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## Imagined contact as a prejudice-reduction intervention in schools: the underlying role of similarity and attitudes

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### Abstract

The present research tested a prejudice-reduction intervention based on imagined contact. White children imagined interacting with a child from an ethnic out-group (Asian) once a week for 3 weeks, or did not take part in this activity (control group). Compared with the control group, children who engaged in imagined contact subsequently showed more positive attitudes, greater perceived similarity, and willingness for intergroup contact. The effect of the intervention on willingness for contact was mediated by positive attitude change. Implications for imagined-contact theory and the development of prejudice-reduction techniques for schools are discussed.

Psychological research has demonstrated that from a young age, children can express negative intergroup attitudes, whereby they have more positive views of members of their own social group, compared with other groups. This is the case, for example, with ethnic groups, nationalities, teams, and even *ad hoc* minimal groups (see Abrams, Rutland, & Cameron, 2003; Brown, 1995; Cameron, Rutland, Brown, & Douch, 2006; Nesdale, 2001, 2008; Nesdale, Durkin, Maass, Kiesner, & Griffiths, 2008). These attitudes can manifest themselves in a number of ways. For example, when asked to attribute positive and negative traits to members of their own and other ethnic groups, children tend to assign more positive traits and/or less negative traits to their own group compared with the ethnic out-group (Rutland et al., 2007). Children are also more likely to choose to play with members of their own group (Hayden-Thompson, Rubin, & Hymel, 1987; Maccoby & Jacklin, 1987) and show more general positive affect for them, compared with other groups, a process that can lead to prejudice (Nesdale, Durkin, Maass, & Griffiths, 2005; Nesdale & Flessler, 2001).

Importantly, these negative attitudes in childhood can be challenged through prejudice-reduction interventions (e.g., Aboud & Fenwick, 1999; Bigler, 1999; Cameron et al., 2006; Pfeifer, Brown, & Juvonen, 2007; Turner & Brown, 2008; for review, see Paluck & Green, 2009). A number of anti-racist programs used in schools that prompt children to recognize and confront prejudice both in their own attitudes and

in society tend to be successful in improving children's attitudes toward out-groups (Short & Carrington, 1996; Walker, 1989). Recent reviews have highlighted the need to develop prejudice-reduction interventions that derive from psychological theories of prejudice development, as well as the need for systematic evaluation of such interventions (Bigler, 1999; Cameron & Rutland, 2006; Paluck & Green, 2009). Importantly, the evaluation of interventions is necessary in order to determine its effectiveness, establish why the intervention works and identify who is most likely to benefit from it (see Paluck & Green, 2009).

In line with this, in the present research, we implement and evaluate a prejudice-reduction program based on a recent development in social psychology, imagined contact (Crisp & Turner, 2009). To this end, research of imagined contact as a school-based intervention is scarce (for an exception see Vezzali, Capozza, Stathi, & Giovannini, 2012). We examine the effect of imagined contact on willingness for real intergroup contact, and test whether perceived similarity and positive attitudes mediate this effect. In this way, the research offers both theoretical and practical implications. That is, we aim to develop an effective prejudice-reduction intervention, and advance the social psychological and developmental literatures by testing imagined contact in the field and by examining new potential underlying mechanisms of its effect on children's attitudes.

## Intergroup contact theory

A theory that focused on reducing intergroup bias and has become one of the most influential theories in the field of intergroup relations is intergroup contact theory (Allport, 1954; Pettigrew, 1998). According to the “contact hypothesis” (Allport, 1954), social interactions between members of different groups lead to improved intergroup relations, provided these interactions meet the optimal conditions of equal status, cooperation in order to achieve common goals, high degree of frequency, and institutional support. Ample research has provided strong evidence about the effectiveness of intergroup contact in reducing prejudice (e.g., Eller & Abrams, 2004; Pettigrew & Tropp, 2008; Stathi & Crisp, 2010; Voci & Hewstone, 2003; for review, see Pettigrew & Tropp, 2006). Research with adolescents and children in particular has shown that direct intergroup contact is associated with reduced intergroup bias among children from 3 years of age through to adolescence, and in multiple social contexts (e.g., Aboud, Mendelson, & Purdy, 2003; Feddes, Noack, & Rutland, 2009; Jackson, Barth, Powell, & Lochman, 2006; Rutland, Cameron, Bennett, & Ferrell, 2005; Tropp & Prenovost, 2008; Wagner, Van Dick, Pettigrew, & Christ, 2003).

