

Imagining Contact Reduces Prejudice in Pre-School Children

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Word count (text, tables, references): 11,786

Abstract: 120

Cite as:

Birtel, M. D., Di Bernardo, G. A., Stathi, S., Crisp, R. J., Cadamuro, A., & Vezzali, L. (in press).

Imagined contact reduces prejudice in pre-school children. *Social Development*.

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Conflict of Interest

All authors declare that there are no conflicts of interest.

Acknowledgments

We thank Monica Lombardelli, Chaima Nadi and Chiara Sorzia for their help as research assistants.

Abstract

We examined the effectiveness of an imagery-based strategy designed to reduce prejudice in pre-schoolers in Italy. Three studies involving different target groups (disabled children, Black children) were conducted within Italian pre-schools. Children (4-6 years) were asked to imagine and draw meeting an outgroup member (Studies 1 and 2) or to imagine writing a letter to an outgroup member (Study 3). Results revealed that pre-schoolers in the experimental condition, relative to a control group, reported less intergroup bias in form of contact intentions and resource allocation as well as greater behavioral inclusiveness; effects were mediated by improved intergroup attitudes. Our findings are important in understanding ways that promote positive intergroup relations in ways that align with the interests of young children.

Keywords: imagined contact, intergroup contact, prejudice, pre-school children, mental imagery, drawing

Imagining Contact Reduces Prejudice in Pre-School Children

Since prejudice in childhood is more malleable than during adulthood, reducing it at a young age is of primary importance (Aboud et al., 2012; Killen, Mulvey, Hitti, & Rutland, 2012; Raabe & Beelmann, 2011). The social-cognitive developmental perspective on prejudice (Rutland, Killen, & Abrams, 2010) argues that prejudice develops from a complex interplay between socio-cognitive (i.e., morality) and socio-contextual (i.e., group processes) factors. Prejudice-interventions in children based on intergroup contact theory (Allport, 1954) have been shown to be particularly effective (Aboud et al., 2012; Raabe & Beelmann, 2011; Skinner & Meltzoff, 2018; Ülger, Dette-Hagenmeyer, Reichle, & Gaertner, 2018). However, as very young children have less control over their social environments and therefore may have little opportunities to seek direct outgroup contact, more indirect intergroup contact forms such as mentally simulating positive outgroup contact (imagined contact, Crisp & Turner, 2012) may be more effective in tackling prejudice in early childhood. Although a significant amount of research has shown the effectiveness of imagined contact in both adults and school children (for a meta-analysis see Miles & Crisp, 2014), we do not know whether it also can work for very young children.

The present research investigated, for the first time, whether imagined contact can reduce prejudice in 4-6-year-old children attending *pre-school* in Italy. Critically, we tested whether mental imagery in this age group can be used fruitfully in order to reduce prejudice toward stigmatized groups. To test this hypothesis, we applied two new variants of imagined contact, based on mentally simulating an intergroup interaction *while* performing a pleasant and engaging task such as drawing or narrating an experience. Engaging children at such a young age through

playful activities that are important for their development may be important for prejudice-reduction interventions.

Prejudice in Childhood

Prejudice is defined as a negative attitude toward individuals because of their group membership. It manifests itself in negative affect, derogatory beliefs and hostile behavior toward the outgroup (Brown, 2011). Previous research has emphasized the importance of studying prejudice in young children (Abrams & Rutland, 2008). Childhood is a period of significant socio-cognitive changes affecting not only interpersonal but also intergroup relations. Social-cognitive theories of children's development suggest that children start developing an understanding that social categories, such as ethnicity, are not changeable from 3/4 years (Kohlberg, 1969; Ruble et al., 2004). Children also start displaying explicit prejudice when they are around 3-4 years (Aboud, 2008; Bigler & Liben, 2007), peaking between the ages of 5-7 (for a meta-analysis of 128 studies across the world see Raabe & Beelmann, 2011). Because in the present research we examined children who were 4-6 years old, our focus specifically is on the age group where prejudice typically forms and peaks.

According to the integrative social-cognitive developmental perspective on prejudice (Rutland et al., 2010), the development of prejudice is considered to be the result of a complex interplay between the socio-cognitive development (i.e., morality) and socio-contextual factors (i.e., group processes of social norms and identity). Rutland et al. argued that social factors such as intergroup contact and social norms affect the weight children place on moral beliefs about fairness and justice during the development of prejudice. Research supporting their model suggests that contextual variables contribute to the development of prejudice from a young age on. Already in early childhood (3-4 years), children consider the self, the group and morality

when making judgments (Smetana, 2006; Turiel, 2006). For example, studies of peer exclusion and social reasoning demonstrated that young children (4-5 years) make use of stereotypes (especially in ambiguous situations), when evaluating social exclusion based on the group membership of peers (Killen, Pisacane, Lee-Kim, & Ardila-Rey, 2001; Theimer, Killen, & Stangor, 2001). Young children (4-5 years) also were shown to reduce the use of stereotypes when making exclusion decisions when being made aware of anti-exclusion probes relating to morality (Killen et al., 2001).

Although prejudice seems to decrease at the ages of 8-10 years, this only has been found for explicit but not implicit measures, indicating that children become better at controlling public responses in line with social norms (Raabe & Beelman, 2011; Rutland et al., 2007). Furthermore, opportunities for contact appear to be necessary for a decline of prejudice in adolescence (Raabe & Beelmann, 2011). Therefore, as early childhood (3-8 years) sets the stage for children's attitudes and behaviors toward outgroups (Aboud et al., 2012; Raabe & Beelmann, 2011) and holding biases can result in an avoidance of disconfirming information about contact with outgroups (Stephan & Stephan, 1985), interventions should be focused on an early age.

Prejudice-Interventions in Childhood

Prejudice-interventions in children have shown to be particularly effective when including intergroup contact (Allport, 1954) or education and anti-bias communication (Bigler & Liben, 2006), although effects can vary according to age and target outgroup (for reviews see Aboud et al., 2012; Raabe & Beelmann, 2011; Skinner & Meltzoff, 2018; Ülger et al., 2018). In line with the social-cognitive developmental perspective on prejudice (Rutland et al., 2010), these interventions with a focus on changing children's context in turn influence emotional and cognitive processes (e.g., higher empathy, fewer stereotypes) (Aboud et al., 2012) to counteract

the development of prejudice. A recent systematic review of interventions targeted at enhancing ethnic tolerance in early childhood (children 8 years and younger) between 1980 and 2010 (Aboud et al., 2012) indicated that interventions based on intergroup contact ($n = 14$) and anti-bias communication ($n = 18$) were mostly observed for ethnic majority than minority children, and for them these interventions were equally effective and effects were stronger for attitudes than for peer relations (social behavior, friendships).

