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ORIGINAL PAPER

A Mindful Path Toward Prejudice Reduction: Key Mindfulness Facets and Mediators for Promoting Positive Intergroup Relations

Giulia Fuochi[1] · Jessica Boin[1] · Alice Lucarini[2] · Alberto Voci[1]

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Abstract

Objectives Mindfulness might promote an open, accepting, less stereotypical view of people belonging to other social groups. We hypothesized positive cross-sectional (H1) and longitudinal (H2) associations between dispositional mindfulness — especially the Observing facet — and positive intergroup outcomes (i.e., better intergroup attitudes and contact experiences, lower intergroup prejudice, higher deprovincialization), and that those associations would be mediated by dispositional curiosity and reflection (H3).

Method We tested H1 in Study 1 (two waves, 1-month interval, $n = 102$) and Study 2 (cross-sectional, $n = 679$), with linear models in which attitudes and prejudice toward immigrants, contact with immigrants (only in Study 2), and deprovincialization were predicted by mindfulness facets. We tested H2 in Study 1, with cross-lagged path models replicating the cross-sectional analyses, and H3 in Study 2, with structural equation models in which Reflection, Joyous Exploration, Stress Tolerance, and Social Curiosity mediated the relationships between facets of dispositional mindfulness and intergroup outcomes.

Results Results largely supported hypotheses. Consistent with H1, in Studies 1 and 2, Observing was associated with all intergroup outcomes; in Study 2, Describing was associated with higher deprovincialization, better attitudes, and lower prejudice, and Nonjudging with higher deprovincialization and positive contact. As for H2, we found a unidirectional association from Observing to attitudes. Concerning H3, we found mediating paths between some mindfulness facets and intergroup outcomes through Reflection, Joyous Exploration, Stress Tolerance, and Social Curiosity.

Conclusions Results support the possibility to build prejudice reduction interventions grounded on mindfulness, to increase awareness of negative stereotypes and openness to differences among people.

Preregistration The study was not preregistered.

Keywords Mindfulness · Intergroup · Prejudice · Mediation · Curiosity

Mindfulness is a mental state (i.e., state mindfulness) and a tendency (i.e., dispositional mindfulness) grounded on the awareness of present-moment external experiences and internal mental states, and a nonjudgmental attitude toward them (Bishop et al., 2004; Kabat-Zinn, 1994). An extensively employed operationalization of dispositional mindfulness (Baer et al., 2006; Five Facet Mindfulness Questionnaire, FFMQ) describes it as a five-faceted construct, adding important elements to its definition. The five facets are Acting with awareness, Nonjudging of inner experience, Nonreactivity to inner experience, Describing, and Observing. Acting with awareness and Observing represent the awareness component of mindfulness: the first one focuses on non-distracted actions and behavior, whereas the second one measures awareness of emotions, sensations, and bodily experiences. Nonjudging represents the nonjudgmental attitude of mindfulness, whereas Nonreactivity is the tendency to allow feelings and thoughts to come and go, without being carried away by them. Describing represents the tendency to identify and label present-moment internal experiences with words.

All these features of mindfulness support its de-automatizing function. According to the theoretical model by Kang et al. (2013), which was based on a large body of previous research on mindfulness and automaticity, mindfulness

✉ Alberto Voci
alberto.voci@unipd.it

[1] Department FISPPA–Applied Psychology Section, University of Padua, via Venezia 14, 35131 Padua, Italy

[2] Faculty of Medicine, University of Modena and Reggio Emilia, viale Allegri 9, 42121 Reggio Emilia, Italy

can help individuals recognize and remove maladaptive automatized emotional and thought processes. These processes include the following: automatic inference, which frequently activates stereotypes and categorization-based biases; non-controlled maladaptive or even risky behavior; excessive elaboration of thoughts, such as in rumination; distortion and suppression of thoughts. According to the de-automatization model, reducing or removing those processes has desirable health and social outcomes, such as increased well-being, reduced stress, and more positive, empathic attitudes toward other people and groups. This claim found empirical evidence, especially for what concerns well-being outcomes (compared to the social outcomes perspective taking and use of stereotypes), and for the mindfulness facets Acting with awareness, Nonjudging, Nonreactivity, and to some extent Observing; mediators were cognitive flexibility, decentering, low rumination, and low suppression (Fuochi & Voci, 2020a).

The de-automatization function and core features of mindfulness suggest that mindfulness is a multifaceted phenomenon with widespread cognitive benefits, a lens through which people see the inner and the outer world in a way that is more aware, careful, open, nonjudging, and de-automatized. In a social perspective, mindfulness should promote a more open, accepting, less stereotypical view of people belonging to other social groups, i.e., outgroups. Moreover, reduced prejudice and improved attitudes toward outgroups could easily be outcomes of the previously explained de-automatization process (Kang et al., 2013).

Consistent with these expectations, a recent systematic review (Oyler et al., 2022) has shown that regardless of the type of mindfulness (i.e., dispositional mindfulness, brief mindfulness induction, mindfulness-based intervention, and long meditation experience) considered in the selected 36 research papers, intergroup bias was attenuated by mindfulness, with a small but statistically significant effect. In this review, the measures of intergroup bias (or lack of it) for which authors found statistically significant results included self-reported attitudes and prejudice toward outgroups (including racism, sexism, homophobia, outgroup-specific feeling thermometers and affective reactions), implicit prejudice, behavioral (trust game, chair distance paradigm) and linguistic intergroup bias, intergroup contact and contact intentions, discrimination, social categorization, and social distancing. Even more recently, Zheng et al. (2023) showed that a mindfulness meditation training fostered participants' positive reactions toward the outgroup, in this case Arab people. Compared to the control group, people exposed to the mindfulness training showed greater altruism toward the outgroup, higher support for outgroup immigration, and reduced parochial empathy, measured as the difference between the feelings for the outgroup's and the ingroup's fortunes and misfortunes.

