# The moderating effect of trait mindfulness on implicit racial bias following a brief mindfulness induction: A pilot study

Miranda H. Scheps and James J. Walsh*

School of Psychology,

University of East London, UK.

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*Corresponding Author

Dr James J. Walsh
School of Psychology,
University of East London,
Water Lane,
London E15 4LZ,
UK.
Tel: 020 8223 3000 Ext 4471
Email: j.j.walsh@uel.ac.uk

Compliance with Ethical Standards

Ethical approval: All procedures performed in this study involving human participants were in accordance with the ethical standards of the University of East London and with the 1964 Helsinki Declaration and its later amendments.

Informed consent: All participants who took part in this study provided informed consent prior to commencement.

Conflict of interest: The authors declare they have no conflicts of interest.

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## ABSTRACT

Objective:

This study was designed to explore the interactive effects of state and trait mindfulness in reducing implicit racial bias.

Method:

A 3-factor, quasi-experimental mixed design was employed. The factors were induction type, order of presentation and trait mindfulness. Post-induction implicit racism as well as explicit racism comprised the two dependent variables. Twenty-five older adults completed an Implicit Association Test on two occasions, one week apart.

Results:

The non-significant main effect of induction type (H1) was moderated by trait mindfulness (H2). Specifically, low trait mindful participants showed a significant reduction in implicit racism following the mindfulness induction compared with the control induction. There were no differences in implicit racism between induction conditions among high trait mindful counterparts. Explicit racism did not vary as a function of trait mindfulness (H3) and was independent of implicit racism (H4).

Conclusion:

A combination of state and trait mindfulness is needed to demonstrate a causal reduction in implicit racial bias. Differences between system 1 and system 2 thinking (Kahneman, 2011) are drawn upon to explain the findings.



Keywords: Trait mindfulness; brief mindfulness induction; Implicit Association Test

## Introduction

Racial discrimination continues to exert a significant negative impact on Black people's lives. To account for indirect expressions of discrimination in society, Gaertner & Dovidio (1986) drew upon Kovel's (1970) concept of 'Aversive Racism'. According to Pearson et al (2009), many White people consciously consider themselves non-prejudiced while simultaneously harbouring unconscious negative thoughts and feelings about Black people; while their explicit attitudes are non-prejudicial their implicit attitudes indicate bias (Hofmann et al., 2005).

Explicit attitudes are believed to respond to prevailing social norms and therefore change over time; implicit attitudes remain largely stable (Baron & Banaji, 2006). Such consistency may be explained by Kahneman's (2011) dual processing model of cognition. According to Kahneman, System 1 is characterised by rapid, automatic thinking in response to stimulus perception. System 2, in contrast, involves slower, more controlled engagement with a given percept (Kahneman & Frederick, 2005); here, thinking is effortful, rule-based and analytical. Being 'cognitive misers' (Crocker et al., 1984), humans typically rely on System 1 processing. However, this renders them vulnerable to stereotypical thinking and negative evaluation of other ethnic groups (Greenwald & Kreiger, 2006). In theory, reducing implicit racial bias towards Black people requires an intervention enabling System 2 processing to override the unconscious bias arising in System 1. Mindfulness may prove instrumental in pursuing this goal.

Mindfulness comprises two fundamental elements (Bishop et al., 2004): (1) attending to one's immediate experience while simultaneously inhibiting the inclination to elaborate related thoughts and feelings; (2) an attitude of curiosity, openness and non-judgmental acceptance. Racial prejudice occurs, in contrast, where there is an absence of openness, a lack of acceptance, and a strong tendency to elaborate the contents of one's conscious awareness and pronounce judgments thereon. Mindfulness and racial prejudice appear therefore to be mutually exclusive.

Mindfulness as a temporary state (Lau et al., 2006) differs from mindfulness as a more enduring, naturally-occurring individual difference (Brown & Ryan, 2003). How might these two manifestations of mindfulness affect implicit racial bias? Temporarily inducing people into a mindful state so they are focused on the present moment in a non-judgmental manner should see them switching from System 1 to System 2 processing and thereby mitigating their underlying implicit racial bias. The current study involves presenting a racial Implicit Association Test (IAT) to participants following a brief mindfulness induction and a control

induction. In the latter condition, participants are expected to rely on established stereotypes and respond automatically to IAT stimuli. Counter-balancing induction order across participants, the study's first hypothesis anticipated significantly lower levels of implicit bias following the mindfulness induction.

