



Effects of Brief Mindfulness Meditation and Compassion Meditation on Parochial Empathy and Prosocial Behavior Toward Ethnic Out-Group Members

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Abstract

Objectives Relative to the tendency to empathize with and help sociocultural in-group members, there are often social and psychological barriers to responding prosocially toward out-group members. This experiment examined the roles of mindfulness instruction and compassion instruction in fostering prosocial behavior toward an ethnic out-group (non-U.S. Arabs) relative to an ethnic in-group (U.S. residents). The study also examined whether contemplative practices would predict less parochial empathy and whether parochial empathy would mediate the relations between mindfulness/compassion and prosocial behavior toward the out-group.

Method A national sample of $n = 450$ U.S. residents was recruited online via the Prolific platform using the standard sample function, which distributed the study to available participants on Prolific. Participants were randomly assigned to one of three brief, structurally equivalent audio-recorded instruction conditions: mindfulness meditation, compassion meditation, or a relaxation control, and then completed a series of tasks to assess prosociality toward in- and out-group members.

Results The compassion training was most effective in reducing parochial empathy when controlling for all covariates. The mindfulness training reduced parochial empathy when controlling for in-group empathy, and it led to greater out-group altruism and support for out-group immigration. Parochial empathy predicted out-group altruism; however, it was not a better predictor of support for Arab immigration than trait empathic concern. Training conditions did not differ on support for out-group cause. Exploratory moderation analyses found that those with higher trait empathic concern and intergroup contact quality were more likely to show compassion training and mindfulness training effects, respectively, on support for out-group immigration.

Conclusions Brief compassion training had the strongest effect on parochial empathy, but mindfulness training showed stronger effects on out-group altruism and support for out-group immigration. Predisposing social psychological characteristics may enhance intergroup prosociality among those receiving compassion or mindfulness instruction.

Preregistration This study is preregistered at <https://osf.io/rnc97>.

Keywords Mindfulness · Compassion · Relaxation · Empathy · Intergroup · Prosocial Behavior

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While it is easy to empathize with and give aid to close, similar others, such as family and friends, it can be difficult to extend prosociality toward strangers who are perceived as “psychologically distant” from and/or dissimilar to oneself (e.g., Kurzban et al., 2015). In intergroup contexts, empathy and prosocial behavior are often shown preferentially toward one’s social in-group over social out-group members (called *parochial empathy*; Bruneau et al., 2015; Cikara et al., 2011). Parochial empathy can have deleterious consequences for collective well-being, including taking pleasure in out-group members’ pain (Cikara et al., 2014) and even intergroup conflict (Cikara et al., 2014). The consequences

of parochial empathy point to the need to overcome it as a barrier to prosociality when it is most difficult—in intergroup contexts marked by conflict and animosity.

Meditation refers to a family of practices that entail self-regulation of mental capacities such as attention, emotion, and memory (e.g., Tang et al., 2015). Social psychological and contemplative theory has long posited that these forms of regulation via meditation (or other psychological interventions) are critical for empathy and kindness to grow (Davidson & Harrington, 2002; Decety & Jackson, 2004). On the surface, compassion meditation seems most obviously linked to empathy and prosocial behavior, as it includes explicit instruction to cultivate compassion toward others (Lippelt et al., 2014), and indeed, it appears to do so. For example, a form of compassion meditation called loving-kindness meditation has been shown to enhance helping behavior (Leiberg et al., 2011; Weng et al., 2013). Loving-kindness meditation has also been shown to reduce implicit biases in social cognition, and this reduction was due in part to positive other-regarding emotions (Kang et al., 2014; Stell & Farsides, 2016).

Previous research has also demonstrated that mindfulness meditation can promote prosocial responses in various interpersonal contexts, despite the lack of explicit compassion-based instructions (e.g., Berry et al., 2018; Hafenbrack et al., 2020; Iwamoto et al., 2020; Tan et al., 2014). Most of this research has used real or ostensible peer strangers or workplace colleagues as targets of empathy and prosociality. Meta-analyses support the notion that mindfulness (and other) meditation practices can engender prosocial responses across many domains, including compassionate and instrumental helping, empathy, and reduced retaliation (Berry et al., 2020; Donald et al., 2019). Mindfulness meditation practices have also been shown to reduce prejudice and discrimination in intergroup contexts. In two experiments by Lueke and Gibson (2015, 2016), brief (10-min) focused-attention mindfulness meditation was shown to reduce implicit age and race bias, as well as decrease out-group discrimination in the Trust Game. Further, a 4-day focused-attention-based mindfulness training increased helping behavior in both scenario-based and in vivo contexts toward racial out-group members (Berry et al., 2021). Meta-analyses on the topic of mindfulness-based interventions' benefits in intergroup contexts have found small, meaningful effects on reducing intergroup biases (Chang et al., 2022; Oyler et al., 2022).

Extended programs that integrate mindfulness practices or use these practices as the centerpiece of the intervention have been found to alleviate intractable intergroup conflicts and promote peace-building. In the context of the Israeli-Palestinian conflict, for example, Israeli participants who completed the 8-week Mindfulness-Based Stress Reduction program (MBSR; Kabat-Zinn, 2003) and those who

completed MBSR in combination with cognitive reappraisal training showed greater willingness to compromise and to show support for conciliatory policies that would reduce the Israeli-Palestinian conflict as compared to those in a waitlist control condition (Alkoby et al., 2017). The effects of mindfulness training on conciliation were mediated by decreases in negative emotions toward Palestinians. Compared to mindfulness combined with reappraisal training, mindfulness training also increased support for conciliatory policies by decreasing perceived threat. In another study, Israeli-Jewish 3rd–5th-grade children who underwent a 24-session mindfulness-based and compassion-based program that also incorporated socio-emotional learning showed less prejudice toward and greater willingness to interact with their Israeli-Palestinian peers (Berger et al., 2018). Reduction in prejudice and negative stereotypes was evident even at a 6-month follow-up. However, given the multicomponent nature of the program, it is unclear what training components (mindfulness, compassion, social-emotional learning) may have produced these salutary outcomes. The potential mechanisms of mindfulness and compassion mediation in improving intergroup relations also remain unclear.