In their systematic review, Oyler et al. (2022) also summarized the significant mediators of these relationships: lower intergroup anxiety when contact intentions or attitudes toward the outgroup was the outcome variable (Parks et al., 2014; Price-Blackshear & Bettencourt, 2020; Price-Blackshear et al., 2017), internal motivation to respond without sexism (Gervais & Hoffman, 2013), positive other-regarding emotions (Stell & Farsides, 2015), empathy (Hunsinger et al., 2014), psychological stress (Kang et al., 2014), acceptance and flexibility (Lillis & Hayes, 2007), and automaticity (Lueke & Gibson, 2014; Stell & Farsides, 2015), the latter measured in terms of automatic responding. Interestingly, the automaticity channel is consistent with the de-automatization model of mindfulness (Fuochi & Voci, 2020a; Kang et al., 2013) and supports the idea that one positive social outcome of de-automatization is reduced intergroup bias, in its many possible forms.

Among the 36 research papers reviewed by Oyler et al. (2022), only seven papers (five published articles and two dissertations) investigated dispositional mindfulness, without considering meditation or mindfulness inductions and interventions. Overall, the seven papers supported a positive association between dispositional mindfulness and social de-categorization, intergroup contact, acknowledgment of White privilege, positive attitudes, and reduced prejudice toward the outgroup; ingroup-outgroup dynamics regarded ethnic identity or sexual orientation. The mediators investigated and supported by these seven papers were intergroup anxiety and sexism-related attitudes and internal motivation. When dispositional mindfulness was measured as a multifaceted construct — employing the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004) or the FFMQ (Baer et al., 2006) and keeping the facets separate — the positive associations between mindfulness and positive intergroup outcomes held for specific facets as well as its total score (Nicol & De France, 2018; Salvati et al., 2019). In particular, the Observing facet was found negatively associated with modern homophobia (Salvati et al., 2019) and negative attitudes toward homeless people (Nicol & De France, 2018, Study 2); the Accept without judging facet of KIMS (corresponding to FFMQ nonjudging) was negatively related to negative attitudes toward black people (Nicol & De France, 2018, Study 2); the Describing facet was positively associated with warmer feelings toward dissident outgroup members (e.g., protestors; Nicol & De France, 2018, Study 3).

Although the findings regarding specific mindfulness facets may not offer conclusive evidence, previous research seems to highlight an important role of the Observing facet. As defined by Baer et al., (2006), Observing involves a heightened awareness of one's internal and external experiences. This specific kind of awareness might enable people to notice their implicit stereotyping and schematizing

processes, thereby helping them to rely less on prejudiced beliefs, and to be more open to diversity.

In summary, previous research on mindfulness and intergroup outcomes has tended to focus on inductions and interventions, rather than on mindfulness as a disposition. The existing results regarding dispositional mindfulness suggest that specific aspects of the mindfulness construct may be associated with evaluations of and affective reactions toward the outgroup, whereas others are not, but no study has clarified why such relationships hold only for some mindfulness dimensions. Specifically, the mechanisms — i.e., the mediators — of the relationships between intergroup variables and singular facets of mindfulness have not been investigated yet. Moreover, until now there has been a focus on intergroup mediators, such as intergroup anxiety, whereas cognitive mediators, such as the ones suggested by the de-automatization model, have been rarely investigated. Lastly, all published evidence on the associations between dispositional mindfulness and intergroup outcomes is cross-sectional; longitudinal research would help understand the persistence of the associations between mindfulness and intergroup outcomes over time, as well as its direction, i.e., is mindfulness predicting prejudice reduction or vice versa?

The present article addressed all these knowledge gaps while investigating the relationships between the five facets of dispositional mindfulness — measured by the FFMQ — and multiple intergroup outcomes, together with the cognitive mediators of such relationships, in one longitudinal and one cross-sectional study. Study 1 had a two-wave research design: the FFMQ, three intergroup outcomes — i.e., attitudes and prejudice toward immigrants, and deprovincialization — and control variables — i.e., age and gender were measured in both waves, with a 1-month time span between waves. The cross-sectional associations between facets of dispositional mindfulness and intergroup outcomes were tested through linear models, also controlling for age and gender. The longitudinal associations between facets of mindfulness and intergroup outcomes were investigated with cross-lagged path models, testing whether those associations are reciprocal or unidirectional. In Study 2, we replicated the cross-sectional analyses of Study 1 in a larger sample and with two additional intergroup outcomes, i.e., positive and negative intergroup contact; moreover, we tested — with structural equation modeling — a latent variable mediation model in which four cognitive tendencies mediated the relationships between dispositional mindfulness and intergroup outcomes.

We selected four cognitive tendencies that could portray (a) self-questioning and openness to ideas and cognitive schemata that may be different from one's own; (b) curiosity for and acceptance of new stimuli, information, and people; and (c) tolerance of uncertainty and doubt. These four cognitive mediators are dispositional reflection and three dimensions of dispositional curiosity, namely Joyous Exploration, Stress Tolerance, and Social Curiosity. Dispositional reflection is a tendency for introspection and a playful exploration of alternative self-perceptions (Trapnell & Campbell, 1999); Joyous Exploration captures the tendency to enjoy and seek new experiences and knowledge; Stress Tolerance represents the ability to manage distress when exposed to unfamiliar stimuli; Social Curiosity assesses the degree to which one is interested in other people's lives (Kashdan et al., 2018). These four cognitive tendencies can also be linked to the general concept of de-automatization: higher scores on dispositional reflection portray a tendency to openly explore the inner self, which is grounded on the ability to analyze one's characteristics and behavior without following habitual, automatic schemata; dispositional curiosity is instead grounded on the liking of novelty and the unknown, whereas automaticity works through what is known and repeated, creating habits and schemata.

Based on relevant previous research (Oyler et al., 2022), especially on studies focusing on mindfulness facets and showing that Observing could be more strongly associated with intergroup outcomes (Nicol & De France, 2018; Salvati et al., 2019), we hypothesized that: (H1) the cross-sectional associations between dimensions of dispositional mindfulness and positive intergroup outcomes would be positive and would hold especially for the Observing facet; (H2) in longitudinal analyses, dimensions of dispositional mindfulness — Observing in particular — and positive intergroup outcomes would have positive unidirectional associations, from mindfulness to intergroup outcomes, and not the reversed path; and (H3) Reflection, Joyous Exploration, Stress Tolerance, and Social Curiosity would explain part of the positive associations between dimensions of dispositional mindfulness and positive intergroup outcomes.