The hypothesised change in implicit bias following the different inductions may be moderated by pre-existing levels of trait mindfulness. Theoretically, among those low in trait mindfulness one might expect to see significant changes in implicit racial bias following a brief mindfulness induction compared with a control induction. This is because the former should activate System 2 thinking whereas the latter will see participants respond automatically and rely on stereotypes located in long-term memory (i.e., System 1 thinking). In contrast, high trait mindful counterparts are expected to exhibit System 2 more consistently. Therefore, one would expect to see much less change in implicit racial bias between control and mindfulness induction conditions. Accordingly, the second hypothesis predicts that trait mindfulness will moderate the effect of induction condition on implicit racial bias.

Just three studies have assessed the effects of mindfulness-based interventions on implicit racial bias. Mann (2012) tested a 6-week mindfulness-based stress reduction intervention on both implicit and explicit biases in an all-female student sample and found no change in either outcome. In contrast, participants in a 6-week loving-kindness intervention showed a significant reduction in implicit bias compared with controls (Kang, Gray & Dovidio, 2014). No corresponding changes in explicit racial bias were observed. In the final study, Lueke and Gibson (2015) tested the impact of a brief mindfulness induction on implicit and explicit racial attitudes. Using IATs, they reported a main effect of intervention type; participants exposed to the mindfulness induction reported less implicit racial bias than those in the control induction (brief presentation on natural history). The authors attributed their findings to the greater likelihood of activation of automatic associations between 'Black' and 'Bad' in the control condition relative to the mindfulness induction condition.

Lueke and Gibson's (2015) results had some important limitations. First, their between-groups design made it impossible to control for baseline levels of implicit bias. Second, their participants also completed the Motivation To Respond Without Prejudice scale (Plant & Devine, 1998) at the commencement of the study which may have primed them to its true nature. Third, participants completed two counter-balanced IATs in rapid succession: one on race and one on age. This may have consolidated their suspicions about the nature of the study before responding to the race IAT. Fourth, while their sample was relatively young, previous research suggests that problematic implicit bias is greater in older people (e.g., Nicol & De

France, 2018; Stewart et al., 2009). Fifth, just one state mindfulness item was used to check the effectiveness of the mindfulness intervention. Finally, the potential moderating effects of trait mindfulness were not explored even though the data were available.

The current study addressed these shortcomings. A within-participants design was employed and just one IAT was used. Trait Mindfulness was measured at the end of an experimental session rather than at the start while a more extensive measure of state mindfulness was used to check the experimental manipulations. An older sample of White participants was recruited in the belief that they would be more likely to show signs of implicit racial bias compared with younger counterparts. Finally, the moderating effects of trait mindfulness on the association between induction type and implicit racism were explored.

The study enabled the exploration of two additional questions. The first concerns the association between trait mindfulness and explicit racial bias. Theoretically, one would expect low trait mindful participants to score higher on explicit racism than high mindful counterparts because they are more judgmental (Bishop et al., 2004). In practice, however, expressions of explicit racism are socially proscribed, so the likelihood of detecting differences between these two groups is comparatively small. Nicol and De France (2018) found few significant links between trait mindfulness and indirect markers of prejudice. Accordingly, we used a more direct measure of explicit racism. The second issue concerns possible associations between explicit and implicit racial bias. Reported correlations between the two are typically weak (e.g., Greenwald et al., 2009). Given the difficulties in measuring explicit racial bias, we did not expect to find strong positive correlations between the two measures.

## Method

### Participants

A convenience sample of 31 London-based participants (17 males, 11 females, 3 unrecorded) was recruited through email and snowballing techniques. Inclusion criteria stipulated Caucasians aged 40 or above. Participation was voluntary and no incentive was offered. Two participants were aged between 40 and 49 years, 12 between 50 and 59 years, 10 between 60 and 69 years, and four between 70 and 79 years. Age range was unrecorded in three cases.

### Design

A crossover, quasi-experimental, 3-factor mixed design was used. The first factor was induction type with two levels: mindfulness induction and control induction. The second factor was trait mindfulness: low and high. Two different orders of presentation comprised the third factor: mindfulness induction first and

control condition second, and vice versa. The dependent variables were implicit and explicit racism scores. Levels of state mindfulness were obtained before and after each induction and constituted a manipulation check. The two experimental sessions were separated by one week and lasted approximately 30 minutes each. All sessions were carried out in participants' homes.