The contact hypothesis has since been applied to understand the impact of indirect forms of contact (Dovidio, Eller, & Hewstone, 2011), such as extended (Wright, Aron, McLaughlin-Volpe, & Ropp, 1997) and imagined contact (Crisp & Turner, 2009). These indirect contact forms are powerful adaptations of the theory, as they do not require direct experience of contact; rather, they require the psychological representation of contact.

More specifically, according to the extended contact hypothesis, knowledge that an in-group member has a close relationship with an out-group member can help improve intergroup attitudes. This hypothesis has been supported both with adult (Paolini, Hewstone, Cairns, & Voci, 2004; Wright et al., 1997) and child samples (Cameron & Rutland, 2006; Cameron, Rutland, & Brown, 2007; Liebkind & McAlister, 1999). Extended contact is especially valuable because it can be implemented in contexts where there is little opportunity for direct interactions between groups. As an indirect form of contact, it is also less likely to evoke negative feelings that have been associated with avoidance of interracial interactions (Plant & Devine, 2003; Stephan & Stephan, 1985).

Capitalizing on the idea that direct experiences are not necessary for contact to exert positive effects, Crisp and his colleagues have argued that simply imagining positive intergroup interactions may lead to improved attitudes toward an out-group (Crisp, Husnu, Meleady, Stathi, & Turner, 2010; Crisp, Stathi, Turner, & Husnu, 2008; Crisp & Turner, 2009; Stathi, Crisp, Turner, West, & Birtel, 2012). Imagined inter-

group contact is defined as the “mental simulation of social interaction with a member or members of an outgroup category” (Crisp et al., 2008, p. 8; see also Crisp & Turner, 2009). Research shows that mental imagery increases the accessibility of abstract groups as a result of mentally simulated concepts associated with that social context (Garcia, Weaver, Moskowitz, & Darley, 2002). As such, the imagined-contact hypothesis suggests that mentally simulating a positive contact experience activates thoughts and feelings that are normally associated with successful interactions with members of other groups. The beneficial effects of imagined contact have been well documented in the literature. Indeed, the mental simulation of contact experiences has generally been found to improve both explicit (Harwood, Paolini, Joyce, Rubin, & Arroyo, 2011; Turner, Crisp, & Lambert, 2007; West, Holmes, & Hewstone, 2011) and implicit out-group attitudes (Turner & Crisp, 2010; Vezzali, Capozza, Giovannini, & Stathi, 2012). Overall, research has shown that imagined contact enhances positive intergroup attitudes and perceptions of out-group variability (Turner, Crisp, et al., 2007), projection of positive traits to the out-group (Stathi & Crisp, 2008), contact self-efficacy (Stathi, Crisp, & Hogg, 2011), trust (Pagotto, Visintin, De Iorio, & Voci, 2013; Vezzali, Capozza, Stathi, et al., 2012) and reduces self-stereotyping and stereotype threat (Abrams et al., 2008; Crisp & Abrams, 2008), anxiety (Turner, Crisp, et al., 2007), negative stereotyping (Brambilla, Ravenna, & Hewstone, 2012; Stathi, Tsantila, & Crisp, 2012) and infrahumanization of the out-group (Vezzali, Capozza, Stathi, et al., 2012).

The imagined-contact technique has important strengths: it can be used where actual or extended contact is impractical, for example, in contexts of pervasive segregation where even extended contact is unlikely. Furthermore, it can be used as an inexpensive and easily applied implementation of contact theory. In addition, when properly structured, the mental imagery of contact can allow people to engage in simulated contact without experiencing the anxiety that is in many cases associated with direct intergroup contact (Stephan & Stephan, 1985; see also Plant & Devine, 2003; for an extended discussion of this issue, see Crisp & Turner, 2009).

According to Crisp and colleagues, imagined contact has great potential as a practical prejudice-reduction intervention for use in schools as it can be used with a wide age range of children from diverse backgrounds and abilities and could be both practical and efficient (Crisp et al., 2008; Crisp & Turner, 2009). Furthermore, unlike direct and extended contact, imagined contact does not require a person to live in a context where they themselves have contact with out-group members, or where out-group members are known to anyone from the in-group (as required for the extended contact strategy). Therefore, it can be used in low-diversity contexts where intergroup bias is likely to form and go unchallenged (e.g., Rutland et al., 2005). Furthermore, since extended contact

has been shown to be an effective prejudice-reduction tool with young children (Cameron et al., 2006), it is feasible that imagined contact will also be effective, particularly as it is more immediate and involves the child directly, as opposed to merely observing intergroup interactions. That is, while in extended contact interventions, children typically either read about or observe in-group members interacting with the out-group; in imagined-contact interventions, children take an active role in creating a contact scenario that involves the self and an out-group member.