Study 1

Method

Raw data, R script, and MPlus inputs and outputs of Study 1 are openly available at https://osf.io/cn35u/?view_only=d6cc7cf7a3384b49aed168096d7c58f2.

Participants

Due to resource constraints, we did not conduct a power analysis to establish the sample size a priori. Participants (n = 102; 70% women) were Italian. Age ranged from 18 to 60 years (M = 27.43; SD = 10.57) and their occupations were as follows: 5% were manual or specialized workers; 21% were retailers, employees, or primary school teachers; 7% were professionals, high school teachers, or academics; 60% were

students; and 4% were retired, unemployed, or housekeepers; the remainder of the sample did not provide this information. As for their education, 5% of participants attained middle school; 30% had a high school diploma; 55% had a bachelor's degree; and 10% got a master's degree or a PhD.

Procedure

The survey was administered online using a snowball sampling method: a research assistant collected a convenience sample of adults recruited from the general population, relying on their personal network (i.e., acquaintances) and members of various social media groups. Participation in the study was voluntary, without any compensation. At the beginning of the questionnaires, participants were informed of the study's purposes, the anonymity of their responses, and the possibility to withdraw at any time. The data collection had two time-repeated data points, i.e., waves. The first wave was administered in the second week of January 2020 (9th–14th); a month later, in the second week of February 2020, participants filled in the second wave. Because lagged models need the observations in both time points, participants who did not fill in the second wave were excluded from the analyses: 116 people completed the first wave, whereas 102 people (the final sample) completed both waves (12% attrition).

Measures

When a validated version of a scale was not available in Italian, items were translated using a back-translation procedure, to preserve their original meaning.

Mindfulness We assessed dispositional mindfulness with the 24-item version of the FFMQ (FFMQ-SF, Bohlmeijer et al., 2011; Italian items: Giovannini et al., 2014). As discussed in the "Introduction" section, the scale tackles 5 dimensions of the construct, namely Acting with awareness (e.g., "It seems I am "running on automatic" without much awareness of what I'm doing," reversed item), Nonreactivity to inner experience (e.g., "I watch my feelings without getting carried away by them"), Nonjudging of inner experience (e.g., "I tell myself I shouldn't be feeling the way I'm feeling"), Describing (e.g., "Even when I'm feeling terribly upset, I can find a way to put it into words"), and Observing (e.g., "I pay attention to sensations, such as the wind in my hair or sun on my face"). Participants rated each item on a 5-point Likert-type scale going from 1 (*never or very rarely true*) to 5 (*very often or always true*). After appropriate recoding, higher scores indicated higher levels of dispositional mindfulness. Internal reliability was satisfactory for all facets, in both waves (T1: $\alpha_{\text{Awareness}} = 0.77$, $\alpha_{\text{Nonreactivity}} = 0.65$, $\alpha_{\text{Nonjudging}} = 0.78$, $\alpha_{\text{Describing}} = 0.87$; $\alpha_{\text{Observing}} = 0.73$; T2: $\alpha_{\text{Awareness}} = 0.81$, $\alpha_{\text{Nonreactivity}} = 0.68$, $\alpha_{\text{Nonjudging}} = 0.83$, $\alpha_{\text{Describing}} = 0.90$; $\alpha_{\text{Observing}} = 0.86$).

Intergroup Outcomes As a measure of positive attitudes toward the outgroup, participants employed a 5-point Likert-type scale going from 0 = *not at all* to 4 = *very much* to rate how "positive," "unfavorable" (reversed item), "friendly," and "negative" (reversed item) their attitudes toward immigrants living in Italy were (Pagotto & Voci, 2013; T1: $\alpha = 0.82$; T2: $\alpha = 0.73$). Prejudice toward immigrants was assessed with 7 items: 3 items adapted from Christ et al. (2010), where we substituted the original target group ("Foreigners") with "Immigrants"; the remaining 4 were independently developed by the authors. Participants answered each item (e.g., "Immigrants are a burden for our social security system") on a scale going from 0 (*totally disagree*) to 4 (*totally agree*). The scale was highly reliable at both time points (T1: $\alpha = 0.82$; T2: $\alpha = 0.83$). Finally, we employed the Cultural Deprovincialization Scale (CDS; Boin et al., 2020), a 6-item scale capturing the tendency to have an open and broad-minded view of other cultures and outgroups. Participants rated each item (e.g., "Knowing customs and traditions of different cultures helps me feel closer to other people") on a scale going from 0 = *does not describe me at all* to 4 = *describes me very well* (T1: $\alpha = 0.74$; T2: $\alpha = 0.80$).

Results

Means, standard deviations, and Pearson's correlations of the variables of this study, i.e., mindfulness facets, attitudes and prejudice toward immigrants, deprovincialization, and age, are reported in Table S1 (Supplementary Materials). To test H1, we performed cross-sectional linear models in which each intergroup outcome (i.e., attitudes and prejudice toward immigrants, and deprovincialization) was predicted by the five facets of dispositional mindfulness, controlling for age and gender. Linear models were computed separately for Wave 1 and Wave 2 (Table 1). We always included age and gender in the models to estimate the regression coefficients while controlling for socio-demographic characteristics; moreover, as age is positively correlated with both negative intergroup outcomes, such as prejudice (Franssen et al., 2013), and mindfulness (Mahlo & Windsor, 2021), omitting age would lead to an underestimation of the regression coefficients of mindfulness facets (Wooldridge, 2009).