Intergroup contact theory is regarded as the most influential theory for improving intergroup relations between conflicting groups (Allport, 1954; Brown & Hewstone, 2005; Pettigrew, 1998). Decades of research provided support for contact effectiveness (Davies, Tropp, Aron, Pettigrew, & Wright, 2011; Dovidio, Love, Schellhaas, & Hewstone, 2017; Pettigrew & Tropp, 2006, 2008; Vezzali & Stathi, 2017), also among pre-school and school children (Cameron & Turner, 2017; Guerra et al., 2010; Rutland & Killen, 2015; Tropp & Prenovost, 2008; Turner & Cameron, 2016). The positive effect of contact on attitudes has been found to be independent of age (Tropp & Prenovost, 2008), and early intergroup contact experiences may be important for the development of positive outgroup attitudes. Intergroup contact should promote moral-based rather than norms-based reasoning in children (Rutland et al., 2010). Examining age differences will inform how these contact interventions need to be structured and implemented (Killen & McKown, 2005; Masten, Long, Kuo, McCormick, & Desjardins, 2009), in particular in younger children.

Educational programs to reduce prejudice are often implemented by practitioners based on their experience without input from academics on empirical evidence and evaluation (Cameron & Turner, 2017). Furthermore, a meta-analysis of 50 studies between 1995-2015 of anti-prejudice interventions in schools (age 4 onwards) suggested that interventions led by

researchers produce positive outgroup attitudes but not when implemented by teachers, and that one-to-one interventions are more effective than classroom-wide interventions (Ülger et al., 2018). The effectiveness of the interventions depended on the type of theoretical orientation and age group. Although contact and multifaceted interventions were generally more effective than interventions based on social categorization, these were particularly effective in younger children (ages 4-11), whereas social categorization strategies were more effective in children age 12 and older. Therefore, developmental social psychologists are now considering interventions based on intergroup contact theory.

As young children usually have less control over choosing their social environments and may live in areas with little opportunities for direct contact, implementing interventions based on direct contact may prove challenging (Aboud et al., 2012). Specifically, when direct contact is difficult or lacks opportunities due to voluntary or involuntary segregation, prejudice can also be reduced indirectly (Dovidio, Eller, & Hewstone, 2011), firstly, through knowing or observing an ingroup member interacting with an outgroup member (extended and vicarious contact, Vezzali, Hewstone, Capozza, Giovannini, & Wölfer, 2014; Wright, Aron, McLaughlin-Volpe, & Ropp, 1997) and secondly through mentally simulating positive outgroup contact (imagined contact, Crisp & Turner, 2012; Miles & Crisp, 2014). In our study, we therefore tested a more age-appropriate modification of a contact intervention to test whether prejudice can be targeted early.

Imagined Contact in Children

Derived from intergroup contact theory, imagined contact is defined as “the mental simulation of a social interaction with a member or members of an outgroup category” (Crisp & Turner, 2009, p. 234). Although previous research has focused on adults and school children,

there are, to our knowledge, no studies testing imagined contact in pre-school children, i.e., children younger than age 6.

A meta-analysis on imagined contact with over 70 studies in the past 10 years (Miles & Crisp, 2014) has demonstrated that imagined contact can improve intergroup relations for adults, even in areas characterized by high intensity of conflict and across a range of target groups, on four key measures: *attitudes* (e.g., Brambilla, Ravenna, & Hewstone, 2012; De Carvalho Freitas & Stathi, 2017; Turner, Crisp, & Lambert, 2007), *emotions* (e.g., Birtel & Crisp 2012b; Pagotto, Visintin, De Iorio, & Voci, 2013), *intentions* (e.g. Husnu & Crisp, 2010a, 2010b), and *behavior* (e.g., Birtel & Crisp, 2012a; Meleady & Seger, 2016; Turner & West, 2012). Imagined contact not only successfully promotes positive intergroup relations among adults but also among school children (i.e., children 6 years and older). Recently, research has demonstrated the positive effects of imagined contact for children in terms of explicit and implicit attitudes (Vezzali, Capozza, Giovannini, & Stathi, 2012) and intentions (Cameron, Rutland, Turner, Holman-Nicholas, & Powell, 2011; Stathi, Cameron, Hartley, & Bradford, 2014), trust (Vezzali, Capozza, Stathi, & Giovannini, 2012), inhumanization (Vezzali, Capozza, Stathi et al., 2012), perceived similarity (Stathi et al., 2014), self-disclosure (Vezzali, Capozza, Giovannini, & Stathi, 2012), and helping intentions (Vezzali, Stathi, Crisp, & Capozza, 2015). Imagined contact effects have been found to last up to one (Stathi et al., 2014; Vezzali, Capozza, Giovannini et al., 2012; Vezzali, Capozza, Stathi et al., 2012) and even two weeks for children (Vezzali, Stathi, Crisp, Giovannini, Capozza, & Gaertner, 2015). Furthermore, Miles and Crisp's (2014) meta-analysis has shown that the prejudice-reduction effect of imagined contact was stronger for school children than for adults. These findings support the importance of including prejudice-interventions early in educational strategies to promote positive social change.

Mental Imagery in Children

Imagined contact is based on mental imagery, which can be defined as the experience of perception in the absence of concurrent sensory input (Kosslyn, Thompson, & Ganis, 2006). Drawing on the benefits of mental imagery in several areas of people's life (for a review see Crisp, Birtel, & Meleady, 2011), Crisp, Turner and colleagues have argued that these benefits also can extend to the domain of intergroup contact (for reviews see Crisp & Turner, 2012; Stathi, Crisp, Turner, West, & Birtel, 2012). Mental imagery has characteristics similar to real experience like concrete details, emotions, neurological characteristics (Blair, Ma, & Lenton, 2001; Dadds, Bovbjerg, Redd, & Cutmore, 1997; Kosslyn, 1994, 1995; Taylor & Schneider, 1989). Neuropsychological studies have shown that imagery shares the same neurological basis as perception, and employs similar neurological mechanisms as memory, emotion and motor control (Kosslyn, Ganis, & Thompson, 2001); the neurocognitive substrates of mental imagery overlap substantially with those involved in veridical perception (Schacter, Addis, & Buckner, 2007). In other words, a mental experience of a particular social context can have similar effects as an actual experience of that context (Blair et al., 2001; Garcia, Weaver, Moskowitz, & Darley, 2002; Stathi & Crisp, 2008; Turner, Crisp et al., 2007).