Materials

*Race Implicit Association Test (IAT)*

Based on original work by Greenwald et al (1998), a standard 5-block racial IAT was created for this study using E-Prime software. Comparatively faster response times when pairing Black faces (N=8) and negative words (N=8) or White faces (N=8) and positive words (N=8) versus Black faces and positive words or White faces and negative words indicated a pro-White implicit bias. Two IAT scores following the control and mindfulness induction conditions were calculated for each participant. Positive scores suggest implicit racial bias.

Careful instructions preceded each block and a short respite was offered between blocks three and four. Participants used the 'Z' and 'M' keys on a computer keyboard to signal their responses on each trial and they were instructed to react as quickly as possible while minimizing errors. There were sixteen trials in each of blocks 1, 2, and 4, and 32 trials in each of the two critical blocks (3 and 5). Full details of the IAT are available from the authors.

*Mindfulness Induction*

A brief (9.5 minutes) mindfulness induction audio (https://www.youtube.com/watch?v=CDa96OoZCGw) was downloaded from YouTube and played to participants. They were instructed to focus on being still, to notice their breathing, to allow emotions to arise and then pass, and to direct their wandering mind and related self-talk back to the in-take and output of the breath. The aim of the mindfulness induction presentation was to move participants temporarily into a mindful state.

*Control induction*

This YouTube video (https://www.youtube.com/watch?v=YFELRzS3wxk) comprised of an oral presentation of a Wikipedia article entitled 'United States Census Bureau' (USCB). The content describes the history of the Bureau, the surveys it administers, and the way Federal funds are allocated. Only the first 9.5 minutes were played to the participants. The aim of the control induction was to maintain participants in a similar mental state to the one they were in when they started the study. Both audios were narrated by a female in a British accent.

*State Mindfulness*

The State Mindfulness Scale (SMS; Tanay & Bernstein, 2013) is a 21-item questionnaire that measures respondents' current levels of physical and mental awareness using a 5-point Likert-type scale. Participants were presented with just 6 of these items before and after each induction with item order randomised to reduce practice effects. These measures proved to be reliable on each occasion ($\alpha$ = .80, .78, .87 and .87).

*Trait Mindfulness*

The Philadelphia Mindfulness Scale (PHLMS; Cardaciotto et al., 2008) was used to measure participants' levels of trait mindfulness. All twenty items were rated on a 5-point Likert-type scale according to how frequently each was experienced during the previous week. The PHLMS comprises of two sub-scales: present-moment awareness and acceptance. Cronbach's alpha for the full scale confirmed the measure's reliability ($\alpha$ = 0.72).

*Explicit racism*

The Symbolic Racism Scale (SRS; Henry & Sears, 2002) consists of 8 items that relate to the perception of Black people in society. Seven out of eight items were measured on a 4-point Likert-type scale and one item on a 3-point Likert scale. Five items required reverse scoring and responses to all eight were combined to yield an overall explicit racism score ($\alpha$ = 0.74).

*Demographics*

Participants were asked to provide details of their gender, age category, nationality, whether they had practised mindfulness or meditation before and, if so, how often.

Procedure

Following ethical approval, participants were successively allocated to one of two groups. At their first testing point, those in group one completed the shortened state mindfulness measure and then listened to the mindfulness induction. They immediately completed the second state mindfulness measure and then the race IAT. One week later they repeated the same first four steps with the control induction replacing the mindfulness induction. They then completed the trait mindfulness scale, the demographics measure and finally, due to its sensitive nature, the explicit racism questionnaire. The first testing session for those in group two began with the completion of the state mindfulness scale, the control induction, the second state mindfulness scale and then the race IAT. These participants also completed the trait mindfulness measure at this point. In their second session, they completed two state mindfulness scales either side of the mindfulness induction and then completed their second race IAT. The session ended with the completion of the

demographics measure and the explicit racism scale. All participants were advised at their first experimental session that the study's aim was to determine how personality and emotional states influence responses to minorities.

## Results

Failure to attend the second data-collection session meant that three participants were lost to the study. Technical problems resulted in the loss of data from a further three. Scores from the remaining 25 participants were analysed.