Results showed that only the Observing facet was positively associated with positive intergroup outcomes, i.e., higher levels of positive attitudes and lower levels of prejudice toward immigrants both in Wave 1 and Wave 2, and higher levels of deprovincialization in Wave 1. No other

Table 1 The associations between intergroup outcomes and dispositional mindfulness facets (Study 1)

	Attitudes toward immigrants				Prejudice toward immigrants				Deprovincialization			
	Wave 1		*Wave 2*		*Wave 1*		*Wave 2*		*Wave 1*		*Wave 2*	
	b	*p*	*b*	*p*	*b*	*p*	*b*	*p*	*b*	*p*	*b*	*p*
Intercept	2.41	<0.001	1.88	<0.001	1.87	0.001	1.81	<0.001	2.06	<0.001	2.34	<0.001
Age	−0.01	0.072	−0.00	0.523	0.00	0.715	0.01	0.153	−0.00	0.621	−0.00	0.632
Gender (M)	0.16	0.246	0.02	0.889	−0.22	0.153	−0.06	0.694	0.12	0.380	0.07	0.665
Nonreactivity	−0.14	0.158	0.12	0.136	0.14	0.192	−0.02	0.838	0.04	0.684	0.14	0.213
Awareness	−0.07	0.439	0.01	0.925	0.09	0.381	0.07	0.537	0.04	0.672	−0.10	0.360
Nonjudging	0.06	0.518	−0.05	0.425	−0.15	0.109	−0.04	0.632	−0.04	0.607	−0.05	0.555
Describing	0.12	0.114	0.09	0.162	−0.11	0.185	−0.15	0.076	0.10	0.184	0.17	0.056
Observing	0.18	0.015	0.13	0.012	−0.20	0.015	−0.17	0.018	0.19	0.010	0.11	0.117
n	101		102		101		102		101		102	
R^2	0.15		0.13		0.13		0.12		0.13		0.09	

M, being man compared to being woman; *Awareness*, acting with awareness

facet showed statistically significant relationships with intergroup outcomes. Results thus supported H1 only for what concerns the observing facet.

To test H2, we performed two-wave cross-lagged path models with the five mindfulness facets and one intergroup outcome at a time: all the variables measured at Wave 2 were predicted by all the variables at Wave 1, and within each wave, all the variables were correlated with each other. Intergroup outcomes were included separately to increase model parsimony and to minimize the number of estimated parameters the lowest possible, given the limited sample size of this study. Cross-lagged models were computed with the software *MPlus 7* (Muthén & Muthén, 2012). Statistical significance of the estimated paths was determined by 95% bias-corrected bootstrapped confidence intervals (10,000 bootstraps) not including zero.

Results (fully reported in OSF, https://osf.io/cn35u/?view_only=d6cc7cf7a3384b49aed168096d7c58f2) showed that all autoregressive paths (the variable at Wave 2 predicted by the same variable at Wave 1) were statistically significant, whereas the only statistically significant cross-lagged link between intergroup outcomes and mindfulness was the one between the observing facet at Wave 1 and attitudes toward immigrants at Wave 2. No link going from intergroup outcomes at Wave 1 to mindfulness at Wave 2 was statistically significant, thereby suggesting a unidirectional link from observing to attitudes toward immigrants, and supporting H2 for these two variables. Results of the model with attitudes toward immigrants are reported in Figure 1; for the sake of clarity, arrows are plotted only for statistically significant paths.

Although the associations between dispositional mindfulness, especially the Observing facet, and intergroup outcomes were consistent with previous related research (e.g., Nicol & De France, 2018, Study 2; Salvati et al., 2019), the sample size was quite limited, and this may undermine the reliability of some results; in particular, having a lower statistical power also means that results with smaller effect sizes cannot be reliably detected, so we could have neglected some weaker relationships between mindfulness and intergroup outcomes. To overcome this limitation, and additionally investigate intergroup contact as dependent variable and the role of potential mediators of the associations between mindfulness facets and intergroup outcomes, we designed Study 2.

Study 2

In this second, cross-sectional study, we built upon the findings of Study 1 by replicating the analyses in a larger sample and adding two important correlates of prejudice, namely positive and negative intergroup contact, to the set of outcome variables. In addition, Study 2 delved deeper into the mechanisms of the associations between dispositional mindfulness and intergroup outcomes, by exploring the mediating role of four specific cognitive tendencies: dispositional reflection and three dimensions of dispositional curiosity, i.e., Joyous Exploration, Stress Tolerance, and Social Curiosity.

Method

Raw data, R script, and MPlus inputs and outputs of Study 2 are openly available at https://osf.io/cn35u/?view_only=d6cc7cf7a3384b49aed168096d7c58f2.