Previous research has found that empathy is a reliable antecedent of prosocial behavior (Batson, 2009; Feldman-Hall et al., 2015). Empathy is broadly defined as sharing and/or understanding another person's pain (Davis, 1983; Zaki, 2014). While empathy has been considered by scientists and the public alike to be a positive capacity that should be increased, empathy is also emotionally costly for to-be empathizers (Cameron et al., 2019). As such, people are motivated to avoid empathy in some circumstances and often choose to enact their empathy preferentially (Kurzman et al., 2015). This is perhaps most evident in intergroup contexts, which are marked by lower empathy toward social out-group members than in-group members. This difference in willingness and ability to empathize with in-group members over out-group members has been termed *parochial empathy* (Bruneau et al., 2017). Recent findings indicate that situational parochial empathy may be a stronger predictor of intergroup prosocial behaviors than broadband trait empathy, as individuals' emotions and behaviors are influenced by their social group-based identities (Bruneau et al., 2017; Cikara et al., 2011, 2014).

A series of experiments found that parochial empathy significantly predicted out-group attitudes and behaviors (Bruneau et al., 2017). Parochial empathy also mediated the effects of social identity (as Americans) on out-group (Arab) altruism, support for out-group-related policies (i.e., American participants' support for Arab immigration), and donations toward an Arab cause. In another study in this series, parochial empathy was a stronger predictor of Hungarian participants' support for anti-Muslim refugee-related policies and Greek participants' support for passive harm

toward a stigmatized German out-group than trait empathic concern. Parochial empathy appears to cut across political affiliations in the U.S.A. Both liberals and conservatives have reported being less motivated to empathize with, and less willing to help, political out-group members compared with political in-group members and nonpolitical group members (Hasson et al., 2018).

The role of mindfulness training and compassion training in reducing parochial empathy has been little studied, though theory and incipient empirical science lend some support to the efficacy of meditative practices in this domain. Berry and colleagues (Berry et al., 2022; Berry & Brown, 2017) have argued that meditative practices that incorporate focused attention and open monitoring forms of mindfulness meditation may be particularly effective at enhancing intergroup prosociality. People may be resistant to intergroup empathy for a multitude of reasons, including historical and/or current oppression by an out-group for example (Galinsky et al., 2005). Berry and colleagues (Berry et al., 2022; Berry & Brown, 2017) suggest that (mindfulness) meditation practices engender an “empathic attentional set,” in which prospective empathizers are able to attend receptively to the needs of others, without the overlay of social identities, appraisals, attitudes, and so on. In line with this thinking, Frost (2017) found that a 5-min mindfulness of breathing meditation, compared to a no-treatment control condition and a socialize control condition (socialize with other participants before the start of a game), increased cooperation in the Public Goods game and decreased parochial altruism, measured as a lower difference in offers made to in-group members and out-group members. The mindfulness meditation used in this study also had an emphasis on relaxation, so it is unclear what mechanisms (mindfulness and/or relaxation) produced the effects. In contrast, an experiment by Berry et al. (2021) found that both trainees in mindfulness and trainees in sham mindfulness (which emphasized relaxation) showed parochial helping for racial in-group members in their everyday lives, although mindfulness meditation alone predicted increases in helping behavior. Moreover, meditative practices have been shown to influence political intergroup bias (Simonsson et al., 2022a, b, c). For example, relative to a matched mindfulness condition and an active control condition (listening to educational content on mindfulness meditation), a 10-min audio-guided befriending meditation (similar to compassion and loving-kindness meditations) reduced affective polarization, or the difference in feelings that Americans who are affiliated with Democrats or Republicans had toward political in-group members versus for out-group members (Simonsson et al., 2022c). Similarly, UK nationals who practiced a 10-min audio-guided befriending meditation showed less affective polarization than active control participants who listened to a 10-min audio recording of educational content

on mindfulness meditation (Simonsson et al., 2022b). Sustained mindfulness training may also have the potential to reduce bias in intergroup emotions. An 8-week mindfulness program reduced affective polarization over time more than did a waitlist control condition (Simonsson et al., 2022a).

Investigating how mindfulness and compassion meditation trainings influence intergroup prosociality may complement current efforts to reduce intergroup conflict. While past research on the prosocial potential of mindfulness and compassion often focuses on interpersonal relationships, the present study extended this research on prosocial responses to a challenging intergroup context with real-world implications—namely conflict between Americans and non-American Arabs. This study had three research questions. First, do mindfulness training and/or compassion training reduce parochial empathy, namely that shown toward in-group members (i.e., Americans) versus out-group members (i.e., non-U.S. Arabs)? Second, we asked if the two trainings would increase prosocial behaviors toward Arab out-group members. Finally, we examined whether reduced parochial empathy mediated the relation between meditation practices and intergroup prosocial behaviors.

A representative sample of American participants on Prolific completed either a short mindfulness training, a structurally equivalent compassion training, or an active, progressive muscle relaxation control. Use of an active control, and audio-recorded instructions were important procedural controls. Active controls that are closely matched to mindfulness interventions (e.g., in terms of word count, duration, relaxed breathing), as done in the present study, allow for greater specificity in attributing changes in empathy and prosocial behavior to mindfulness while ruling out non-specific factors (Davidson, 2010). Additionally, a previous meta-analysis has found that the effect sizes of mindfulness interventions on prosocial behavior are stronger when study co-authors (who might be aware of the study aims) deliver the meditation (Berry et al., 2020; Kreplin et al., 2018). Here, our use of audio recordings rules out the possibility of facilitation bias. After listening to the audio recordings, participants reported on empathy felt toward out-group and in-group members in need and completed three measures of prosocial (helping) behaviors toward in-group and out-group members (all measures adapted from Bruneau et al., 2017).

