Imagined contact is more effective for participants with stronger initial prejudices.

Keon West[a]

Victoria Hotchin[a]

Chantelle Wood[b]

[a]Department of Psychology, Goldsmiths, University of London, London, UK, SE14 6NW
[b]Department of Psychology, University of Sheffield, Sheffield, UK, S10 2TP

Please address all correspondence to: Keon West, Department of Psychology, Goldsmiths, University of London, UK, SE15 6NW, keon.west@gold.ac.uk, 0207 919 7171

Word count: 7,992

Abstract

Imagined contact is an intervention that combines the prejudice-reduction of intergroup contact with the easy, low-risk application of imagery-based techniques. Accordingly, it can be applied where direct contact is difficult or risky. However, a possible limitation of imagined contact is that it may not be effective for participants with stronger initial prejudices, which would limit its usefulness and application. Two experiments (N_1 = 103, N_2 = 95) investigated whether initial prejudice moderated imagined contact's effects on explicit attitudes, behavioural intentions (Experiment 1), implicit attitudes and petition-signing behaviours (Experiment 2) toward two different outgroups. In both experiments imagined contact was more effective when initial prejudice was higher. Implications for imagined contact theory and application are discussed.

Sixty years of research, involving hundreds of thousands of participants, including multiple reviews and meta-analyses, have shown that intergroup contact – interactions between members of different social groups (Allport, 1954) – generally decreases intergroup bias and improves intergroup relations under certain positive conditions (Brown & Hewstone, 2005; Pettigrew & Tropp, 2006). Given this success, it is understandable that intergroup contact is one of the most widely used and effective social-psychological interventions for reducing intergroup prejudice (Evans-Lacko et al., 2013; Stuart Oskamp & Jones, 2000). Nonetheless, the application of intergroup contact is limited by barriers that reduce either the willingness or the opportunity to engage in recognizable contact, such as segregation (Christopher, 2001), or secrecy about a stigmatized identity (Meyer, 2003).

One way around these limitations is through the use of imagined contact – the act of imagining oneself in a social interaction with a member of another group (R. J. Crisp & Turner, 2012). Imagined contact combines Contact Theory with research on mental simulation, which shows that imagery elicits neurological, emotional and motivational responses similar to real experiences (e.g., Dadds, Bovbjerg, Redd, & Cutmore, 1997; Kosslyn, Ganis, & Thompson, 2006). Thus, it is based on the hypothesis that imagining positive interactions with members of other groups should have many of the same consequences as actually experiencing these interactions, including reduced anxiety, improved attitudes, and improved subsequent behaviours (Turner, Crisp, & Lambert, 2007). This technique is arguably the most radical extension of Contact Theory in that it removes altogether the need for any direct cross-group interactions.

Since Turner, Crisp, et al. (2007) first demonstrated that imagined contact could reduce prejudice, a growing body of subsequent research has also found support for the 'imagined contact hypothesis' (R. J. Crisp & Turner, 2012, p. 125; see Miles & Crisp, 2014 for a meta analysis), showing that imagined contact can reduce intergroup anxiety (Turner et al., 2007; West, Holmes, & Hewstone, 2011), improve intergroup attitudes (Turner & Crisp,

2010), reduce implicit prejudice as well as explicit prejudice (Turner & Crisp, 2010), and alter subsequent behaviour (Meleady & Seger, 2016; Turner & West, 2012; West, Turner, & Levita, 2015).

This research also found that imagined contact can reduce bias against a range of groups and in a variety of social contexts (Husnu & Crisp, 2010a, 2010b; Stathi & Crisp, 2008; Turner & Crisp, 2010; Turner & West, 2012; Vezzali, Capozza, Giovannini, & Stathi, 2012; West & Bruckmüller, 2013; West et al., 2011; West, Husnu, & Lipps, 2014). Furthermore, this research has ruled out alternative explanations for the effects of imagined contact on bias including cognitive load, stereotype priming (Turner et al., 2007), demand characteristics (Turner & Crisp, 2010; West et al., 2015) and generalized positive affect (Stathi & Crisp, 2008).

Does imagined contact work for high-prejudice participants?

Despite its overall success, imagined contact also has limitations. Beyond recent considerations of the reliability and replicability of its prejudice reducing effects (e.g., Mcdonald, Donnellan, Lang, & Nikolajuk, 2014), research to date has found that it is more effective when elaborated (Husnu & Crisp, 2010a), group-focused (Stathi, Crisp, & Hogg, 2011) and cooperative (Kuchenbrandt, Eyssel, & Seidel, 2013). Furthermore, it may backfire (i.e., increase prejudice) when it is neutral rather than explicitly positive (West et al., 2011), difficult rather than easy (West & Bruckmüller, 2013), or prevention-focused rather than promotion-focused (West & Greenland, 2016).

Imagined contact is designed for use in environments where direct contact may not be feasible or desirable (Stathi, Crisp, Turner, West, & Birtel, 2013). This includes high-prejudice environments in which direct contact poses risks to one or more of the interaction partners (West et al., 2014). Thus, the central question of this current research concerns the application of imagined contact in such high-prejudice contexts. Simply put: does imagined contact remain effective when initial prejudices are high?

