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The Role of Mindfulness and Compassion in Parochial Empathy and Prosocial Behavior Toward Out-Groups

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University

by

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Abstract

THE ROLE OF MINDFULNESS AND COMPASSION IN PAROCHIAL EMPATHY AND PROSOCIAL BEHAVIOR TOWARD OUT-GROUPS

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As opposed to the tendency to empathize with and help one's in-group members, there are often barriers to responding altruistically toward out-group members. Little is known about people's capacity to cultivate intergroup prosocial responses through contemplative practices. This experiment examined the role of mindfulness instruction in parochial empathy and prosocial behavior toward an out-group, relative to compassion and relaxation instruction. A national sample of U.S. residents (N = 450) was recruited online through the on-line Prolific platform. Participants were randomly assigned to one of the three brief, structurally equivalent instruction conditions: mindfulness meditation, compassion meditation, or progressive muscle relaxation. Parochial empathy was measured using self-report responses to hypothetical scenarios and prosocial behavior was assessed toward an Arab out-group using three behavioral measures (i.e., out-group altruism, support for outgroup immigration,

and support for an outgroup cause). Parochial empathy was not shown to be a better predictor than trait empathy in predicting out-group prosocial behavior. No differences between training conditions were shown for support for out-group immigration nor support for out-group cause. There were differences between conditions on parochial empathy and out-group altruism. The mindfulness group and compassion group showed less parochial empathy than the relaxation control group. The mindfulness group showed greater out-group altruism than the relaxation control group.

Keywords: mindfulness, compassion, relaxation, empathy, intergroup, prosocial behavior, emotions

The Role of Mindfulness and Compassion in Parochial Empathy and Prosocial Behavior Toward Out-Groups

Although it is easy for one to empathize with those that one is close to (e.g., loved ones like family and friends) and similar to, it can be difficult to extend empathy toward strangers who are psychologically distant and dissimilar from oneself. One such context where empathy is difficult to cultivate is in intergroup relations. When people are categorized into different social groups, those group memberships can elicit emotions and evaluations that lead to distinct behaviors. In an intergroup context, the types of behavior an individual exhibits will depend on the group membership of other individuals and whether those individuals belong to the same group as oneself or to another social group. A lack of or reduced level of empathy toward members of another group can be seen in intergroup conflicts, where one can be insensitive to the pain and suffering of marginalized or stigmatized group members. These biases in empathy point to the need to examine ways to overcome contextual barriers to empathy and cultivate empathy when it is difficult. The current study is set in the context of intergroup conflict (i.e., United States' hostile relationship with Arab-majority countries).

Previous research demonstrates the effects of mindfulness meditation to promote prosocial responses in various social contexts (Berry et al., 2018; Condon et al., 2013; Iwamoto et al., 2020; Tan et al., 2014). In other research, brief (10-minute) mindfulness meditation has been shown to decrease implicit biases toward racial out-groups (Lueke & Gibson, 2015) and to decrease discrimination in the Trust Game (Lueke & Gibson, 2016). Although previous research has shown the potential of mindfulness in promoting prosociality, more mindfulness research on intergroup prosociality is needed. It is unclear whether mindfulness promotes greater empathy toward in-groups and out-groups alike and if it reduces the bias in intergroup empathy, also known as parochial empathy. Furthermore, it

remains to be explored what are the mechanisms through which mindfulness meditation promotes prosocial behaviors toward out-group members. Investigating how mindfulness influences intergroup relations would provide us with a better understanding of how intergroup relations can be enhanced, and critically, how intergroup conflict can be prevented or transformed.

Literature Review

Prosocial Responses

There are eight related but distinct psychological states that have been called empathy: 1) empathic accuracy, 2) motor mimicry or neural response matching, 3) experience sharing or emotional contagion, 4) projecting oneself into another's situation, 5) imagine-other perspective taking, 6) perspective taking (imagine self in another's place), 7) personal distress, and 8) empathic concern (Batson, 2009). Empathic concern, an other-oriented emotion or feeling for the other person in need, motivates one to relieve another's suffering, which leads to prosocial behaviors that enhance the person in need's wellbeing (Batson, 2012; Batson et al., 1987; Batson et al., 2015). In comparison to empathic concern, personal distress is a self-oriented emotion.

Empathy is not always automatic. It depends on contexts and individual differences. When it is difficult to empathize with another person and there are costs (e.g., risks and mental resources) associated with empathy, people are motivated to avoid empathy using emotion regulation strategies (Cameron et al., 2019; Zaki, 2014). One context where empathy is difficult is in intergroup contexts such as intergroup conflicts.

Empathy at the Intergroup Level

One factor that influences the motivation to engage in empathy is the type of relationship one has with another individual (Batson et al., 1987). Based on the appraisal model of compassion, one is more likely to feel compassion (or feel it with greater intensity)

for another's suffering if that person is related to the self and is relevant to one's goal (Goetz et al., 2010). Self-relevant others are people deemed as important for their well-being including others they are close with (e.g., families) and similar to, such as their in-group members. While prosocial responses in interpersonal contexts can be determined by individual-based emotions and behaviors, prosocial responses set in intergroup contexts heavily depend upon group-based emotions, appraisal, and behavior. At the intergroup level or in intergroup contexts, it is difficult for people to empathize with those who belong to another social group (i.e., out-group) that is not one of their own (i.e., in-group).

Based on the Social Identity Theory (SIT), individuals are biased to favor their in-groups over out-groups to maintain a positive social identity: cognitions, emotions, and evaluations associated with group membership (Tajfel, 1981; Tajfel & Turner, 2004). In-groups are the social groups with which one identifies, and this social identity is an integral part of one's self-concept (e.g., in-groups can be based on social categories such as nationalities and race, Tajfel, 1974). When a social category is made salient, one engages in social comparison to make a positive distinction from out-groups (i.e., other social groups that one does not identify with) in order to maintain a positive social identity. The need for a positive social identity thus fosters ingroup favoritism, which is people's tendency to favor their in-group members more than out-group members and their motivation to have their in-group do better than the out-groups. Individuals engage in differential treatments based on ingroup favoritism even in a minimal group paradigm, in which group membership is based solely on random assignment and without previous contact with in-group and out-group members (Tafjel, 1970). Ingroup favoritism has been identified as the prime cause of discrimination against racial out-groups in the United States, and as a better predictor than out-group derogation or hostility toward out-groups (Greenwald & Pettigrew, 2014).

Based on the Intergroup Emotions Theory, individuals experience group-based emotions based on their social identities through social categorization and intergroup appraisals, which motivates their behaviors toward out-groups (Mackie et al., 2008). Social categorization takes place when one's group membership is made salient, and one perceives oneself as a member of one's in-group rather than as an individual (Mackie et al., 2015). Social categorization leads to intergroup appraisals (i.e., interpret events in terms of their effects on the in-group) and emotional self-stereotyping (i.e., experience emotions that are typical of their in-group). The relationship between social categorization and intergroup appraisals is moderated by the strength of social identification and people who strongly identify with their in-group are more likely to experience group-based appraisals and emotions (Mackie et al., 2015). Through intergroup appraisals, events are interpreted in terms of their implications (e.g., beneficial or harmful) for the in-group, even if they are personally irrelevant, and lead to distinct emotions toward one's in-groups (e.g., feel happy about in-group's success) and out-groups (e.g., feel angry about out-group's victory over in-group). Intergroup emotions then lead to distinct behavioral tendencies (e.g., approach or avoid) toward in-group members and out-group members. Given that intergroup emotions serve a regulatory function, like individual emotions, these behavioral tendencies are likely to lead to actual behavior toward in-groups and out-groups. Like the Social Identity Theory, Intergroup Emotions Theory states that when a particular social identity is made salient in an intergroup context, people view themselves as members of the group rather than as individuals (i.e., depersonalization, Smith & Mackie, 2008). As a consequence, people react to others and events in terms of their implications for the in-group, which is an integral part of the self.

Parochial Empathy

Although previous research has shown empathic concern to be an antecedent of prosocial behavior, recent findings indicate parochial empathy to be a stronger predictor than

trait empathic concern in intergroup prosociality because individuals' emotions and behaviors are influenced by their social identities (Bruneau et al., 2017; Cikara et al., 2011; 2014). People are more motivated to empathize with their in-group members compared to out-group members (Zaki, 2014). This bias in empathy based on one's social identity is also termed parochial empathy, which is assessed by the difference between in-group empathy and out-group empathy (Bruneau et al., 2017). The specific component of empathy measured in this study is experience sharing. Based on the Social Identity Theory, parochial empathy could be caused by the need for positive differentiation when comparing in-group with relevant out-groups in order to achieve or maintain a positive social identity. In a minimal group paradigm, people discriminate against out-groups in favor of in-group because they want their in-group to be positively distinct from relevant out-groups to achieve a positive social identity, even when people are given choices to benefit both in-group and out-group (Tajfel & Turner, 2004). Hence, with the motivation to achieve or maintain a positive social identity, people aim for maximizing intergroup differences rather than behave in a way that would benefit both in-group and out-group. This could explain why people are biased to empathize more with in-group members as compared to with out-group members. From the Intergroup Emotions Theory perspective, intergroup emotions are consequences of social categorization and intergroup appraisals and these emotions can vary over time and context (Mackie et al., 2015). In the context of intergroup conflict or intergroup competition, people who strongly identify with their in-group are likely to appraise in-group members favorably and perceive out-group members as a threat, which leads to distinct emotions toward in-group members (i.e., more empathy) and out-group members (less empathy or even schadenfreude).

A series of three experiments found that parochial empathy significantly predicted out-group attitudes and behaviors (Bruneau et al., 2017). Parochial empathy mediated the effects of social identity on out-group altruism, support for out-group related policies (i.e.,

American participants' support for Arab immigration), and donations toward an out-group cause. Moreover, parochial empathy was a stronger predictor of Hungarian participants' support for anti-Muslim refugee-related policies and Greek participants' support for passive harm toward stigmatized German out-group than trait empathic concern. These findings suggest that although empathic concern predicts prosocial behaviors in interpersonal contexts, parochial empathy serves as a better predictor of out-group prosocial outcomes because intergroup empathy and behaviors are shaped by one's social identity.

Besides accounting for trait differences in empathy, parochial empathy influences intergroup behaviors accounting for individual differences in political ideologies. Both liberals and conservatives were less motivated to empathize with and less willing to help political out-groups compared with nonpolitical groups and in-groups (Hasson et al., 2018). The findings from this study suggest that both liberals and conservatives displayed parochial empathy and parochial altruism. Moreover, rather than empathizing with out-group members' pain, people can experience schadenfreude or feeling pleasure at others' pain (Cikara et al., 2011, 2014). People showed a more active neural circuit for pain, which consists of the anterior cingulate cortex (ACC), supplementary motor area (SMA), and insula, when viewing in-group members experiencing physical pain compared with viewing out-group members experiencing physical pain.

Importantly, what predicts harmful behaviors toward out-groups is not out-group derogation but ingroup favoritism, which can be elicited even in a minimal group paradigm (Tajfel, 1981). Ingroup favoritism is present in empathy set in intergroup contexts as parochial empathy. Thus, decreasing parochial empathy is more effective in enhancing intergroup relations than promoting empathy in general, which people tend to reserve for their in-group members.

Mindfulness and Prosocial Responses

Mindfulness has multiple definitions depending on the cultural contexts. In this study, mindfulness is defined as paying attention to and cultivating nonjudgmental, present-centered awareness of the moment-to-moment experiences (Dunne, 2011; Kabat-Zinn, 2003). Mindfulness, or *sati* in Pali, has its roots in the teaching of the Buddha, called the Dharma (Bodhi, 2011). Mindfulness translated from *sati* means remembering (Gethin, 2011). Remembering in the context of Buddhist meditation means that during meditation when thoughts, physical, and emotional experiences arise, one remembers to return to the focus of the meditation and thus, cultivates mindfulness. The Buddha indicates that right mindfulness (i.e., samma sati) can be practiced to attain nirvana and to alleviate suffering by fostering clear comprehension of the impermanence nature of phenomena that arise during meditation.

Facets of trait mindfulness, or dispositional mindfulness, have been shown to predict helping behaviors. Specifically, the attention to the present moment component of mindfulness was associated with an increase in positive emotions during helping, while the nonjudgmental acceptance component of mindfulness was associated with a decrease in negative emotions during helping (Cameron & Fredrickson, 2015). Trait mindfulness has also predicted greater empathic concern for ostracized strangers and helping behavior toward these strangers (Berry et al., 2018).

