for altruism. Accordingly, there were main effects for threat for target group  $F(1,1425) = 397.83, p < .001, \eta^2 = 0.22$ , target gender  $F(1,1425) = 27.12, p < .001, \eta^2 = 0.02$  and target age  $F(1,1425) = 3.67, p = .056, \eta^2 = 0.003$  (although the effect of target age did not reach standard requirements for statistical significance), with Shia Arabs, males and younger individuals perceived as more threatening. Similarly, the analysis showed main effects for altruism for target group  $F(1,1405) = 212.24, p < .001, \eta^2 = 0.13$ , target gender  $F(1,1405) = 27.36, p < .001, \eta^2 = 0.02$  and target age  $F(1,1405) = 9.60, p = .002, \eta^2 = 0.01$ , with Shia Arabs, males and younger individuals being shown less altruism.

Second, participants with greater war exposure generally perceived the targets as more threatening and showed them less altruism. In the figure, this is illustrated by the values for high exposure participants (black columns) overall being higher for threat and lower for altruism. Accordingly, in the ANOVAs, there were main effects of exposure on threat  $F(1,1425) = 12.10, p < .001, \eta^2 = 0.01$  and on altruism  $F(1,1405) = 62.47, p < .001, \eta^2 = 0.04$ .

Third, the tendency to perceive more threat and extend less altruism to individuals belonging to threatening social categories was stronger among participants with greater war exposure. This is apparent in the

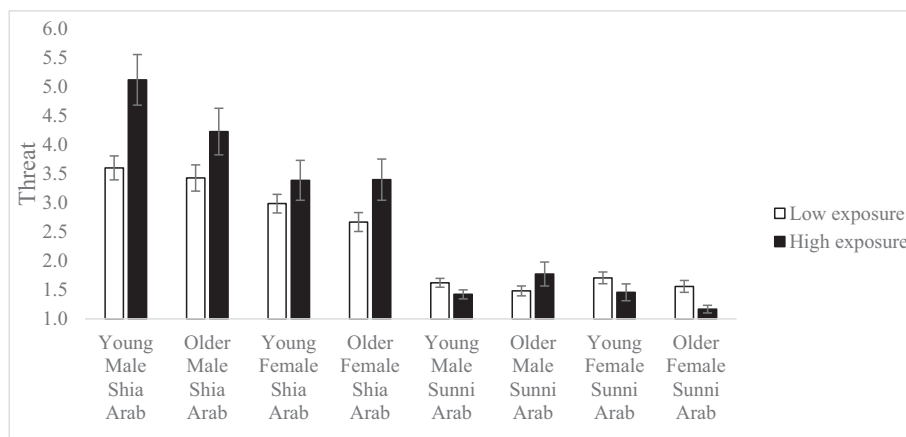
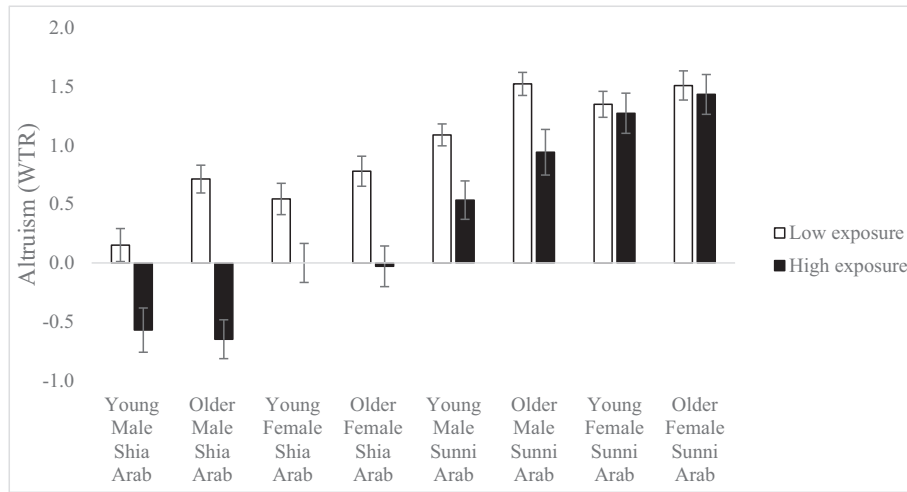


Fig. 2. Mean values of threat for the different experimental conditions among participants with a low and high degree of war exposure. Error bars represent standard errors of the mean.