No research to date directly addresses this question. Furthermore, prior imagined contact research can paint an inconsistent picture. Imagined contact is more effective for participants who are high in right-wing authoritarianism (Asbrock, Gutenbrunner, & Wagner, 2013), intergroup anxiety (Birtel & Crisp, 2012), and intergroup disgust sensitivity (Hodson, Dube, & Choma, 2015), all of which are associated with more prejudice. However, it is also more effective for participants who are low in social dominance orientation (Asbrock et al., 2013), and low in prevention focus (West & Greenland, 2016), both of which are associated with less prejudice. It also seems reasonable to suppose that high-prejudice individuals would find imagined contact more difficult and experience it as less positive: two conditions under which imagined contact is ineffective or counter effective (West & Bruckmüller, 2013; West et al., 2011).

Prior research on *direct* intergroup contact, however, suggests a more optimistic hypothesis. In a recent review, Hodson (2011) found that direct contact "works well, if not best, among those higher on prejudice-prone individual-difference variables" (p. 155), while low-prejudice counterparts responded inconsistently to direct contact. Similarly, West and Hewstone (2012) found that direct contact was a stronger predictor of positive attitudes toward gay men in Jamaica (where anti-gay prejudice is higher) than in the UK (where anti-gay prejudice is lower). Dhont, Roets and Van Hiel (2011) also found that participants scoring higher in need-for-closure (who are typically also higher in prejudice, see Van Hiel, Pandelaere, & Duriez, 2004) benefited more from direct intergroup contact than did participants who were low in need-for-closure.

Similar patterns have been found for *extended* intergroup contact - a form of indirect intergroup contact that involves knowing an ingroup member who interacts positively with outgroup members, or observing such an intergroup interaction (West & Turner, 2014; Wright, Aron, McLaughlin-Volpe, & Ropp, 1997). Munniksma, Stark, Verkuyten, Flache and Veenstra (2013) found that extended contact was most effective when initial outgroup

attitudes were more negative. Dhont and Van Hiel (2011) similarly found that extended contact works best for individuals high in authoritarianism, which is associated with more prejudice (Ekehammar, Akrami, Gylje, & Zakrisson, 2004).

Despite these encouraging findings in prior research on direct and extended contact, there is still a gap in the literature concerning the moderating role of initial prejudice on the effectiveness of imagined contact as a prejudice reduction technique; no existing research directly addresses the key role of initial prejudice. Understanding this potential moderating effect would have important implications for the application of imagined contact in high-prejudice contexts. In two experiments, this current research addresses this gap.

Present Research and Hypotheses

These two experiments investigate whether initial prejudice can moderate the effects of imagined contact on prejudice. Specifically, we investigated whether imagined contact more effectively (or less effectively) reduces prejudice for participants with higher initial prejudices. We investigated imagined contact's effects on explicit attitudes and behavioural intentions (Experiment 1), and implicit attitudes and behaviours (Experiment 2), toward two different groups: homeless people (Experiment 1) and transgender women (Experiment 2). In both experiments, we also investigated whether attitudes moderated the effects of imagined contact on behavioural intentions or behaviours, and whether prior prejudice moderated this mediated relationship.

Experiment 1

In Fiske, Cuddy, Glick and Xu's (2002) stereotype content model, perceptions of outgroups can be condensed along two axes – competence and warmth (e.g., Jews are stereotyped as competent but hostile, while older adults are stereotyped as incompetent but warm). These groups tend to engender different emotional reactions, but pure derogation, contempt and disgust is reserved for groups that are perceived as both incompetent and

hostile, such as homeless people (Knecht & Martinez, 2009). Homeless people are stereotyped as dirty, lazy, morally bankrupt and potentially dangerous (Whaley & Link, 1998). Though positive contact can improve attitudes toward the homeless, it is a relatively rare occurrence (Hocking & Lawrence, 2000) and to date, only two studies have shown that imagined contact can improve responses to homeless people (Falvo, Capozza, Di Bernardo, & Pagani, 2015; Hodson et al., 2015). In Experiment 1, we focused on this target group.

Prior research has found that changes in attitudes mediate changes in behaviour and behavioural intentions (Brown & Hewstone, 2005; West & Turner, 2014). We thus predicted that imagined contact would improve behavioural intentions toward homeless people, and that this relationship would be mediated by an increase in positive attitudes toward them. We also investigated whether these effects of imagined contact would be moderated by participants' initial prejudice against homeless people.

Method

Participants and design. One hundred and three members of the British public living in London (26 male, 66 female, 11 who did not state a gender, 97 White, *mean age* = 26.88, *SD* = 11.24) were asked to take part in this experiment. Participants were recruited individually by a research assistant and completed the study individually, in private, using pen and paper. They received the opportunity to enter a prize draw in exchange for their participation. Participants indicated their initial level of prejudice against homeless people and were then randomly allocated to complete either an imagined contact or a control task. Imagined contact was thus the independent variable, participants' initial prejudice was used as a moderator, behavioural intentions toward homeless people was the dependent variable, and attitudes toward the homeless was the mediator of the effect of imagined contact on behavioural intentions.