Past research has shown that mindfulness promotes prosocial responses in social relations, mostly in interpersonal contexts. Mindfulness training increases helping behavior such as prosocial behavior in the workplace context and donations toward nonprofit organizations (Hafenbrack et al., 2020; Iwamoto et al., 2020). Mindfulness training increases cooperation in the Ultimatum Game (UG) and the findings suggest that mindfulness enhances the regulation of negative emotions to aversive experiences such as being presented with unfair offers (Kirk et al., 2016).

Because mindfulness training promotes other-oriented focus and care for others' suffering, mindfulness meditation could reduce parochial empathy through enhancing empathy toward the out-group rather than solely enhancing empathy toward the in-group (Berry et al., 2018). A 10-minute focused attention mindfulness meditation has been shown to decrease intergroup implicit biases such as prejudice toward racial out-groups (Lueke & Gibson, 2015). The effects of the mindfulness were not limited to prejudice but also decreased discrimination in the Trust Game, during which White participants generally give more money to Whites as compared to Black strangers (Lueke & Gibson, 2016). A 4-day focused attention mindfulness training also increased helping behavior (i.e., scenario-based or in vivo helping) toward racial out-group members (Berry et al., 2021). However, this study found that participants in mindfulness condition and control condition both showed parochial helping for racial in-group members in everyday lives. In contrast, Frost (2017) found that 5-minute breath awareness mindfulness meditation increased cooperation in the Public Goods games and decreased parochial altruism (i.e., difference in offers for in-group members and out-group members).

It is further clarified that state mindfulness cultivated through mindfulness training, rather than trait mindfulness, enhances prosocial behavior toward ostracized strangers (Berry et al., 2018). Mindfulness meditation increases empathic concern but does not change one's personal distress. Importantly, empathic concern mediated the effects of mindfulness on prosocial behavior toward ostracized strangers, and alternative explanations like changes in personal distress and empathic anger were ruled out.

How does mindfulness work to reduce parochial empathy and enhance prosocial responses toward out-groups? Two potential mechanisms through which mindfulness promotes intergroup prosocial responses are dis-identification and de-automatization (Berry & Brown, 2017). Given that parochial empathy could be caused by the motivation to achieve

or maintain a positive social identity, this points out that targeting social identity, specifically the need for positive differentiation that contributes to positive social identity, could be an effective way to address parochial empathy. During mindfulness practice, people observe and notice thoughts, emotions, and physical sensations as they arise. These cognitive, affective, and physical processes are acknowledged as what they are without identifying with them (i.e., knowing that these phenomena do not represent the self). Through practicing to reduce identification with phenomena that arise during practice, people can also reduce the need for differentiation to maintain a positive social identity. Parochial empathy and prosocial behavior toward out-groups are also influenced by automaticity because people automatically engage in social categorization and social comparison. From the Intergroup Emotions Theory perspective, intergroup emotions are preceded by social categorization, which depends on which social categories are made salient. A person has multiple group memberships and thus, different social identities can be activated. Changing the salience of one's social identity (e.g., telling participants that the study is examining gender differences in opinions versus examining individual differences in opinion) leads to distinct group-based emotions and appraisals toward out-groups (e.g., those self-categorized as women reported more fear and disgust and also intentions to avoid Muslims than those categorized as an individual, Kuppens & Yzerbyt, 2012). Thus, identity-based emotion regulation strategy has been suggested as one way intergroup emotions can be changed to influence intergroup relations (Smith & Mackie, 2015). Mindfulness can offer more flexible social categorization by reducing automatic responses in intergroup relations, which could change intergroup appraisal and subsequent intergroup emotions. Instead of engaging in intergroup appraisals based on one particular social identity, one can be more aware of other group memberships that one has, including the shared, encompassing social group of humanity. Through practicing mindfulness, people become more aware of their thoughts and actions by directing

attention to the present moment. De-automatization can occur through enhancing meta-awareness (i.e., being aware of one's conscious processes) when practitioners not only pay attention to the object of focus (e.g., anchor such as the breath) but are also aware of the content of their awareness and other stimuli in the background (Lutz et al., 2015). Fostering greater meta-awareness enables practitioners to notice when they have been distracted, or are mind-wandering, and to shift their attention back to the task at hand with flexibility. This monitoring state could reduce automatic or habitual intergroup behavioral patterns because individuals are more attuned to their responses as well as how their responses impact out-group members (Berry & Brown, 2017). Research on processes underlying social categorization and intergroup behavior reveals that depersonalization, or people's tendency to perceive an out-group as a homogenous mass and to disregard individual differences within out-groups, precedes dehumanization (Tajfel, 1981). By enhancing the ability to separate people's biased evaluations of the out-groups as homogenous from the objective reality of complex individuality within other social groups, people might be more motivated to reduce out-groups' suffering (Lutz et al., 2015).

Extended programs that incorporate a mindfulness component or use mindfulness-based training demonstrate the potential to alleviate intergroup conflicts and promote peace-building. Mindfulness-based programs such as the 8-week mindfulness-based stress reduction (MBSR) have been studied in prolonged intergroup conflicts such as the Israeli-Palestinian conflict (Alkoby et al., 2017). Israeli participants who took MBSR, and those who took MBSR in combination with cognitive reappraisal, showed greater willingness to compromise and to show support for conciliatory policies that would reduce the Israeli-Palestinian conflict as compared to those in the control group. The effects of mindfulness training on conciliation were mediated by decreases in negative emotions toward Palestinians. Compared to reappraisal training, mindfulness training also increased support for conciliatory policies

through decreasing perceived threat. Similarly, Israel-Jewish youths who underwent a 24-session Call to Care-Israel (C2C-I), mindfulness-based and compassion-based program that also incorporated socio-emotional learning, showed less prejudice toward and greater willingness to interact with their Israel-Palestinian peers (Berger et al., 2018). Reduction in prejudice and negative stereotypes were evident even at a 6-month follow-up. However, given the multicomponent nature of the program, it is unclear what mechanisms induce these prosocial outcomes.

Mindfulness Training Versus Compassion Training

Although this study focuses on the role of mindfulness in intergroup prosociality, compassion meditation has also been widely used to study the effects of contemplative practices on prosocial responses. Compassion meditation includes explicit instruction intended to cultivate compassion toward others, whereas mindfulness meditation does not. However, few studies have directly compared the effects of mindfulness meditation with compassion meditation to examine whether these practices operate through similar mechanisms to promote intergroup prosociality. Compassion meditation or loving-kindness meditation (LKM) has been shown to enhance empathy and prosocial behaviors (Leiberg et al., 2011; Weng et al., 2013). Compassion cultivated during LKM reduces amygdala and anterior insula activations, which suggests that compassion decreases empathic distress to others' suffering (Weng et al., 2018). LKM has also been shown to reduce intergroup bias and this prejudice reduction was shown to be mediated by positive other-regarding emotions (Kang et al., 2014; Stell & Farsides, 2016). To examine whether mindfulness-based meditation practices and compassion-based meditation practices promote similar social benefits, a meta-analysis paper shows that mindfulness-based interventions showed medium-sized effects on increasing prosocial behaviors (Donald et al., 2019). Although results showed no significant differences between these two types of interventions in promoting

prosocial outcomes, it is unclear if mindfulness-based meditation practices and compassion-based meditation practices promote prosocial outcomes through similar mechanisms. Another meta-analysis paper demonstrated that mindfulness training, without ethics-based instructions, enhances prosocial action (Berry et al., 2020). The results support mindfulness theory and previous meta-analysis (Donald et al. 2018).

The Present Research

While past research often focuses on interpersonal relationships, this study extended mindfulness research on prosocial responses by using social groups that have a history of conflict and examined whether the prosocial effects of mindfulness apply to intergroup contexts. The present study addressed whether mindfulness decreases parochial empathy and enhances prosocial behaviors toward out-group members. The measures and the procedure were adapted from a paradigm developed by Bruneau et al. (2017). This study first examined whether a short mindfulness training will decrease parochial empathy and increase prosocial behaviors toward a stigmatized out-group. Specifically, does mindfulness training decrease the difference in empathy American participants feel for their in-group (i.e., Americans) and they feel for the out-group (i.e., Arabs) and increase prosocial behaviors to enhance the well-being of this ethnic/national out-group and promote its causes? This study included three behavioral measures that assess prosocial behaviors toward an out-group adapted from Bruneau et al. (2017) Experiment 1. The first behavioral measure assessed out-group altruism (i.e., voluntarily spending additional time and effort to support an Arab non-profit organization), the second measure assessed the inclusion of the out-group in one's community (i.e., support for Arab immigration), and the third measure assessed support for an in-group versus an out-group cause (i.e., distribution of a COVID-19 relief fund between people in the United States and people in Syria). In addition, this study sought to examine the mechanisms through which mindfulness enhances prosocial behaviors toward the out-group

by asking whether the reduction in parochial empathy as a result of mindfulness meditation leads to greater prosocial behaviors toward the out-group. Moreover, this study examined whether parochial empathy is a stronger mediator in the mindfulness and intergroup prosociality relationship than trait empathic concern. Last, this study compared the effects of mindfulness meditation with that of compassion meditation to examine how they impact parochial empathy and intergroup prosocial behaviors. This study explored whether there are differences between mindfulness and compassion training in promoting prosocial responses.

It was first hypothesized that participants in the mindfulness condition and compassion condition will show less parochial empathy than participants in the relaxation control condition. Second, it was hypothesized that the mindfulness condition and the compassion condition will promote prosocial behavior toward the out-group significantly more than the relaxation control condition. Third, it was hypothesized that parochial empathy will significantly mediate the relationship between mindfulness and prosocial behavior toward the out-group and be a stronger predictor of prosocial behavior toward the out-group than trait empathic concern.

Method

Sample Size Determination

Given the novelty of the proposed study, a pilot study (pre-registered at osf.io/5yv8q) was used to determine the sample size for this study. Power analysis using G*Power 3.1 (Faul et al., 2009) showed that 400 participants were needed to obtain a medium effect size as obtained from pilot testing (Cohen's $f = 0.25$). We recruited 450 participants to account for inattention and drop-out.

Participants

The study (pre-registered at osf.io/rnc97) used a community sample drawn from the general American population. Participants located in the United States and fluent in English

were recruited online through Prolific (www.prolific.co). Participants below the age of 18 years were excluded and a liberal upper age limit was set (100 years). Participants were compensated $6.50 for this 45-minute study.

On average, most participants were in early middle age (*M* = 39.10, *SD* = 13.13); 311 (71.50%) of the participants identified as White, 38 (8.74%) as Black or African American, 35 (8.05%) as Asian, 27 (6.21%) as Hispanic or Latinx, 17 (3.91%) as other, 4 (0.92%) preferred not to answer, 2 (0.46%) as Pacific Islander, and 1 (0.23%) as Middle Eastern. N = 239 (54.90%) participants identified as woman, 190 (43.70%) identified as man, 5 (1.10%) identified as non-binary, and 1 (0.20%) preferred not to answer. Fifteen participants were excluded from analyses for multivariate outliers and missing data and the remaining 435 participants were used for the statistical analyses. There are 142 participants in the mindfulness group, 150 participants in the compassion group, and 143 participants in the relaxation group.

Interventions

Participants were randomly assigned to the mindfulness meditation condition, the compassion meditation condition, or the relaxation control condition. This study compared the effects of two different types of meditation, mindfulness meditation and compassion meditation. Both types of contemplative practices and the relaxation control condition lasted around 10 minutes. The same female instructor recorded all the scripted intervention audio tracks, and the interventions were matched in duration, complexity, introduction, setup, and ending (audio scripts will be posted on the OSF project page). Using the same gender voice for all conditions controlled for gender in the effects of meditation on prosocial outcomes. The mindfulness training instructed participants to use the breath as the anchor to foster greater receptive attention to, and awareness of the psychological and somatic experiences that arose during practice. This is a type of focused attention (FA) mindfulness practice (Lutz

et al., 2015). This training does not include explicit instructions on compassion or any prosocial-related terms.

The compassion meditation condition used a loving-kindness meditation (LKM), which instructed participants to practice compassion toward loved ones, compassion toward acquaintances, compassion toward a neutral person, compassion toward a difficult person, and then extending compassion toward strangers and all living beings (adapted from Weng et al., 2013). Comparing compassion meditation to mindfulness meditation that does not include explicit instruction to cultivate compassion helps to isolate the effects of mindfulness itself.