The capacity for imaginative thought is central to the human experience and, as such, a correspondingly critical component of behavioral change strategies. The acquisition of imaginative capacities is an essential step of development in children (Bruner, 1964; Piaget & Inhelder, 1966). Research indicates that children as young as 3 years can generate and maintain mental imagery when verbally instructed to do so (Dias & Harris, 1990; Richards & Sanderson, 1999), although they tend not to do so spontaneously and require instructions and support in order to use their imagination (Joh, Jaswal, & Keen, 2011; Rieser, Garing, & Young, 1994).

Wimmer, Maras, Robinson, Doherty, and Pugeault (2015) suggested that the precision of mental images significantly develops over the pre-school period, and that from 4- to 8-years-of-age children's ability to coordinate mental and real images becomes increasingly similar to adults'.

Research has demonstrated that mental imagery can be educated and oriented through interventions, not only to facilitate learning (Benedan & Antonietti, 1997) and to prevent or recover from disorders (Di Nuovo, 1999), but also to promote the use of cognitive, emotional and social skills, and to provide a child with opportunities to practice social interactions via active construction of fantasy scenarios (Pylyshyn, 1973). Imagined contact could be such an example of a social interaction. The standard imagined contact instruction involves writing down what one has imagined (Crisp & Turner, 2012; Stathi, Crisp, & Hogg, 2011). As pre-school children (from which we sampled our participants) are not able to write yet, a different type of imagined contact needs to be implemented, taking advantage of activities that children enjoy, such as drawing or narrating invented stories in which they play the main character.

The Present Research

Previous research has established the positive effects of imagined contact on intergroup relations across various target groups, in adults and school-age children. No research to this date has tested imagined contact as a prejudice-intervention in children as young as preschool age. The present research was conducted in pre-schools in Italy, where children begin school from age 6 years onwards. Although some children start school at 5 years, others start school at 6 years. The exact age for children to enter school depends on the month in which they were born. The studies included children ages 4-6 years (Study 1), 5 years (Study 2) and 4-5 years (Study 3).

Based on their systematic review of children ages 0-12 years, Skinner and Meltzoff (2018) recommended tailoring intergroup bias interventions to younger children by focusing them around concrete experiences and representations of relations between ingroup and outgroup members, an example could be imagined contact interventions. In contrast, older children are more able to understand abstract concepts of group memberships and therefore interventions are recommended to include more complex information about perspective-taking and cultural contexts. Therefore, we adapted the conventional manipulations (imagined contact) and measures (attitudes, behavior) to make them appropriate for our age group and context. As young children are not able to read and write yet, and they need to be guided during mental simulation (Joh et al., 2011; Rieser et al., 1994), new versions of imagined contact were created, the first one based on drawing (Studies 1 and 2) and the second one based on dictating a letter (Study 3). Both activities, drawing and narrating an experience, are activities children greatly enjoy naturally as well as are ways of engaging young children in a pleasant, creative and interesting prejudice-intervention task appropriate for this age group, when abstract concepts and information are too difficult to process (Skinner & Meltzoff, 2018). We tested two different adaptations of imagined contact in order to see whether including different tasks that are important for children's development would be effective.

In the first two studies, we tested drawing as an adaptation of the imagined contact intervention. Drawing has been identified as one area through which children learn about other subjects. Drawing plays an important role in children's development in various ways. For example, ideas about the worlds they live in can be explored more easily, and spatial visualization and orientation skills are improved. Through drawing, children also learn how to visually represent their thoughts and feelings (Brook, 2009). The drawings children create are a

reflection of their inner world. Various feelings can be seen on them, but also information about their psychological status or their interpersonal style can be extracted (Malchiodi, 1998). In order to draw, children need to understand the link between intention and action, already two-year-old children show some understanding of this link. By the age of three to four, children can interpret and apply such understanding to the drawings they produce (Golomb, 1974).

In the third study we tested narrating an experience as an adaption of the imagined contact intervention. Children were asked to imagine positive contact while dictating a letter on this experience to the researcher. This way, children could narrate their experience while imagining it. Children not only enjoy drawing, they also enjoy social conversations with adults (Test, Cunningham, & Lee, 2010). Research supports the importance of encouraging children to engage in a social conversation, such as the development of larger vocabularies (Hart & Risley, 1999; Hoff & Naigles, 2002), better reading abilities (Snow, Burns & Griffin, 1998), higher intelligence (Hart & Risley, 1999), as well as social and emotional development (Ensor & Hughes, 2008; Harris, 2005). Furthermore, developmental theories suggest that the child's understanding of self develops in relation to other people (e.g., attachment theory by Bowlby, 1969). Narrating an experience in the form of a story or a letter to another person is a way for the child to portray her/himself in relation to other people (Miller, Mintz, Hoogstra, Fung, & Pott, 1992), and help to develop a link between the child's self and others (Bruner, 1986).

We predicted that children who were asked to imagine a positive intergroup contact scene would report less prejudice on attitudes and intentions measures than children in the control group. In addition to measures from previous research (attitudes and intentions), we also used self-reported measures of behavior, i.e., intergroup bias in a resource allocation task, and behavioral inclusiveness. Resource allocation was chosen as one of the measures as it refers to

moral beliefs about fairness and the tendency to discriminate against the outgroup. Behavioral inclusiveness refers to the willingness to share one's friends with the outgroup child and to include the outgroup child into the friendship circle. Both measured tendencies of inclusion of the outgroup, both morally (resource allocation) and socially (friendship circle).

Moreover, in line with previous studies, we tested outgroup attitudes as the process underlying the effects of imagined contact (e.g., Birtel & Crisp, 2012b, Study 3; Harwood, Paolini, Joyce, Rubin, & Arroyo, 2011; Husnu & Crisp, 2010a, Study 2; Stathi et al., 2014; Turner, West, & Christie, 2013, Studies 1 and 2; West, Hotchin, & Wood, 2017, Study 1; for a review, see Crisp, Husnu, Meleady, Stathi, & Turner, 2010).