Materials and procedure. In a pre-testing session, participants indicated their initial prejudice against homeless people using a sliding scale (Haddock et. al, 1993), for which

higher scores indicated more prejudice (1 = *Very favourable* to 7 = *Very unfavourable*). This question was included along with other questions about contemporary society to distract participants from the true purpose of the task. After responding to these initial items, participants either completed the recommended imagined contact task (Stathi et al., 2013), or a control task that was almost identical, but that did not mention a homeless person. Thus, imagined contact participants received the following instructions "Please spend the next 2 minutes imagining yourself meeting a homeless stranger for the first time. Imagine that the interaction is positive, relaxed and comfortable". Control participants received the following instructions "Please spend the next 2 minutes imagining yourself meeting a stranger for the first time. Imagine that the interaction is positive, relaxed and comfortable".

We assessed post-intervention positive attitudes using 6 items ($\alpha = .89$) on 7-point semantic differential scales (from Wright, Aron, McLaughlin-Volpe, & Ropp, 1997): cold–warm, negative-positive, friendly-hostile, suspicious–trusting, respect–contempt (reversed), admiration–disgust (reversed). As indicated, the appropriate items were reversed so that higher scores were indicative of more positive attitudes. To assess participants' negative behavioural intentions toward homeless people, we used 9 items ($\alpha = .87$) from Tam, Hewstone, Kenworthy and Cairns (2009). Participants indicated on 7-point Likert scales whether they would react in each of the following ways to homeless people: "talk to them" (reversed), "avoid them", "confront them", "learn more about them" (reversed), "keep them at a distance", "argue with them", "spend time with them" (reversed), "have nothing to do with them", and "oppose them" (1 = *Not at all*, 7 = *Very much*), such that higher scores indicated more negative behavioural intentions.

Results

Means and standard deviations of all relevant variables can be seen in Table 1. Participant age did not predict any of our dependent variables ($-.084 < r < .17, .09 < p < .40$). Nor were there any significant differences between men and women ($1.64 < t < 1.81, .07 < p$

< .10) or between White and non-White participants (.63 < t < 72, .47 < p < .53). Thus, none of these was considered further in our analyses.

Initial examinations of the data did not suggest ceiling or floor effects. After a median split, we found that both the low-initial-prejudice participants, M = 2.00, SD = .79, t (51) = 9.07, p < .001, and the high-initial prejudice-participants, M = 4.61, SD = .94, t (50) = 27.60, p < .001, reported initial prejudices significantly above the extreme low end of the (negative) prejudice scale (i.e., 1), indicating room for improvement. High-initial-prejudice participants also reported initial prejudice levels significantly higher than the midpoint of the scale (i.e., 4), t (50) = 4.69, p < .001, indicating that their levels of prejudice were genuinely high.

We did find the usual effect of imagined contact on prejudice. Compared to participants in the control condition, participants who had completed the imagined contact task reported more positive attitudes toward homeless people (M = 4.45, SD = .93 vs. M = 3.75, SD = 1.13), t (101) = 3.34, p = .001, as well as less negative behavioural intentions (M = 3.08, SD = .98 vs. M = 3.67, SD = 1.20), t (101) = 2.77, p = .007.

Moderated mediation. We hypothesised that imagined contact would decrease negative behavioural intentions toward homeless people, and that this relationship would be mediated by an increase in positive attitudes toward homeless people. Furthermore, these effects may be moderated by participants' initial prejudice against homeless people, such that imagined contact becomes either less or more effective when initial prejudices are high. We investigated these relationships using Process Macros (Model 8, with 95% confidence intervals based on 1,000 bootstrap samples; see Hayes, 2009), see Figure 1. Compared to other widely used tests of mediation and moderation (e.g., the methodology of Baron & Kenny, 1986), bias-corrected bootstrapping techniques have a superior ability to detect significant effects with smaller sample sizes while retaining the most power (Fritz & Mackinnon, 2007; Zhao, Lynch Jr., & Chen, 2010). They are also superior to median-split techniques, which can lead to spurious results with moderating variables that are continuous,

rather than categorical (Bissonnette, Ickes, Bernstein, & Knowles, 1990).

We found all the hypothesised moderated and mediated relationships. As expected, initial prejudice moderated the effect of imagined contact on post-intervention attitudes ($b_{interaction}$ = .19, *S.E.* = .06, *p* = .002). When initial prejudice was low (*M* = 1.72), imagined contact had no significant effect on attitudes (*b* = .007, *S.E.* = .13 *p* = .96). However, imagined contact had a positive effect on attitudes (*b* = .30, *S.E.* = .09, *p* = .0009) at the mean of the initial prejudice scale (*M* = 3.29), and an even stronger positive effect on attitudes (*b* = .59, *S.E.* = .12, *p* < .0001) when initial prejudice was high (*M* = 4.86). Initial prejudice did not moderate the direct effect of imagined contact on negative behavioural intentions ($b_{interaction}$ = .008, *S.E.* = .04 *p* = .85). However, initial prejudice did moderate the indirect effect of imagined contact and negative behavioural intentions via attitudes. When initial prejudice was low, imagined contact did not have a significant indirect effect on negative behavioural intentions (*LLCI* = -.22, *ULCI* = .21, point estimate *b* = -.006). However, imagined contact did have a significant effect on negative behavioural intentions at the mean of the initial prejudice scale (*LLCI* = -.43, *ULCI* = -.12, point estimate *b* = -.27) and an even stronger effect when initial prejudice was high (*LLCI* = -.76, *ULCI* = -.32, point estimate *b* = -.52). The residual effect of imagined contact on attitudes was not significant (*b* = -.31, *S.E.* = .21, *p* = .14), though the effect of attitudes on behavioural intentions was significant (*b* = -.89, *S.E.* = .07, *p* < .001)[1].