The relaxation control condition used a relaxation technique called progressive muscle relaxation. The training started by instructing participants to take a deep inhalation and exhalation to relax. Then, participants were asked to identify tensions or tightness in different muscles of the body and to relax these muscles. Participants started by relaxing their hands, then their face and neck, and then their chest, shoulders, upper back, and abdomen, and lastly their legs. The relaxation control condition was included to ensure that it is not the mere relaxation that causes mindfulness to produce its effects on parochial empathy and prosocial behavior but rather is due to state mindfulness itself. The relaxation control condition was also included to provide a baseline level for comparison between the mindfulness condition and the compassion condition. The use of these three conditions helped to reduce alternative explanations for the outcomes (e.g., that mindfulness meditation enhances prosocial responses rather than compassion meditation or relaxation reducing prosocial responses).

One booster induction for each condition was included part way through the study because the effects of brief interventions are ephemeral, especially considering the duration of the study session (about 45 minutes). The instructor who recorded the training audios also recorded the booster audios. Each booster lasted about 1-2 minutes. All booster inductions began with the same setup: asking participants to take a moment to pause, please their feet

flat on the floor, and rest their hands in their lap. The mindfulness meditation booster induction asked participants to pay attention to their present moment experiences with receptivity (i.e., fully notice their experiences without trying to change them). The induction ended with instructing participants to bring this mindful state to their experience in the next task. The compassion meditation booster induction, adapted from Weng et al. (2013), instructed participants to practice compassion toward all beings and extend these warm feelings toward others in the next task. The induction ended with instructing participants to bring this compassionate state to the next task. The relaxation control booster induction instructed participants to take a few long, deep breaths and to feel their inhalation and exhalation. They were instructed to take several 4 second inhalations and 4 second exhalations and then return to their normal breathing. The induction ended with instructing participants to bring this relaxed state to the next task. All booster inductions were matched in word count, introduction, setup, and ending.

Measures

Behavioral Measures

Prosocial behaviors toward out-groups were assessed by three measures (Bruneau et al., 2017). First, out-group altruism was measured by the number of additional problem-solving tasks (Raven's Matrices problems) that participants choose to complete for charity toward an Arab non-profit organization ("Arab Red Crescent Society"). Participants were told that for each additional problem they completed correctly, $0.50 would be donated to the Arab Red Crescent Society. Participants were given the choice to complete as many (0 to 20) of the additional Raven's Matrices problems as they wished. Participants were given the choice to engage in this task or to skip to complete the next task. Second, support for Arab immigration was measured by the percentage of the U.S. visas that participants think should be granted to Arabs among other groups: East Asians, Hispanics, Africans, and Eastern

Europeans. The percentages for each group needed to total up to 100%. Lastly, support for an out-group cause was measured by the amount of money participants distribute to an in-group cause versus an out-group cause. Participants were given a choice to distribute a $0.50 monetary bonus between an in-group cause (i.e., World Health Organization (WHO) COVID-19 Solidarity Response Fund for people in the United States) and an out-group cause (i.e., WHO COVID-19 Solidarity Response Fund for people in Syria). A greater amount of the money donated to the out-group cause indicates greater support for the out-group cause.

Parochial Empathy

The parochial empathy measure was adapted from the Bruneau et al. (2017) study. American participants read 16 in-group and out-group events, including four positive events and four negative events experienced by eight Americans (in-group) and eight Arabs (out-group). The events were randomized. Parochial empathy was measured by how good participants felt about the in-group's fortunes (e.g., Bill recovered from an illness) and out-group's fortunes (e.g., Ibtihaj was praised by someone important to her) and how bad they felt about the in-group's misfortunes (e.g., Diana overheard someone she cared about talking bad about her) and out-group's misfortunes (e.g., Hassan slammed his finger in the door). For each event, participants were asked to use a slider to indicate how good it made them feel that the event happened to the group member and how bad it made them feel that the event happened to the group member on a scale of 0 (*not at all*) to 1 (*very good*). The parochial empathy measure had excellent internal consistency (sample $\alpha = .93$). Parochial empathy was calculated as in-group empathy minus out-group empathy.

Covariates

A basic form of trait mindfulness was measured by the 15-item dispositional Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003). MAAS asked participants to report how frequently they experience mindful states (e.g., "I find myself preoccupied with

the future or the past") in their daily life using a 6-point Likert Scale ranging from 1 (*almost always*) to 6 (*almost never*). Trait mindfulness was calculated by computing a mean score of the 15 items. Higher scores indicated higher levels of trait mindfulness. In the Brown and Ryan (2003) study, the internal consistency was good ($\alpha = .82$). The MAAS in this sample had excellent internal consistency ($\alpha = .93$).

Trait empathy was measured by the 7-item empathic concern (EC) subscale and 7-item personal distress (PD) subscale of the Interpersonal Reactivity Index (IRI, Davis, 1980) using a 5-point Likert scale ranging from 0 (*does not describe me well*) to 4 (*describes me very well*). The EC subscale assessed people's tendency to respond with an other-oriented emotion and concern for another's suffering. The PD subscale assessed people's tendency to respond to another's suffering with a self-oriented emotion or distress. The internal consistency for IRI was acceptable ($\alpha = .68$-$.79$, Davis, 1980). The IRI in this sample was excellent for the EC subscale ($\alpha = .90$) and good for the PD subscale ($\alpha = .88$).

Social identification was assessed using an adapted version of the Inclusion of In-group and Out-group in the Self measure (Schubert & Otten, 2002). Participants were asked to select from a list of seven Venn-like diagrams – each a pair of circles that they felt best represents how closely they identify with their in-group (Americans) and out-groups (Arabs and Chinese). The diagrams displayed seven different degrees of overlap between a smaller circle titled "You" and a larger circle titled "Americans/Arabs/Chinese" with the first Venn-like diagrams depicting the two circles being completely separate and distanced (i.e., the lowest level of group identification) to the last diagram with the smaller circle being completely inside the larger circle and centered (i.e., the highest level of group identification). The pair of circles participants selected for each of the three social groups was a measure of the strength of their in-group and out-group identification.

Intergroup contact was measured using Islam and Hewstone (1993) intergroup contact quantity and contact quality items to control for the effects of previous intergroup contact on individuals' prosocial responses toward Arab out-group members. Five contact quantity questions asked participants about the amount of contact they have with Arabs across five social contexts: 1) at college, 2) as neighbors, 3) as close friends, and 4) frequency of informal talks, and 5) frequency of visit to an out-group member's home. Responses were made on a 7-point Likert scale ranging from 1 (*none at all*) to 7 (*a great deal*) for items 1-3 and ranging from 1 (*never*) to 7 (*very often*) for items 4 and 5. Higher scores indicated greater amount of intergroup contact. The five intergroup contact quantity items in this sample had good internal consistency ($\alpha = .86$). Five contact quality questions asked participants whether contact with Arab out-group members was: 1) perceived as equal, 2) involuntary or voluntary, 3) superficial or intimate, 4) experienced as pleasant, and 5) competitive or cooperative. Responses were made on a 7-point Likert scale ranging from: 1 (*definitely not*) to 7 (*definitely yes*) for item 1; 1(*definitely involuntary*) to 7 (*definitely voluntary*) for item 2; 1 (*very superficial*) to 7 (*very intimate*); 1 (*not at all*) to 7 (*very*) for item 4; and 1 (*very competitive*) to 7 (*very cooperative*). Higher scores indicated higher quality of intergroup contact. The five intergroup contact quality items in this sample had good internal consistency ($\alpha = .80$).

Mindfulness manipulation items (Brown et al., 2016) were included at post-intervention as a proxy to check for state mindfulness. The measure asked participants to "indicate the extent to which they felt the following items while listening to the audio recording instructions" using a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Three items measured attentiveness (alert, attentive, concentrating; sample $\alpha = .82$), three items measured serenity (calm, relaxed, at ease; sample $\alpha = .90$), and three items measured fatigue (tired, sluggish, drowsy; sample $\alpha = .89$). Audio recording checks measured

participants' experiences with the audio recordings. One item asked participants to indicate "How easy was it for you to follow the recorded audio instructions?" on a 7-point Likert scale ranging from 1 (*extremely difficult*) to 7 (*extremely easy*). Two items asked participants to indicate "To what extent were you able to focus on the recorded audio instructions?" and "I felt uncomfortable about the activities the audio recording asked me to do." on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*completely*). One item asked participants to indicate the quality of the audio recording using a 5-point Likert scale ranging from 1 (*very poor*) to 5 (*very good*).

Procedure

Figure 1 shows the procedure for this study. First, participants were asked to give their informed consent to participate in the study after having read the consent form. Second, they were presented with the cover story for the research (i.e., to examine the effects of mental training on directional problem-solving in people who learned languages that are written in different directions). Participants were then randomly assigned by Qualtrics randomizer to either the experimental condition (mindfulness or compassion) or the control condition (relaxation). Participants then listened to a brief, 10-minute audio recording of either mindfulness meditation, compassion meditation, or relaxation control audio tracks before proceeding to the prosocial response measures.

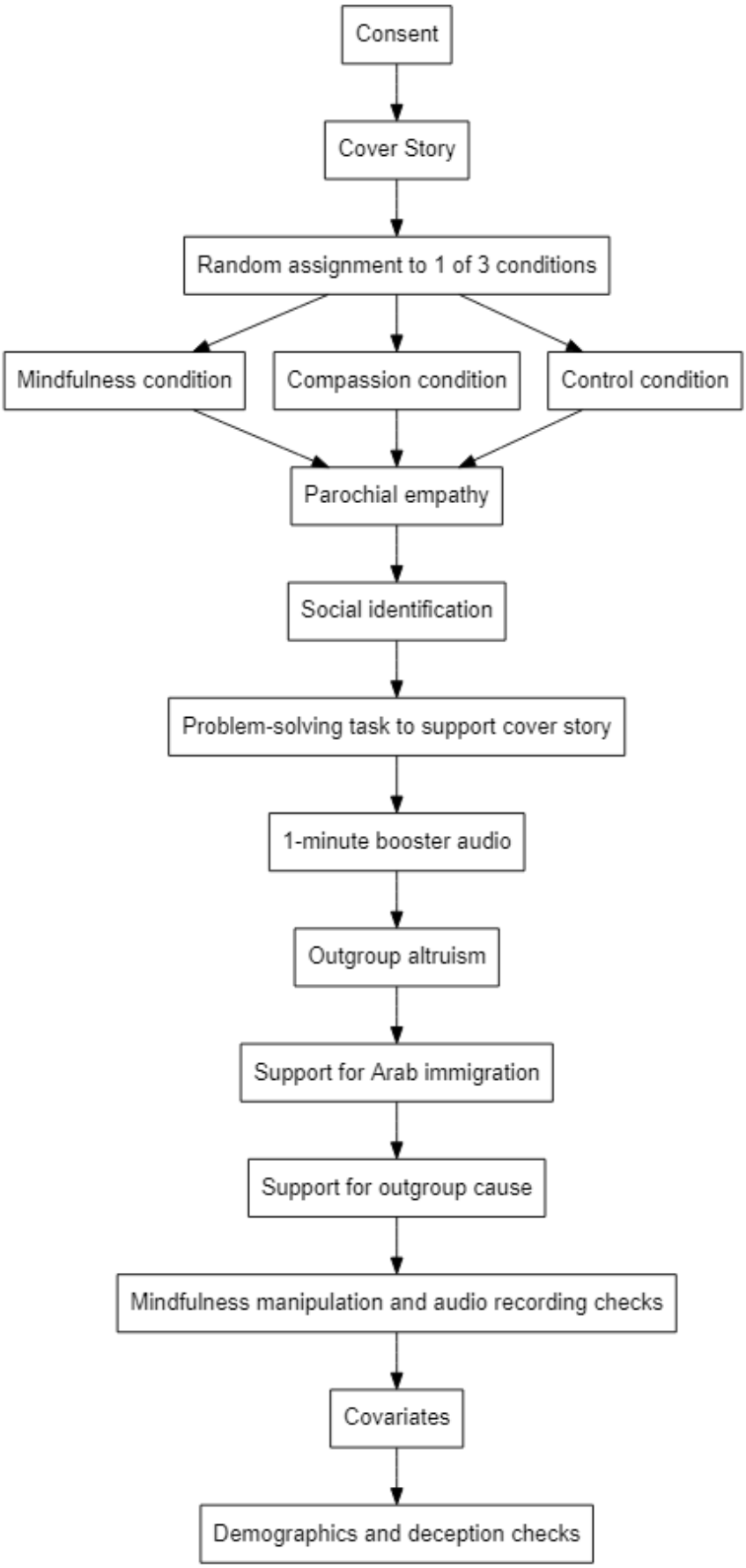
All participants then engaged in a paradigm adapted from Bruneau et al. (2017). Participants were told that they were playing in an English-speaking team against an Arabic-speaking team on a problem-solving challenge and the first team to accumulate a score of 100 points would win the challenge. They were instructed to read 16 events (positive and negative) that were purportedly randomly assigned to members of the English-speaking team and the Arabic-speaking team. For each event, participants reported how good or bad they feel about in-group's or out-group's fortunes and misfortunes. Before beginning the study's

main task (problem-solving; see below), participants were asked to indicate their in-group and out-group identification.