In a recent pilot study, Cameron and colleagues found that immediately after imagining interacting with a member of a stigmatized group (the disabled), children held more positive views of that group (Cameron et al., 2011). In a more structured intervention, Vezzali, Capozza, Giovannini, et al. (2012) tested the impact of imagined contact among 10-year-old Italian elementary school children who participated in a three-session program. Children were asked to imagine a positive interaction with an unknown immigrant child at school (first session), in the neighborhood (second session), at the park (third session). After each imagery task, children were given 15 minutes to write down a detailed description of the imagined events. Approximately 1 week after the last session, children who participated in the intervention indicated more positive explicit and implicit attitudes toward immigrants, compared with controls. Furthermore, children's reported self-disclosure to the out-group mediated the effect of imagined contact on behavioral intentions. Therefore, there is initial evidence that imagined contact can be effective in improving children's intergroup attitudes. In our research, we aim to extend research by Vezzali and colleagues by evaluating a more elaborate imagined-contact intervention with younger children. We also extend imagined-contact theory by testing the role of similarity as a potential outcome of imagined contact.

## The current research

The current intervention builds on recent findings and tests a more elaborate version of the imagined-contact technique, where White British children create stories, with the use of pictures, drawings, and other materials to stimulate their imagination, featuring themselves and Asian children. The increasing number of Asian children in British schools, especially in urban areas, makes this context particularly pertinent. Furthermore, we test the intervention with younger children compared with those in Vezzali, Capozza, Giovannini, et al. (2012); the mean age of children in their study was 10 years and 5 months, whereas we test the intervention among 7- to 9-year-olds. We also include two variables that have not been investigated in imagined contact with children before: similarity and attitudes.

The critical role of imagined contact is based on its potential as a *preparatory* measure (Crisp et al., 2008; Crisp & Turner, 2009; Stathi et al., 2011). In the imagined-contact technique, people are generally asked to mentally simulate an intergroup interaction, and imagine how they feel and what they learn in intergroup situations, so they can gradually become more inclined to seek out real contact with the out-group. In other words, imagined contact may help people overcome initial inhibitions regarding intergroup interactions and prepare them for future contact (Stathi et al., 2011). Therefore, the current research sought to investigate whether engaging in imagined contact promotes children's willingness to interact with the out-group.

## Underlying mechanisms

The current research also examines two potential underlying mechanisms of the imagined-contact effect: perceived similarity with the out-group and positive attitudes toward the out-group.

### Similarity

Similarity plays an important role in predicting affiliation and liking (Byrne, 1969; for review, see McPherson, Smith-Lovin, & Cook, 2001). Gaertner, Dovidio, Anastasio, Bachman, and Rust (1993) and Gaertner, Mann, Dovidio, Murrell, and Pomare (1990) argue that an important part of the process leading from contact to the reduction of intergroup bias is the out-group moving closer to the self, a process that can be operationalized as similarity to the self. In addition, research on intergroup contact and closeness has shown that similarity is a key factor in reducing bias (Stephan, 1999). Similarity within and between groups has been shown to be related to intergroup contact and perceptions of cross-group friendship. For example, McGlothlin (2004) found that European American children attending an ethnically homogeneous school thought cross-race friendships were less likely than same-race friendships. In addition, McGlothlin and Killen (2005) examined the impact of intergroup contact on perceived similarity between members of the in-group and out-group and perceptions of cross-group friendships and found that intergroup contact influenced perceptions of similarity in first and fourth grade children. Accordingly, Wright and Tropp (2005) found that White pupils in bilingual classes perceived greater similarity between the self and Latino children than pupils in English-only classes.