In sum, the results of Experiment 1 did find a significant moderating effect of initial prejudice on the effect of imagined contact; specifically, imagined contact was more effective for participants whose initial prejudice against homeless people was stronger. Both the direct effect of imagined contact on attitudes and the indirect effect of imagined contact on behavioural intentions (via attitudes) were strongest for high-prejudice participants and weakest for low-prejudice participants.

Experiment 2

Experiment 1 found that imagined contact was more effective for high-prejudice participants than for low-prejudice participants. We used Experiment 2 to replicate this finding and to rule out demand characteristics as an alternative explanation for our results. Experiment 1 used only explicit self-report measures, which may be vulnerable to self-presentation biases (Bigler & Hughes, 2010); participants who reported the most initial prejudice against homeless people may have altered their responses the most if they guessed the hypotheses of the study. Though we minimised these concerns in Experiment 1 through deception and participant anonymity, in Experiment 2 we sought to eliminate this interpretation of our results by using an implicit rather than explicit attitude measure – the Implicit Association Test (IAT: Greenwald, McGhee, & Schwartz, 1998).

We also included a measure of behaviour toward the target group, which is useful as research on Contact Theory has been criticised for focusing extensively on intergroup attitudes to the detriment of investigating useful behaviours (Dixon, Durrheim, & Tredoux, 2005, though see Birtel & Crisp, 2012; Turner & West, 2012; West et al., 2015 for examples of imagined contact studies that included behavioural measures).

Lastly, we extend research on imagined contact's effects to an as yet uninvestigated target group – transgender women. A transgender woman is a person who was assigned a male gender identity at birth, but who identifies as a female. Attitudes toward transgender women (and men) tend to correlate with attitudes toward gay men and lesbians, but are significantly more negative (Norton & Herek, 2013). Though rarely the focus of prejudice-reducing research, transgender women are victims of legal discrimination, violence, sexual assault and hate crimes, including murder (Grant et al., 2011; Ryan & Rivers, 2003). This research will be the first to investigate whether imagined contact reduces prejudice against transgender women, as well as whether initial prejudice moderates this relationship.

Similar to Experiment 1, we hypothesised that imagined contact would increase

positive behaviour toward transgender women, and that this relationship might be mediated by an increase in the positivity of implicit attitudes toward transgender women. Prior research has often found divergences between implicit and explicit measures of bias (Nosek, Greenwald, & Banaji, 2007). However, these measures can also be strongly correlated (Nosek, Greenwald, & Banaji, 2007), and this is more likely for outgroups like transgender women for whom participants are not strongly motivated to suppress or mask their prejudice (Hofmann, Gschwendner, Nosek, & Schmitt, 2005). Prior research has also shown that implicit attitudes can be good predictors of behaviour (McConnell & Leibold, 2001), including behaviours that are similar to petition-signing, such as voting (Arcuri, Castelli, Galdi, Zogmaister, & Amadori, 2008). We thus hypothesised this mediated effect and further hypothesised it would be moderated by initial prejudice. Specifically, imagined contact should be more effective when initial prejudice against transgender women was higher.

Method

Participants and design. Ninety-five participants living in the UK (27 male, 68 female, 85 White, *mean age* = 32.54, *SD* = 9.04,) took part in this experiment. Participants were recruited online via internet forums and completed all measures, including the IAT, online as well. Participants first indicated their initial prejudice against transgender women, as in Experiment 1. Participants were then randomly allocated to complete either an imagined contact task or a control task. The dependent variables were implicit attitudes measured with an implicit association test and pro-transgender petition-signing behaviour. Initial prejudice against transgender women was used a moderator. Participants entered a prize draw in exchange for their participation.

Materials and procedure. We measured initial prejudice as we did in Experiment 1; prior to completing either the imagined contact or control tasks, participants indicated their evaluations of transgender women on a sliding scale (1 = *Very favourable* to 7 = *Very unfavourable*). We also asked participants to indicate their evaluations of six other groups

used as filler items to distract participants. In order to further separate the initial prejudice measures from the imagined contact task, participants were then asked to do a filler task in which they were given 2 minutes to memorise a series of 30 4-digit numbers. Participants then proceeded to complete either the imagined contact or control task.

Participants either completed the recommended imagined contact task (Stathi et al., 2013), or a control task used by Turner et al. (2007), in which participants imagined an outdoor scene. Participants then completed a version of the IAT (see Greenwald, McGhee, & Schwartz, 1998; Nosek, Greenwald, & Banaji, 2007 for a full explanation of the IAT task and scoring methods) that we developed to measure implicit anti-transgender bias. The IAT is a computer-based task that measures response times and error rates when cross-categorizing paired concepts and is considered the gold standard measure of implicit biases.