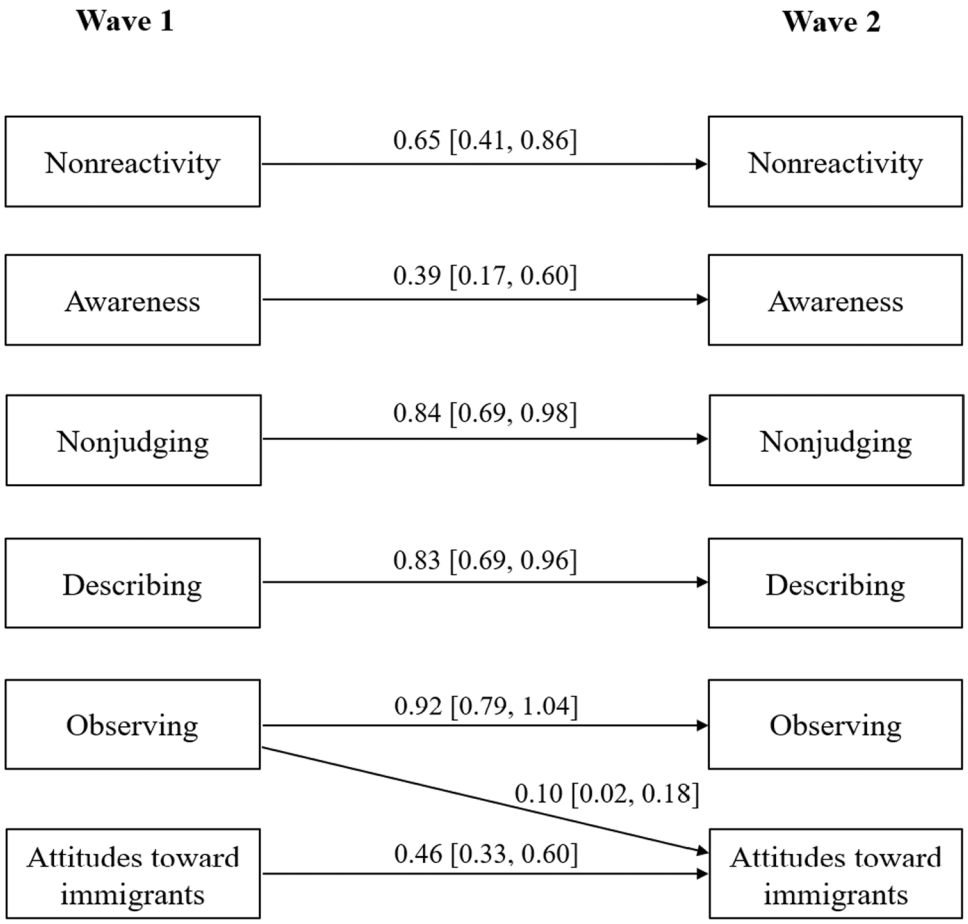

Fig. 1 Path model testing bidirectional relationships between dispositional mindfulness facets and attitudes toward immigrants (Study 1). Note. Statistical significance assessed by 95% confidence intervals calculated with bias-corrected bootstrap technique (10,000 bootstraps). Paths that are not statistically significant are omitted for readability. Statistically significant correlations between variables in Wave 1: Nonreactivity-Describing, 0.15 [0.03, 0.28]; Awareness-Nonjudging, 0.20 [0.07, 0.35]; Awareness-Describing, 0.27 [0.15, 0.41]; Nonjudging-Describing, 0.33 [0.18, 0.49]; Nonjudging-Observing, −0.20 [−0.35, −0.06]; Observing-Attitudes toward immigrants, 0.14 [0.04, 0.24]. Statistically significant correlations between variables in Wave 2: Nonreactivity-Describing, 0.05 [0.00, 0.11]; Awareness-Describing, 0.13 [0.06, 0.24]

Participants

As in Study 1, resource constraints prevented us from establishing the sample size a priori with power analysis. Participants ($n = 679$; 398 women; 274 men; 3 "other"; the rest did not answer the question) were Italian and aged between 18 and 80 years ($M = 34.88$, $SD = 16.12$). Concerning occupation, 8% were unemployed, housekeepers, or retired; 35% were students; 7% were manual or specialized workers; 19% were retailers, employees, or teachers in primary school; 15% were professionals, high school teachers, or university professors. The remaining 16% of the sample did not report any occupation. Finally, participants' education levels were fairly heterogeneous: 4% attained primary or middle school; 42% graduated in high school; 25% got a bachelor's degree; and 29% got a master's degree or a PhD.

Procedure

Four research assistants were in charge of data collection; they administered the survey link to their acquaintances and in various social media groups employing a snowball procedure, between August 2020 and November 2021. Participants completed the online questionnaire individually and voluntarily, with no compensation for their participation. As in Study 1, the participants were informed on the study's purposes, the anonymity of their responses, and the possibility to withdraw at any time in the informed consent form, at the beginning of the questionnaire.

Measures

Overall, in Study 2, we employed the same measures as Study 1, with a few differences and additions.

Mindfulness We administered the 39-item version of the FFMQ (Baer et al., 2008; Italian validated version: Giovannini et al., 2014), rather than the 24-item Short Form, employed in Study 1. All facets of the FFMQ showed excellent reliability in our sample ($\alpha_{Awareness} = 0.88$, $\alpha_{Nonreactivity} = 0.79$, $\alpha_{Nonjudging} = 0.88$, $\alpha_{Describing} = 0.87$; $\alpha_{Observing} = 0.80$).

Curiosity To measure dispositional curiosity, we employed 3 subscales of the Five-Dimensional Curiosity Scale (Kashdan et al., 2018), namely Stress Tolerance (e.g., "The smallest doubt can stop me from seeking out new experiences"), Joyous Exploration (e.g., "I am always looking for experiences that challenge how I think about myself and the world"),

and Social Curiosity (e.g., "I like to learn about the habits of others"). We decided to include only 2 (out of the 5) items of the Social Curiosity subscale because the other 3 may capture a predisposition to gossip (e.g., "When other people are having a conversation, I like to find out what it's about"), rather than an interest in how people feel, think, and behave. For each subscale, responses were provided on a 7-point Likert-type scale, going from 0 = *does not describe me at all* to 7 = *describes me perfectly*; reliability was high ($\alpha_{\text{Joyous Exploration}} = 0.82$; $\alpha_{\text{Stress Tolerance}} = 0.83$). For social curiosity, we used the Spearman-Brown coefficient (the most appropriate reliability index for 2-item measures; Eisinga et al., 2013), which displayed high reliability ($\rho_{\text{Social Curiosity}} = 0.82$).

Reflection We employed the 12 Self-reflection subscale items of the Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999; Italian validated version by Vannucci & Chiorri, 2018) to measure peoples' tendency to reflect on one's own thoughts and feelings (example item: "I love analyzing why I do things"). Responses were provided on a scale going from 1 (*strongly disagree*) to 5 (*strongly agree*) and the scale was highly reliable ($\alpha = 0.88$).

Intergroup Outcomes We measured the same intergroup outcomes of Study 1, and additionally positive and negative intergroup contact with immigrants living in Italy. To measure intergroup contact, we employed 4 items — 2 items, then averaged, respectively assessing positive and negative contact — from Fuochi et al. (2020). Items stated as follows: "How many immigrant people do you know and see in a positive [negative] way?" (quantity of contact: 0 = *none*; 1 = *very few*; 2 = *few*; 3 = *quite a lot*; 4 = *a lot*); "How often do you meet immigrant people you know and perceive the experience as positive [negative]?" (frequency of contact: 0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, 4 = *very often*). To assess reliability of contact, we employed the Spearman-Brown coefficient, which showed excellent values for both positive (ρ =0.77) and negative (ρ =0.81) contact. Reliability was high also for the other intergroup outcomes, namely prejudice toward immigrants ($\alpha = 0.84$), positive attitudes toward the outgroup ($\alpha = 0.81$), and CDS ($\alpha = 0.83$).