After participants completed eight progressive Raven's Matrices to support the cover story, they listened to a 1-minute booster induction. Next, participants were given choices to either continue solving up to 20 more problems or opt out and skip to the next task in the survey. They were told that for each additional problem that they correctly completed, $0.50 would be donated to the "Arab Red Crescent Society." Then, participants answered questions assessing their support for Arab immigration. In the last behavioral measure, participants were provided with a $0.50 monetary bonus to distribute between an in-group cause and an out-group cause. Participants then completed the mindfulness manipulation checks and audio recording checks. Lastly, participants answered questions assessing their trait mindfulness, intergroup contact quantity and quality, empathic concern, and personal distress. At this point participants also answered demographic questions, three questions assessing their environment while taking the study, deception checks (i.e., "What did you think this study was about?", "Did anything seem strange during the study?", "Did you feel like you were being deceived about anything during the study?"), and questions about their current meditation practice.

Figure 1

Flowchart for Study Procedure


Consent
Cover Story
Random assignment to 1 of 3 conditions
Mindfulness condition
Compassion condition
Control condition
Parochial empathy
Social identification
Problem-solving task to support cover story
1-minute booster audio
Outgroup altruism
Support for Arab immigration
Support for outgroup cause
Mindfulness manipulation and audio recording checks
Covariates
Demographics and deception checks

Results

Data Analyses

The analyses were conducted using R version 4.1.2 (R Core Team, 2021). Prior to data analyses, univariate and multivariate outliers were checked. Skewness and kurtosis values of dependent variables that exceeded +/- 1.50 were considered to violate the univariate normality assumption (Figure 1). Dependent variables that had z-scores greater than +/- 3.29 were considered univariate outliers (Tabachnick & Fidell, 2013). Twenty-one univariate outliers were winsorized by replacing with the next highest or lowest value. Six participants were excluded for having multivariate outliers using Mahalanobis distance with $p < .001$, and nine participants were excluded for missing data. No participants were excluded for failure to pass more than half of the four attention checks and speeding (i.e., completing the study in less than half of the median duration it took to complete the study).

Parochial empathy scores were compared across the three conditions using one-way ANCOVA to test the first hypothesis – whether participants in the mindfulness condition and compassion condition would show less parochial empathy than participants in the relaxation control condition. Based on the methods used in past research (Bruneau et al., 2017), parochial empathy was calculated as a difference score for the mediation analysis. However, information about in-group empathy scores and out-group empathy scores individually are lost in using a difference score. For example, a participant who has low in-group empathy and out-group empathy would be scored the same way as a participant who has high in-group empathy and out-group empathy. That is, both participants would show low parochial empathy. To account for this issue with difference scores, out-group empathy was used as the outcome and in-group empathy was used as the covariate in the ANCOVA analyses. Trait empathy (empathic concern and personal distress) was also used as covariates in the ANCOVA analyses. Support for Arab immigration and support for out-group cause were

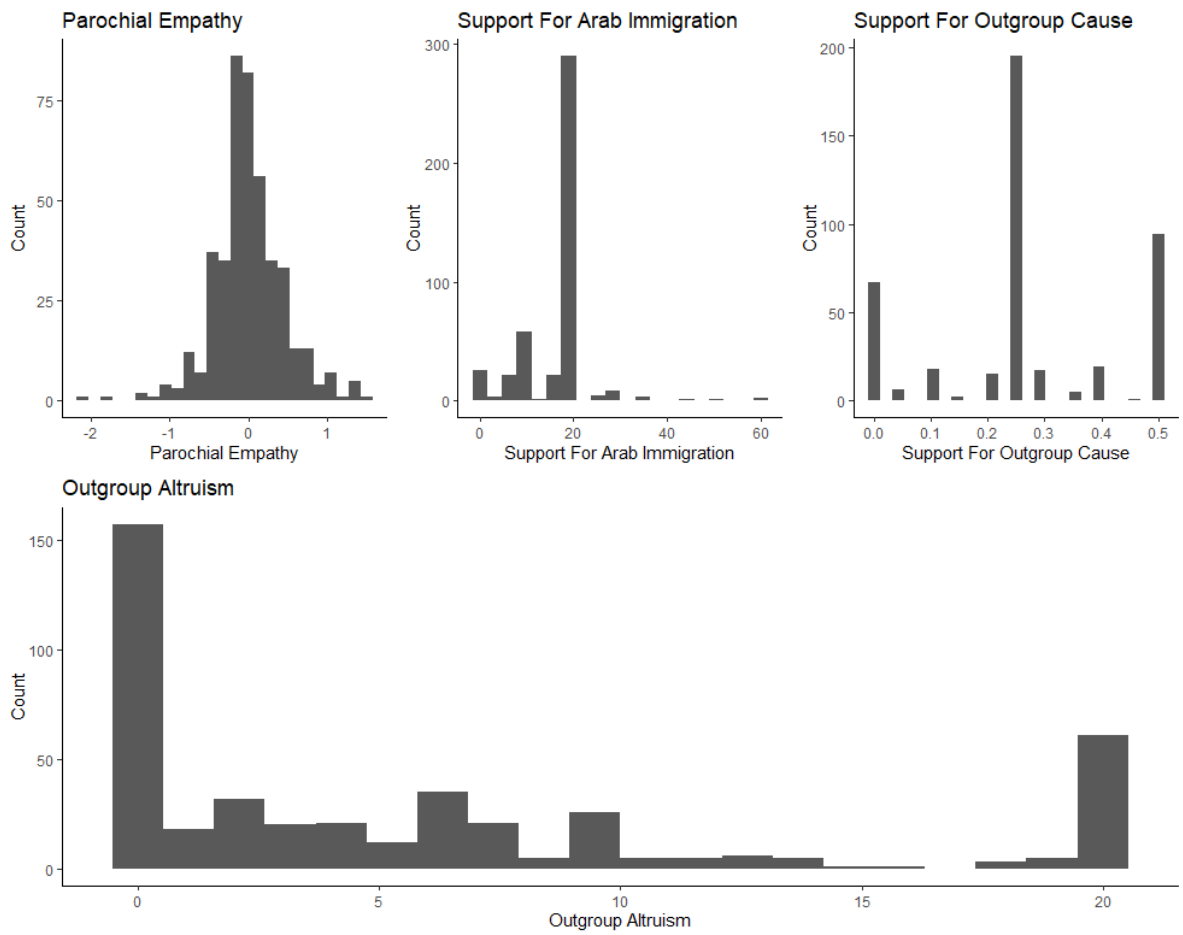
compared across the three conditions using two one-way ANCOVAs and Tukey post hoc comparison tests to test the second hypothesis – whether the mindfulness condition and the compassion condition would promote prosocial behavior toward the out-group significantly more than the relaxation control condition. Mediation analysis to test the third hypothesis that parochial empathy significantly mediated the relationship between mindfulness instruction and prosocial behavior toward the Arab out-group was not conducted because the ANOVA results showed that there were no significant condition differences in the outcomes. The assumption of homogeneity of variance was met for parochial empathy, support for Arab immigration, and support for out-group cause. However, the assumption of normality of the residuals for these outcomes was not met as indicated by the Shapiro-Wilk test.

The out-group altruism variable had a bimodal distribution (see Figure 2). Out-group altruism peaked at zero completed Raven's Matrices problems and peaked again at 18 to 20 questions. Given that most participants did not engage in out-group altruism after being given the choice to complete additional tasks for donation toward the out-group non-profit organization, a zero-inflated Poisson model was used to analyze this outcome.

Two hierarchical regressions investigated whether parochial empathy was a better predictor of prosocial behaviors (support for Arab immigration and support for out-group cause) toward the out-group above and beyond trait empathic concern to test the third hypothesis. ANCOVAs were used to control for trait differences in mindfulness, empathy, social identification, and intergroup contact. The study used an alpha level of .05 and a confidence level of 95% to determine the significance of the results.

Figure 2

Histograms For Parochial Empathy and Prosocial Behavioral Outcomes Post-winsorizing



Preliminary Analysis

I first examined whether there were demographic differences between the experimental conditions. Table 1 shows the demographic characteristics for each condition. One-way ANOVAs tested for differences across conditions in age, political orientation, and level of privacy while completing the study. Participants' age did not differ significantly across experimental conditions, $F(2, 430) = 0.04$, $p = .965$. Political viewpoint was measured on a 5-point Likert scale ranging from 1(*very conservative*) to 5 (*very liberal*). On average, participants indicated neutral to slightly liberal viewpoint. Participants' viewpoint did not differ significantly across experimental conditions, $F(2, 431) = 2.85$, $p = .059$. Environment privacy was measured on a 5-point Likert scale ranging from 1 (*extremely private*) to 5 (*not at all private*). On average, participants indicated their environment was extremely private to

very private. Participants' environment privacy did not differ significantly across experimental conditions, $F(2, 432) = 1.65$, $p = .194$.

Chi-square tests of independence were conducted to determine if there were significant differences between conditions on the categorical demographic variables (see Table 1). Conditions did not differ in gender composition, χ^2 (6, $N = 435$) = 2.72, $p = .843$, or race or ethnicity, χ^2 (14, $N = 435$) = 16.76, $p = .269$. Given that the study concerns Arab out-group prosociality, a control item asked participants to indicate if they are a member of the following ethnic groups: Arab or Arab American, Chinese or Chinese American, or neither. There was no significant difference across conditions in these ethnic groups, χ^2 (4, $N = 435$) = 4.89, $p = .299$. There were also no significant differences between conditions in native or first language (English or another language), χ^2 (2, $N = 435$) = 0.78, $p = .678$; marital status, χ^2 (8, $N = 435$) = 5.24, $p = .732$; income, χ^2 (20, $N = 435$) = 18.12, $p = .580$; nor education level, χ^2 (10, $N = 435$) = 3.58, $p = .964$. There were also no significant differences between conditions and the number of people participants interacted with while completing the study, χ^2 (6, $N = 435$) = 6.24, $p = .397$; nor in the level of engagement (i.e., whether people engaged in other activities while completing the study), χ^2 (2, $N = 435$) = 0.17, $p = .920$; nor whether participants currently have a meditation practice, χ^2 (2, $N = 435$) = 1.24, $p = .538$.