### Attitudes

Previous research has also demonstrated the positive relationship between out-group attitudes and willingness for intergroup contact (or intended behavior) among children

(Cameron et al., 2006). Also, research with adults has shown that out-group attitudes mediate the effect of imagined contact on contact intentions (Husnu & Crisp, 2010). However, out-group attitudes have not previously been examined for their potential role in mediating the relationship between prejudice-reduction interventions and willingness for contact in children. In a recent longitudinal study, Jugert, Noack, and Rutland (2011) found that positive intergroup attitudes predicted reduced preference for same-ethnic friendships among children attending an ethnically heterogeneous school. Given this link between attitudes and friendship preference, evaluating ways to promote positive attitudes in children is highly important. Especially in contexts of homogenous schools, where the opportunity for actual intergroup contact is more scarce, testing whether a prejudice-reduction technique such as imagined contact can improve intergroup attitudes, and subsequently lead to greater willingness to mix with the out-group when given the opportunity, can be particularly beneficial. This hypothesis is also theoretically interesting as it is in line with the literature that suggests that attitudes can predict behavior, at least when they are accessible from memory and in relevant situations (DeBono & Snyder, 1995; Zanna & Fazio, 1982).

## Hypotheses

We predicted that children who engaged in imagined intergroup contact would hold more positive attitudes, perceive greater self-out-group similarity, and report greater willingness for contact than the control group, which did not receive the intervention. It was hypothesized that the intervention would have no effect on in-group orientation so that the control group and intervention group would hold similar attitudes toward, and willingness for contact with, the in-group (cf. Cameron & Rutland, 2006). Finally, we predicted that the effect of the intervention on willingness for contact would be mediated by increased similarity between self and the out-group, and more positive out-group attitudes.

## Method

### Participants

One hundred twenty-nine White children (65 boys, 59 girls, 5 unknown) from local primary (elementary) schools were tested.<sup>1</sup> Children were randomly assigned to either the intervention or the control condition. The age of the children ranged from 7 years to 9 years and 11 months (mean age in both the control and intervention condition was 8 years and 7

months). Children attended schools in mixed social class suburban or rural areas outside a medium-size city in the south-east of England.

### Design

The study used a one-factor between-participants design: condition (control vs. imagined contact). The dependent variables were willingness for future contact (intended behavior) with the in-group and out-group; in-group and out-group attitude; and self-in-group and self-out-group similarity.

### Procedure

The children from the participating classes were randomly assigned to the imagined contact or control condition. Those in the imagined-contact condition took part in the intervention once a week, for 3 weeks (making a total of three sessions per participant) and completed the activity individually with the researcher. Children in the intervention were given a large drawn picture (A3 size), different in every session, of either a park setting, a birthday party or the beach, and laminated pictures of related objects (e.g., swings, a dog, a round-a-bout, a birthday cake, flowers, a fish, a ball, a sandcastle, etc.). Children were also given a photograph of themselves and a photograph of an Asian child (gender-matched to participant). Importantly, in every session, children were presented with a different Asian child in order to enhance the generalizability of the intergroup interactions. Furthermore, in order to stimulate the imagination of the children and create the conditions that resemble real friendships (Turner, Hewstone, Voci, Paolini, & Christ, 2007), some information about the Asian child in the picture was provided (e.g., what they like and dislike, what subjects they are good at, etc.).

Children used the photographs and the pictures to create a story that featured themselves and the Asian child. Specifically, children were told: "Today we are going to be creating stories about a day out that you might have with a new friend. This is (for example) Suneeta (Aaron) and you are going to pretend you are going out for the day with her (him). What I want you to do today is think about a day out at the beach (party/park) that you may have with your new friend. Create a story about the day out at the beach (party that you go to/playing at the park) with this child." During the session, the researcher used the following prompt: "Can you please tell me what things you did that were fun and what things you did that you found interesting whilst you were at the beach (party/park) with your Asian friend?" Such questions and pictures served as a prompt for children to encourage them to create their imagined-contact scenario. The intervention incorporated the elements that previous research has shown are required for effective imagined contact: the simulation of

<sup>1</sup>The data were collected from four schools. Only those children who had participated in all three intervention sessions were included in the analysis.

interactions and the positive tone of the contact experience (Crisp et al., 2008).

In order to provide a baseline of children's attitudes toward Asian children, there was a control condition in which children did not receive the intervention. Children in the imagined-contact intervention were interviewed individually approximately 1 week after the imagined-contact session. Children in the control condition did not complete the imagined-contact activity, and completed the individual interview only.

The researchers who visited the schools were trained to control their reactions toward children's responses to ensure they would not provide positive or negative feedback on the responses, and thus reduce the possibility that children provide socially acceptable answers. Furthermore, the researchers who conducted the post-intervention questionnaire were different from the researchers who delivered the intervention.