We tested our hypotheses in three studies, using different target groups, i.e., disabled children (Study 1) and Black children (Studies 2 and 3), and different types of contact, i.e., imagining meeting the outgroup child (Study 1 and 2) and imagining writing a letter to the outgroup child (Study 3). Two types of outgroups varying on different dimensions were chosen, one based on ethnicity (Black children) and one based on disability (physically disabled child). Both disabled people and Black people are stigmatized minority groups in society. However, prejudice characterizing Black children can be very different from prejudice characterizing disabled children. For example, Black children face dehumanization, e.g., they are rated as less child-like, and this dehumanization predicts racial inequalities in police violence against child suspects (Goff, Jackson, Leone, Culotta, & DiTomasso, 2014). Physically disabled children often experience prejudice and discrimination from their peers (for a meta-analysis see Nowicki & Sandleson, 2002); however, following social norms against discrimination, prejudice toward disabled can be more subtle (Vezzali & Capozza, 2011). According to Goffman (1963), prejudice based on race or on disability represents two different types of stigma. Specifically,

racial prejudice refers to tribal stigma, which applies to stigmatized ethnic, racial, religious groups; prejudice toward disability refers to abominations of the body, with the possession of specific physical characteristics that indicate the presence of disability. Adding to this, generally, interventions have been found to be more effective for outgroup targets relating to disability than ethnicity (Aboud et al., 2012; Miles & Crisp, 2014; Raabe & Beelmann, 2011; Tropp & Prenovost, 2008; Ülger et al., 2018). We tested whether our interventions can be effective across outgroup type: finding that the planned interventions are effective for two groups characterized by different types of prejudice would provide strong support for our hypotheses.

In order to address the limitations of previous research designs in studies on interventions in pre-school children (Aboud et al., 2012), we used random assignment of children to different contact conditions to counter the problem of self-selection. Moreover, in order to increase the strength of our findings and rule out alternative explanations such as cognitive load, priming and positive affect (see Crisp & Turner, 2009), we varied the control condition, by asking individuals to imagine an outdoor scene (Study 1), a member of the outgroup (Study 2), positive *intragroup* contact (Study 3).

Study 1

The aim of the first study was to test whether modifying the imagined contact paradigm by including an interesting and engaging task for young children, i.e., the ability to draw, can be employed for creating an effective intervention that stimulates mental imagery and reduces prejudice.

Method

Participants

Participants were 81 nondisabled children (39 males, 42 females) from a pre-school located in Northern Italy. Age ranged from 4 years 4 months to 6 years 3 months ($M = 5$ years 4 months, $SD = 5.70$ months). Parental consent was obtained, none of the parents opted out of the study.

Design and Procedure

Children were randomly allocated to either the experimental ($N = 43$) or to the control ($N = 38$) condition. Participants were examined individually. In the *experimental* condition, children were first shown a drawing of a same-sex disabled child in wheelchair, in order to be sure that all children understood who disabled children are. The choice to use people in wheelchairs specifically is because this disability is visibly salient, compared to other forms of disability (see also Carvalho-Freitas & Stathi, 2017). Then, children were asked to draw an interaction with a same-sex child at the park. Specifically, they were instructed to imagine and draw meeting with an unknown same-sex disabled child in a wheelchair in a park, to start to speak, have fun and become friends with them (see e.g., Vezzali, Capozza, Stathi et al., 2012). After completing the drawing, children spent ten minutes with the researcher explaining the drawing and describing in detail the interaction with the disabled child. In the *control* condition, children were asked to draw and then describe in detail an outdoor scene (see e.g., Turner, Crisp et al., 2007). After discussing the drawing with the researcher, participants of both groups had face-to-face interviews with the researcher to complete a questionnaire. In the control group, prior to completing the questionnaire, children were shown a drawing of a same-sex disabled child in a

wheelchair, in order to be sure that all children understood who disabled children (as a target group) are.

Measures

Intergroup attitudes. To assess intergroup attitudes, we adapted the Multiple-Response Racial Attitude measure (Aboud, 2003; Doyle & Aboud, 1995). Participants were randomly presented eight traits, four positive (nice, likeable, clean, good) and four negative (ugly, bad, dirty, unpleasant). For each trait, children had to decide whether to assign it to an ingroup member (a drawing of a same-sex non-disabled child), an outgroup member (a drawing of a same-sex disabled child in a wheelchair), both an ingroup and an outgroup member (the two drawings of the same-sex non-disabled and of the disabled child), or to nobody. We computed the number of positive and negative traits assigned to ingroup and outgroup members: a trait was calculated as assigned to one group when the children assigned it to that group specifically or to both groups (two out of the four options given to participants). We then calculated the difference to obtain a single index of *ingroup attitudes* and *outgroup attitudes*, with higher scores denoting more positive attitudes (range: from -4 to +4). We then subtracted the outgroup from the ingroup evaluation, to obtain a single index of *intergroup attitude bias* ranging from -8 to +8: positive scores indicate ingroup bias, negative scores reflect outgroup bias, 0 indicates neutrality/absence of bias.

Behavioral intentions. The following five items (adapted from Cameron & Rutland, 2006; Tropp, Stout, Boatswain, Wright, & Pettigrew, 2006; Turner, Hewstone, & Voci, 2007; Vezzali, Capozza, Giovannini et al., 2012) were used: “Would you loan a toy to this child?”; “Would you tell a secret to this child?”; “Would you like to play with this child?”; “Would you like having this child as a friend?”; “Would you like to have an ice-cream with this child”? Each

item was proposed twice, once for an ingroup (non-disabled) and once for an outgroup (disabled in wheelchair) child. Specifically, children were first shown a drawing of a same-sex ingroup child; then, they responded to the same question by referring to the drawing of a same-sex outgroup child in a wheelchair. The 3-step scale, pictorially represented by smiles, ranged from 1 (*no*) to 3 (*yes*); 2 was the neutral point (*don't know*). Items were aggregated to obtain one index of *ingroup* (Cronbach's $\alpha = .70$) and one of *outgroup behavioral intentions* (Cronbach's $\alpha = .81$). We then computed the difference between the two indices to obtain a *behavioral intentions bias* index, with higher number indicating more ingroup bias (range: from -2 to +2).