### Manipulation check

Mean state mindfulness levels increased from 15.92 (SD=5.31) to 18.28 (SD=4.80) following the mindfulness induction and decreased from 16.84 (SD=5.64) to 14.48 (SD=5.03) after the control induction. A 2 (time: pre- and post-induction) x 2 (condition: mindfulness induction and control induction) repeated measures ANOVA was carried out to check the effectiveness of the mindfulness induction. The interaction between time and condition proved to be significant [$F(1, 24) = 11.39$, $p = .003$]. Within-condition follow-up t-tests indicated that the post-mindfulness induction increase in state mindfulness was significant [$t(24) = -1.92$, $p = .034$, 1-tailed]. The unexpected decrease in state mindfulness following the control induction also proved to be significant [$t(24) = 2.56$, $p = .017$]. These findings confirm that the interventions were successful in increasing state mindfulness levels after the mindfulness induction and avoiding inducing a mindful state in the control induction.

### Order Effects

Table 1 presents group A and group B's mean reaction times and standard deviations for the IATs following the mindfulness induction and the control induction. Implicit racial bias is manifested in positive scores. To determine whether implicit racial bias was affected by induction order, a two-way mixed ANOVA between induction order (mindfulness first/control second v control first/mindfulness second) and induction type (control v mindfulness) was carried out. The main effect of order was found to be non-significant [$F(1,23) = 1.15$, $p = .29$]. The main effect of induction type was also non-significant [$F(1,23) = .88$, $p = .36$], as was the interaction between induction type and order [$F(1,23) = .32$, $p = .58$). These results suggest that the order in which participants undertook the two IATs did not impact on levels of implicit racial bias. Groups one and two were therefore combined.

Table 1: Mean IAT response times (and SDs) in milliseconds as a function of induction condition and order of completion

| | | Mean | SD |
|---|---|---|---|
| | Group A (N = 13) | | |
| Session 1 | Mindfulness Induction | -31.46 | 478.05 |
| Session 2 | Control Induction | 15.67 | 261.87 |
| | Group B (N = 12) | | |
| Session 1 | Mindfulness Induction | 200.15 | 482.79 |
| Session 2 | Control Induction | 11.15 | 384.66 |

Scores on the PHLMS were divided at the median (69) and participants were categorized as either low (N = 13) or high (N = 12) in trait mindfulness. Mean levels of implicit racial bias as a function of induction type and trait mindfulness are presented in Table 2 below. Differences in implicit bias between high and low trait mindful participants are greater in the control condition (383.54 msecs) than in the mindfulness condition (130.89 msecs).

*Table 2. Mean implicit racism scores in milliseconds (plus SDs) as a function of trait mindfulness and induction type (N=25).*

| | Induction type | | | |
|---|---|---|---|---|
| | Control | | Mindfulness | |
| | Mean | SD | Mean | SD |
| Low Trait Mindfulness (N = 13) | 288.27 | 421.33 | -73.83 | 503.82 |
| High Trait Mindfulness (N = 12) | -95.27 | 223.76 | 57.06 | 334.18 |

The first two hypotheses were investigated using a mixed 2 (induction type: mindfulness v control) x 2 (trait mindfulness: high v low) ANOVA. The main effect of induction type [$F$ (1,23) = 0.83, $p$ = .37] failed to support the first hypothesis that implicit bias would be significantly lower following the mindfulness

induction than the control induction, even though the means were in the predicted direction (Ms = -11.0 msecs and 104.2 msecs, respectively).

The second hypothesis, that trait mindfulness would moderate the effect of induction type on implicit bias, was supported by the significant interaction term [$F(1, 23) = 5.01$, p = .035]. Two within-group follow-up t-tests were subsequently conducted. The first compared the mean implicit bias scores following the control induction (-95.27 milliseconds) and the mindfulness induction (57.06 milliseconds) among high trait mindful participants. The t-value proved to be non-significant [$t(11) = -1.43$, $p = .18$]. Thus, exposure to different inductions did not affect levels of implicit bias among high trait mindful participants.

The second t-test compared the mean implicit bias scores following the control induction and the mindfulness induction among the low trait mindful participants. The t-value was significant [$t(12) = 1.83$, $p = .046$, (1-tailed)]; among low trait mindful participants implicit racism levels were affected by induction type. Specifically, levels of bias were greater following the control induction (288.27 milliseconds) than the mindfulness induction (-73.83 milliseconds). The main effect of trait mindfulness was itself non-significant [$F(1,23) = 1.45$, $p = .24$]. These effects are clearly visible in Figure 1.