### Dependent measures

The interview took place in one session, lasting approximately 15–20 minutes. To avoid order effects, the measures were counterbalanced with half the children receiving the intended behavior measure first and the other half receiving the general attitude measure first.

#### *Perceived similarity with the in-group and the out-group*

A simplified version of the "inclusion of others in the self" scale (Aron, Aron, & Smollan, 1992) was used. This scale consisted of three pairs of circles varying in their degree of overlap between the self (as one circle), and a sketch of in-group or out-group children (as another circle). Children were asked to choose the pair of circles that best described how similar they are to the children in the picture (representing the in-group and the out-group, respectively). Higher numbers indicate higher perceived similarity.

#### *Attitudes toward the in-group and the out-group*

This measure was used to create separate indices of in-group attitude and out-group attitude. Children were presented with 10 traits (5 positive and 5 negative) that were derived from Cameron and Rutland (2006). The positive traits were nice, pretty or handsome, good, friendly, and smart. The negative traits were mean, dirty, selfish, naughty, and unfriendly.

Children were presented with two photographs of children, one child was Asian (representing the target out-group) and one child was White (representing the in-group). Children were asked to think about the children in the photograph and indicate, on a 4-point scale (1 for *none*, 4 for *all*),

how many of those children possess the relevant trait. The mean of positive and of negative traits assigned to the in-group and the out-group was then calculated. An in-group general attitude score was then computed by subtracting the mean of the negative adjectives from the mean of the positive adjectives. Out-group general attitude was calculated in the same way. In this way, indicators of general positive attitude toward the in-group and out-group were calculated, with higher scores indicating more favorable attitudes toward the in-group and the out-group, respectively.

#### *Willingness for contact (intended behavior)*

This measure assessed how children intended to behave in a hypothetical situation toward Asian children, and was an indicator of children's future contact behaviors toward the target out-group (Cameron et al., 2006). Children were presented with a hypothetical scenario in which they were asked to imagine they were at the park and they met a child. Children were shown a photograph of an Asian child (gender-matched to participant) and were asked to indicate how much they would like to play with this child, how much they would like them, and how much they would like to have them over to their house for a meal and to stay overnight (Lewis & Lewis, 1987). Participants responded on 5-point Likert scale, using smiley faces to indicate the extent they would like to engage in that contact behavior with the target, where 1 = *big frown* to 5 = *big smile*. The same process, by using a picture of an in-group child, was used to measure willingness for contact with the in-group. Composite means were created resulting in a measure of willingness for contact for each child.

## Results

Correlations among variables can be found in Table 1.

### Perceived similarity

An independent samples *t* test revealed that following the imagined-contact intervention, children reported significantly higher similarity between the self and the out-group ( $M = .95$ ,  $SD = .65$ ) compared with the control condition, in which children did not receive the intervention ( $M = .70$ ,  $SD = .54$ ),  $t(127) = -2.31$ ,  $p = .023$ , Cohen's  $d = .42$ . There was no significant effect of condition on similarity with the in-group. In other words, as we expected, the intervention increased perceived similarity with the out-group without affecting similarity with the in-group.

### Positive attitudes

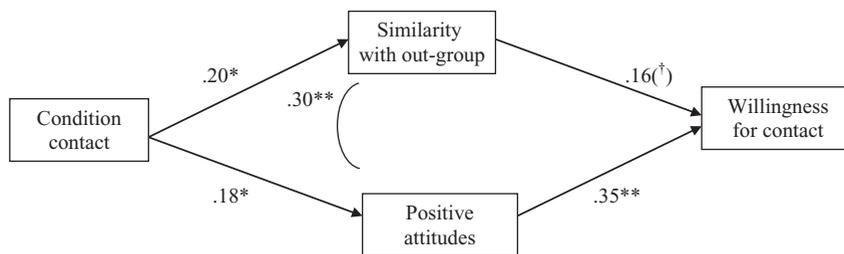
An independent samples *t* test revealed that children who took part in the intervention reported significantly higher positive attitudes toward the out-group ( $M = 1.35$ ,  $SD = .85$ )

**Table 1** Correlations Among All Variables

	1	2	3	4	5	6	7
1. Condition	—						
2. Positive out-group attitudes	.184*	—					
3. Positive in-group attitudes	.013	.491***	—				
4. Self-out-group similarity	.201*	.327***	.240**	—			
5. Self-in-group similarity	.069	.141	.087	.291***	—		
6. Willingness for contact with the out-group	.182*	.401***	.293**	.271**	.180*	—	
7. Willingness for contact with the in-group	.104	.302***	.232**	.185*	.181*	.455***	—

Note. Experimental condition is a dummy-coded variable (1 = *imagined contact*; 0 = *control*).