Participants cross-categorised the concepts of *Good* vs. *Bad* (using 16 word stimuli from Greenwald et al., 1998) and the concepts of *cisgender* people vs. *transgender* people (depicted using a combination of two gender labels – *male*, *female* vs. *trans*, *transgender* – and two gender images – the planetary symbols for male and female, coloured blue and pink respectively vs. two variations of a symbol that merges the planetary symbols with a blue-pink gradient overlaid; see Appendix). As the term 'cisgender' and the symbols we used for transgender are not widely recognised we clearly explained their meanings to participants before the IAT started. Pilot testing with 8 participants indicated that all words and symbols were understood and there was no evidence of participant confusion during the task.

As recommended, participants completed 7 blocks: two 20-trial practice blocks involving a single concept (e.g., *Good* vs. *Bad*); a practice block (20 trials) involving simultaneously categorising words and images using both concepts (*Good* vs. *Bad* and *Transgender* vs. *Cisgender*); a full block (40 trials) similar to the previous paired-concept block; a second single-concept practice block (40 trials) in which the Good/Bad categories switched sides; a paired-concept practice block (20 trials) with the labels in their new

positions; and full block (40 trials) with the labels in their new positions. The study was counterbalanced so that half of the participants first paired *Good* with *transgender* and the other half first paired *Bad* with *transgender*. A built-in error penalty was incorporated, whereby participants were required to correct their errors, and only the RT for the correct item was used in the final calculation.

Also as recommended by Greenwald, Nosek and Banaji (2003), trials with RTs of over 10,000ms were removed from the data set, along with participants with a percentage rate of 10% or more RTs of less than 300ms. Two participants with an error rate of over 35% were also discarded. Mean RTs for each concept pairing during blocks 3, 4, 6 and 7 (a total of 120 trials) were then used to calculate a D score for each participant, which reflected the relative strength and direction of their implicit association. The final D score for each participant had a possible range of -2 to +2 (+2 indicating a very strong association between Transgender and Bad) and was calculated using Greenwald's (2007) SPSS script for D measures with a built-in error penalty.

After the experiment was over, we gave all participants the option of signing a real online petition supporting emergency refuge accommodation for transgender victims of domestic abuse. Unbeknownst to the participants, we recorded whether or not they clicked the link to sign this petition and recorded this as our pro-transgender behavioural measure.

Results

Means and standard deviations of all relevant variables can be seen in Table 2. Participant age did not predict any of our dependent variables ($-.082 < r < .032$, $.43 < p < .76$). Nor were there any significant differences between men and women ($1.18 < t < 1.21$, $.23 < p < .24$). White participants did show marginally more implicit bias ($M = .20$, $SD = .39$ vs. $M = -.08$, $SD = .58$) $t (93) = -2.00$, $p = .05$, as well as marginally more frequent petition signing behaviour $\chi^2 (1) = 3.42$, $p = .06$. Thus, ethnicity was used as a covariate in the analyses below.

Initial examination of the data did not suggest ceiling or floor effects. After a median

split, we found that both the low-initial-prejudice participants, $M = 1.19$, $SD = .28$, $t (47) =$ 4.67, $p < .001$, and the high-initial-prejudice participants, $M = 3.49$, $SD = 1.24$, $t (47) = 13.74$, $p < .001$, reported initial prejudices significantly above the extreme low end of the (negative) prejudice scale indicating room for improvement. Furthermore, post-intervention, both the low-initial-prejudice participants, $M = .07$, $SD = .36$ $t (47) = 1.41$, $p = .17$, and the high-initial- prejudice participants, $M = .27$, $SD = .46$ $t (46) = 4.08$, $p < .001$, reported implicit bias above the neutral point of the scale (i.e., 0) indicating overall anti-transgender bias (though only in the latter group was this difference significant). However, when the data were analysed without the moderator we failed to find the usual effect of imagined contact on either implicit bias ($M = .16$, $SD = .43$ vs. $M = .17$, $SD = .42$) $F (1, 90) = .02$, $p = .89$, or on petition-signing behaviour ($M = .43$, $SD = .91$ vs. $M = .53$, $SD = .86$) $F (1, 90) = .28$, $p = .60$.

As this was the first use of this particular measure of implicit anti-transgender bias, we examined the convergent validity with the other measures of bias. As expected, our measure of implicit anti-trans bias was positively correlated with our explicit measure of initial anti-transgender prejudice ($r = .41$, $p < .001$) and negatively correlated with participants' decision to sign the petition ($r = -.36$, $p < .001$), though neither correlation was high enough to suggest multi-colinearity. We also note that, while relationships between implicit and explicit measures of prejudice are often weak to absent, they can also be strongly correlated (Nosek et al., 2007). Furthermore, this is more likely for outgroups like transgender women for whom participants are not strongly motivated to suppress or mask their prejudice (Hofmann et al., 2005).

Moderated mediation. We hypothesised that imagined contact would strengthen participants' decision to sign the pro-transgender petition, and that this relationship would be mediated by a reduction in implicit anti-transgender bias. As with the previous study, we further investigated whether this mediated relationship would be moderated by initial prejudice, such that imagined contact would be more effective at reducing implicit anti-

transgender bias for participants with higher initial prejudice (see Figure 2).