This research also leverages quantitative methods to extend prior research, which has commonly calculated parochial empathy as a difference score (see Behler & Berry, 2022; cf., Bruneau et al., 2015, 2017). However, important information is 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 an analysis of covariance approach (c.f., Brown et al., 2009). In all analyses, we accounted for the role of baseline and procedural variables that could, on their own, alter prosociality: trait empathy (empathic concern and personal distress), quality and quantity of contact with Arab individuals, trait present-moment attention (a basic component of mindfulness), in-group and out-group identification, training manipulation checks, and audio-recording checks.

Method

Participants

Given the novelty of the proposed study, a pilot study 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 with the same participant pool (Cohen's $f = 0.25$). We recruited 450 participants to account for inattention and drop-out.

The study used a community sample drawn from the general American population. Participants located in the U.S.A. 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-min 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, four (0.92%) preferred not to answer, two (0.46%) as Pacific Islander, and one (0.23%) as Middle Eastern. Two-hundred thirty-nine (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 (36.12 chi-square cut-off) and missing data, and the remaining 435 participants were included in the statistical analyses. One-hundred forty-two participants received mindfulness instructions, 150 received compassion instructions, and 143 received relaxation control instructions.

Procedure

Figure 1 shows the procedural flow through this study. All procedures were automated and presented using Qualtrics software. Participants were first asked to read the consent form and give their informed consent to participate

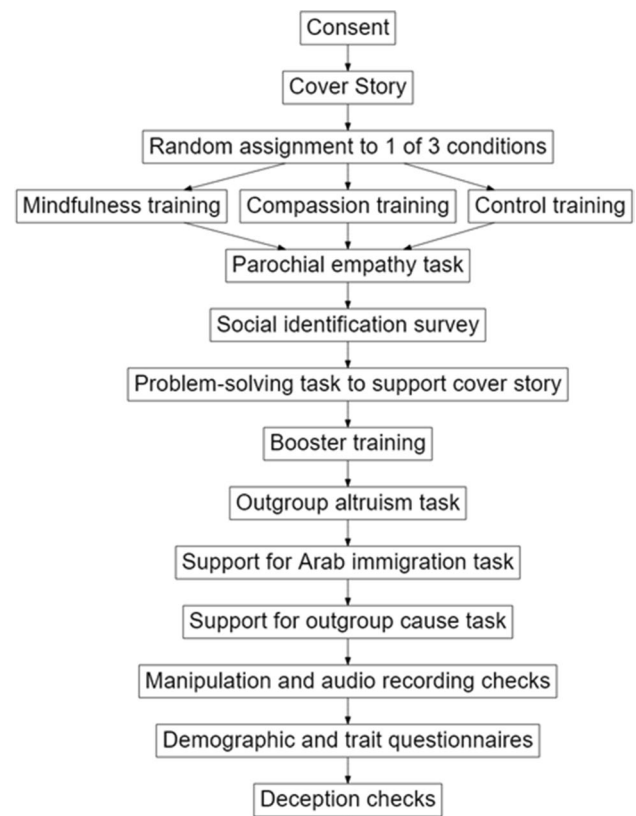


Fig. 1 Flowchart of study procedure

in the study. 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 the Qualtrics randomizer to one of the three experimental conditions. Participants listened to a brief audio recording of either guided mindfulness meditation, guided compassion meditation, or guided relaxation 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 on 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 felt about the in-group's or out-group's fortunes and misfortunes. Then, 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-min, 23-s booster training in their respective condition. Next, participants were given the choice to either continue solving up to 20 more problems or to opt out and skip to the next task in the survey. They were told that for each additional problem that they correctly completed, US\$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 US\$0.50 monetary bonus to distribute between an in-group cause and an out-group cause.

Participants then completed the audio-manipulation checks and audio-recording checks. They then completed the self-report measures of trait presence, empathic concern, empathic personal distress, and intergroup contact quantity and quality. Within these measures were embedded four directed questions to catch inattentiveness and noncompliance (Maniaci & Rogge, 2014). Participants also answered demographic questions: three questions assessing presence of distractions in their immediate 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 any current meditation practice.

Interventions

Both types of contemplative practices and the relaxation control practice lasted 10 minutes and 30 seconds. One female instructor unassociated with the study and naive to study questions recorded all the scripted intervention audio tracks, and the interventions were matched in duration, complexity, introduction, setup, and ending. These structural equivalence variables helped to control for spurious effects of condition on the 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 (adapted from Segal et al., 2002). This is a type of focused-attention mindfulness practice (Lutz et al., 2015). This training did not include explicit instructions on compassion or any prosocial-related terms. The compassion meditation condition used a loving-kindness meditation, which instructed participants to practice compassion toward loved ones, compassion toward acquaintances, compassion toward a neutral person, compassion toward a difficult person, and then compassion toward strangers and all living beings (adapted from Weng et al., 2013). The relaxation control condition was a form of progressive muscle relaxation (adapted from Bernstein and Borkovec (1973) and Feldman et al. (2010)). The training

asked participants to identify tension or tightness in different muscles of the body and to progressively relax these muscles. The relaxation control condition was included to ensure that mere relaxation and attention directed toward sensations of mind and body did not explain the effects of mindfulness and/or compassion on parochial empathy and prosocial behavior.