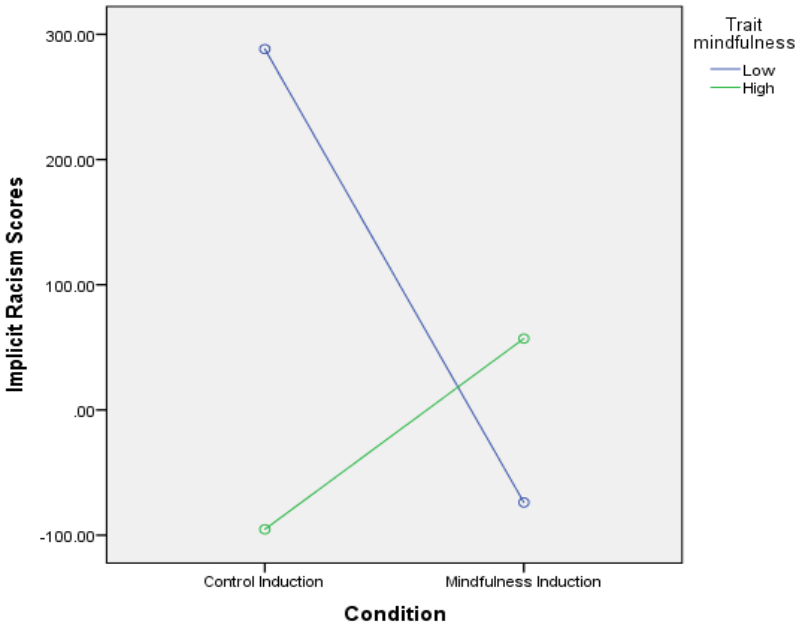


*Figure 1.* Mean implicit bias scores in milliseconds as a function of trait mindfulness and induction type.

Mean levels of explicit racism among low mindful participants (M = 16.00, SD = 4.36, N=13) were slightly higher than those noted among high mindful counterparts (M = 15.25, SD = 2.73, N = 12). However,

an independent t-test revealed this difference to be non-significant [$t(23) = 0.51$, $p = .61$]. Therefore, no differences in explicit racism as a function of trait mindfulness levels were observed.

Finally, the correlation between explicit racism and implicit racism post-mindfulness induction was non-significant ($r = .093$, $p = .33$). The corresponding correlation between explicit racism and implicit racism post-control induction was also non-significant ($r = .089$, $p = .34$). These findings suggest that implicit and explicit racism scores may be considered as independent of each other.

## Discussion

Contrary to prediction (H1), a brief mindfulness induction did not lead to a decrease in implicit bias. Lueke and Gibson's (2015) findings were therefore unsupported. It may be that a higher level of state mindfulness must be reached for such change to occur; the brevity of the current mindfulness intervention may have precluded the attainment of such a threshold. Alternatively, it may be due to a comparative lack of power: Lueke and Gibson required 72 participants to detect a significant effect (p = .04). With 25 completed sets of data the power of the current study was .83 and was therefore classified as a pilot study.

As noted earlier, however, their findings could have been explained by low trait mindful participants displaying high levels of implicit bias following the control induction and correspondingly low levels of bias following the mindfulness induction, with high trait mindful counterparts showing no differences between inductions. This moderating impact of trait mindfulness on the effect of induction type on implicit racial bias (H2) was statistically supported.

Kahneman's (2011) dual processing theory can account for this finding. Low mindful participants, almost by definition, typically process information in an automatic and reflexive manner (i.e., System 1 thinking). Following the control induction, which was designed to prevent the activation of mindfulness, they may have dealt with the race IAT by resorting to inaccurate stereotypical representations stored in long-term memory (Greenwald & Krieger, 2006). This would account for the high levels of implicit bias displayed. However, when instructions exhorted them to pay attention to the present moment and to maintain awareness thereof (i.e., following the mindfulness induction), they were able to respond in a much more mindful manner and engage with System 2 thinking. No longer reliant on stereotypic activation or automatic processing, their implicit racial bias disappeared completely.

High trait mindful participants, in contrast, showed no differences in implicit bias as a function of induction type. Trait mindfulness is characterised by attention to the present moment and a non-judgmental attitude to the contents of awareness (Bishop et al., 2004). Features of System 2 thinking that may underpin

these characteristics include effortful, conscious, and analytical processing. High trait mindful participants are more likely to deploy System 2 thinking as a matter of course than doing so only when encouraged to via experimental instructions. Their reduced reliance upon past associations stored in long term memory frees them to choose responses more deliberatively and in a less automatic or biased manner (Ostafin & Kassman, 2012).