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



**Figure 1** Path model showing the relationship between condition (coded as 0 for control, 1 for intervention), similarity with the out-group, positive attitudes, and the outcome of willingness for contact with the out-group. Numbers are standardized regression coefficients ( $\beta$ ). Only significant and marginally significant paths are reported. (†) $p = .065$ . \* $p < .05$ . \*\* $p < .001$ .

compared with children in the control condition ( $M = 1.03$ ,  $SD = .83$ ),  $t(127) = -2.12$ ,  $p = .036$ , Cohen’s  $d = .38$ . Therefore, as predicted, White children who imagined positive contact experiences with Asian children reported more positive attitudes toward them. There was no significant effect of condition on positive attitudes toward the in-group.

**Willingness for contact (intended behavior)**

An independent samples  $t$  test revealed that following the imagined-contact intervention children were significantly more willing to interact with the out-group ( $M = 4.13$ ,  $SD = .80$ ) compared with children in the control condition who did not participate in the intervention ( $M = 3.79$ ,  $SD = .99$ ),  $t(127) = -2.08$ ,  $p = .039$ , Cohen’s  $d = .38$ . That is, White children who had imagined positive contact with Asian children were more willing to interact with the out-group in the future. There were no significant differences on willingness for contact with the in-group between the intervention and the control condition.

**Path analysis**

Path analysis with observed variables was computed to examine whether the intervention predicted willingness for contact with the out-group via perceived similarity between the self and the out-group and positive out-group attitudes. Figure 1 shows the significant paths of the hypothesized

model. As Figure 1 illustrates, there was an indirect path from the condition (coded 0 for control and 1 for intervention) to the dependent variable via out-group attitudes. Imagined contact led to increased willingness for contact via increasing positive attitudes about the out-group. Specifically, the intervention enhanced positive attitudes ( $\beta = .18$ ,  $p < .05$ ), while more positive attitudes were related to greater willingness for contact ( $\beta = .35$ ,  $p < .001$ ). With regard to the role of similarity, the intervention led to higher similarity with the out-group ( $\beta = .20$ ,  $p < .05$ ), which in turn was marginally associated with increased willingness for contact with the out-group ( $\beta = .16$ ,  $p = .065$ ). When we added a direct path from condition to the dependent variable, this path was not significant ( $\beta = .09$ ,  $p = .266$ ). The similarity and willingness for contact path became nonsignificant, although the effect approaches significance ( $\beta = .14$ ,  $p = .096$ ). To test if the mediation effects were significant, bootstrapping analyses were conducted by using the SPSS macros provided by Preacher and Hayes (2008). With respect to out-group attitudes, 0 was excluded from the 95% confidence interval (ranging from .01 to .14), and thus, the indirect effect was significant. That is, imagined contact increased willingness for contact with the out-group via enhancing out-group attitudes. With respect to similarity, 0 was included in the 95% confidence interval (ranging from  $-.00$  to  $.09$ ), indicating that the indirect effect was nonsignificant. However, we note that 0 was only fractionally included in the 95% confidence

interval (lower CI =  $-.0040$ ), thus suggesting a potentially marginal mediating role of similarity.

The above variables explained 18% of the variance in willingness for contact. The fit of the model was very good, as indicated by:  $\chi^2(1) = 1.23$ ,  $p = .267$ , comparative fit index (CFI) = .995 and root mean square error of approximation (RMSEA) = .043.

In order to establish if the fit of this model was better than alternatives, two other models were tested. One alternative model tested attitudes as a second dependent variable along with willingness for contact, and similarity as the only mediator. All paths were significant and the fit was good but not better than the fit of the hypothesized model,  $\chi^2(2) = 3.36$ ,  $p = .187$ , CFI = .968 and RMSEA = .073. A second alternative model tested willingness for contact as a mediator and similarity and attitudes as the dependent variables. Again, all paths were significant but the fit of the model was relatively poor,  $\chi^2(2) = 4.32$ ,  $p = .116$ , CFI = .946 and RMSEA = .095.

## Discussion

This research evaluates a theoretically based prejudice-reduction intervention for schools. Based on the imagined-contact paradigm, the intervention involved children imagining that they are interacting positively with same-age peers belonging to the target out-group (Asian children) in a number of contexts.