Because the effects of brief interventions are ephemeral, one brief booster induction matching each condition was included partway through the study. The instructor who recorded the audio instructions also recorded the boosters. Each booster lasted 1 minute and 23 seconds. All booster inductions began with the same setup: asking participants to take a moment to pause, place their feet flat on the floor, and rest their hands on 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 instructions 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 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-s inhalations and 4-s 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 with three measures (Bruneau et al., 2017). First, participants completed eight problem-solving tasks (Raven's Matrices problems). Out-group altruism was measured by the number of additional Arab non-profit organization ("Arab Red Crescent Society") charity tasks that participants chose to complete. Participants were told that for each additional problem they completed correctly, US\$0.50 would be donated to this charity. 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 the next task. The second outcome, support for Arab immigration, was measured by the percentage of U.S. visas that participants thought should be granted to Arabs relative to other groups: East Asians, Hispanics, Africans, and Eastern Europeans. The percentages for each group were required to total 100%. The

third prosocial outcome, support for an out-group cause, was measured by the amount of money participants distributed to an in-group cause versus an out-group cause. Participants were given a choice to distribute a US\$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 indicated greater support for the out-group cause.

Parochial Empathy

The parochial empathy measure was adapted from the Bru-near et al. (2017) study. Participants read 16 in-group and out-group vignettes, including four positive events and four negative events experienced by eight Americans (in-group) and eight Arabs (out-group). The vignettes were randomized without replacement. 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 badly about her) and out-group's misfortunes (e.g., Hassan slammed his finger in the door). For each event, participants were asked to use an unmarked slider bar 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/very bad*). The parochial empathy measure had excellent internal consistency with the current sample ($\alpha = 0.93$).

Covariates

After the experimental portion of the study, a series of trait and interpersonal surveys were completed. *Present-moment attention* ("presence") was measured by the 15-item dispositional Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The MAAS asked participants to report how frequently they experience states of present-centered (in) attention (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 presence was calculated by computing a mean score of the 15 items. Higher scores indicated higher levels of present-moment attention. The MAAS had excellent internal consistency with the current sample ($\alpha = 0.93$).

Trait empathy was measured by the 7-item empathic concern (EC) subscale and 7-item empathic 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. Internal consistency in this sample was excellent for the EC subscale ($\alpha = 0.90$) and good for the PD subscale ($\alpha = 0.88$).

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 represented 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 one of the three social groups, "Americans/Arabs/Chinese," with the first Venn-like diagram 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. This measure was used to control for in-group (American) versus out-group (non-U.S. Arab) identification in this study.

Intergroup contact was measured using Islam and Hewstone's (1993) intergroup contact quantity and contact quality items to control for the potential role 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 ($\alpha = 0.86$). 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*) for Item 3; 1 (*not at all*) to 7 (*very*) for Item 4; and 1 (*very competitive*) to 7

(*very cooperative*) for Item 5. Higher scores indicated higher quality of intergroup contact. The five intergroup contact quality items in this sample had good internal consistency ($\alpha = 0.80$).

Manipulation check items (Brown et al., 2016) were included at post-intervention to check for attentiveness, serenity, and fatigue. The measure asked participants to “indicate the extent to which they felt the following 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 $\alpha = 0.82$), 3 items measured serenity (calm, relaxed, at ease; sample $\alpha = 0.90$), and 3 items measured fatigue (tired, sluggish, drowsy; sample $\alpha = .89$). Audio-recording checks measured participants’ comfort in listening to 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*).

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 (see Figure S1A in the supplemental materials). Dependent variables that had z scores greater than ± 3.29 were winsorized (Tabachnick & Fidell, 2013). Twenty-one univariate outliers were winsorized by replacing with the next highest or lowest value, as appropriate. Six cases were excluded from analyses for having multivariate outliers using Mahalanobis distance with $p < 0.001$. Nine cases were excluded for missing data. Results without winsorized treatment of outliers are included in the “Main Analyses Without Winsorizing Outliers” section of the supplemental materials.

No cases were excluded for failure to correctly answer more than half of the four attention checks (directed questions) or for speeding, operationalized as study completion in less than half of the sample median time to study completion. Thus, the sample size for analysis was $n = 435$. 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.

To address the first study question—whether participants in the mindfulness and compassion conditions would show less parochial empathy than participants in the relaxation control condition—parochial empathy scores were compared across the three conditions using one-way ANCOVA. ANCOVAs were conducted with the following covariates: trait presence, empathy (empathic concern and empathic distress), social identification (in-group and out-group identification), intergroup contact (quality and quantity), age, gender, political viewpoint, and manipulation check items. To address the second study question—whether the mindfulness and compassion conditions would promote prosocial behavior toward the out-group significantly more than the relaxation control condition—one-way ANCOVA was also used.

The support for out-group cause variable had a multimodal distribution (see supplemental Figure S1A). Support for out-group cause has the highest peak at the center of the distribution, which means that most participants distributed the US\$0.50 monetary support fund evenly between in-group cause and out-group cause. There was a small group of participants at the low end of the distribution (around US\$0.00) who chose to distribute the fund to support only the in-group cause and another small group of participants at the high end of the distribution (around US\$0.50) who chose to distribute the fund to support only the out-group cause. A k -means clustering algorithm (Lloyd, 1982; MacQueen, 1967) was used to determine the number of meaningful clusters to split this outcome into groups for multinomial logistic regression. When $k = 3$, there were 3 clusters: cluster 1 ranged from US\$0.40 to US\$0.50 ($M = 0.48$) and had a size of 113 participants, cluster 2 ranged from US\$0.00 to US\$0.01 ($M = 0.02$) and had a size 88 participants, and cluster 3 ranged from US\$0.15 to US\$0.35 ($M = 0.25$) and had a size of 234 participants. The effect of the experimental manipulation on support for out-group cause was tested with a multinomial logistic regression to test the second hypothesis. Multinomial logistic regression was run using support for out-group cause cluster groups as the outcome and condition as the predictor.

The out-group altruism variable had a bimodal distribution (see supplemental Figure S1A). 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.

Mediation analysis to examine the third question—whether parochial empathy significantly mediated the relation between instruction condition 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. All statistical analyses used an alpha level of 0.05 and a confidence level of 95% to determine the significance of the results.