Table 1

Demographic Characteristics By Condition

Demographic variables	Total sample	Mindfulness condition	Compassion condition	Relaxation condition
Continuous variables	M (SD)	M (SD)	M (SD)	M (SD)
Age	39.10 (13.13)	38.90 (13.50)	39.20 (12.80)	39.20 (13.2)
Political viewpoint	3.70 (1.27)	3.86 (1.17)	3.51 (1.40)	3.73 (1.21)

Privacy	1.38 (0.68)	1.45 (0.69)	1.31 (0.68)	1.39 (0.68)
Categorical variables	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Gender				
Woman	239 (54.90)	76 (53.50)	82 (54.70)	81 (56.60)
Man	190 (43.70)	64 (45.10)	66 (44.00)	60 (42.00)
Non-binary	5 (1.10)	1 (0.70)	2 (1.33)	2 (1.40)
Prefer not to answer	1 (0.20)	1 (0.70)	0	0
Race/ethnicity				
White	311 (71.50)	100 (70.40)	100 (66.70)	111 (77.60)
Black, African American	38 (8.74)	11 (7.75)	18 (12.00)	9 (6.29)
Asian	35 (8.05)	11 (7.75)	14 (9.33)	10 (6.99)
Hispanic, Latinx	27 (6.21)	13 (9.15)	5 (3.33)	9 (6.29)
Middle Eastern	1 (0.23)	2 (1.40)	0	0
Pacific Islander	2 (0.46)	1 (0.70)	1 (0.67)	0
Other	17 (3.91)	4 (2.82)	10 (6.67)	3 (2.10)
Prefer not to answer	4 (0.92)	1 (0.70)	2 (1.33)	1 (0.70)
Ethnic group				
Arab or Arab American	3 (0.69)	1 (0.71)	2 (1.33)	0
Chinese or Chinese American	16 (3.70)	2 (1.43)	7 (4.67)	7 (4.90)
Neither	414 (95.60)	137 (97.90)	141 (94.00)	136 (95.10)
Native language				
English	425 (97.70)	138 (97.20)	146 (97.30)	141 (98.60)
Other	10 (2.30)	4 (2.82)	4 (2.67)	2 (1.40)
Marital status				
Never married	221 (50.90)	71 (50.40)	76 (50.70)	74 (51.70)
Married	163 (37.60)	56 (39.70)	57 (38.00)	50 (35.00)
Divorced	39 (8.99)	13 (9.22)	13 (8.67)	13 (9.09)
Widowed	8 (1.84)	0	3 (2.00)	5 (3.50)
Separated	3 (0.69)	1 (0.71)	1 (0.67)	1 (0.70)
Income				
Less than $25,000	71 (16.30)	26 (18.30)	21 (14.00)	24 (16.80)
$25,000 to $39,999	62 (14.30)	21 (14.80)	20 (13.30)	21 (14.70)
$40,000 to $54,999	53 (12.20)	16 (11.30)	25 (16.70)	12 (8.39)

$55,000 to $69,999	59 (13.60)	24 (16.90)	13 (8.67)	22 (15.40)
$70,000 to $84,999	40 (9.20)	10 (7.04)	17 (11.30)	13 (9.09)
$85,000 to $99,999	52 (12.00)	17 (12.00)	20 (13.30)	15 (10.50)
$100,000 to $114,999	28 (6.44)	8 (5.63)	7 (4.67)	13 (9.09)
$115,000 to $129,000	16 (3.68)	5 (3.52)	5 (3.33)	6 (4.20)
$130,000 to $144,000	9 (2.07)	2 (1.41)	2 (1.33)	5 (3.50)
$145,000 to $159,000	11 (2.53)	3 (2.11)	5 (3.33)	3 (2.10)
$160,000 or more	34 (7.82)	10 (7.04)	15 (10.00)	9 (6.29)
Education				
12th grade or less	7 (1.61)	2 (1.41)	3 (2.00)	2 (1.40)
Graduated high school	39 (8.97)	14 (9.86)	14 (9.33)	11 (7.69)
Some college, no degree	101(23.20)	32 (22.50)	38 (25.30)	31 (21.70)
Associates degree	38 (8.74)	14 (9.86)	11 (7.33)	13 (9.09)
Bachelor’s degree	185 (42.50)	62 (43.70)	58 (38.70)	65 (45.50)
Post-graduate degree	65 (14.90)	18 (12.70)	26 (17.30)	21 (14.70)
Interaction with others				
0	422 (97.00)	138 (97.20)	146 (97.30)	138 (96.50)
1	10 (2.30)	4 (2.82)	3 (2.00)	3 (2.10)
2	1 (0.23)	0	1 (0.67)	0
3+	2 (0.46)	0	0	2 (1.40)
Activity				
Did not engaged in other activities	424 (97.50)	138 (97.20)	146 (97.30)	140 (97.90)
Engaged in other activities	11 (2.53)	4 (2.82)	4 (2.67)	3 (2.10)
Currently have a meditation practice				
Yes	90 (20.70)	27 (19.00)	29 (19.30)	34 (23.80)
No	345 (79.30)	115 (81.00)	121 (80.70)	109 (76.20)

Note. Total percentages in each category may exceed 100 because of rounding.

Another set of preliminary analyses used one-way ANOVA and Tukey post hoc tests to examine condition differences in the experimental manipulation variables. Assessed first was whether the experimental audio manipulations promoted different levels of attentiveness among participants. Participants' attentiveness differed significantly across experimental conditions, $F(2, 432) = 4.26$, $p = .015$, $\eta_p^2 = .02$. Post hoc comparisons indicated that the compassion group was significantly different from the relaxation group and the mindfulness group at $p < .05$; the mindfulness group and the relaxation group did not differ significantly. The compassion group showed a mean score of 0.26 points higher (95% CI [0.02, 0.50]) than the relaxation group. The compassion group showed a mean score of 0.25 points higher (95% CI [0.02, 0.49]) than the mindfulness group.

Participants' fatigue differed significantly across experimental conditions, $F(2, 432) = 3.25$, $p = .040$, $\eta_p^2 = .01$. Post hoc tests indicated that the compassion group was significantly different from the relaxation group at $p < .05$; the mindfulness group and the relaxation group did not differ significantly and the compassion group and the mindfulness group did not differ significantly. The compassion group showed a mean score of 0.30 points lower (95% CI [-0.58, -0.02]) than the relaxation group. Participants' serenity differed significantly across experimental conditions, $F(2, 432) = 6.05$, $p = .003$, $\eta_p^2 = .03$. Post hoc comparisons indicated that the compassion group was significantly different from the mindfulness group at $p < .05$; the compassion group and the relaxation group did not differ significantly. The mindfulness group showed a mean score of 0.24 points lower (95% CI [-0.48, -0.01]) than the relaxation group. The compassion group showed a mean score of 0.34 points higher (95% CI [0.10, 0.57]) than the mindfulness group.

A third set of ANOVA models assessed whether participants in each condition showed different levels of trait mindfulness, empathic concern, and empathic (personal) distress. Participants' trait mindfulness did not differ significantly across experimental

conditions, $F(2, 432) = 1.58$, $p = .207$, nor did empathic concern, $F(2, 432) = 0.11$, $p = .895$, nor did personal distress, $F(2, 432) = 0.29$, $p = .751$.

A fourth set of ANOVAs assessed whether participants in each condition showed different levels of intergroup contact quantity and quality with Arab out-group members, and identification with Arabs and Americans. Participants' intergroup contact quantity did not differ significantly across experimental conditions, $F(2, 432) = 0.33$, $p = .717$, nor did they differ in intergroup contact quality, $F(2, 432) = 0.20$, $p = .818$. Participants' in-group (American) identification did not differ significantly across experimental conditions, $F(2, 432) = 0.81$, $p = .447$, nor did their out-group (Arab) identification, $F(2, 432) = 0.71$, $p = .493$.

Main Analyses

This study first hypothesized that participants in the mindfulness condition and compassion condition would show less parochial empathy and greater prosocial behavior toward the Arab out-group than did those in the relaxation control condition. Figure 3 A-D shows how the distributions of the prosocial outcome scores varied by condition.