**Fig. 3.** Mean values of altruism for the different experimental conditions among participants with a low and high degree of war exposure. Error bars represent standard errors of the mean.

figures from the steeper left-to-right slopes among high exposure participants (black columns), compared to low exposure participants (white columns). In line with this visual tendency, there were significant interactions between exposure and target group for threat  $F(1,1425) = 23.01, p < .001, \eta^2 = 0.02$  and for altruism  $F(1,1405) = 12.93, p < .001, \eta = 0.01$ . There were also significant interactions between exposure and target gender for threat  $F(1,1425) = 27.36, p < .001, \eta^2 = 0.02$  and for altruism  $F(1,1405) = 8.24, p = .004, \eta^2 = 0.01$ . The interactions between exposure and target age did not reach statistical significance. We also ran a 6-way ANOVA, including participant gender and age as predictors to see whether the participant characteristics affected any of the obtained main effects or interactions. No such effects were found.

8.2. Threat as mediator

We acknowledge that mediation analyses are based on theoretical models and assumptions about causality and that such analyses only examine the compatibility of one out of several possible theoretical models with the data. Since the independent variables target group, target gender and target age were experimentally varied, we are justified in drawing causal conclusions regarding the effect of these variables on threat and altruism. Further, war exposure cannot reasonably be assumed to be the consequence of target social categories, perceived threat or prosocial tendencies. Because of this, we assume exposure to be an independent, moderating, variable in the model. According to our theoretical reasoning, exposure to traumatic events increases perceived threat, which in turn decreases altruism for social categories associated with threat. The mediation analyses in the present study examine whether a prediction derived from this theoretical model can account for a substantial part of the variance. The statistical analysis does not, however, rule out the accuracy of competing theoretical models, notably that war exposure leads to decreased prosocial tendencies, which in turn leads to increased perceptions of threat. Adjudicating between such competing theoretical accounts is at base a theoretical rather than statistical endeavor, and any conclusions regarding whether perceived threat mediates the relationship between exposure and altruism are intended as theoretical conclusions.

In order to test whether threat perceptions mediated the relationship between each target social category and altruism, and whether this mediating effect was moderated by degree of war exposure, we first carried out mediation analysis and then moderated mediation analysis, using Hayes' (2013) PROCESS macro. For the simple mediation analysis, we ran three analyses using model 4 of the PROCESS macro, each time entering either target group, target gender or target age as independent

variable. In each of these analyses, we entered threat as a mediator and altruism (WTR) as dependent variable. Sunni targets, female gender and older age positively predicted altruism. Sunni targets and female gender further negatively predicted threat, while the relationship between older age and threat was non-significant. Threat was negatively associated with altruism when controlling for target group, target gender and target age. The effect of target group and target gender on altruism was significantly reduced when controlling for threat, as indicated by significant indirect effects of target group and target gender on altruism through threat. The indirect effect of target age on altruism through threat was not significant. The results are presented in Table 1.

We further carried out two separate moderated mediation analyses, one with target group as independent variable and one with target gender as independent variable. Each of these analyses was carried out using Hayes' (2013) PROCESS macro, model 59, testing for moderation of all three paths of the mediation model. The analyses indeed indicated moderated mediation of exposure for the effect of target group  $\beta = 0.13, SE = 0.03, LLCI = 0.08, ULCI = 0.19, p < .05$  and target gender  $\beta = 0.06,$

**Table 1**

Direct, indirect and total effects of target group, gender and age on threat and altruism.