Results

Preliminary Outcomes

First examined was whether there were demographic or procedural 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, $F(2, 430) = 0.04, p = 0.965$. 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, $F(2, 431) = 2.85, p = 0.059$. Personal privacy while completing the study 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, $F(2, 432) = 1.65, p = 0.194$.

A second 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, $F(2, 432) = 4.26, p = 0.015, \eta_p^2 = 0.02$. Post hoc comparisons indicated that the compassion group showed a mean score 0.26 points higher (95% CI [0.02, 0.50]) than the relaxation group. The compassion group showed a mean score 0.25 points higher (95% CI [0.02, 0.49]) than the mindfulness group. The mindfulness group and the relaxation group did not differ significantly.

Participants' fatigue differed significantly across experimental conditions, $F(2, 432) = 3.25, p = 0.040, \eta_p^2 = 0.01$. The compassion group showed a mean score 0.30 points lower (95% CI [-0.58, -0.02]) than the relaxation group. The mindfulness group and the relaxation group did not differ significantly nor did the compassion group and the mindfulness group. Participants' serenity differed significantly across experimental conditions, $F(2, 432) = 6.05, p = 0.003,$

$\eta_p^2 = 0.03$. The mindfulness group showed a mean score 0.24 points lower (95% CI [-0.48, -0.01]) than the relaxation group, and the compassion group showed a mean score of 0.34 points higher (95% CI [0.10, 0.57]) than the mindfulness group. The compassion group and the relaxation group did not differ significantly. Given the differences between conditions in the manipulation check items, attentiveness, fatigue, and serenity were covaried in all analyses.

A third set of preliminary 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. No condition differences on these variables were found, $p > 0.05$. A final set of ANOVA models assessed whether participants in each condition showed different levels of trait presence, empathic concern, and empathic (personal) distress. Again, no differences across conditions were found, $p > 0.05$.

Main Outcomes

This study's primary aims were to examine whether participants in the mindfulness condition and/or compassion condition would show less parochial empathy and greater prosocial behavior toward an Arab out-group than did those in the relaxation control condition. Table 2 shows the prosocial outcome and control variable descriptive statistics for each condition, while supplementary Figure S2 A–D shows the distributions of the prosocial outcome scores by condition.

Study question 1: To examine the first study question—whether the mindfulness and compassion conditions would show less parochial empathy toward the Arab out-group than the relaxation group—two one-way ANCOVAs were conducted. Model assumptions were met. In the first ANCOVA model with only in-group empathy as the covariate, there was a significant effect of condition on out-group empathy after controlling for in-group empathy, $F(2, 431) = 9.27, p < 0.001, \eta_p^2 = 0.04, 95\% \text{ CI}(\eta_p^2) [0.01, 1.00]$. Tukey post hoc tests indicated that while the mindfulness group and the compassion group did not differ significantly, the mindfulness group showed a mean score 0.14 points higher (95% CI [0.02, 0.26]) than the relaxation group. The compassion group showed a mean score 0.21 points higher (95% CI [0.09, 0.33]) than the relaxation group. This result indicated that both mindfulness and compassion groups showed lowered parochial empathy than the relaxation control group when controlling for in-group empathy. In the second ANCOVA model with all covariates, there was also a significant effect of condition on out-group empathy after controlling for in-group empathy and other covariates noted in the “Methods” section, $F(2, 408) = 8.09, p < 0.001, \eta_p^2 = 0.04, 95\% \text{ CI}(\eta_p^2) [0.01, 1.00]$. Tukey post hoc tests indicated

Table 1 Demographic Characteristics by Condition

Demographic variables	Total sample	Mindfulness condition	Compassion condition	Relaxation condition
Continuous variables	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
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	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>
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)

Table 1 (continued)

Demographic variables	Total sample	Mindfulness condition	Compassion condition	Relaxation condition
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)
Study activity				
Did not engage 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

that while the mindfulness group and the compassion group did not differ significantly and the mindfulness group and the relaxation group did not differ significantly, the compassion group showed a mean score of 0.20 points higher than the relaxation group, $p < 0.001$, 95% CI(η_p^2) [0.08, 0.31]. In this model, in-group empathy was a significant predictor of out-group empathy, $F(1, 408) = 2577.23$, $p < 0.001$, $\eta_p^2 = 0.86$, 95% CI(η_p^2) [0.85, 1.00], as was trait empathic concern, $F(1, 408) = 15.34$, $p < 0.001$, $\eta_p^2 = 0.04$, 95% CI(η_p^2) [0.01, 1.00]; age, $F(1, 408) = 7.94$, $p = 0.005$, $\eta_p^2 = 0.02$, 95% CI(η_p^2) [0.00, 1.00]; and fatigue, $F(1, 408) = 4.72$, $p = 0.030$, $\eta_p^2 = 0.01$, 95% CI(η_p^2) [0.00, 1.00]. Trait empathic distress, social identification, intergroup contact, gender, political viewpoint, attentiveness, and serenity were not significant predictors, $p > 0.05$. These results indicated that only participants receiving compassion instruction showed

lower parochial empathy than participants receiving relaxation instruction after controlling for dispositional and interpersonal characteristics.