Figure 3A

Violin Plot Showing Distribution of Parochial Empathy Scores By Condition

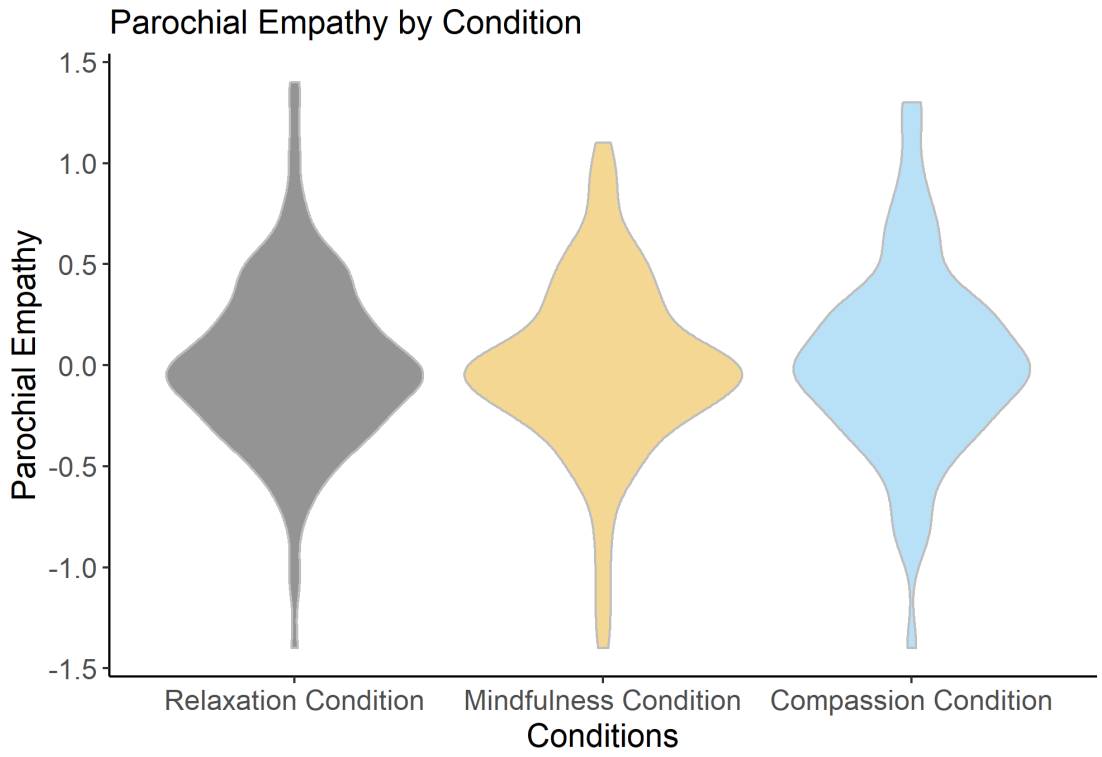


Figure 3B

Bar Graph Showing Distribution of Support For Arab Immigration By Condition

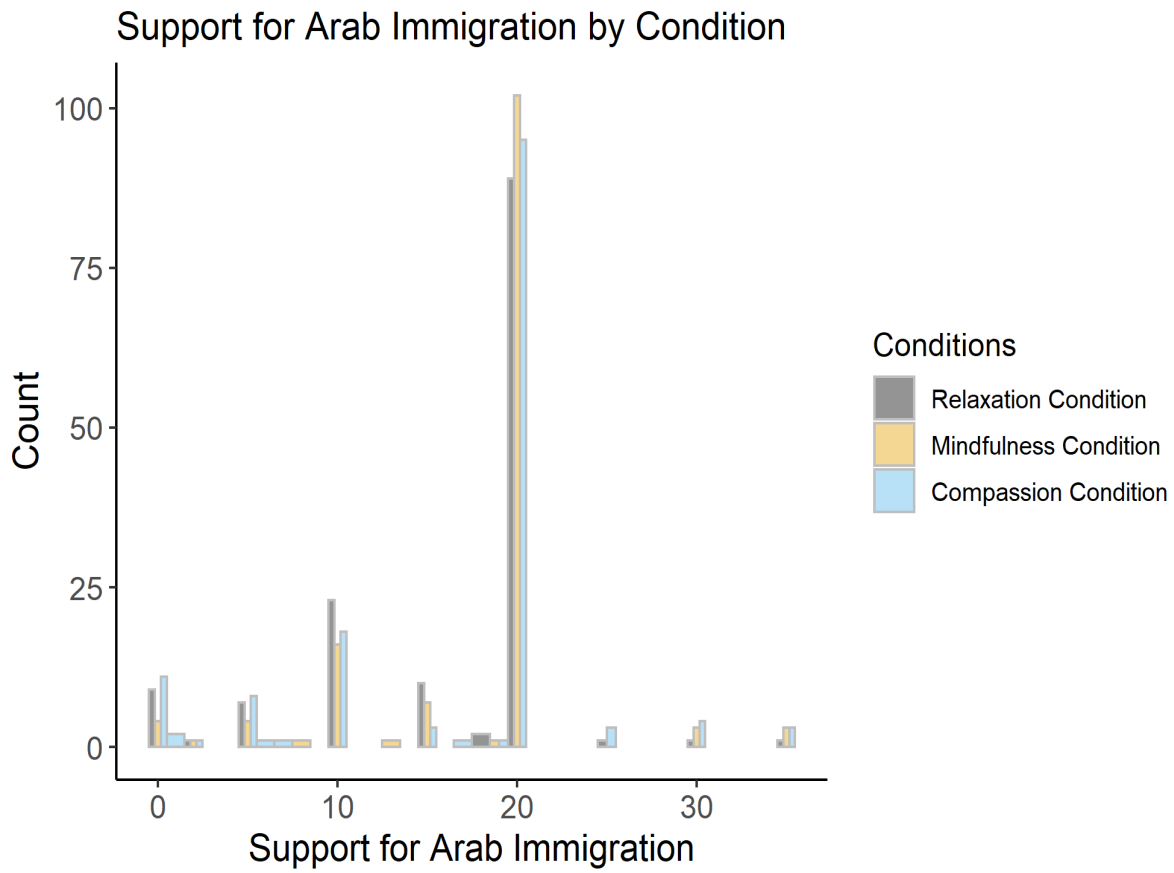


Figure 3C

Violin Plot Showing Distribution of Support for Out-group Altruism By Condition

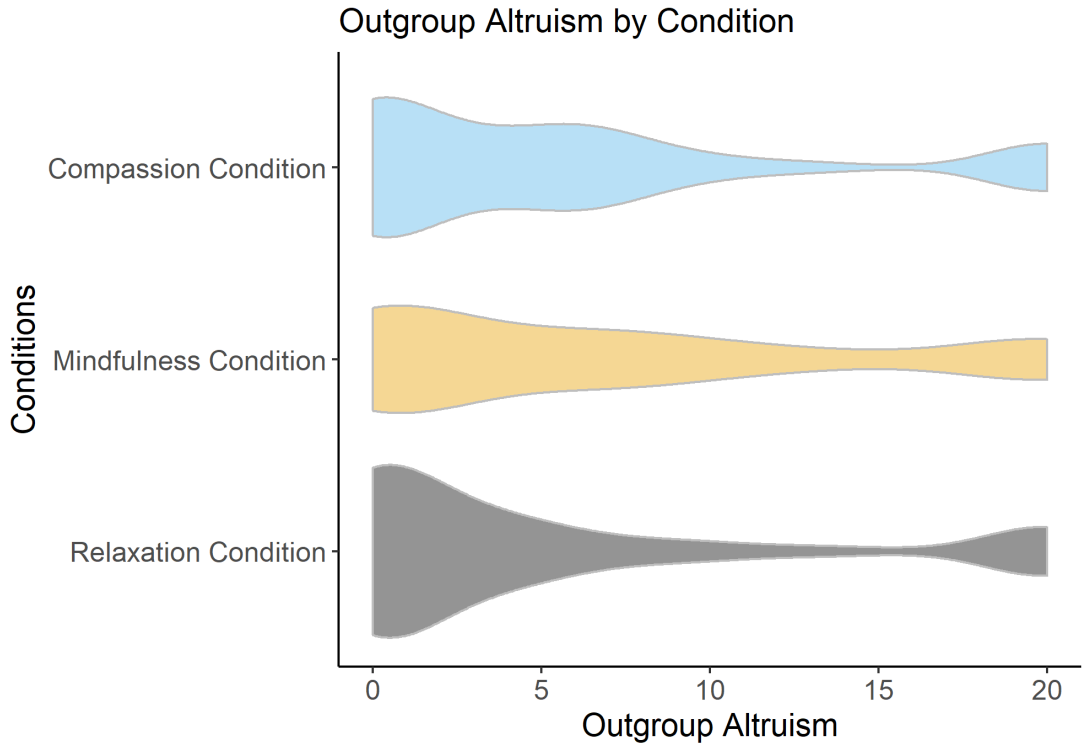


Figure 3D

Violin Plot Showing Distribution of Support For Out-group Cause Donation By Condition

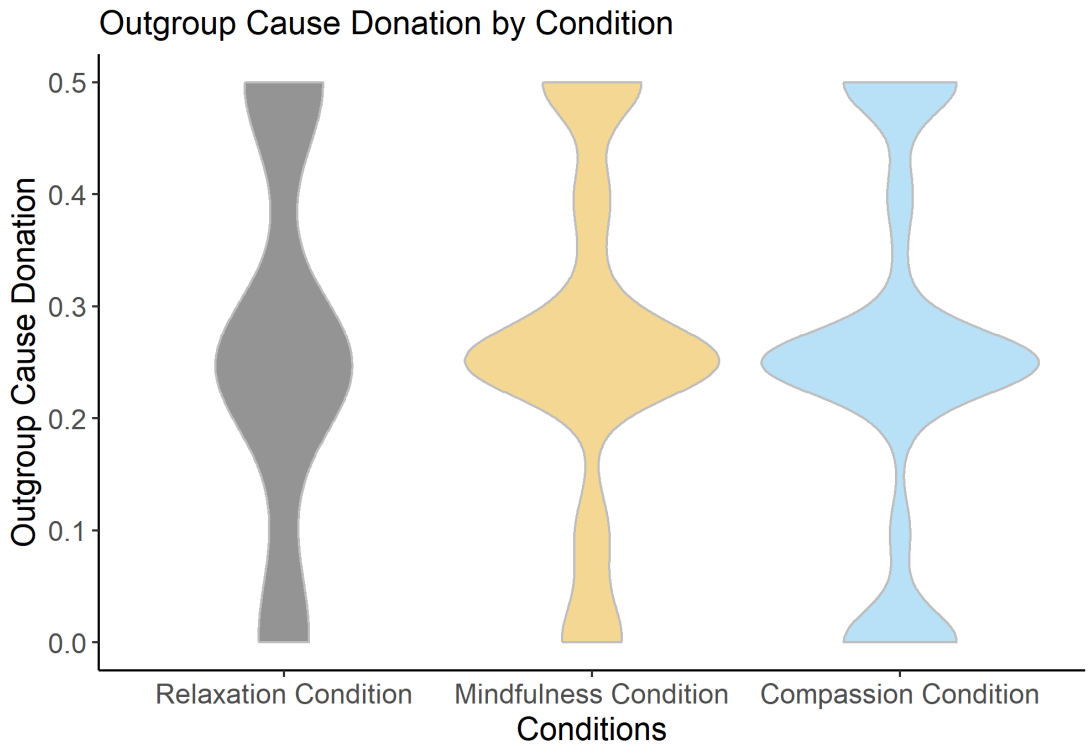


Table 2 shows the prosocial outcome and control variable descriptive statistics for each condition. The first hypothesis stated that the mindfulness group and the compassion group would show less parochial empathy toward the Arab out-group than the relaxation group. To test the first hypothesis, a one-way ANCOVA was conducted to examine differences between experimental conditions on parochial empathy (i.e., out-group empathy controlling for in-group empathy). Of note however, the linearity of residuals assumption was violated; there was a nonlinear relation between in-group empathy and out-group empathy for each condition, as assessed by visual inspection of a scatterplot. There was homogeneity of regression slopes as the interaction term (grouping variable and in-group empathy) was not statistically significant, $F(2, 429) = 0.11$, $p = .899$. Supporting the first hypothesis, there was a significant effect of condition on out-group empathy after controlling for in-group empathy, $F(2, 429) = 9.55$, $p < .001$, $\eta_p^2 = .04$, 95% CI [0.01, 1.00]. Post hoc comparisons indicated that the relaxation group was significantly different from the mindfulness group and the compassion group at $p < .05$; the mindfulness group and the compassion group did not differ significantly. The mindfulness group showed a mean score of 0.14 points higher (95% CI [0.02, 0.26]) than the relaxation group. The compassion group showed a mean score of 0.21 points higher (95% CI [0.09, 0.32]) than the relaxation group. In this model, in-group empathy was a significant predictor of out-group empathy, $F(1, 429) = 2683.64$, $p < .001$, $\eta_p^2 = .86$, 95% CI [0.81, 1.00] and trait empathic concern was a significant predictor, $F(1, 429) = 14.94$, $p < .001$, $\eta_p^2 = .03$, 95% CI [0.01, 1.00] Trait personal distress was not a significant predictor, $F(1, 429) = 0.003$, $p = .957$, 95% CI [0.00, 1.00]. This result indicated that the first hypothesis was supported; participants in the mindfulness condition and the compassion condition showed greater out-group empathy controlling for in-group empathy, or less parochial empathy, than participants in the relaxation control condition.

Table 2

Prosocial Outcome and Control Outcome Characteristics By Condition

Outcome variables	Total sample	Mindfulness condition	Compassion condition	Relaxation condition
Outcome variables	M (SD)	M (SD)	M (SD)	M (SD)
Parochial empathy	0.01 (0.44)	-0.01 (0.43)	0.04 (0.44)	0.01 (0.40)
Ingroup empathy	6.69 (1.10)	6.69 (1.07)	6.81 (1.05)	6.57 (1.18)
Outgroup empathy	6.68 (1.12)	6.70 (1.09)	6.77 (1.08)	6.56 (1.19)
Outgroup altruism	5.90 (6.99)	6.63 (7.14)	5.85 (6.76)	5.22 (7.07)
Support for Arab immigration	16.82 (6.81)	17.80 (5.87)	16.59 (7.68)	16.10 (6.63)
Support for outgroup cause	0.27 (0.16)	0.27 (0.15)	0.26 (0.16)	0.27 (0.17)
Control variables	M (SD)	M (SD)	M (SD)	M (SD)
Trait mindfulness	4.30 (0.97)	4.26 (0.87)	4.41 (1.03)	4.22 (0.97)
Empathic concern	4.04 (0.83)	4.07 (0.72)	4.02 (0.88)	4.04 (0.88)
Personal distress	2.53 (0.90)	2.50 (0.94)	2.57 (0.91)	2.51 (0.87)
Intergroup contact quantity	1.86 (1.01)	1.86 (1.02)	1.91 (1.06)	1.81 (0.96)
Intergroup contact quality	4.99 (1.07)	5.02 (1.06)	5.00 (1.05)	4.94 (1.11)

In-group identification	5.11 (1.45)	5.00 (1.51)	5.13 (1.45)	5.22 (1.38)
Out-group identification	2.64 (1.37)	2.74 (1.39)	2.64 (1.37)	2.55 (1.37)

The second hypothesis stated that the mindfulness group and the compassion group would show greater prosocial behavior toward the Arab out-group than the relaxation group. To test the second hypothesis, a one-way ANCOVA was conducted to examine differences between experimental conditions on support for Arab immigration controlling for trait mindfulness, trait empathy (empathic concern and personal distress), intergroup contact quantity and quality, and social identification (in-group identification and out-group identification). Contrary to the second hypothesis, there was not a significant effect of condition on support for Arab immigration after controlling for these covariates, $F(2, 425) = 2.82$, $p = .061$. In this model, intergroup contact quantity was a significant predictor of support for Arab immigration, though not reliably, $\beta = -.03$, $F(1, 425) = 13.14$, $p < .001$, $\eta_p^2 = .03$, 95% CI [0.01, 1.00], intergroup contact quality was a significant predictor of support for Arab immigration, $\beta = .20$, $F(1, 425) = 33.89$, $p < .001$, $\eta_p^2 = .07$, 95% CI [0.04, 1.00], out-group identification was a significant predictor of support for Arab immigration, $\beta = .18$, $F(1, 425) = 17.05$, $p < .001$, $\eta_p^2 = .04$, 95% CI [0.01, 1.00], empathic concern was a significant predictor of support for Arab immigration, $\beta = .22$, $F(1, 425) = 23.32$, $p < .001$, $\eta_p^2 = .05$, 95% CI [0.02, 1.00], and personal distress was a significant predictor of support for Arab immigration, $\beta = .10$, $F(1, 425) = 4.77$, $p = .030$, $\eta_p^2 = .01$, 95% CI [0.00, 1.00]. In this model, trait mindfulness was not a significant predictor, $\beta = -.04$, $F(1, 425) = 0.49$, $p = .486$, 95% CI [-0.97, 0.37] and in-group identification was not a significant predictor, $\beta = -.08$, $F(1, 425) = 0.19$, $p = .661$, 95% CI [-0.80, 0.03]. Thus, the results indicated that there was not a significant difference between conditions on support for Arab immigration after

controlling for intergroup contact quantity, intergroup contact quality, out-group identification, and trait empathy and mindfulness.

Next, a one-way ANCOVA was conducted to examine differences between experimental conditions on support for out-group cause controlling for trait mindfulness, trait empathy (empathic concern and personal distress), intergroup contact quantity and quality, and social identification (in-group identification and out-group identification). There was not a significant effect of condition on support for out-group cause after controlling for these covariates, $F(2, 425) = 0.60$, $p = .550$. Results indicated that this part of the second hypothesis was not supported, as participants in the mindfulness condition and the compassion condition did not show greater support for out-group cause than participants in the relaxation condition controlling for trait mindfulness, trait empathy, intergroup contact quantity and quality, and social identification. In this model, intergroup contact quantity was a significant predictor of support for out-group cause, $\beta = .11$, $F(1, 425) = 24.05$, $p < .001$, 95% CI [0.001, 0.03], intergroup contact quality was a significant predictor of support for out-group cause, though not reliably, $\beta = .07$, $F(1, 425) = 9.45$, $p = .004$, 95% CI [-0.006, 0.03], trait mindfulness was a significant predictor $\beta = -.14$, $F(1, 425) = 5.63$, $p= .027$, 95% CI [-0.04, -0.01], out-group identification was a significant predictor of support for out-group cause, though not reliably, $\beta = .07$, $F(1, 425) = 6.38$, $p = .036$, 95% CI [-0.003, 0.02], and empathic concern was a significant predictor of support for out-group cause, $\beta = .24$, $F(1, 425) = 22.15$, $p < .001$, 95% CI [0.03, 0.06]. In this model, in-group identification was not a significant predictor, $\beta = -.12$, $F(1, 425) = 2.84$, $p= . 093$, 95% CI [-0.02, -0.001] and personal distress was not a significant predictor of support for out-group cause, $\beta = -.01$, $F(1, 425) = 0.07$, $p = .797$, 95% CI [-0.02, 0.01].