Resource allocation bias. Participants were presented with two drawings, one of a same-sex non-disabled and one of a same-sex disabled child in a wheelchair, and were asked to distribute five coins to the two figures. We calculated the difference between coins assigned to ingroup and outgroup targets, with higher scores indicating more bias (range: from -5 to +5).

Results and Discussion

Differences between Conditions

Means and standard deviations of all measures in the two conditions are reported in Table 1. As shown in Table 1, in line with our hypotheses, intergroup attitude bias was lower in the experimental than in the control condition. Notably, although bias was significant in the control condition, as demonstrated by the fact that the average score was higher than 0, $t(37) = 6.10, p < .001, d = 0.99$, bias in attitudes was significantly lower than 0 in the experimental condition, $t(42) = 2.34, p < .05, d = 0.35$, thus providing evidence for outgroup bias. Interestingly, the effect on bias reduction was due both to less positive ingroup attitudes and to an increase in positive outgroup attitudes in the experimental than in the control condition (Table 1). It is worth noting that, whereas ingroup attitudes were positive in both conditions (scores were significantly above

0), $t_s > 5.87$, $p_s < .001$, $d_s > 0.89$, outgroup attitudes were positive in the experimental condition, $t(42) = 10.24$, $p < .001$, $d = 1.56$, and were neutral (they did not differ from 0) in the control condition, $t < 1$, $d \approx 0$.

The results for intentions were similar to those found for attitudes, with children expressing less bias in behavioral intentions in the experimental than in the control condition, an effect driven by more favorable intentions toward the outgroup (Table 1). It should be noted that, as for attitudes, bias in behavioral intentions was significant in the control condition, because the average score was higher than 0, $t(37) = 6.52$, $p < .001$, $d = 1.05$. However, the behavioral intentions bias score did not differ from 0 in the experimental condition, $t(42) < 1$, $d = 0.11$, thus showing that the intervention was effective in inhibiting the preference in intentions to have contact with the outgroup relative to the ingroup.

Finally, bias in resource allocation was lower in the experimental than in the control condition. In line with findings for the other measures, bias was higher than 0 in the control condition, $t(37) = 5.40$, $p < .001$, $d = 0.88$, but it tended toward favoring the outgroup in the experimental condition, $t(42) = 1.87$, $p = .068$, $d = 0.28$.

Mediation Analyses

In order to test whether outgroup attitudes (represented by the index of intergroup attitude bias) mediated the effect of condition, we conducted two regressions, where we regressed behavioral intentions bias and resource allocation bias on condition (coded 1 for experimental condition, 0 for control condition) and intergroup attitude bias. See Figures 1 and 2. Results revealed that the association between intergroup attitude bias and the dependent variables was significant ($bs = .09$ and $.22$, $SEs = .02$ and $.05$, $ps < .05$, for behavioral intentions bias and resource allocation bias, respectively); the residual effect of experimental condition remained

significant, both for behavioral intentions bias, $b = -.34$, $SE = .13$, $p < .01$, and for resource allocation bias, $b = -.93$, $SE = .34$, $p < .01$. To test whether indirect effects calculated with bootstrapping procedures were significant, we used the PROCESS macro by Hayes (2016, Model 4). Results revealed that the mediation by intergroup attitude bias was significant both for behavioral intentions bias (point estimate = $-.31$, $SE = .12$, confidence interval ranging from $-.579$ to $-.090$; completely standardized indirect effect = $-.26$, $SE = .10$, confidence interval ranging from $-.448$ to $-.075$) and resource allocation bias (point estimate = $-.80$, $SE = .29$, confidence interval ranging from -1.493 to $-.327$; completely standardized indirect effect = $-.25$, $SE = .08$, confidence interval ranging from $-.416$ to $-.116$).

Study 1 provided initial support that imagined contact can reduce intergroup bias in young children, using a new type of imagined intergroup contact where mental simulation was embedded in the drawing task. Moreover, reduced bias in attitudes emerged as the mediator of the effect.

Study 2

The aim of the second study was to replicate and extend the findings obtained in Study 1. In order to do so, we introduced two main differences: Firstly, we tested a different target group, this time based on ethnicity, to see whether our adaption of imagined contact is also effective for a different target outgroup. Participants were White children, and we examined their relationship with Black children. Secondly, we tested a different control condition to rule out explanations based on priming effects: in the control condition, children drew an outgroup member, a Black child (see also Turner, Crisp et al., 2007).

Method

Participants were 60 White 5-year-old pre-school children (29 males, 31 females) from a pre-school located in Northern Italy. Parental consent was obtained, none of the parents opted out of the study. Children were randomly allocated to the experimental ($N = 29$) or to the control ($N = 31$) condition. The procedure was identical to that used in Study 1, with two differences. First, outgroup targets were now Black children (children were shown a drawing of a Black child). The experimental condition was therefore identical to that of Study 1, where the Black target replaced the disabled target. Second, in the control condition, participants were asked to draw an outgroup member, a Black child, instead of an outdoor scene. Therefore, in the control condition, participants drew an outgroup member in isolation, in contrast to the experimental condition where the outgroup member was drawn in interaction with an ingroup member. The measures were identical to those used in the Study 1, with the difference that now the target outgroup was represented by Black children, and the ingroup was represented by White children. The Cronbach's α for the measure of behavioral intentions was .75 for the ingroup and .76 for the outgroup.

Results and Discussion

Differences between Conditions

Means and standard deviations of all measures for the experimental and control conditions are reported in Table 2. Results closely replicated those obtained in Study 1. In line with our hypotheses, intergroup attitude bias was lower in the experimental than in the control condition, an effect due to both less positive ingroup attitudes and more positive outgroup attitudes. In this study, however, intergroup attitude bias was higher than 0 in both conditions, $ts > 6.66$, $ps < .001$, $ds > 1.24$. Although predictably ingroup attitudes were positive (the mean

score was above 0) in both conditions, $ts > 6.92$, $ps < .001$, $ds > 1.30$, outgroup attitudes were negative (the mean score was lower than 0) in both conditions, $ts > 2.03$, $ps \leq .05$, $ds > 0.38$.

Mirroring results obtained in the first study, behavioral intentions bias was reduced in the experimental compared to the control condition, an effect driven by more positive intentions toward the outgroup (Table 2). In this case, however, average scores of bias were above 0 in both conditions, $ts > 3.24$, $ps < .01$, $ds > 0.59$.