Results

Means, standard deviations, and Pearson's correlations between the variables of this study are reported in Table S2 (Supplementary Materials). To test H3, we performed a structural equation model (SEM) with latent constructs using *Mplus 7* (Muthén & Muthén, 2012). The five facets of dispositional mindfulness were the predictors; Reflection, Joyous Exploration, Stress Tolerance, and Social Curiosity were the mediators; attitudes and prejudice toward immigrants, deprovincialization, and positive and negative contact with immigrants were the dependent variables.

To simplify the model, the parceling technique was used. Initially, exploratory factor analysis (EFA) was conducted to evaluate the unidimensionality of each latent construct and establish loadings to allocate items into parcels. Meaningful factor loadings were observed for all scales' items. As recommended by the literature (Little et al., 2002), we employed latent variables only for scales that had at least 3 items, to ensure sufficient reliability and validity in capturing the underlying construct. Therefore, we created parcels for all scales except for positive contact, negative contact, and Social Curiosity, which were composed of 2 items each and were thus entered in the model as observed variables. We followed the item-to-construct balance approach (Little et al., 2002), whereby related items were assigned to 3 parcels for each latent construct, with a balance of the magnitudes of factor loadings derived from EFA in each parcel.

In the mediation model, correlations between mediators were estimated for all pairs of mediators. Parameters were estimated using maximum likelihood estimation, and missing data were handled using full information maximum likelihood. A bias-corrected bootstrapping procedure (Preacher & Hayes, 2008) with 10,000 resamples was conducted for all models to identify mediating processes. The effects of each model were assessed by calculating 95% confidence intervals for the unstandardized effects to determine their statistical significance. Standardized estimates were used to evaluate effect sizes, as they are less biased and more efficient than proportion and ratio effect sizes (Miočević et al., 2018).

Following the thresholds indicated by Hu and Bentler (1999), the goodness of fit indexes suggested adequate correspondence between the model and the data (RMSEA = 0.05; SRMR = 0.05; CFI = 0.92; TLI = 0.90). Moreover, standardized factor loadings were all significant at $p < .001$ and ranged from 0.67 to 0.95. Total and direct effects of the mediation model are reported respectively in Tables 2 and 3. Table 4 shows the statistically significant indirect effects (both unstandardized and standardized) of the mediation model that were interpretable as mediation, that is if the predictor had a statistically significant association with the outcome variable (total effects in Table 2) and with the mediator (direct effects in Table 3), and the mediator had a statistically significant relation with the outcome variable (direct effects in Table 3).

Total effects, displayed in Table 2, indicated that Observing was associated with all the intergroup outcomes, except for negative contact: Observing was positively related to attitudes toward immigrants, deprovincialization, and positive contact, while having a negative association with prejudice toward immigrants. Describing was positively associated with attitudes toward immigrants and deprovincialization,

Table 2 Total effects of the mediation model with latent variables (Study 2)

Predictors	*Outcomes*				
	Attitudes toward immigrants	Prejudice	Deprovincialization	Positive contact	Negative contact
Mindfulness facets					
Nonreactivity	0.02 [−0.124, 0.150]	−0.00 [−0.140, 0.133]	−0.07 [−0.223, 0.073]	−0.07 [−0.224, 0.085]	−0.05 [−0.211, 0.113]
Awareness	−0.04 [−0.131, 0.066]	−0.07 [−0.173, 0.028]	0.06 [−0.072, 0.119]	−0.06 [−0.155, 0.100]	−0.08 [−0.200, 0.041]
Nonjudging	0.07 [−0.036, 0.179]	−0.10 [−0.198, 0.001]	**0.12 [0.017, 0.221]**	**0.13 [0.005, 0.254]**	−0.03 [−0.158, 0.097]
Describing	**0.21 [0.114, 0.313]**	**−0.11 [−0.204, −0.014]**	**0.11 [0.008, 0.213]**	0.08 [−0.043, 0.198]	0.08 [−0.035, 0.191]
Observing	**0.12 [0.018, 0.225]**	**−0.15 [−0.253, −0.047]**	**0.29 [0.188, 0.402]**	**0.29 [0.157, 0.419]**	−0.06 [−0.188, 0.062]

Effects are unstandardized. Statistically significant effects (in bold) determined by 95% bias-corrected bootstrapped confidence interval (10,000 bootstrapped samples). *Awareness*, acting with awareness

while being negatively associated with prejudice toward immigrants. Nonjudging was positively associated with deprovincialization and positive contact with immigrants. Acting with awareness and Nonreactivity did not show any statistically significant relationship with intergroup outcomes. Overall, these results support H1, thereby showing that dispositional mindfulness, and especially the Observing facet, is positively related to positive intergroup outcomes.

As for direct effects, shown in Table 3, Nonreactivity and Acting with awareness were positively associated with Joyous Exploration and Stress Tolerance. Nonjudging was also found to be positively related to Stress Tolerance and Social Curiosity. Both Observing and Describing were positively related to Reflection, Joyous Exploration, and Social Curiosity, and Describing was also positively related to Stress Tolerance. When controlling for the mediators, most relationships between predictors and outcomes changed, indicating strong links between mediators and both outcomes and predictors. Specifically, Joyous Exploration was positively related to attitudes toward immigrants, deprovincialization, and positive contact. Stress Tolerance was positively associated with deprovincialization and positive contact. Lastly, Reflection was negatively related to prejudice, while Social Curiosity showed a positive association with deprovincialization (Table 3).

Results of indirect effects (Table 4) indicated that Describing, and Observing were positively related to attitudes toward immigrants, deprovincialization, and positive contact with immigrants (only for Observing) via higher Joyous Exploration. Describing and Observing were also positively related to deprovincialization through higher Social Curiosity. Reflection mediated the negative link between Describing and Observing and prejudice. No indirect effects emerged for negative contact with immigrants. These results show that dispositional reflection and dimensions of dispositional curiosity mediate some, but not all, relationships between mindfulness facets and intergroup outcomes, thereby partially supporting H3.