	Altruism	Threat
Sunni target group (Total effect)	$\beta = 0.34, p < .001$	$\beta = -0.47, p < .001$
Female target gender (Total effect)	$\beta = 0.09, p < .001$	$\beta = -0.10, p < .001$
Older target age (Total effect)	$\beta = 0.08, p = .002$	$\beta = -0.04, p = .129$
Threat (Direct effect controlling for target group)	$\beta = -0.13, p < .001$	
Threat (Direct effect controlling for target gender)	$\beta = -0.25, p < .001$	
Threat (Direct effect controlling for target age)	$\beta = -0.26, p < .001$	
Sunni target (Direct effect controlling for threat)	$\beta = 0.28, p < .001$	
Female gender (Direct effect controlling for threat)	$\beta = 0.07, p = .010$	
Older age (Direct effect controlling for threat)	$\beta = 0.07, p = .005$	
Indirect effect of target group on altruism through threat	$\beta = 0.06, p < .05$	
Indirect effect of target gender on altruism through threat	$\beta = 0.03, p < .05$	
Indirect effect of target age on altruism through threat	$\beta = 0.01, p > .05$	

SE = 0.02, LLCI = 0.02, ULCI = 0.10,  $p < .05$  on altruism through threat. As indicated in the previous analyses, the moderated mediation analyses showed that exposure increased the tendency to perceive individuals belonging to social categories associated with threat – i.e. outgroup members, men and young people – as threatening. These analyses also showed that exposure increased the degree to which threat perceptions affect altruism, indicating that individuals with greater war exposure weight threat more strongly as a cue when determining how altruistic to be towards others. Full results for all individual paths, interactions, conditional indirect effects and indices of moderated mediation can be found in the supplementary material.

### 8.3. Robustness checks

In order to test whether these effects were robust to the inclusion of demographic controls, we reran the ANOVAs, mediation analyses and moderated mediation analyses twice, once including all demographic variables as covariates in the model and once including both the demographic variables and the experimental manipulations not included in the model (e.g., including target gender and target age in the model testing the effect of target group). We further ran multilevel models to examine whether variation in intergroup conflict across subnational geographical units confounds the relationship between individual-level war exposure on the one hand and threat and altruism on the other. We also replicated the analysis including participants that had participated in a previous related study. To examine whether the results were robust to alternative specifications of our war exposure variable, we also re-ran the analyses treating exposure as a continuous variable. The results proved robust to all these variations in the statistical analysis and there were no substantive differences in the main results in these robustness checks. In fact, many results were strengthened as a result of the inclusion of additional controls, attesting to the robustness of the results. A detailed report of the robustness checks can be found in the supplementary material.

## 9. Discussion

We carried out a large-scale survey experiment in a naturalistic field setting among Syrian and Iraqi refugees residing in Turkey to examine the effects of war exposure and social categorization on threat perception and altruism. The results indicated that outgroup targets, males and younger individuals were perceived as more threatening and met with less altruism compared to ingroup targets, females and the elderly. The effects of target group and target gender were stronger among highly exposed individuals. Perceived threat further mediated the effect of target group and target gender on altruism and war exposure moderated this mediating effect.

The results of the present study have important implications for the literature on war and prosociality and could potentially resolve existing inconsistencies. The main finding emanating from this line of research is that war tends to increase prosociality (e.g., Bauer et al., 2014; Cecchi et al., 2016; Mironova & Whitt, 2018). This effect is primarily observed in relation to ingroup members but has also been found to extend to certain categories of the outgroup, such as deprived families (Hartman & Morse, 2018). We suggest that the degree of threat associated with the target individual, and the social categories to which he/she belongs, play a critical role in determining the impact of exposure. The experience of traumatic events often leads to vigilance and threat sensitivity (e.g., Yehuda et al., 2015) and appears to sharpen the distinction between threatening and non-threatening individuals and social categories. This could account for both an increase in altruism towards trusted, non-threatening social categories, such as fellow ingroup members (Bauer et al., 2014) and deprived refugee families (Hartman & Morse, 2018), while at the same time decreasing levels of altruism towards threatening categories, such as members of hostile outgroups (Hall & Kahn, 2020). The results further entail one of the first

examinations of the differential effects of war exposure on prosociality across multiple cross-cutting social categories, including females and males as well as younger and older individuals, in addition to ethno-religious identity.