We also found a positive effect of experimental condition on the measure of resource allocation bias; this effect, however, was only marginally significant (Table 2). As for the attitude and intention measures, also in the case of resource allocation bias remained above 0 in both conditions, $ts > 4.26$, $ps < .001$, $ds > 0.79$.

Mediation Analyses

Mediation was tested by following the same procedure used in the first study. See Figures 1 and 2. Results revealed that, whereas intergroup attitude bias was associated positively with both behavioral intentions bias, $b = .11$, $SE = .03$, $p < .01$, and resource allocation bias, $b = .38$, $SE = .13$, $p < .01$, the association between experimental condition and outcomes was nonsignificant for either variables, $bs = -.13$ and $-.02$, $SEs = .17$ and $.66$, $ps > .461$, for behavioral intentions bias and resource allocation bias, respectively. In line with expectations, mediation by intergroup attitude bias was significant both for behavioral intentions bias (point estimate = $-.29$, $SE = .14$, confidence interval ranging from $-.648$ to $-.081$; completely standardized indirect effect = $-.23$, $SE = .10$, confidence interval ranging from $-.468$ to $-.064$) and resource allocation bias (point estimate = -1.02 , $SE = .50$, confidence interval ranging from -2.192 to $-.217$; completely standardized indirect effect = $-.22$, $SE = .10$, confidence interval ranging from $-.454$ to $-.049$).

Study 2 replicated Study 1 with a different target group and a different control condition, and provided further support that imagined contact can reduce intergroup bias in young children, using a new type of imagined contact.

Study 3

The aim of the third study was to replicate and extend findings obtained in Studies 1 and 2. Specifically, in Study 3, we tested a different type of imagined interaction that has shown to be both pleasurable as well as important for children's development (Miller et al., 1992). Instead of imagining while drawing a meeting with an outgroup member, we asked children to imagine while writing a letter to an outgroup member by narrating it to the researcher. The target group was again represented by Black children. With the aim of adding generalizability to our findings, we used a slightly different measure of resource allocation. In fact, the choice to allocate resources to outgroup members may be independent from the choice to allocate resources to the ingroup (Brewer, 1999), while our previous measures confounded ingroup with outgroup allocation. To parallel the attitude and behavioral intentions measures used in the three studies, we therefore used a similar measure tapping specifically on allocation to the *outgroup*. In order to further extend our conclusions, we also introduced a new dependent measure, behavioral inclusiveness (i.e., the degree to which participants agreed to share their friends with outgroup members), allowing us to test whether positive effects of the intervention are independent on the type of behavioral measure used, and a new type of control condition where children were asked to imagine contact with an ingroup member (e.g., Vezzali, Stathi, Crisp, Giovannini, et al., 2015, Study 1).

Method

Participants, Design and Procedure

Participants were 45 White 4- and 5-year-old children (22 males, 23 females) from a pre-school located in Northern Italy. Parental consent was obtained, none of the parents opted out of the study. Children were randomly allocated to the experimental ($N = 23$) or to the control ($N = 22$) condition.

Participants engaged in the tasks individually. In the *experimental* condition, children were asked to imagine that a new child would come to their class, and they were shown the drawing of the same-sex Black child used in Study 2. The researcher then explained that they would imagine writing a letter to this child, and in order to do so they had to imagine playing with him/her in order to become friends. Children were then asked to dictate to the researcher what they were imagining in order to write the letter. The *control* condition was identical; in this case however children were shown a drawing of a same-sex White child and asked to imagine contact with him/her. As in Studies 1 and 2, immediately after the manipulation, children had face-to-face interviews with the researcher to complete the dependent measures. The experimental design also included 38 participants from two additional conditions that we had included with exploratory purposes, tapping on the new concept of imagined vicarious contact, consisting in imagining to observe a positive encounter between an ingroup and an outgroup member. However, we had indications that children did not understand the manipulation. This is consistent with previous theorizing that perspective-taking abilities and importance attributed to social norms start developing in later childhood (e.g., Aboud, 2003, 2008). Therefore, we excluded these conditions from analyses.

Measures

Intergroup attitudes. Intergroup attitudes were assessed with the same measure used in Study 2.

Behavioral intentions. The measure was similar to the one used in the first two studies. In this case, however, we used two items: “Would you like to play with this child?”; “Would you like having this child as a friend?”. Because the two items used to assess behavioral intentions toward the ingroup were uncorrelated ($r = .11, p = .459$), we only considered items where the outgroup was the target ($r = .84, p < .001$).

Resource allocation bias. The measure was similar to the one used in the first two studies. In this case, however, we only asked to allocate coins to the outgroup child (scores therefore ranged from 0 to 5).

Behavioral inclusiveness. Participants were asked to indicate their three best friends. They were then shown the drawing of a same-sex Black child and invited to imagine that a child like him/her would come to their class. They were then asked how many of their three best friends just nominated they would like to introduce to the new Black child in order to play altogether. Scores ranged from 0 to 3.

Results and Discussion

Differences between Conditions

Means and standard deviations of all measures in the experimental and control conditions are reported in Table 3. As can be noted, intergroup attitude bias was significantly lower in the imagined contact than in the control condition, an effect driven by more positive outgroup attitudes. It is interesting to note that, whereas ingroup attitudes were positive (i.e., scores above 0) in both conditions, $t_s > 11.09, p_s < .001, d_s > 2.36$, outgroup attitudes were positive in the

experimental condition, $t(22) = 3.11, p < .01, d = 0.65$, but negative (i.e., mean score lower than 0) in the control condition, $t(21) = 2.24, p < .05, d = 0.48$.

As predicted, outgroup behavioral intentions were more positive in the experimental condition. Importantly, the positive effect of the intervention extended to both measure of behavior, i.e., resource allocation bias and behavioral inclusiveness (Table 3).

Mediation Analyses

Mediation was tested by following the same procedure used in the first two studies. See Figures 1 and 2. We found that intergroup attitude bias was significantly associated with the three outcome measures ($b = -.14, SE = .03, p < .001$, for outgroup behavioral intentions, $b = -.18, SE = .07, p < .05$, for resource allocation bias, $b = -.16, SE = .05, p < .01$, for behavioral inclusiveness). Moreover, the association between experimental condition and outcome variable was significant for outgroup behavioral intentions, $b = .68, SE = .17, p < .001$, and for behavioral inclusiveness, $b = .52, SE = .24, p < .05$, but not for resource allocation bias, $b = .50, SE = .37, p = .179$.