Overall, the results suggest that the intervention was successful in improving White children's attitudes toward Asian children. Specifically, children reported higher perceived similarity, more positive attitudes toward the out-group and greater willingness to engage in contact with members of the out-group. The size of the effects, ranging from .38 to .42, provides further support for the effectiveness of imagined contact at a moderate level. Furthermore, the imagined-contact strategy was effective in promoting intergroup contact intentions via an increase in positive attitudes, and more marginally through increased self-out-group similarity. The views toward the in-group, as expected, remained unchanged. These findings are consistent with those from the extended contact literature (e.g., Cameron & Rutland, 2006) and extend the field of prejudice reduction with children using an arguably more "accessible" intervention tool.

## Theoretical implications

The intervention was successful at promoting positive attitudes and intended behavior toward the out-group across the age range of participants (7–9 years old) without reducing in-group attitudes. Developmental research outlines how interventions may be more or less effective with children depending on their age and accompanying cognitive ability. For example, Aboud's (1988) socio-cognitive developmental

theory states that before children reach middle childhood (approximately 8 years of age), they are mostly concerned with the self and with group identities and memberships. As such, people belonging to these groups are categorized according to their group membership. After this age, children begin to observe the individual characteristics and properties of people, using these attributes to evaluate the individual (see also Bigler & Liben, 1992). Thus, it is important to be aware of these cognitive differences when designing prejudice-reduction interventions (Bigler, 1999). Importantly for the present research, the intervention was successful for 7- to 9-year-old children. This provides evidence that the strategy is effective in reducing intergroup biases among a younger sample compared with that in Vezzali, Capozza, Giovannini, et al. (2012), where the mean age of participants was 10 years and 5 months. However, future research could determine whether it would be as successful at reducing prejudice when children are below the age of 7, or above the age of 9.

In this research, we developed a flexible and cost-effective prejudice-reduction technique for use in schools that does not rely on direct or extended access to out-group members. The mechanisms by which imagined intergroup contact influences attitudes toward other social groups have not been extensively investigated. In research with children, Vezzali, Capozza, Giovannini, et al. (2012) found that the effects of imagined contact on behavioral intentions are mediated by self-disclosure. We aimed to explore novel mechanisms underlying the effectiveness of the technique in order to understand how imagined contact reduces intergroup bias in children. Based on intergroup contact and the developmental literature, we examined two further potential underlying processes, similarity and positive attitudes. The role of positive attitudes as a mediator was highlighted in this research, while self-out-group similarity provided a similar, albeit only marginally significant, mediating mechanism. These variables accounted for 18% of the variance on children's intended intergroup behavior. It is important to further examine variables that account for the remaining variance. Previous research on imagined contact has highlighted some key mechanisms that underlie the effects of the technique, and that we did not examine in this research, such as intergroup anxiety (Husnu & Crisp, 2010; Turner, Crisp, et al., 2007), out-group trust (Turner, West, & Christie, 2013; Vezzali, Capozza, Stathi, et al., 2012), and vividness of the mental imagery (Husnu & Crisp, 2010). Future research can delve deeper into potential affective and cognitive processes that mediate the effectiveness of the technique among children.

Based on the current research and previous research by Cameron et al. (2006, 2007), both extended contact and imagined contact are effective strategies to reduce biases in children, and to some extent work via similar mechanisms (such as perceived similarity or closeness between the self and the

out-group). We suggest that despite the overlap between the two techniques as operationalizations of indirect contact, the critical difference pertains to children creating immediate and direct mental simulations involving the self and the out-group in imagined contact, as opposed to merely observing intergroup interactions in extended contact. Future research can directly compare these two types of interventions and identify potential differences in their effectiveness.

A potential limitation of imagined contact is that it may not be as powerful as more direct experiences of contact. Given that direct experiences are shown to produce stronger attitudes than indirect experiences (Fazio, Powell, & Herr, 1983), imagined contact may have a weaker effect on reducing bias. Undoubtedly, research over the past 60 years across various contexts, samples, and target groups, has demonstrated that direct contact experiences can have a highly beneficial impact on reducing prejudices (Pettigrew & Tropp, 2006). Research on direct and extended contact shows that on average, direct contact is more effective in reducing prejudice than extended contact (Paolini et al., 2004; Turner, Hewstone, & Voci, 2007). Similarly, imagined contact, being a more indirect form of interaction, may have a weaker and possibly more temporary effect compared with actual contact. Despite this, the potential of the imagined-contact technique as an intervention is considerable as it constitutes an effective preparatory measure to encourage greater intergroup contact. In contexts where direct contact is not feasible or desirable, for example, in homogenous schools or in segregated areas, imagined contact can act as a measure that prepares children to engage out-groups with an open mind. Indeed, our research provides support for this idea by showing that imagined contact can encourage children to have positive contact experiences with the target out-group.