Discussion

The paper aimed to extend the investigation of the relationships between dispositional mindfulness and intergroup outcomes. Based on relevant previous research (e.g., Oyler et al., 2022), we hypothesized: positive cross-sectional associations between dispositional mindfulness — especially the Observing facet — and positive intergroup outcomes (H1); unidirectional longitudinal associations, from mindfulness at time 1 to intergroup outcomes at Time 2 (H2); mediator roles of dispositional curiosity and reflection in the relationships between dispositional mindfulness and intergroup outcomes (H3).

Results largely supported our hypotheses. Regarding H1, we found that Observing and for some outcomes also Describing and Nonjudging were positively associated with positive intergroup outcomes: better attitudes, lower prejudice, and higher levels of deprovincialization and positive contact. Results for Observing were consistent between Study 1 and Study 2, whereas the associations of Describing with attitudes, prejudice, and deprovincialization, and of Nonjudging with deprovincialization and positive contact, emerged only in Study 2. The reason for this difference can be attributed to the different sample sizes of the study (Study 1: $n = 102$; Study 2: $n = 679$): the larger the sample size, the narrower the confidence intervals of the estimates (e.g., Bonett & Price, 2002). Therefore, a smaller sample size results in wider confidence intervals, which are more likely to include 0 if the estimated regression coefficients are already small, namely close to 0. Importantly, the results regarding Observing, Describing, and Nonjudging are in line with previous research that employed multifaceted measures for mindfulness and found that these 3 facets — Observing especially — were the ones showing associations with intergroup outcomes (Nicol & De France, 2018; Salvati et al., 2019).

The results regarding these 3 facets can be explained by their inner features and previous related findings. Observing

Table 3 Direct effects of the mediation model with latent variables (Study 2)

Predictors	*Mediators*				*Outcomes*			
	Reflection	Joyous Exploration	Stress Tolerance	Social Curiosity	Attitudes toward immigrants	Prejudice	Deprovincialization	Positive contact
Mindfulness facets								
Nonreactivity	−0.03 [−0.149, 0.088]	**0.23 [0.107, 0.356]**	**0.19 [0.014, 0.368]**	0.07 [−0.115, 0.238]	−0.03 [−0.170, 0.111]	0.02 [−0.121, 0.157]	**−0.17 [−0.330, −0.037]**	−0.15 [−0.320, 0.009]
Awareness	0.09 [−0.020, 0.210]	**0.12 [0.032, 0.218]**	**0.17 [0.054, 0.286]**	0.05 [−0.084, 0.181]	−0.07 [−0.166, 0.033]	−0.02 [−0.129, 0.073]	−0.05 [−0.143, 0.038]	−0.08 [−0.211, 0.039]
Nonjudging	−0.06 [−0.164, 0.047]	−0.09 [−0.186, 0.009]	**0.28 [0.165, 0.400]**	**−0.16 [−0.296, −0.021]**	0.10 [−0.017, 0.208]	−0.10 [−0.207, 0.002]	**0.14 [0.040, 0.245]**	0.11 [−0.016, 0.240]
Describing	**0.25 [0.159, 0.345]**	**0.14 [0.054, 0.223]**	**0.12 [0.014, 0.229]**	**0.19 [0.068, 0.313]**	**0.16 [0.057, 0.265]**	−0.02 [−0.115, 0.072]	0.00 [−0.097, 0.101]	0.02 [−0.101, 0.143]
Observing	**0.39 [0.286, 0.488]**	**0.21 [0.117, 0.314]**	0.09 [−0.026, 0.209]	**0.31 [0.180, 0.454]**	0.04 [−0.081, 0.151]	−0.02 [−0.136, 0.087]	**0.13 [0.020, 0.243]**	**0.21 [0.074, 0.354]**
Mediators								
Reflection	–	–	–	–	0.09 [−0.044, 0.220]	**−0.25 [−0.393, −0.130]**	0.11 [−0.008, 0.233]	0.04 [−0.116, 0.191]
Joyous Exploration	–	–	–	–	**0.18 [0.044, 0.311]**	−0.08 [−0.208, 0.054]	**0.36 [0.232, 0.490]**	**0.27 [0.119, 0.433]**
Stress Tolerance	–	–	–	–	0.02 [−0.089, 0.114]	−0.06 [−0.173, 0.040]	**0.11 [0.004, 0.215]**	**0.13 [0.009, 0.257]**
Social Curiosity	–	–	–	–	0.04 [−0.032, 0.113]	−0.02 [−0.080, 0.046]	**0.10 [0.032, 0.175]**	−0.03 [−0.115, .048]
Control variables								
Age	0.00 [−0.003, 0.003]	**−0.00 [−0.007, −0.001]**	0.00 [−0.004, 0.004]	−0.00 [−0.008, 0.001]	0.00 [−0.003, 0.004]	0.00 [−0.001, 0.006]	0.00 [−0.004, 0.003]	**−0.01 [−0.009, −0.001]**
Gender (W)	**0.14 [0.034, 0.242]**	0.00 [−0.094, 0.097]	−0.07 [−0.182, 0.057]	**0.24 [0.093, 0.378]**	**0.13 [0.027, 0.251]**	**−0.18 [−0.285, −0.075]**	**0.26 [0.150, 0.365]**	0.04 [−0.088, 0.168]

Effects are unstandardized. Statistically significant effects (in bold) determined by 95% bias-corrected bootstrapped confidence interval (10,000 bootstrapped samples). *W*, being woman compared to being man; *Awareness*, acting with awareness

is grounded on a heightened awareness of one's internal and external experiences, such as sounds, smells, sensations, and thoughts. Therefore, people scoring high on observing are more likely to be in the "here and now," paying more attention to actual stimuli than to mental images. Thus, they may be more aware of their stereotypes, negative cognitive schemata of the outgroup, and automatized negative emotional reactions toward outgroup member; this heightened awareness can help fight such automatized negative beliefs and reactions (e.g., Kang et al., 2013). Nonjudging and Describing involve the tendency to, respectively, accept one's thoughts and feeling without judging them, and label and communicate one's emotions (Baer et al., 2008). Deeply knowing and peacefully accepting one's thoughts and feelings could be related to a higher acceptance of other people as well, including those people that are different from us in terms of group membership. Indeed, previous research has shown that Nonjudging and Describing are positively associated with social connectedness, which is the tendency to seek and create connections and to value closeness with others, and that Describing is also related to higher perspective taking (Fuochi & Voci, 2020b).