Next, I tested condition differences in out-group altruism. To account for a bimodal distribution of the out-group altruism, this outcome was analyzed using a zero-inflated

Poisson model. Participants in the control condition showed an out-group altruism score of 8.68. Being in the mindfulness condition, as compared to being in the control condition, increased the likelihood of engaging in one additional unit of out-group altruism by 1.12 (exp(0.11062) = 1.12), and this is statistically significant (p = .024). Being in the compassion condition, as compared to being in the control condition, increased the likelihood of engaging in one additional unit of out-group altruism by 1.03 (exp(0.03101) = 1.03), and this is not statistically significant (p = .534). The likelihood of engaging in any amount of out-group altruism among participants in the control condition was 0.66. Being in the mindfulness condition, as compared to being in the control condition, did not affect the likelihood of engaging in any amount of out-group altruism by 0.70 (exp(-0.3568) = 0.70), (p = .151). Being in the compassion condition, as compared to being in the control condition, also did not affect the likelihood of engaging in any amount of out-group altruism by 0.80 (exp(-0.2225) = 0.80) (p = .358). The results indicated that the mindfulness group showed greater out-group altruism than the control group. However, the compassion group did not show greater out-group altruism than the control group.

The third hypothesis stated that parochial empathy would be a stronger predictor of prosocial behavior toward the out-group than trait empathic concern. To test the third hypothesis, two hierarchical regression models were constructed to examine whether parochial empathy (using the difference score or in-group empathy minus out-group empathy) was a stronger predictor than trait empathic concern in predicting prosocial behavior toward the out-group. A two-level hierarchical multiple regression model first regressed support for Arab immigration on trait empathic concern in the first block, followed by parochial empathy in the second block. The first block was significant, $F(1, 433) = 45.59$, $p < .001$, $R^2 = .09$. The second block was not significant, $F(2, 432) = 0.36$, $p = .551$, $R^2 = .09$. Thus, adding parochial empathy to the model did not increase the model fit. In this second

model, empathic concern was a significant predictor of support for Arab immigration, β = .31, $t(432) = 6.65$, $p < .001$, 95% CI [1.76, 3.24], whereas parochial empathy was not a significant predictor β = -.03, $t(432) = -0.60$, p= .551, 95% CI [-1.88, 1.00]. Thus, trait empathic concern was a stronger predictor of support for Arab immigration than parochial empathy.

Next, a two-level hierarchical multiple regression model regressed support for out-group cause on trait empathic concern in the first block, followed by parochial empathy in the second block. The first block was significant, $F(1, 433) = 31.01$, $p < .001$, $R^2 = .06$. The second block was not significant, $F(2, 432) = 0.03$, p = . 869, $R^2 = .06$. In this model, trait empathic concern was a significant predictor, β = .26, , $t(432) = 5.55$, $p < .001$, 95% CI [0.03, 0.07], whereas parochial empathy was not a significant predictor, β = .01, $t(432)$ = 0.17, p= . 869, 95% CI [-0.03, 0.04]. Thus, trait empathic concern was a better predictor of support for out-group cause than parochial empathy.

Discussion

Although people's well-being depends upon others, people often have a difficult time feeling empathy for and helping out-group members who are suffering, relative to their suffering in-group members. This study examined how parochial empathy could be reduced and prosocial behavior toward out-groups could be enhanced. Specifically, this study used an intergroup competition paradigm (i.e., competition between American players and Arab players) to examine the effects of a brief, 10-minute mindfulness training and a brief, 10-minute compassion training on parochial empathy and three behavior outcomes: outgroup-altruism for donation toward an Arab non-profit organization, support for Arab immigration, and support for out-group cause (i.e., distribution of a monetary fund for a WHO COVID-19 relief fund to people in Syria).

The first hypothesis was supported. Result indicated that participants in the mindfulness condition and the compassion condition showed different levels of parochial empathy than participants in the relaxation control condition. The second hypothesis was partially supported. Results indicated that participants in the mindfulness condition and the compassion condition did not show greater support for Arab immigration than participants in the relaxation control condition after controlling for intergroup contact quantity, intergroup contact quality, out-group identification, and trait empathy. Results indicated that participants in the mindfulness condition and the compassion condition did not show different levels of support for out-group cause than participants in the relaxation control condition. However, participants in the mindfulness condition showed greater levels of out-group altruism than the control group while the compassion condition did not show greater levels of out-group altruism toward the Arab out-group than the control group. Finally, the third hypothesis was not supported. Results indicated that parochial empathy was not a better predictor of out-group prosocial behavior than trait empathic concern. Control variables including trait mindfulness, trait empathy (empathic concern and personal distress), intergroup contact quantity and quality, and social identification did not contribute to condition differences in the prosocial outcomes.

The results did not support previous research that showed parochial empathy to be a better predictor of prosocial behavior toward out-groups than trait empathic concern (Bruneau et al., 2017). In this study, empathic concern was a stronger predictor of support for Arab immigration and support for out-group cause. One explanation for this result is that participants in this study showed very little parochial empathy, making it less likely that parochial empathy could have an effect on prosocial behavioral outcomes. There were eight items that measured in-group empathy and there were eight questions that measured out-group empathy. Traditionally, parochial empathy is calculated as in-group empathy minus

out-group empathy. Greater parochial empathy would be indicated by higher positive values (maximum difference score would be eight). Given that average scores for parochial empathy in the total sample were very close to zero, it means that participants felt a similar amount of empathy for in-group and out-group members. Thus, participants' trait levels of empathic concern could override the effects of parochial empathy on the prosocial behavioral outcomes. Another explanation for this result is that the parochial empathy measure in this study measured experience sharing or affective empathy for in-group and out-group members. However, past research has shown that mindfulness enhances state empathic concern and that state empathic concern was a significant mediator between mindfulness and prosocial behavior toward ostracized strangers (Berry et al., 2018).

The present study is one of the first to examine how mindfulness and compassion training influence intergroup emotions (i.e., parochial empathy) and their effects on prosocial behavior toward an out-group in the context of intergroup competition. The findings have important implications for future research examining intergroup emotions and the impact of contemplative practices on prosocial outcomes toward out-groups. Brief, 10-minute mindfulness training and compassion training had the expected effect in reducing the gap in empathy people have for in-group members versus for out-group members, as compared to a relaxation control condition. This shows the potential of using mindfulness-based and compassion-based interventions to address intergroup biases in emotions. Future research should replicate and extend this study by utilizing longer-term mindfulness-based and compassion-based interventions to examine their effects on parochial empathy and prosocial behavior. Although the current research did not show that mindfulness and compassion training enhanced support for out-group immigration and out-group cause, it showed that mindfulness training has the potential to enhance one type of prosocial behavior, namely out-group altruism. The results suggest that mindfulness training might be used alone or in

combination with other interventions to promote greater prosocial emotions and behavior toward other social groups in the context of intergroup competition or conflict. More research is needed to examine how mindfulness and compassion impact changes in intergroup emotions given the important role that emotions play in intergroup relations, especially in intergroup conflict.

Limitations

This study had several limitations. Participants completed the study online through a survey on the Prolific platform. Although participants could only move on to the next task if the whole duration of the audio recordings was played, it cannot be ensured that the participants paid attention to the audio recordings and practiced mindfulness, compassion, or relaxation by following the instructions. This limitation of the study could have influenced the effects of mindfulness training and compassion training on prosocial outcomes. Future research should include intervention verification questions to check whether participants paid attention to the content of the audio recordings and practiced the audio instructions (c.f., Iwamoto et al., 2020). Future research should also try to replicate the findings with an in-person study to examine whether there are condition differences in the prosocial outcomes when the interventions are provided in-person, given the greater level of engagement that could occur. Moreover, one of the prosocial behavioral outcomes, out-group altruism, does not have a normal distribution (Figure 1 shows that out-group altruism had a bimodal distribution). Another limitation of the study was that the normality of the residuals assumption for parochial empathy, support for Arab immigration, and support for out-group cause was not met.

Another limitation of this study is the lack of a passive control condition that has no instructions. It is possible no condition differences were found because all three conditions, including the relaxation control condition, influenced the parochial empathy and prosocial

behavioral outcomes. The relaxation effect of the control condition might have reduced parochial empathy and promoted prosocial behavior toward the out-group. This alternative explanation could not be ruled out without an additional no-instruction passive control condition.

It is important to consider the results in the context of the current socio-political events and the demographics of the participants. The results for prosocial behavior toward an Arab out-group could have been influenced by the current war in Ukraine. Support for out-group immigration was measured by the percentage of visas participants allocated to Arabs among five social groups, including Eastern Europeans. Participants might have wanted to support Ukrainians living in Eastern Europe who are influenced by the Russian invasion by offering Eastern Europeans more visas. Thus, participants could have chosen to distribute the visas evenly among these social groups due to the current socio-political context. Given that the average age of the participants was 39 years (born in 1983), there was a long list of socio-political challenges that many members of the sample faced at different ages: (e.g., the Afghan War (1978-1992), the Iran-Iraq War (1980-1988), the Persian Gulf War (1990-1991), the Bosnian Conflict (1992-1995), the Kosovo Conflict (1998-1999), the Afghanistan War (2001-14), the Iraq War (2003-2011), and the Syrian Civil War (2012-present)) in addition to the current war in Ukraine. A number of these conflicts have received and do receive significant media attention in the U.S., and this could have dampened prosocial responses in this study. An additional limitation of the sample is the paucity of racial and ethnic diversity. Most (about 71%) participants in this study identified as White. The paucity of diversity in this sample limits the generalizability of the results to other racial or ethnic groups, who might respond differently to the parochial empathy and prosocial behavioral measures in an intergroup context. Future research should examine the impact of mindfulness and compassion training on intergroup prosociality with greater sample diversity.

Lastly, this study examined parochial empathy using self-report responses to hypothetical scenarios of in-group and out-group experiences. These scenarios measured experience sharing or affective empathy. However, this study showed that trait empathic concern significantly predicted prosocial behavior toward the out-group. There is a need to examine parochial empathy by measuring differences in state empathic concern for in-group and out-group members. However, this is hampered by the absence of measures of state parochial empathy that focus on empathic concern for other social out-groups. In the current study, I examined experience sharing and empathic concern components of empathy. Empathy also has a cognitive component, namely perspective taking, that should be examined in intergroup contexts.

Conclusion

This study examined whether mindfulness training and compassion training would reduce parochial empathy and enhance prosocial behavior toward an out-group as compared to a relaxation control condition. Results showed that people who practiced a brief mindfulness training or compassion training showed less parochial empathy than people who practiced a relaxation technique. Moreover, people who practiced a brief mindfulness training showed greater levels of out-group altruism than people who practiced a relaxation technique. However, people who practiced a brief mindfulness training or compassion training did not show greater support for Arab immigration or for Arab out-group cause than people who practiced relaxation. Future research should examine the effects of mindfulness and compassion training on different components of empathy and extend this research to examine other types of intergroup emotions and behavior.

References

Alkoby, A., Halperin, E., Tarrasch, R., & Levit-Binnun, N. (2017). Increased support for political compromise in the Israeli-Palestinian conflict following an 8-week mindfulness workshop. *Mindfulness, 8*(5), 1345-1353. https://doi.org/10.1007/s12671-017-0710-5

Berger, R., Brenick, A., & Tarrasch, R. (2018). Reducing Israeli-Jewish pupils' outgroup prejudice with a mindfulness and compassion-based social-emotional program. *Mindfulness, 9*(6), 1768-1779.

Batson, C. D. (2009). These things called empathy: Eight related but distinct phenomena. In J. Decety & W. Ickes (Eds.), *The social neuroscience of empathy* (pp. 3–15). MIT Press. https://doi.org/10.7551/mitpress/9780262012973.003.0002

Batson, C. D. (2012). The empathy–altruism hypothesis: Issues and implications. In Decety, J. (Ed.), *Empathy: From bench to bedside* (pp. 41–54). MIT Press.