In this intervention, children in the experimental condition participated in imagined-contact sessions, whereas children in the control condition did not. Therefore, it is important to note as a limitation that the current design may have been susceptible to demand characteristics. Extensive previous research on imagined contact with adults has demonstrated that the effects of the technique are not a result of demand characteristics (Turner & Crisp, 2010), informational load and mere exposure to the out-group (Turner, Crisp, et al., 2007), and nonrelevant imagined interaction (Stathi & Crisp, 2008). Based on the above research, we suggest that experimental demand did not play any role in the results we obtained; however, research on imagined contact among children has not yet fully tested this, and we highlight the need for using a wide range of control conditions to further support the effects of positive imagined contact in children.

The effects of the current intervention need to be tested further, especially in majority–minority contexts or settings

of severe conflict, where contact is not always associated with better attitudes (Tropp & Pettigrew, 2005). Furthermore, although imagined contact was effective in predicting positive intended behavior, further research should examine if the technique can successfully predict actual intergroup behavior in children. Importantly, the impact of successful interventions is often small and can diminish relatively quickly (Bigler, 1999). Thus, future research should test the longevity of the effects of imagined contact on attitudes and intended behavior.

### Practical implications

The potential of imagined contact as an intervention in educational settings is considerable and our research directly examined how this phenomenon, previously developed and tested in the lab, could be translated into a technique that could be used practically in the field. Indeed, our research increases the external validity of the imagined contact as it shows that the technique is effective in improving intergroup relations outside the laboratory, with young schoolchildren in England. Understanding how mentally simulated interactions can elicit positive intergroup attitudes and promote willingness for intergroup contact in children has important practical implications and can provide a useful tool for teachers, policy makers, and practitioners. For example, schools can develop and apply teaching techniques that will encourage imagined contact with out-groups (such as ethnic minorities, refugees, people with disability, the elderly, etc.) in order to promote tolerance and positive intergroup relations. We note that imagined contact does not provide a “one-shot” solution to conflict between groups, but it has considerable potential when combined with other successful prejudice-reduction interventions (see also Stathi, Crisp, et al., 2012). In other words, the benefits of imagined contact can extend and complement other prejudice-reduction techniques, like anti-racism programs and extended contact interventions. Imagined contact could enhance methods employed by educators and practitioners by serving as a preparatory measure, laying the foundations for reduced prejudice and positive interactions. As a flexible, inexpensive, and easy-to-use tool, imagined contact can be implemented in the classroom, with teachers and seminar-leaders leading the mental imagery sessions and following up with classroom-based discussions on intergroup issues.

In terms of further practical implications, additional benefits include the potential for imagined contact to be implemented in both ethnically homogenous and heterogeneous schools. Further research could determine the usefulness of the technique while direct contact is available (i.e., in heterogeneous schools). In particular, this type of intervention could act as a preventative to common inter-ethnic bullying in schools (e.g., Verkuyten & Thijs, 2002), by promoting

positive attitudes and perceived similarity between groups. Moreover, as attitudes prior to contact can be more malleable than post-contact (e.g., Fazio & Zanna, 1981), homogenous primary schools may find the imagined-contact intervention useful in promoting attitudes to out-groups before attending secondary schools, which often draw from a wider demographic (with increased likelihood for direct out-group contact). More research is necessary in this area, in order to determine who would gain most from an imagined-contact intervention, and at what age it would be most effective.

## Conclusion

Our research evaluates a practical and effective prejudice-reduction intervention for use in schools, driven by current advances in the contact literature. Drawing on

imagined-contact theory (Crisp & Turner, 2009), we designed an intervention that explored the effects of mentally simulated positive intergroup encounters on children's willingness to interact with the out-group. The intervention was successful at increasing similarity, improving attitudes, and encouraging intergroup contact intentions. The effect of the technique on willingness for future contact was mediated by improved intergroup attitudes. Our results suggest that imagined contact can provide an efficient, flexible, and cost-effective tool for schools and educators.

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