While the findings clearly indicate that war exposure sharpens the distinction between threatening and non-threatening social categories, we did not see an increase in altruism as the result of war exposure even among non-threatening social categories in the present study. This result contrasts with those from previous studies, which typically find that war exposure increases altruism for non-threatening targets, such as ingroup members (Bauer et al., 2014; Gilligan, Pasquale, & Samii, 2014; Mironova & Whitt, 2018; Voors et al., 2012). Our study shows that the subtle ways in which a target individual is presented can have a decisive influence and we suggest that such variations can account for these differences in results. Indeed, based on the present results, we would suggest that general statements about the effect of war exposure on altruism are likely to be misleading. The effect of war exposure on altruism appear to be contingent on the social categories to which the target belongs. In the present research, we show that the degree of threat associated with the social categories to which the target belongs has a decisive influence on the relationship between war exposure and altruism. There may, however, be other characteristics of the target that also influence this relationship, such as similarity or proximity. Notably, the targets in previous studies have often been presented as coming from the same village (e.g., Bauer et al., 2014; Gilligan et al., 2014; Voors et al., 2012). Such individuals may be perceived as particularly non-threatening. If so, war exposure would according to our reasoning lead to increased altruism for such individuals.

The results also have implications for the welfare tradeoff ratio (WTR) perspective. According to this perspective we use social cues, emotions and threat perceptions to regulate the value we place on the welfare of others relative to our own welfare (Delton & Robertson, 2016; Tooby & Cosmides, 2008). The results provide support for this process, demonstrating the importance of cross-cutting social categories, and the threats they pose, in determining WTRs. According to the welfare tradeoff perspective, fear of negative reciprocity/perceiving another as threatening/formidable has been theorized to lead to a higher degree of submission/WTR (Delton & Robertson, 2016; Tooby & Cosmides, 2008). However, the conditions that moderate this process have yet to be examined (Delton & Robertson, 2016). We argue that in the welfare tradeoff task (Kirkpatrick et al., 2015) and analogous real-life situations, e.g. opportunities to donate anonymously or give a hitchhiker a ride, people are unlikely to fear negative reciprocity and thus less likely to submit to a formidable other. Future research should put this hypothesis to the test more directly by, for example, randomly assigning subjects to both *formidability* and *interdependence* conditions when evaluating WTRs.

### 9.1. Limitations

The overall level of the welfare tradeoff ratio in the present study was high compared to previous research (e.g., Forster, Pedersen, Smith, McCullough, & Lieberman, 2017; Kirkpatrick et al., 2015). Since the overall degree of war exposure was also very high in the sample, this could be interpreted as supporting the claim that war exposure is related to increased prosociality and altruism. Such comparisons across different studies, however, should be made with caution, since the target individual in the present study was presented as a refugee, which has not been the case in these previous studies. Identifying the target as a refugee may have raised the overall level of altruism by engendering a sense of common ingroup identity (all participants were themselves refugees) and/or by connoting a person in need of help, compassion and altruism. Indeed, Hartman and Morse (2018) found that those exposed to greater violence during the Liberian Civil War were less biased against, and more likely to host, Ivorian refugees – particularly those that appeared to be in greater need. Further, previous research has

shown that perceived neediness constitutes a cue that increases altruism and generosity (Sznycer, Delton, Robertson, Cosmides, & Tooby, 2019). Our use of the term refugee was however constant across all experimental manipulations and thus does not constitute a limitation in terms of comparisons between different experimental conditions or levels of exposure to trauma.

In addition, while the community-based sampling method used in this study was necessary to reach an otherwise hidden population, it may have also introduced selection bias. Perhaps most saliently, it is possible that the effects observed in the study are limited to young and highly educated individuals. We judge this as unlikely, however, since the inclusion of a rich set of demographic variables, including age, education and socioeconomic status, as covariates in the analyses did not significantly affect the results. In fact, many of the results were strengthened as the result of the inclusion of demographic controls, which speaks to the robustness of the results.

We further acknowledge that the mediation analyses reported in the article only indicate that the prediction derived from this theoretical model can account for a substantial part of the variance. The statistical analysis does not, however, rule out the accuracy of competing theoretical models, notably that war exposure would lead to decreased prosocial tendencies, which in turn results in increased perceptions of threat.

## 9.2. Applied implications

Former rivals must often live side-by-side and cooperate in a postwar reality, either in efforts at reconstructing war-torn societies or as refugees attempting to integrate into new host societies. Understanding how exposure to traumatic events affects prosocial tendencies is therefore critical to fostering harmonious postwar relations and the successful integration of refugees. The results imply that reducing perceived vulnerability increases the potential for prosocial interactions across social categories. By mitigating the level of perceived threat posed by outgroup members, males and young people – and combinations thereof, such as young outgroup males – particularly among those with greater war exposure, should generate positive ripple effects across postwar intergroup relations.