Study question 2: This question asked whether the mindfulness group and/or the compassion group would show greater prosocial behavior toward the Arab out-group than the relaxation group. ANOVA and ANCOVA were conducted. In the ANOVA model, participants' support for Arab immigration did not differ significantly across experimental conditions, $F(2, 436) = 2.68$, $p = 0.069$, $\eta_p^2 = 0.01$, 95% CI(η_p^2) [0.00, 1.00]. Results indicated that participants in the mindfulness condition and the compassion condition did not show greater support for out-group immigration than participants in the relaxation control condition. However, ANOVA results without winsorized treatment of outliers showed significant effects, with participants receiving

Table 2 Prosocial Outcome and Control Outcome Characteristics by Condition

Outcome variables	Total sample	Mindfulness condition	Compassion condition	Relaxation condition
Outcome variables	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
In-group empathy	6.69 (1.10)	6.69 (1.07)	6.81 (1.05)	6.57 (1.18)
Out-group empathy	6.68 (1.12)	6.70 (1.09)	6.77 (1.08)	6.56 (1.19)
Out-group 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 out-group cause	0.27 (0.16)	0.27 (0.15)	0.26 (0.16)	0.27 (0.17)
Control variables	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Trait presence	4.30 (0.97)	4.26 (0.87)	4.41 (1.03)	4.22 (0.97)
Trait empathic concern	4.04 (0.83)	4.07 (0.72)	4.02 (0.88)	4.04 (0.88)
Trait empathic 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)

mindfulness instruction showing greater support for Arab immigration than participants receiving relaxation instruction (“Main Analyses Without Winsorizing Outliers” section in Supplemental Materials). Moreover, the ANCOVA model showed that there was a significant effect of condition on support for Arab immigration after controlling for the covariates, $F(2, 409) = 3.04$, $p = 0.049$, $\eta_p^2 = 0.01$, 95% CI(η_p^2) [0.00, 1.00]. Tukey post hoc tests indicated that while the mindfulness group and the compassion group did not differ significantly and the compassion group and the relaxation group did not differ significantly, the mindfulness group showed a mean score 1.72 points higher than the relaxation group, $p = 0.045$, 95% CI [0.03, 3.42]. In this model, empathic concern was a significant predictor of support for Arab immigration, $\beta = 0.20$, $F(1, 409) = 53.64$, $p < 0.001$, $\eta_p^2 = 0.12$, 95% CI(η_p^2) [0.07, 1.00], as was out-group identification, $\beta = 0.19$, $F(1, 409) = 26.83$, $p < 0.001$, $\eta_p^2 = 0.06$, 95% CI(η_p^2) [0.03, 1.00]; intergroup contact quality, $\beta = .16$, $F(1, 409) = 10.90$, $p = 0.001$, $\eta_p^2 = 0.03$, 95% CI(η_p^2) [0.01, 1.00]; age, $\beta = -.16$, $F(1, 409) = 12.26$, $p < 0.001$, $\eta_p^2 = 0.03$, 95% CI(η_p^2) [0.01, 1.00]; and political viewpoint, $\beta = 0.13$, $F(1, 409) = 7.70$, $p = 0.006$, $\eta_p^2 = 0.02$, 95% CI(η_p^2) [0.00, 1.00]. Trait presence, empathic distress, in-group identification, intergroup contact quantity, gender, and manipulation items were not significant predictors, $p > 0.05$. Thus, the results generally indicated that participants receiving mindfulness instruction showed greater support for Arab immigration than participants receiving relaxation instruction after controlling for dispositional and interpersonal characteristics.

The subsequent analyses assessed whether the experimental manipulations promoted different levels of support for an Arab cause. As stated in the “Data Analyses” subsection, a k -means clustering algorithm was used to split support for out-group cause into three categories. A multinomial logistic regression examined the effects of mindfulness and compassion training on the likelihood that participants will be in the “give all” group, distributing most or all of the support fund to an out-group cause (coded 1); a “keep” group, distributing most or all the support fund to an in-group cause (coded 2); and a “fair play” group, evenly distributing the support fund between an in-group cause and an out-group cause (coded 3). The “keep” group was used as the reference group in the logistic regression. In this analysis, the log odds of being in one group versus another did not differ across conditions; the log odds varied from 0.02 to 0.26, $p > 0.05$.

The subsequent analyses assessed condition differences in out-group altruism. To account for a bimodal distribution of out-group altruism, this outcome was analyzed using a zero-inflated Poisson model. Participants in the relaxation control condition showed an out-group altruism score of 8.68.

Relative to this, participation in the mindfulness condition predicted a higher likelihood of engaging in out-group altruism by 1.12 units, $p = 0.024$. Participation in the compassion condition, as compared to being in the control condition, was associated with a higher odds of out-group altruism by 1.03 units, which was not statistically significant ($p = 0.534$). The results indicated that the mindfulness group showed greater out-group altruism than the relaxation control group, but the compassion group did not show greater out-group altruism than the control condition.

Study question 3: The third question asked whether parochial empathy would mediate the effect of experimental condition on prosocial behavior. Focus was on the out-group altruism and support for Arab immigration outcomes gives the aforereported results. Given the oft-reported role of empathic concern in prosocial behavior, as well as the positive results for this variable discussed in the *Study question 2* section of the “Results,” this variable was covaried in the analysis. First, a two-level hierarchical multiple regression model 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, $F(1, 433) = 45.59$, $p < 0.001$, $R^2 = 0.09$. The second block was not significant, $F(2, 432) = 0.36$, $p = 0.551$, $R^2 = 0.09$. Thus, adding parochial empathy to the model did not improve the model fit. In this second model, empathic concern was a significant predictor of support for Arab immigration, $\beta = 0.31$, $t(432) = 6.65$, $p < 0.001$, 95% CI [1.76, 3.24], whereas parochial empathy was not a significant predictor, $\beta = -0.03$, $t(432) = -0.60$, $p = 0.551$, 95% CI [-1.88, 1.00]. Thus, trait empathic concern was a stronger predictor of support for Arab immigration than parochial empathy.

Second, to account for a bimodal distribution of out-group altruism, this outcome was analyzed using a zero-inflated Poisson model with parochial empathy and trait empathic concern as covariates. In this model, parochial empathy was calculated as a difference score (in-group empathy minus out-group empathy). Compared to the control group, mindfulness trainees had a higher likelihood of engaging in out-group altruism by 1.12 units, $p = 0.025$. Participation in the compassion condition, as compared to being in the control condition, predicted a higher likelihood of engaging in out-group altruism by 1.03 units, which was not statistically significant ($p = 0.575$). In this model, parochial empathy decreased the likelihood of engaging in out-group altruism by 0.82 units, $p < 0.001$, whereas empathic concern predicted a higher odds of out-group altruism by 1.15 units, $p < 0.001$. These results indicated that parochial empathy did not mediate the effect of experimental condition on support for Arab immigration, but it did predict out-group altruism.