Regarding H2, it was supported for the Observing facet and attitudes toward immigrant people: the unidirectional

Table 4 Indirect effects of mindfulness facets on intergroup outcomes through mediators in the model with latent variables (Study 2)

Mindfulness facets	*Mediators*	*Intergroup outcomes*	*IE*	[95% CI *IE*]	*Std IE*
Describing	Joyous Exploration	Attitudes toward immigrants	0.024	[0.006, 0.056]	0.027
Describing	Reflection	Prejudice toward immigrants	−0.063	[−0.116, −0.030]	−0.078
Describing	Joyous Exploration	Deprovincialization	0.049	[0.018, 0.093]	0.053
Describing	Social curiosity	Deprovincialization	0.020	[0.005, 0.044]	0.021
Observing	Joyous Exploration	Attitudes toward immigrants	0.037	[0.011, 0.079]	0.043
Observing	Reflection	Prejudice toward immigrants	−0.098	[−0.165, −0.050]	−0.122
Observing	Joyous Exploration	Deprovincialization	0.076	[0.039, 0.129]	0.083
Observing	Social curiosity	Deprovincialization	0.032	[0.011, 0.064]	0.036
Observing	Joyous Exploration	Positive contact	0.058	[0.024, 0.113]	0.054

Only statistically significant effects (determined by 95% bias-corrected bootstrapped confidence interval with 10,000 bootstrapped samples) are reported. *IE*, unstandardized indirect effect; *95% CI IE*, 95% confidence interval of unstandardized indirect effect; *Std IE*, standardized indirect effect

association from Observing to attitudes toward the outgroup strengthens the cross-sectional results and suggests that mindfulness could positively act on intergroup variables. This result opens the possibility to test the effect of mindfulness on intergroup outcomes in a more causal way — not only relying on temporal precedence — and to build prejudice reduction interventions grounded on mindfulness, which may help individuals to be more aware of their negative stereotypes and potentially fight them.

We found partial support for H3: Reflection, Joyous Exploration, and Social Curiosity mediated only the associations between the Observing and Describing facets of dispositional mindfulness and intergroup outcomes. The mediator conveying more associations was Joyous Exploration: Observing and Describing were associated with higher levels of Joyous Exploration, which in turn was positively associated with attitudes toward immigrants, deprovincialization, and positive intergroup contact with immigrants. These findings suggest that these mindfulness facets are associated with greater motivation to seek novel experiences and information, which, in turn, could promote positive interactions with individuals from diverse backgrounds and facilitate the understanding of their perspectives and worldviews, thereby ameliorating attitudes toward them. This finding is consistent with the positive relationship between dispositional mindfulness and cognitive flexibility found in previous studies (e.g., Fuochi & Voci, 2020a), which is part of the de-automatization process (Kang et al., 2013).

Reflection and Social Curiosity showed to be mediators of two paths: from Observing and Describing to lower prejudice (Reflection) and higher deprovincialization (Social curiosity). These results suggest that paying attention to internal and external stimuli and describing one's experience with words are positively associated with greater self-awareness and introspection and higher curiosity toward other people; in turn, these cognitive tendencies convey a more open and accepting attitude toward other groups. Observing and Describing have a common feature: enhanced attention to one's emotions and thoughts. This can facilitate awareness of negative stereotypes — which belong to the maladaptive side of automaticity — and simultaneously increase interest in and attention to the experiences and perspectives of other people; such a process can reduce automatic reactions to social stimuli, and consequently prejudiced attitudes.

Limitations and Future Research

We acknowledge some limitations in this paper: first, we only relied on self-report data, which may be affected by response biases (e.g., self-enhancement, impression management; see Paulhus, 1991). Second, we only relied on convenience samples of Italian respondents, and thus, our findings may not be necessarily generalizable to the Italian population or other cultural contexts. Future studies should use more representative samples. Third, our longitudinal data only had two waves and a limited sample size, thereby not allowing analyses on within-person processes. Future research could investigate the intra-individual associations between state mindfulness and time-varying intergroup outcomes. Fourth, in Study 2, we conducted mediation analyses with a non-experimental, cross-sectional design: this type of data does not allow establishment of the direction of the associations; therefore, the results of Study 2 do not shed light on the causal mechanisms of the relationship between mindfulness facets and intergroup outcomes. Future research could employ experimental and longitudinal designs to investigate the mediators of the links between dispositional mindfulness and intergroup outcomes.

Despite these limitations, the results suggest that some facets of dispositional mindfulness, especially Observing and, to a lesser extent, Describing and Nonjudging, are

positively associated with positive intergroup outcomes. Moreover, they suggest that the positive associations that Observing and Describing have with positive intergroup outcomes are conveyed by greater self-awareness, more curiosity for new information and experiences, and the understanding of others' behaviors and perspectives. From a practical point of view, the construct of mindfulness could be employed in prejudice reduction interventions to increase the awareness and appreciation of group and cultural differences and societal diversity, thereby paving the way for the amelioration of intergroup attitudes and the attenuation of intergroup conflict.

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Use of Artificial Intelligence AI tools were not used for this research.

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Data Availability Raw data, R scripts, and MPlus inputs and outputs of Study 1 and Study 2 are openly available at https://osf.io/cn35u/?view_only=d6cc7cf7a3384b49aed168096d7c58f2.

Declarations

Ethics Approval The studies reported in this manuscript involve human participants and were approved by the Psychological Research Ethics Committee of the University of Padova, protocol #4,444. All procedures of these studies are in accordance with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent In the data collection of both studies, participants provided their informed consent at the beginning of the online questionnaire.

Conflict of Interest The authors declare no competing interests.

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