## Acknowledgement

Jonathan Hall gratefully acknowledges the financial support of the Swedish Research Council through grant no. 2015-06564. Theory development is based on work supported by the U. S. Army Research Office through the Minerva Initiative under grant number W911NF1810089. We wish to especially thank Dogukan Karakus for his excellent research assistance and rigorous attention to detail during the data collection process. Correspondence should be addressed to Jonathan Hall, Department of Peace and Conflict Research, Box 514, 751 20 Uppsala, Sweden. Email: [jonathan.hall@pcr.uu.se](mailto:jonathan.hall@pcr.uu.se).

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jesp.2021.104101>.

## References

- Batson, C. D. (2010). Empathy-induced altruistic motivation. In M. Mikulincer, & P. R. Shaver (Eds.), *Prosocial motives, emotions, and behavior: The better angels of our nature* (pp. 15–34). Washington, DC: American Psychological Association.
- Bauer, M., Blattman, C., Chytilová, J., Henrich, J., Miguel, E., & Mitts, T. (2016). Can war foster cooperation? *Journal of Economic Perspectives*, *30*, 249–274.
- Bauer, M., Cassar, A., Chytilová, J., & Henrich, J. (2014). War's enduring effects on the development of egalitarian motivations and in-group biases. *Psychological Science*, *25*, 47–57.
- Becker, D. V., Kenrick, D. T., Neuberg, S. L., Blackwell, K. C., & Smith, D. M. (2007). The confounded nature of angry men and happy women. *Journal of Personality and Social Psychology*, *92*, 179–190.
- Bernhard, H., Fischbacher, U., & Fehr, E. (2006). Parochial altruism in humans. *Nature*, *442*, 912–915.
- Britt, C. L. (2019). Age and crime. In D. P. Farrington, L. Kazemian, & A. R. Piquero (Eds.), *The Oxford handbook of developmental and life-course criminology* (pp. 13–33). Oxford, NY: Oxford University Press.
- Canetti, D., Hall, B. J., Rapaport, C., & Wayne, C. (2013). Exposure to political violence and political extremism: A stress-based process. *European Psychologist*, *18*, 263–272.
- Cecchi, F., Leuvel, K., & Voors, M. (2016). Conflict exposure and competitiveness: Experimental evidence from the football field in Sierra Leone. *Economic Development and Cultural Change*, *64*, 405–435.
- Cosmides, L., & Tooby, J. (2013). Evolutionary psychology: New perspectives on cognition and motivation. *Annual Review of Psychology*, *64*, 201–229.
- Delton, A. W., & Robertson, T. E. (2016). How the mind makes welfare tradeoffs: Evolution, computation, and emotion. *Current Opinion in Psychology*, *7*, 12–16.
- Ebner, N. C., & Johnson, M. K. (2009). Young and older emotional faces: Are there age group differences in expression identification and memory? *Emotion*, *9*, 329–339.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175–191.
- Gilligan, M. J., Pasquale, B. J., & Samii, C. (2014). Civil war and social cohesion: Lab-in-the-field evidence from Nepal. *American Journal of Political Science*, *58*(3), 604–619.
- Goldstein, J. S. (2003). *War and gender: How gender shapes the war system and vice versa*. Cambridge University Press.
- Hagenaars, J. A., & McCutcheon, A. L. (2002). *Applied latent class analysis*. Cambridge University Press.
- Hall, J., & Kahn, D. T. (2020). Exposure to war-time trauma decreases positive emotions and altruism towards rival outgroups (but not non-rival outgroups): A field experiment among Syrian refugees. *Social and Personality Psychology Science*, *11*, 552–559.
- Hall, J., Skoog, E., & Karakus, D. C. (2020). *Kindness in the aftermath of cruelty? The effect of exposure to war-time trauma on altruism across social categories*. Unpublished manuscript.