Exploratory Outcomes

Moderation analysis was conducted to evaluate whether the relation between training condition and the outcomes—parochial empathy and the three prosocial behaviors—depended on the covariates discussed earlier: age, gender, various psychosocial traits, and manipulation check items. To create moderation variables, continuous predictors were centered and product terms were created as recommended by Baron and Kenny (1986). In preliminary analyses, trait presence, empathic distress, in-group identification, manipulation check items, age, and gender were nonsignificant moderators, $p > 0.05$ and thus were excluded from additional analyses. Empathic concern, intergroup contact quantity, intergroup contact quality, out-group identification, and political viewpoint were included for the main analyses.

In the first ANOVA model, the interactions between the training condition and these five variables were nonsignificant predictors of parochial empathy, $p > 0.05$. A second ANOVA-based moderation analysis evaluated whether the relation between training condition and support for Arab immigration depended on these variables. The effect of practicing compassion meditation compared to relaxation control training was different depending on participants' trait empathic concern scores ($b = 1.81$, 95% CI [0.80, 2.82], $p < 0.001$), indicating that the effect of compassion training on support for Arab immigration was stronger among participants scoring higher in trait empathic concern. The effect of practicing mindfulness meditation compared to relaxation control training was different depending on participants' past intergroup contact quality ($b = -1.49$, 95% CI [-2.43, -0.55], $p = 0.002$). Among relaxation participants, the quality of previous intergroup contact was positively associated with support for Arab immigration, but among mindfulness participants, previous contact was not related to support for Arab immigration. The other interaction terms were not significant, $p > 0.05$.

A third moderation analysis focused on out-group altruism, in which this outcome was analyzed using a zero-inflated Poisson model. Mindfulness instruction participants were 1.13 times ($p = 0.019$) more likely to engage in out-group altruism, p relative to the control group. Compassion and control participants were not statistically different in out-group altruism, OR = 1.03, $p = 0.640$. A one-unit increase in trait empathic concern predicted a higher odds of out-group altruism by 1.19, $p = 0.002$. A one-unit increase in political viewpoint (toward more liberal) predicted higher out-group altruism by 1.11, $p = 0.002$. Turning to moderation results, for the mindfulness group, a one-unit increase in out-group identification surprisingly decreased the likelihood of engaging in out-group altruism by 0.89 unit, $p = 0.003$. The other variables and interaction terms were not significant, $p > 0.05$. These results indicated that trait empathic concern and political viewpoint predicted out-group altruism, and out-group identification significantly moderated the relation between mindfulness instruction and out-group altruism.

In a final analysis, a multinomial logistic regression evaluated whether the relation between training condition and support for out-group cause was dependent on the covariates discussed earlier. A one-unit increase in the variable political viewpoint (toward being more liberal) was associated with the increase in the log odds of being in the “give all” group versus the “keep” group in the amount of 0.28, $p < 0.001$. A one-unit increase in the variable political viewpoint (more liberal) was associated with the increase in the log odds of being in the “fair play” group versus the “keep” group in the amount of 0.23, $p = 0.014$. The log odds of being in one group versus another did not differ across conditions in a way that depended on these variables; the log odds varied from -0.54 to 0.55 , $p > 0.05$. The results indicated that a more liberal political viewpoint predicted support for the out-group cause; however, none of the covariates tested here moderated the relation between instruction condition and support for the out-group cause.

Discussion

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

The first study question was answered somewhat affirmatively. Both mindfulness group and compassion group showed less parochial empathy than the control group when controlling for in-group empathy. Participants in the compassion condition showed lower levels of parochial empathy than participants in the relaxation control condition controlling for all covariates. However, participants in the mindfulness condition did not show lower levels of parochial empathy than participants in the relaxation control condition after controlling for all covariates (i.e., trait presence, empathy [empathic concern and empathic distress], social in-group versus out-group identification, intergroup contact [quality and quantity], age, gender, political viewpoint, and manipulation check items). The second question was answered somewhat affirmatively as well. Participants in the mindfulness condition showed a higher level of out-group altruism than participants in both the compassion training

and relaxation training conditions. Participants in the mindfulness condition also showed a higher level of support for Arab immigration after controlling for the covariates noted above. This is a significant finding in that the form of mindfulness examined here—training in focused attention—did not include any prosocial elements. The contemplative practice conditions did not differ in support for Arab cause than participants in the relaxation control condition. Finally, the third study question was answered somewhat affirmatively. Parochial empathy did not mediate the effect of training condition on support for Arab immigration after controlling for trait empathic concern, but it did predict less out-group altruism.

Exploratory analyses showed that trait empathic concern, intergroup contact quantity and quality, out-group identification, and political viewpoint did not moderate the effects of condition on parochial empathy. However, trait empathic concern and intergroup contact quality with Arabs moderated the effects of compassion training and mindfulness training, respectively, and in an expectable direction, on support for Arab immigration. Trait empathic concern and a more liberal political viewpoint predicted out-group altruism. More liberal political viewpoint also predicted greater support for out-group cause.

The findings that mindfulness meditation and compassion meditation reduced parochial empathy (dependent on what variables were controlled for) and mindfulness meditation improved intergroup helping behaviors provide nuance to contemplative theory (Berry et al., 2022; Kang et al., 2014) and bridge that theory with social psychological theory on empathy and compassion (e.g., Zaki & Cikara, 2015). Brief compassion training had the expected effect of reducing the gap in empathy that participants reported feeling for in-group members versus for out-group members, as compared to relaxation training. This shows the potential of using compassion-based interventions to address intergroup biases in emotions. The present study differs from prior compassion research in a number of ways, including the fact that it is among the first to examine how mindfulness and compassion training influence *intergroup* emotions (not merely interpersonal emotions; see Mackie et al., 2008) as well as their effects on prosocial behavior toward *out-group* members in the context of intergroup competition.