We investigated these relationships using Process Macros. For consistency (with Experiment 1) we used Model 8, with 95% confidence intervals based on 1,000 bootstrap samples (see Hayes, 2009). Results were somewhat similar to those found in Experiment 1. Initial prejudice moderated the direct effect of imagined contact on implicit anti-transgender bias (b $_{interaction}$ = .06, *S.E.* = .03, *p* = .03) Imagined contact had no significant effect on implicit bias when initial prejudice was low (*M* = 1.00), *b* = .05, *S.E.* = .05, *p* = .29, nor at the mean of the initial prejudice scale (*M* = 2.33), *b* = -.02, *S.E.* = .04, *p* = .56. However, when initial prejudice was high (*M* = 3.79), imagined contact reduced implicit bias against transgender women (*b* = -.10, *S.E.* = .05), an effect on the cut-off point for statistical significance (*p* = .05).

However, using Model 8, we did not find the expected moderated mediated relationship. Imagined contact did not have a significant indirect effect on positive behaviour when initial prejudice was low, (*LLCI* = -.52, *ULCI* = .13, point estimate, *b* = -.10), nor at the mean of the moderator (*LLCI* = -.12, *ULCI* = .35, point estimate, *b* = .06) nor when initial prejudice was high, (*LLCI* = -.04, *ULCI* = .72, point estimate, *b* = .23). Considering that neither the preliminary *t*-test, nor the Process Macros found either a direct effect of imagined contact on petition-signing or a moderation of this direct effect by prior prejudice, we removed these redundant pathways from the model and re-analysed the data using Model 7 (Hayes, 2009).

In this re-analysis, we found the expected moderated mediation effect. As before (using Model 8), initial prejudice moderated the direct effect of imagined contact on implicit anti-transgender bias (*b* $_{interaction}$ = .06, *S.E.* = .03, *p* = .03). The effects of imagined contact on implicit bias at different levels of prior prejudice were also the same. Concerning the moderated mediation, imagined contact did not have a significant indirect effect on positive behaviour when initial prejudice was low, (*LLCI* = -.55, *ULCI* = .16, point estimate, *b* = -.14),

nor at the mean of the moderator (*LLCI* = -.15, *ULCI* = .37, point estimate, *b* = .08), but it did have a significant indirect effect on petition signing when initial prejudice was high, (*LLCI* = .02, *ULCI* = .78, point estimate, *b* = .33). The residual effect implicit bias on petition signing was significant (*b* = -2.99, *S.E.* = .88, *p* = .0007), though the residual effect of imagined contact on implicit attitudes was not (*b* = .10, *S.E.* = .07 *p* = .15); see Figure 2.

In sum, Experiment 2 used implicit measures of attitude (which are resistant to self-presentation biases), and found a moderating effect similar to that found in Experiment 1. Imagined contact directly reduced implicit anti-transgender attitudes and indirectly increased participants' likelihood of signing a pro-transgender petition, and this effect was stronger when initial prejudice was higher.

Discussion

A substantial body of research has demonstrated that imagined contact is a simple but effective method for reducing bias against a wide variety of groups, on multiple components of bias, and in a variety of social contexts (Miles & Crisp, 2014). A major strength of imagined contact is that it can be applied in challenging circumstances, even when opportunities for contact are scarce or remain unrealized. Therefore it is important for the *application* of imagined contact to test whether the intervention remains effective in conditions of high prejudice. Across two experiments we did find a moderating effect of participants' initial prejudice. However, in both experiments imagined contact was *more* effective when initial prejudices were stronger. Below we discuss these findings in terms of study design and potential limitations, implications, and suggested avenues for future research.

Study Design and Limitations

Both studies supported the use of imagined contact in high-prejudice contexts and indeed suggested that these may be the contexts in which it is most effective. Furthermore, these 2 studies had a number of noteworthy strengths. Social psychological research is

criticised for the overuse of undergraduate student participant samples, who may not be representative of the wider society (Sears, 1986). These current studies, however, used non-student members of the public as participants, increasing the generalizability of our findings. We also used a number of divergent measures, and two very different target groups, one of which had never been investigated in imagined contact research. This further adds to the generalizability of our findings and of the broader body of imagined contact research as well.

Experiment 1 used only explicit measures of bias, which we acknowledge as a limitation. The use of explicit measures leaves open the possibility of demand characteristics or self-presentation concerns (though see Turner & Crisp, 2010, for findings that address these concerns for imagined contact). In Experiment 1 we minimised these concerns by using distraction techniques and filler questions to mask our true hypotheses. However, Experiment 2 offered the most compelling method of managing this limitation: the use of implicit measures of bias, which are resistant to attempts at self presentation (Nosek et al., 2007).

We note other limitations of these studies as well. We did not use measures that were entirely novel in imagined contact research (with the possible exception of the new version of the IAT specifically created for Experiment 2). Furthermore the behavioural measure in Experiment 2 tracked whether participants clicked a link to sign a petition, but not whether they actually completed the petition-signing process. This makes it a somewhat weak behavioural measure, and one that lacks the robustness of behavioural measures used in other imagined contact research (Birtel & Crisp, 2012; Turner & West, 2012; West et al., 2015).