Batson, C. D., Fultz, J., Schoenrade, P. A. (1987). Distress and empathy: Two qualitatively distinct vicarious emotions with different motivational consequences. *Journal of Personality*, *55*(1), 19–39. https://doi.org/10.1111/j.1467-6494.1987.tb00426.x

Batson, C. D., Lishner, D. A., & Stocks, E. L. (2015). The empathy—Altruism hypothesis. In D. A. Schroeder & W. G. Graziano (Eds.), *The Oxford handbook of prosocial behavior* (pp. 259–281). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195399813.013.023

Berry, D. & Brown, K.W. (2017). Reducing separateness with presence: How mindfulness catalyzes intergroup prosociality. In J. Karremans & E. Papies (Eds.), *Mindfulness in Social Psychology* (pp. 153-166). Routledge. https://doi.org/10.4324/9781315627700-11

Berry, D. R., Cairo, A. H., Goodman, R. J., Quaglia, J. T., Green, J. D., & Brown, K. W. (2018). Mindfulness increases prosocial responses toward ostracized strangers through empathic concern. *Journal of Experimental Psychology: General*, *147*(1), 93–112. https://doi.org/10.1037/xge0000392

Berry, D. R., Hoerr, J. P., Cesko, S., Alayoubi, A., Carpio, K., Zirzow, H., Walters, W., Scram, G., Rodriguez, K., & Beaver, V. (2020). Does mindfulness training without explicit ethics-based instruction promote prosocial behaviors? A meta-analysis. *Personality and Social Psychology Bulletin*, *46*(8), 1247–1269. https://doi.org/10.1177/0146167219900418

Berry, D. R., Wall, C. S. J., Tubbs, J. D., Zeidan, F., & Brown, K. W. (2021). Short-term training in mindfulness predicts helping behavior toward racial ingroup and outgroup members. *Social Psychological and Personality Science*, 19485506211053096. https://doi.org/10.1177/19485506211053095

Bodhi, B. (2011). What does mindfulness really mean? A canonical perspective. *Contemporary Buddhism*, *12*(1), 19–39. https://doi.org/10.1080/14639947.2011.564813

Brown, K. W., Goodman, R. J., Ryan, R. M., & Anālayo, B. (2016). Mindfulness enhances episodic memory performance: Evidence from a multimethod investigation. *PLOS ONE*, *11*(4), e0153309. https://doi.org/10.1371/journal.pone.0153309

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*(4), 822–848. https://doi.org/10.1037/0022-3514.84.4.822

Bruneau, E. G., Cikara, M., & Saxe, R. (2017). Parochial empathy predicts reduced altruism and the endorsement of passive harm. *Social Psychological and Personality Science*, *8*(8), 934–942. https://doi.org/10.1177/1948550617693064

Cameron, C. D., & Fredrickson, B. L. (2015). Mindfulness facets predict helping behavior and distinct helping-related emotions. *Mindfulness*, *6*(5), 1211–1218. https://doi.org/10.1007/s12671-014-0383-2

Cameron, C. D., Hutcherson, C. A., Ferguson, A. M., Scheffer, J. A., Hadjiandreou, E., & Inzlicht, M. (2019). Empathy is hard work: People choose to avoid empathy because of its cognitive costs. *Journal of Experimental Psychology: General*, *148*(6), 962–976. https://doi.org/10.1037/xge0000595

Cikara, M., Bruneau, E. G., & Saxe, R. R. (2011). Us and them: Intergroup failures of empathy. *Current Directions in Psychological Science*, *20*(3), 149–153. https://doi.org/10.1177/0963721411408713

Cikara, M., Bruneau, E., Van Bavel, J. J., & Saxe, R. (2014). Their pain gives us pleasure: How intergroup dynamics shape empathic failures and counter-empathic responses. *Journal of Experimental Social Psychology*, *55*, 110–125. https://doi.org/10.1016/j.jesp.2014.06.007

Condon, P., Desbordes, G., Miller, W. B., & DeSteno, D. (2013). Meditation increases compassionate responses to suffering. *Psychological Science*, *24*(10), 2125–2127. https://doi.org/10.1177/0956797613485603

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, *10*, 85.

DeSteno, D. (2015). Compassion and altruism: How our minds determine who is worthy of help. *Current Opinion in Behavioral Sciences*, *3*, 80–83. https://doi.org/10.1016/j.cobeha.2015.02.002

Donald, J. N., Sahdra, B. K., Zanden, B. V., Duineveld, J. J., Atkins, P. W. B., Marshall, S. L., & Ciarrochi, J. (2019). Does your mindfulness benefit others? A systematic review

and meta-analysis of the link between mindfulness and prosocial behaviour. *British Journal of Psychology*, *110*(1), 101–125. https://doi.org/10.1111/bjop.12338

Dunne, J. (2011). Toward an understanding of non-dual mindfulness. *Contemporary Buddhism*, *12*(1), 71–88. https://doi.org/10.1080/14639947.2011.564820

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Gethin, R. (2011). On some definitions of mindfulness. *Contemporary Buddhism*, *12*(1), 263–279. https://doi.org/10.1080/14639947.2011.564843

Goetz, J. L., Keltner, D., & Simon-Thomas, E. (2010). Compassion: An evolutionary analysis and empirical review. *Psychological Bulletin*, *136*(3), 351–374. https://doi.org/10.1037/a0018807

Greenwald, A. G., & Pettigrew, T. F. (2014). With malice toward none and charity for some: Ingroup favoritism enables discrimination. *American Psychologist*, *69*(7), 669–684. https://doi.org/10.1037/a0036056

Hafenbrack, A. C., Cameron, L. D., Spreitzer, G. M., Zhang, C., Noval, L. J., & Shaffakat, S. (2020). Helping people by being in the present: Mindfulness increases prosocial behavior. *Organizational Behavior and Human Decision Processes*, *159*, 21–38. https://doi.org/10.1016/j.obhdp.2019.08.005

Halperin, E. (2015). Empathy as a peace catalyst in intractable conflict: Is it feasible? Is it enough? In *Emotions in Conflict* (pp. 132–150). Routledge. https://doi.org/10.4324/9781315850863-13

Hasson, Y., Tamir, M., Brahms, K. S., Cohrs, J. C., & Halperin, E. (2018). Are liberals and conservatives equally motivated to feel empathy toward others? *Personality and*

Social Psychology Bulletin, *44*(10), 1449–1459. https://doi.org/10.1177/0146167218769867

Islam, M. R., & Hewstone, M. (1993). Dimensions of contact as predictors of intergroup anxiety, perceived out-group variability, and out-group attitude: An integrative model. *Personality and Social Psychology Bulletin*, *19*(6), 700–710. https://doi.org/10.1177/0146167293196005

Iwamoto, S. K., Alexander, M., Torres, M., Irwin, M. R., Christakis, N. A., & Nishi, A. (2020). Mindfulness meditation activates altruism. *Scientific Reports*, *10*(1), 6511. https://doi.org/10.1038/s41598-020-62652-1

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, *10*(2), 144–156. https://doi.org/10.1093/clipsy.bpg016

Kang, Y., Gray, J. R., & Dovidio, J. F. (2014). The nondiscriminating heart: Lovingkindness meditation training decreases implicit intergroup bias. *Journal of Experimental Psychology: General*, *143*(3), 1306–1313. https://doi.org/10.1037/a0034150

Kirk, U., Gu, X., Sharp, C., Hula, A., Fonagy, P., & Montague, P. R. (2016). Mindfulness training increases cooperative decision making in economic exchanges: Evidence from fMRI. *Neuroimage*, *138*, 274–283. https://doi.org/10.1016/j.neuroimage.2016.05.075

Kteily, N., Bruneau, E., Waytz, A., & Cotterill, S. (2015). The ascent of man: Theoretical and empirical evidence for blatant dehumanization. *Journal of Personality and Social Psychology*, *109*(5), 901–931. https://doi.org/10.1037/pspp0000048

Kuppens, T., & Yzerbyt, V. Y. (2012). Group-based emotions: The impact of social identity on appraisals, emotions, and behaviors. *Basic and Applied Social Psychology*, *34*(1), 20–33. https://doi.org/10.1080/01973533.2011.637474

Leiberg, S., Klimecki, O., & Singer, T. (2011). Short-term compassion training increases prosocial behavior in a newly developed prosocial game. *PLoS One*, *6*(3). https://doi.org/10.1371/journal.pone.0017798

Lueke, A., & Gibson, B. (2015). Mindfulness meditation reduces implicit age and race bias: The role of reduced automaticity of responding. *Social Psychological and Personality Science*, *6*(3), 284–291. https://doi.org/10.1177/1948550614559651

Lueke, A., & Gibson, B. (2016). Brief mindfulness meditation reduces discrimination. *Psychology of Consciousness: Theory, Research, and Practice*, *3*(1), 34–44. https://doi.org/10.1037/cns0000081

Lutz, A., Jha, A. P., Dunne, J. D., & Saron, C. D. (2015). Investigating the phenomenological matrix of mindfulness-related practices from a neurocognitive perspective. *American Psychologist*, *70*(7), 632.

Mackie, D. M., Maitner, A. T., & Smith, E. R. (2015). Intergroup emotions theory. In T. D. Nelson (Ed.), *Handbook of prejudice, stereotyping, and discrimination* (2nd Ed., pp. 149-174). Psychology Press. https://doi.org/10.4324/9780203361993

Mackie, D. M., Smith, E. R., & Ray, D. G. (2008). Intergroup emotions and intergroup relations. *Social and Personality Psychology Compass*, *2*(5), 1866–1880. https://doi.org/10.1111/j.1751-9004.2008.00130.x

R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Saguy, T., Tausch, N., Dovidio, J. F., & Pratto, F. (2009). The irony of harmony: Intergroup contact can produce false expectations for equality. *Psychological Science*, *20*(1), 114–121. https://doi.org/10.1111/j.1467-9280.2008.02261.x

Salvati, M., Giacomantonio, M., & Ten Velden, F. (2020). Dispositional mindfulness moderates the association between social value orientation and in-group love and out-group hate. *Current Psychology*. https://doi.org/10.1007/s12144-020-00853-7

Schubert, T. W., & Otten, S. (2002). Overlap of self, ingroup, and outgroup: Pictorial measures of self-categorization. *Self and Identity*, *1*(4), 353–376. https://doi.org/10.1080/152988602760328012

Smith, E. R., & Mackie, D. M. (2015). Dynamics of group-based emotions: Insights from intergroup emotions theory. *Emotion Review*, *7*(4), 349–354. https://doi.org/10.1177/1754073915590614

Stell, A. J., & Farsides, T. (2016). Brief loving-kindness meditation reduces racial bias, mediated by positive other-regarding emotions. *Motivation and Emotion*, *40*(1), 140–147. https://doi.org/10.1007/s11031-015-9514-x

Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (6th ed.). Pearson.

Tajfel, H. (1970). Experiments in intergroup discrimination. *Scientific American*, *223*(5), 96–103. https://www.jstor.org/stable/24927662

Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science Information*, *13*(2), 65–93. https://doi.org/10.1177/053901847401300204

Tajfel, H. (1981). *Human groups and social categories : Studies in social psychology*. Cambridge University Press.

Tajfel, H., & Turner, J. C. (2004). The social identity theory of intergroup behavior. In J. T. Jost & J. Sidanius (Eds.), Political Psychology (pp. 276–293). Psychology Press. https://doi.org/10.4324/9780203505984-16

Tan, L. B., Lo, B. C., & Macrae, C. N. (2014). Brief mindfulness meditation improves mental state attribution and empathizing. PLoS ONE, 9, e110510. http://dx.doi.org/10.1371/journal.pone.0110510

Weng, H. Y., Fox, A. S., Shackman, A. J., Stodola, D. E., Caldwell, J. Z. K., Olson, M. C., Rogers, G. M., & Davidson, R. J. (2013). Compassion training alters altruism and neural responses to suffering. *Psychological Science, 24*(7), 1171-1180. https://doi.org/10.1177/0956797612469537

Weng, H. Y., Lapate, R. C., Stodola, D. E., Rogers, G. M., & Davidson, R. J. (2018). Visual attention to suffering after compassion training is associated with decreased amygdala responses. *Frontiers in Psychology*, *9*. https://doi.org/10.3389/fpsyg.2018.00771

Zaki, J. (2014). Empathy: A motivated account. *Psychological Bulletin*, *140*(6), 1608–1647. https://doi.org/10.1037/a0037679