That compassion mediation had no effect on intergroup prosocial behaviors was unanticipated. This finding is consistent with research in social psychology, however. Explicit appeals to feel compassion and empathy for out-group members are often met with psychological resistance. People do not always share the same lived experiences as out-group members, making it challenging for them to understand and identify with their suffering (e.g., Elfenbein & Ambady, 2002; Singer & Lamm, 2009). People may hold animosity

toward or trepidation about empathizing with out-group members based on historical harm done by the out-group (Galinsky et al., 2005), and empathy-integrated interventions often backfire as they can undermine support for restorative justice (Dixon et al., 2010; Saguy et al., 2009). Consistent with this, compassion mediation, which included explicit appeals to feel compassion for others (including out-group members), reduced parochial empathy but had no effect on intergroup prosociality. The parochial empathy result must be qualified by that fact that compassion instruction, which was not included in mindfulness or relaxation instructions, may have created a demand to appear unbiased in the allocation of one's empathy.

Although the current research did not show that mindfulness and compassion training enhanced support for out-group cause, it showed that mindfulness training has the potential to enhance two types of prosocial behavior, namely out-group altruism and support for Arab immigration. Social psychological theory has argued that addressing systemic inequality, for example, may be more efficacious in enhancing intergroup prosociality than enhancing empathy itself (Zaki & Cikara, 2015). Yet contemplative science and theory have suggested that intergroup prosociality is better enhanced surreptitiously, specifically because people are resistant to explicit appeals to feel compassion toward out-group members (Berry et al., 2022; Berry & Brown, 2017). The finding that mindfulness promoted intergroup helping behavior and reduced parochial empathy (when controlling for in-group empathy) is consistent with this thinking and empirical research on the topic (e.g., Berry et al., 2021; Lueke & Gibson, 2016). That mindfulness predicted prosocial behavior but not parochial empathy when controlling for all covariates suggests that empathy may not be a reliable mechanism in intergroup prosociality (but see Berry et al., 2018). Future research should examine social cognitive mechanisms mutable to mindfulness including social categorization (Pinazo & Bresó, 2017), attribution (Tincher et al., 2016), and implicit attitude bias (Lueke & Gibson, 2015). In designing conflict resolution interventions, researchers should be cognizant of the behaviors and emotions they intend their trainees to emit; in doing so, researchers may wish to design interventions to highlight active ingredients like mindfulness meditation that changes intergroup prosocial behavior, and compassion meditation that reduces parochial empathy. Most importantly, further research is needed to show whether longer-term mindfulness-based and compassion-based interventions impact parochial empathy and prosocial behavior.

There is one additional finding in this study that diverged from previous research. Contrary to research upon which this study's procedure was constructed (Bruneau et al., 2017), the present results showed that parochial empathy predicted

out-group altruism but was not a predictor of support for out-group immigration after accounting for the well-established role of trait empathic concern in prosocial outcomes. One explanation for this result is that participants in this study showed very little parochial empathy, making it less likely that parochial empathy could affect prosocial behavioral outcomes. Eight items measured in-group empathy and 8 items measured out-group empathy (Bruneau et al., 2017). In past research, parochial empathy has been calculated as in-group empathy score minus out-group empathy score. Greater parochial empathy would be indicated by higher positive values (maximum difference score = eight). Average scores for parochial empathy in the total sample were very close to zero, indicating that participants in this study reported a similar amount of empathy for in-group and out-group members. Another explanation for these results is that the parochial empathy measure in this study measured experience or emotional sharing (i.e., sharing emotions that are congruent with the target's emotions) for in-group and out-group members. 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). However, as mentioned previously, empathy might not be the mechanism through which mindfulness enhances prosocial behavior in intergroup relations. Recent research shows that empathic concern is not a consistent mediator in interracial contexts (Berry et al., 2021).

Limitations

This study had several procedural limitations. Participants completed the study online through a survey on the Qualtrics 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. Moreover, the trait variables were measured after the experimental inductions. The inductions could have influenced participants' responses on these self-report scales or made them aware of the aims of the study. It might have been better to introduce the trait measures in a separate survey done at a different time. 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 (cf., 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 in the study that could occur.

Another limitation of this study was the lack of a passive control condition that had no instructions. It is possible that the lack of condition differences in support for out-group cause occurred because all three conditions, including the relaxation control condition, influenced this prosocial behavioral outcome. That is, 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. Additionally, explicit instructions to extend warm feelings toward others as they engage in the next task in the compassion meditation booster audio may have created a demand characteristic. The instructions could have influenced how the compassion group responded to the prosocial behavioral outcomes.

It is important to consider the present results in the context of the current socio-political events and the demographics of the participants. Given that the average age of the participants was 39 years (born, on average, in 1983), there was a long list of socio-political challenges that many members of the sample faced, however directly or indirectly, 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.A., and this could have dampened prosocial responses in this study. This poses a threat to external validity. 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 relative lack 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.

A final limitation is that this study examined parochial empathy using self-report responses to hypothetical scenarios of in-group and out-group experiences. These scenarios measured experience sharing. 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 current absence of measures of state parochial empathy that focus on empathic concern for social out-groups.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12671-023-02100-z>.

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Author Contributions DZ: conceptualization, methodology, data collection, data analysis, writing—original draft preparation; DRB: writing—final manuscript, reviewing, and editing; KWB: supervision, collaboration with design and data analysis, writing—reviewing and editing

Data Availability The data has been made publicly available via OSF and can be accessed at <https://osf.io/thnzm/>.

Declarations

Ethics Approval The Institutional Review Board of the Virginia Commonwealth University approved all procedures performed in this study involving human participants.

Informed Consent All participants provided informed consent prior to participation in the study.

Conflict of Interest The authors declare no competing interests.

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