Furthermore, while we did replicate the standard prejudice-reducing effect of imagined contact in Experiment 1, we did not replicate this standard effect in Experiment 2. In this latter experiment, imagined contact was *only* effective for participants with stronger initial prejudices. Taken together these limitations do suggest some caution in the interpretation of our results. While we did find that imagined contact was more effective in these two experiments, replications of these findings and further research with a wider variety

of target groups and measures is necessary to increase confidence in this moderated effect and identify the conditions under which it occurs.

Implications for Application and Theory

As mentioned before, prior research on imagined contact did not provide a clear expectation for imagined contact's effects under conditions of high initial prejudice. Prior research on direct and extended contact suggested that imagined contact should be more effective for high-prejudice participants (Hodson, 2011; Munniksma et al., 2013), and some studies found that imagined contact was more effective under conditions associated with high levels of prejudice (Asbrock et al., 2013; Birtel & Crisp, 2012; Hodson et al., 2015). However, other studies found that imagined contact was more effective under conditions associated with low levels of prejudice, (Asbrock et al., 2013; West & Bruckmüller, 2013; West & Greenland, 2016; West et al., 2011). These current directly investigated this question and found an encouraging and practically useful answer; imagined contact appeared to be *more* effective for high-prejudice participants, arguing well for its application in high-prejudice contexts.

However, on a theoretical level, it is still not clear *when* or *why* imagined contact would be more effective when initial prejudice is higher, rather than lower. One possible explanation is that low-prejudice participants and high-prejudice participants approach imagined contact in very different ways. Very few studies have investigated what the participants actually imagine when completing the task (though, for exceptions, see West & Greenland, 2016; West et al., 2011). However, this approach might shed useful light on why imagined contact works better for some participants than for others.

Another plausible explanation is suggested by the work of Crisp, Husnu, Meleady, Stathi and Turner (2010). They suggested that imagined contact works, at least in part, by making participants generate positive behavioural scripts for cross-group interactions and thus alter their own expectations of these interactions. High-prejudice individuals not only think

more negatively about the target outgroup, but also view outgroup members as more anxiety invoking and (realistically or symbolically) threatening (Dhont & Van Hiel, 2011; Stephan & Stephan, 2000). As such, they are likely to have very negative expectations of outgroup interactions and to benefit the most from the positive behavioural scripts generated by imagined contact. Thus, these high-prejudice participants, though initially higher in anxiety about cross-group interactions, should experience steeper reductions in intergroup anxiety and prejudice following the imagined contact intervention. Future research could investigate this model directly.

Concluding Remarks

Imagined intergroup contact was a radical addition to the broader body of Contact Theory. It found a solution to the limitation of opportunity for contact and seemed to suggest a quick, easy, imagery-based means to produce a meaningful change in prejudice and intergroup bias. The evidence for imagined contact's effectiveness continues to grow. However some have raised questions concerning the reliability of its effects and its successful application as a real-world prejudice-reducing intervention. At this time research on the potential limits of imagined contact becomes increasingly important. This current research is an important addition to that body of evidence, finding that imagined contact not only retained its effectiveness, but was in fact more effective when initial prejudice was higher.

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Tables

Table 1. Means and standard deviations of all relevant variables in Experiment 1 according to condition.

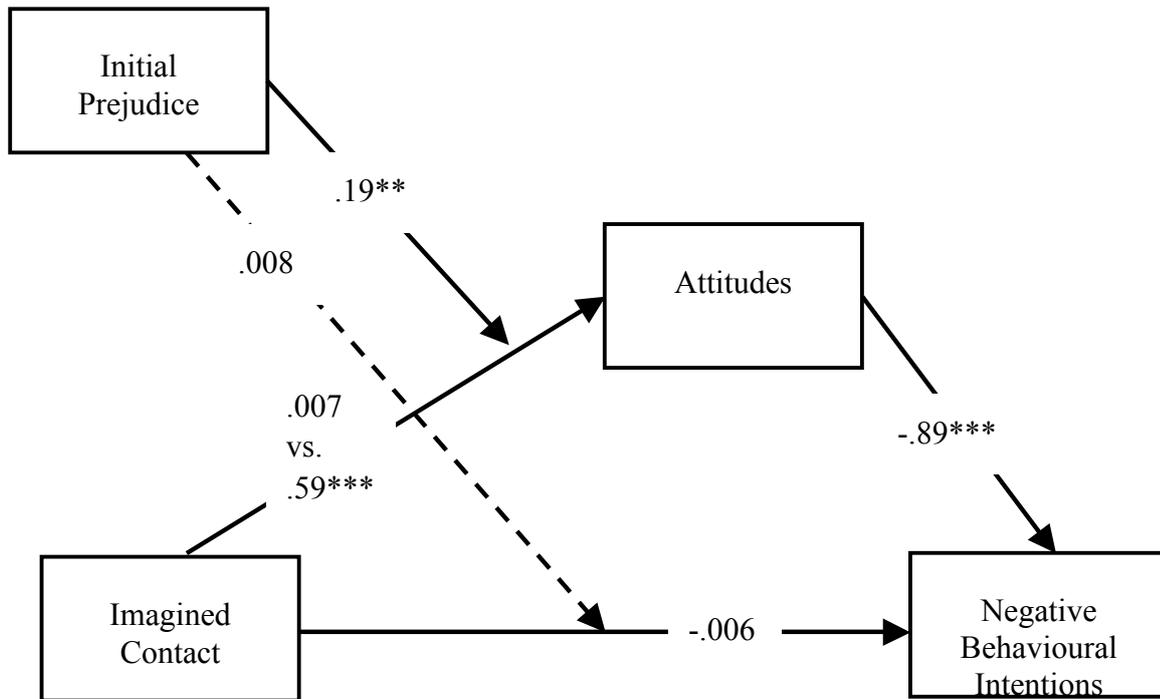|	Condition	
	Imagined Contact	Control
Prior prejudice	3.19 (1.64)	3.44 (1.47)
Positive attitudes	4.45 (.93)	3.75 (1.13)
Negative behavioural intentions	3.08 (.98)	3.67 (1.20)

Note: Standard deviations shown in parentheses.