- Hartman, A. C., & Morse, B. S. (2018). Violence, empathy and altruism: Evidence from the Ivorian refugee crisis in Liberia. *British Journal of Political Science*, *1*–25.
- Hayes, A. F. (2013). Process SPSS Macro. <http://www.afhayes.com/spss-sas-and-mplus-macros-and-code.html>.
- Kirkpatrick, M., Delton, A. W., de Wit, H., & Robertson, T. E. (2015). Prosocial effects of MDMA: A measure of generosity. *Journal of Psychopharmacology*, *29*, 661–668.
- Mironova, V., & Whitt, S. (2018). Social norms after conflict exposure and victimization by violence: Experimental evidence from Kosovo. *British Journal of Political Science*, *48*, 749–765.
- Mollica, R. F., Caspi-Yavin, Y., Bollini, P., Truong, T., Tor, S., & Lavelle, J. (1992). The Harvard trauma questionnaire: Validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochinese refugees. *Journal of Nervous and Mental Disease*, *180*, 111–116.
- Navarrete, C. D., Olsson, A., Ho, A. K., Mendes, W. B., Thomsen, L., & Sidanius, J. (2009). Fear extinction to an outgroup face: The role of target gender. *Psychological Science*, *20*, 155–158.
- Neuberg, S. L., Kenrick, D. T., & Schaller, M. (2011). Human threat management systems: Self-protection and disease avoidance. *Neuroscience and Biobehavioral Reviews*, *35*, 1042–1051.
- Neuberg, S. L., & Schaller, M. (2016). An evolutionary threat-management approach to prejudices. *Current Opinion in Psychology*, *7*, 1–5.
- Olsson, A., Ebert, J. P., Banaji, M. R., & Phelps, E. A. (2005). The role of social groups in the persistence of learned fear. *Science*, *309*, 785–787.
- Pettersson, T., & Eck, K. (2018). Organized violence, 1989–2017. *Journal of Peace Research*, *55*(4), 535–547.
- Rauch, S. L., Whalen, P. J., Shin, L. M., McInerney, S. C., Macklin, M. L., Lasko, N. B., ... Pitman, R. K. (2000). Exaggerated amygdala response to masked facial stimuli in posttraumatic stress disorder: A functional MRI study. *Biological Psychiatry*, *47*, 769–776.
- Schaller, M., & Neuberg, S. L. (2012). Danger, disease, and the nature of prejudice(s). In J. Olson, & M. P. Zanna (Eds.), *vol. 46. Advances in Experimental Social Psychology* (pp. 1–55).
- Smith, A., Pedersen, E. J., Forster, D. E., McCullough, M. E., & Lieberman, D. (2017). Cooperation: The roles of interpersonal value and gratitude. *Evolution and Human Behavior*, *38*(6), 695–703.
- Sznycer, D., Delton, A. W., Robertson, T. E., Cosmides, L., & Tooby, J. (2019). The ecological rationality of helping others: Potential helpers integrate cues of recipients' need and willingness to sacrifice. *Evolution and Human Behavior*, *40*(1), 34–45.
- Tooby, J., & Cosmides, L. (2008). The evolutionary psychology of the emotions and their relationship to internal regulatory variables. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 114–137). New York, NY: Guilford Press.
- UNHCR. (2018). *Provision of Life-Saving Assistance and Supporting Communities: End of Year Report 2018*. United Nations.
- Van vugt, M. (2009). Sex differences in intergroup competition, aggression, and warfare. *Annals of the New York Academy of Sciences*, *1167*(1), 124–134.

- Voors, M. J., Nillesen, E. E., Verwimp, P., Bulte, E. H., Lensink, R., & Van Soest, D. P. (2012). Violent conflict and behavior: A field experiment in Burundi. *American Economic Review*, *102*(2), 941–964.
- Yehuda, R., Hoge, C. W., McFarlane, A. C., Vermetten, E., Lanius, R. A., Nievergelt, C. M., ... Hyman, S. E. (2015). Post-traumatic stress disorder. *Nature Reviews Disease Primers*, *1*, 1–22.
- Zebrowitz, L. A., Kikuchi, J. M., & Fellous, J. M. (2010). Facial resemblance to emotions: Group differences, impression effects, and race stereotypes. *Journal of Personality and Social Psychology*, *98*, 175–189.