Mediation by intergroup attitude bias was significant for the three variables: outgroup behavioral intentions (point estimate = .32, $SE = .13$, confidence interval ranging from .111 to .648; completely standardized indirect effect = .40, $SE = .15$, confidence interval ranging from .158 to .776), resource allocation bias (point estimate = .41, $SE = .22$, confidence interval ranging from .053 to .950; completely standardized indirect effect = .16, $SE = .09$, confidence interval ranging from .022 to .389), behavioral inclusiveness (point estimate = .36, $SE = .15$, confidence interval ranging from .117 to .721; completely standardized indirect effect = .20, $SE = .08$, confidence interval ranging from .069 to .412).

Note that in this study all three dependent variables specifically referred to outgroup perceptions, rather than to comparative measures including components of both ingroup and outgroup perceptions. Therefore, in order to match the mediator variable with the three dependent variables, we added a set of analyses identical to those presented above, using outgroup attitudes instead of intergroup attitude bias as the mediator.

We found that outgroup attitudes was significantly associated with outgroup behavioral intentions and behavioral inclusiveness ($b = .12$, $SE = .04$, $p < .01$, and $b = .14$, $SE = .05$, $p < .01$, respectively), but not with resource allocation bias ($b = .07$, $SE = .08$, $p = .919$). Moreover, the association between condition and outcome variable was significant for outgroup behavioral intentions, $b = .71$, $SE = .19$, $p < .001$, and for behavioral inclusiveness, $b = .53$, $SE = .25$, $p < .05$, but not for resource allocation bias, $b = .73$, $SE = .41$, $p = .080$.

Mediation by outgroup attitudes was significant for outgroup behavioral intentions (point estimate = .29, $SE = .12$, confidence interval ranging from .109 to .612; completely standardized indirect effect = .19, $SE = .07$, confidence interval ranging from .070 to .376), and behavioral inclusiveness (point estimate = .35, $SE = .17$, confidence interval ranging from .076 to .756; completely standardized indirect effect = .20, $SE = .10$, confidence interval ranging from .043 to .415). Mediation was instead nonsignificant for resource allocation bias (point estimate = .18, $SE = .22$, confidence interval ranging from -.210 to .660; completely standardized indirect effect = .07, $SE = .09$, confidence interval ranging from -.088 to .271).

Study 3 replicated Studies 1 and 2 with a different type of imagined interaction and a further control condition, and provided further support that imagined contact can reduce intergroup bias in young children and that it does so via improved outgroup attitudes.

General Discussion

The purpose of the present research was to examine for the first time the effectiveness of using new variants of imagined contact to reduce prejudice in 4-6-year-old preschool children. The findings suggest that there are benefits to using imagined contact interventions for young children who are not yet able to read and write.

The present three experiments consistently suggest that imagined contact can promote more positive intergroup relations in terms of more positive outgroup attitudes, and greater willingness to engage in contact with the outgroup. Moreover, effects are not limited to outgroup attitudes or intentions, but extend to behavior in terms of less bias toward the outgroup in a resource allocation task, and self-reported behavior in terms of greater behavioral inclusiveness toward the outgroup. Note that bias measures (where differences between ingroup and outgroup ratings were computed) revealed that children actually displayed ingroup bias (e.g., preferential treatment of the ingroup over the outgroup), and this effect was reduced in the experimental condition. Intergroup attitudes mediated the effect of imagined contact on behavioral intentions, resource allocation bias and behavioral inclusiveness.

These findings are in line with previous research that demonstrated the power of intergroup mental imagery in promoting positive intergroup relations (e.g., Crisp & Turner, 2012; Miles & Crisp, 2014). The findings are also consistent with research showing that imagined contact not only improves attitudes and behavioral intentions in adults, but also improves intergroup relations in school children. Previous research has focused on children ages 7-10 years (Cameron et al., 2011; Stathi et al. 2014; Vezzali, Capozza, Giovannini et al., 2012; Vezzali, Capozza, Stathi et al., 2012; Vezzali, Stathi, Crisp, Giovannini et al., 2015), only one study looked at younger children ages 5 and 6 years (Cameron et al., 2011). Note that, due to

different educational systems, participants in the study by Cameron et al. (2011) were enrolled in primary school, whereas we focused on pre-schoolers (with the consequence that we had to adapt the basic imagined contact paradigm to children who had yet to be taught how to read and write). In addition, Cameron et al. provided preliminary evidence by considering 5-6 year-old children as one of three age groups in a larger study on imagined contact with children, showing effects on attitudes toward disabled people. We are extending this research by demonstrating the applicability and effectiveness of imagined contact in pre-school children ages 5 and younger, by using different intergroup relations, a wide range of outcome measures and control conditions, and including behavioral measures.

It is worth noting that the intervention seemed to have produced slightly stronger effects when the target was represented by a disabled (Study 1) rather than a Black child (Studies 2 and 3). This may depend at least in part from higher (direct or indirect) experience with Black than with disabled children; unfortunately, the lack of an appropriate contact items (see below) does not allow us to test this possibility.

Limitations

We acknowledge some limitations in this research. First, outcome variables were assessed immediately after the manipulation. Although studies with older children (e.g., Vezzali, Stathi, Crisp, Giovannini et al., 2015, Study 1) and adults (Vezzali, Stathi, Crisp, Giovannini et al., 2015, Study 2) showed that effects of imagined contact can last for some weeks up to several months, this evidence is still needed with very young samples. Second, although we demonstrated effects on behavior, behavioral measures did not entail an actual interaction with an outgroup member (all studies) or were merely self-reported (behavioral inclusiveness, Study 3).

Our study employed a between-participants design, as traditionally used in imagined contact studies (Miles & Crisp, 2014). A limitation of Aboud et al.'s (2012) reviewed contact studies was that there was no check of whether contact occurred at an individual level. An advantage of imagined contact, and our tailored instruction to children ages 4-6 years in an experimental context is that it ensured an individual-level contact situation. Consistently, imagined contact research, which is largely experimental, typically does not control for pre-test differences and/or previous contact level. In fact, individual differences, including past contact experiences, should be randomly distributed between conditions when using experimental designs. In addition, the fact that random assignment was at the individual level, and not at the class level, added to the likelihood that pretest differences, for instance due to exposure to outgroup members within the class, were evenly distributed. Also note that previous studies conducted with children revealed that effects of imagined contact are independent from effects of direct contact (Vezzali, Stathi, Capozza, & Crisp, 2015). However, similar to previous imagined contact research, we did not control for initial contact, this is a limitation of the present study. Relatedly, we did not conduct a pre-test, therefore our conclusions are based on differences between conditions after interventions, rather than on measured change from before to after the intervention. We did not use a within-participants design to avoid problems such as priming, and also to match the school's request to stick to a limited number of sessions in order to avoid taking away class hours. Future research could employ a within-participants design to directly examine a change in the levels of contact and prejudice pre- and post-interventions and control for this important variable. Furthermore, direct contact may moderate the relationship between imagined contact and prejudice.