Table 2. Means and standard deviations (or frequencies, where relevant) of variables in Experiment 2 according to condition.

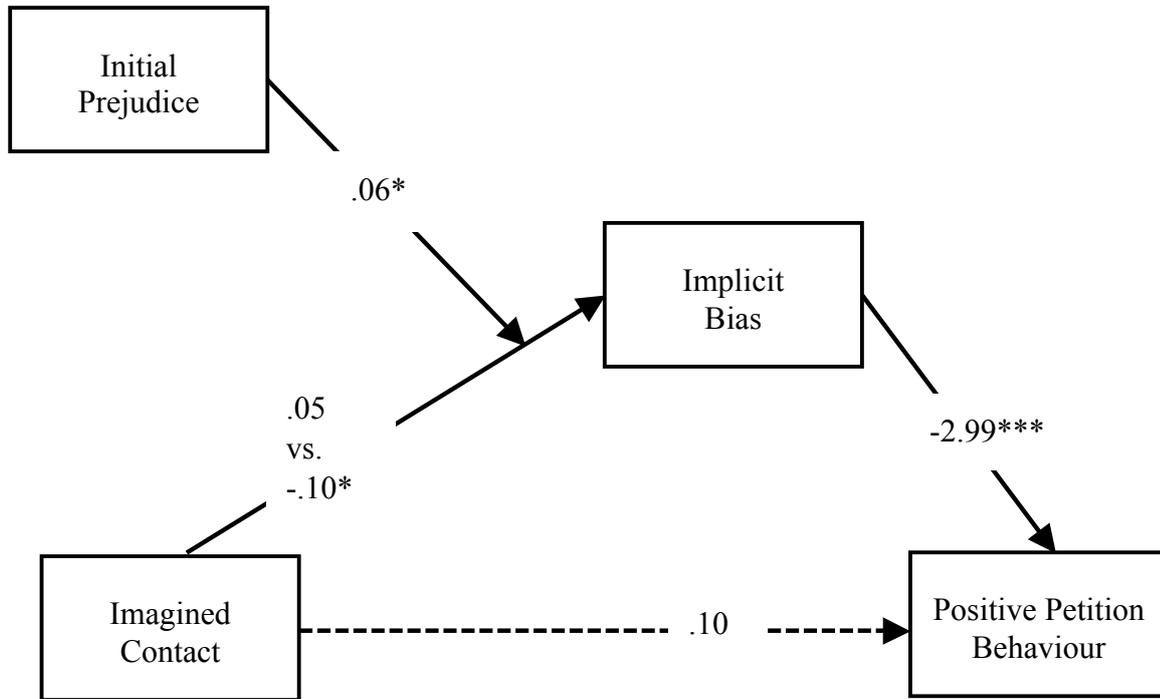|	Condition	
	Imagined Contact	Control
Prior prejudice	2.52 (1.44)	2.13 (1.47)
Implicit anti-trans bias	.18 (.42)	.16 (.43)
Petition signing behaviour	36 of 47 (77%)	33 of 46 (72%)

Note: Standard deviations shown in parentheses next to means. Percentages are shown in parentheses in whole numbers next to frequencies.

Figure 1: Effects of imagined contact on attitudes and behavioural intentions toward homeless people, moderated by initial prejudice.

Note: (1) *p* < .05; **p* < .01; ***p* < .001. (2) *b* values shown for the effect of imagined contact on attitudes are those at the low (mean − 1 SD) and high (mean + 1 SD) values of the moderator.

Figure 2: Effects of imagined contact on implicit anti-transgender bias and signing a pro-transgender petition, moderated by initial prejudice.

Note: (1) *p* < .05; **p* < .01; (2) *b* values shown for the effect of imagined contact on implicit bias are those at the low (mean − 1 SD) and high (mean + 1 SD) values of the moderator.

Appendix

An example of one of the transgender symbols used in the IAT, during a paired-concept trial

Footnotes

[1] We acknowledge that this behavioural intention scale contains 3 types of behavioural intentions – approach, avoid and aggress. Furthermore, factor analysis revealed that the 3 types of behavioural intentions found in this scale loaded on multiple factors, rather than on a single factor. Nonetheless, we reported the results for the combined behavioural intentions scale as the results for all 3 behavioural intentions were extremely similar. For all 3 behavioural intentions – approach, avoid, and aggress – all of the same effects were significant and the indirect (i.e., mediated) effect of imagined contact on the behavioural intention was stronger when imagined contact was high (.71, 67, and .19 respectively), than when it was low (.01, .01, and .002 respectively).