This is the first study to report an interaction between trait mindfulness and induction type (in effect, state mindfulness) in accounting for levels of implicit racial bias. Age may be relevant here (Stewart et al., 2009). The majority of participants were aged between 50 and 69 years; it is highly likely that they were exposed to racist stereotypes while growing up and therefore the schemas they hold may contain negative information about ethnic minorities.

What are the practical implications of the observed findings? Repeated inductions of state mindfulness have been shown previously to increase levels of trait mindfulness (Kiken et al, 2015). Mechanistically, such repetitions may have encouraged low trait mindful participants to employ their System 2 thinking and replace their automatic response tendencies with more deliberative and less judgmental alternatives. If so, then they become indistinguishable from their high trait mindful counterparts who are more likely to engage in non-judgmental, effortful processing. Just one study to date has reported significant reductions in implicit racial bias following repeated state mindfulness-like inductions (Kang et al., 2014). However, changes in trait mindfulness were not assessed. Future studies that explore the effects of repeated mindfulness inductions on implicit racism should include measures of trait mindfulness pre- and post-intervention.

Explicit racism was found to be unrelated to trait mindfulness (H3). Measures of trait mindfulness tend not to contain an ethical behaviour subscale and the PHLMS is no exception (Nilsson & Kazemi, 2016). It may be that the key feature of mindfulness that is related to racism was overlooked when assigning participants to trait mindfulness groups. Also, Nicol and De France (2018) noted that measures of trait mindfulness focus largely on awareness of one's own feelings and non-judgmental attitudes towards oneself. These self-referential features do not translate automatically into an open and non-judgmental attitude towards others which is largely what is being assessed by the IAT. Furthermore, participants had a degree of control over the extent to which they revealed their explicit racial attitudes. It may be that low trait mindful individuals were more likely to experience stereotype threat (Schmader et al., 2008) when invited to complete the Symbolic Racism Scale and may have chosen to present themselves in a socially desirable way so as not

to appear racist. Alternative ways of measuring explicit racial bias may be needed in future to provide a better test of the hypothesised differences therein as a function of trait mindfulness.

No associations were found between implicit and explicit racial bias (H4) following mindfulness or control inductions. The simplest explanation is that people who are implicitly biased are unaware of their inclination. In turn, their explicit racism scores would match those of an unbiased person. However, Nosek and Smyth (2007) noted that correlations between implicit and explicit attitudes range from near zero to moderately strong and tend to be lower when the object of investigation is contentious (as in the case of racism). This may be attributable to the distorting effects of impression management on the accuracy of self-reported responses when engaging with socially sensitive topics (Greenwald et al., 2009). Difficulties in measuring explicit racism have already been noted and the need for a more reliable instrument is again highlighted.

One limitation of the study relates to the self-report nature of the trait mindfulness measure. While the PHLMS includes a subscale to assess acceptance and therefore provides a better classification of mindfulness than did the MAAS, as used by Lueke & Gibson (2015), nevertheless the ability of self-report measures to accurately index trait mindfulness more generally has attracted criticism (Grossman, 2011). Assessing levels of implicit racial bias among groups of experienced mindfulness practitioners and comparison groups of novices might provide a more valid test of the key hypothesis. Relative to the novices, the practitioners would be expected to be high in trait mindfulness and not to display any differences in implicit racial biases across induction conditions. A second limitation acknowledges the one-off nature of the findings. The question concerning the amount of implicit racial bias that low trait mindful participants would display in subsequent IATs remains open. Future studies could consider employing a longitudinal design that entails several brief mindfulness inductions and assessing their impact on implicit racial bias at a later time-point.

In conclusion, this study highlighted the interactive effects of state and trait mindfulness in causing a reduction in implicit racial bias. Previous studies' use of between-participants designs made such causal inferences impossible to establish. It may be that the selective reduction in implicit racial bias among low trait mindful participants following a brief mindfulness induction is underpinned by a shift from System 1 to System 2 thinking (Kahneman, 2011). Providing brief mindfulness inductions to older people low in trait mindfulness may provide a mechanism for reducing implicit racial bias and the significant problems that accompany it.

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