Implications

Our results extend previous research in several ways. First, our results extend imagined contact to children ages 4-6 years. As this is a time when children experience large changes in their development (including ethnic identity and prejudice; Aboud, 2003, 2008; Raabe & Beelman, 2011), it is also a time where interventions may be particularly fruitful to lead to positive socio-cognitive development including lower prejudice.

Second, we showed that imagining intergroup contact does not require writing down what an individual has imagined to reinforce the manipulation. In fact, previous research generally asked participants to engage in mental imagery, before reinforcing instructions, for instance writing down what had been imagined (cf. Crisp & Turner, 2012). In the present article, we considered new ways of implementing imagined contact, by embedding the mental simulation in a specific task (i.e., drawing, Studies 1 and 2, or dictating a letter, Study 3). This form of imagined contact may be especially useful for young children, who may be easily distracted and benefit from instructions and support in order to use their imagination (Joh et al., 2011; Rieser et al., 1994).

Third, we identified outgroup attitudes as a mediator of both behavioral intentions and outgroup behavior. Although previous research has identified attitudes as a mediator of the relationship between imagined contact and contact intentions in primary school children (Stathi et al., 2014), we extend this work by showing that attitudes also mediate the effect of imagined contact on outgroup behavior in 4-6 year-old children.

Practically, as our societies are becoming more and more diverse, designing prejudice-interventions is important to tackle and prevent intergroup conflict from early on. As children's identity develops at a young age, and with it prejudice toward groups other than their own, it is

important to incorporate prejudice education in the school curriculum and include tailored interventions to reduce the development of prejudice (Aboud & Levy, 2000). Imagined contact tasks can be implemented with little cost, in particular when they are linked with already natural and enjoyable tasks for children such as drawing. Such tasks also involve an active approach to engaging with intergroup information rather than a passive receipt of knowledge, which enhances learning (Randi & Corno, 2000). Educational settings are a valuable and safe context in which children can develop cross-group friendships. Imagining and drawing intergroup contact in such a setting can foster direct contact with other groups, which in turn could result in long-lasting changes in attitudes and behaviors toward stigmatized outgroups.

Conclusion

These three experiments contribute to the literature on reducing prejudice in very young children. Previous imagined contact research has focused on intergroup conflict in school children and adults, we show, for the first time, that imagined contact can be effective in 4-6 year-old children enrolled in pre-schools, by using unique imagined contact variants based on mentally simulating an intergroup interaction while performing a pleasurable and engaging task. Our findings are important in promoting more positive intergroup relations from an early age on, and designing prejudice-reduction interventions tailored to the specific needs of young children.

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Table 1

Means and standard deviations of all measures as a function of condition (Study 1)

Measure	Range measure	Condition		<i>t</i> -test	<i>d</i>
		Experimental	Control		
Ingroup attitudes	From -4 to +4	1.60 (1.79)	2.71 (1.43)	3.05**	0.70
Outgroup attitudes	From -4 to +4	2.46 (1.58)	0.00 (2.10)	6.00***	1.32
Intergroup attitude bias	From -8 to +8	-0.86 (2.42)	2.71 (2.74)	6.23***	1.38
Ingroup behavioral intentions	From 1 to 3	2.68 (0.45)	2.70 (0.39)	0.22	0.05
Outgroup behavioral intentions	From 1 to 3	2.73 (0.39)	2.10 (0.54)	5.90***	1.34
Behavioral intentions bias	From -2 to +2	-0.05 (0.47)	0.60 (0.57)	5.58***	1.24
Resources allocation bias	From -5 to +5	-0.30 (1.06)	1.42 (1.62)	5.73***	1.26

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Standard deviations shown in parentheses. $N = 81$.

Table 2

Means and standard deviations of all measures as a function of condition (Study 2)

Measure	Range measure	Condition		<i>t</i> -test	<i>d</i>
		Experimental	Control		
Ingroup attitudes	From -4 to +4	1.90 (1.47)	3.10 (1.22)	3.45***	0.89
Outgroup attitudes	From -4 to +4	-0.55 (1.45)	-2.06 (1.57)	3.87***	1.00
Intergroup attitude bias	From -8 to +8	2.45 (1.97)	5.16 (2.24)	4.97***	1.28
Ingroup behavioral intentions	From 1 to 3	2.67 (0.46)	2.68 (0.45)	0.13	0.02
Outgroup behavioral intentions	From 1 to 3	2.34 (0.43)	1.94 (0.62)	2.94**	0.75
Behavioral intentions bias	From -2 to +2	0.32 (0.54)	0.74 (0.66)	2.69**	0.70
Resources allocation bias	From -5 to +5	1.83 (2.30)	2.87 (2.25)	1.78 [†]	0.46

Note. [†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p \leq .001$. Standard deviations shown in parentheses. $N =$

60.

Table 3

Means and standard deviations of all measures as a function of condition (Study 3)

Measure	Range measure	Condition		<i>t</i> -test	<i>d</i>
		Experimental	Control		
Ingroup attitudes	From -4 to +4	3.35 (0.78)	3.09 (1.31)	0.81	0.24
Outgroup attitudes	From -4 to +4	1.39 (2.15)	-1.09 (2.29)	3.76***	1.17
Intergroup attitude bias	From -8 to +8	1.96 (2.14)	4.18 (2.52)	3.20**	0.95
Outgroup behavioral intentions	From 1 to 3	2.89 (0.30)	1.89 (0.82)	5.44***	1.62
Resources allocation bias	From 0 to 5	2.91 (1.04)	2.00 (1.31)	2.60*	0.77
Behavioral inclusiveness	From 0 to 3	2.65 (0.65)	1.77 (0.92)	3.69***	1.10

Note. * $p < .05$. ** $p < .01$. *** $p \leq .001$. Standard deviations shown in parentheses. $N = 45$.