He who experiences the unity of life sees his own self in all beings, and all beings in his own self, and looks on everything with an impartial eye.

Buddha

Buddha, along with other sagacious figures across the centuries, recognized that people veer away from their typical self-serving ways when distinctions between themselves and others are obscured. This idea emerges prominently in the intergroup literature. Disbanding intergroup boundaries between one’s own group and other groups appears to promote positive intergroup experiences and reduce prejudice toward outgroups (Gaertner & Dovidio, 2000; Sherif, 1966; Turner, Hewstone, & Voci, 2007). Recent research suggests that certain benefits bestowed through intergroup connections may result from self-expansion processes (Page-Gould, Mendoza-Denton, Alegre, & Siy, 2010). We may come to see ourselves in others and others in ourselves, just as Buddha maintained. Furthermore, because people typically view themselves (Taylor & Brown, 1988) and their ingroups (Tajfel & Turner, 1986) favorably, self-expansion encourages a more positive view of others.

Although aspects of prior intergroup relations research have posited that connecting the self to outgroup members can facilitate prejudice reduction, we are unaware of previous research that has tested the influence of self-linking directly and in isolation of other factors that facilitate prejudice reduction. Furthermore, we were interested in whether a single potent link between the self and an outgroup member could stimulate prejudice reduction in relation to the outgroup as a whole. Finally, we examined not only explicit but also implicit prejudice reduction to provide a more complete understanding of the possible benefits bestowed by self-linking.

Self-Linking

The self is a very powerful positive association (Taylor & Brown, 1988). People view themselves as better than others implicitly as well as explicitly (Bosson, Swann, & Pennebaker, 2000; Greenwald et al., 2002). Furthermore, this favorability bias in relation to the self can associatively transfer to other objects, so that what is linked to the self becomes infused with positivity (e.g., Gawronski, Bodenhausen, & Becker 2007). These findings are important for considering why a single potent link could reduce negativity, at least in relation to an outgroup member that becomes associated with the self. However, we posit that other processes must be at work for generalized prejudice reduction to occur, and further that different underlying mental processes

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1Purdue University, West Lafayette, IN, USA

Corresponding Author:
Jill Gulker, Purdue University,
703 3rd Street, West Lafayette, IN 47907, USA.
Email: jgulker@psych.purdue.edu
will be at work for reducing explicit versus implicit attitudes. Before developing our theoretical reasoning, we briefly discuss how our focus differs from other intergroup relation research that has touched on self-linking in one way or another.

Social categorization and social identity theory maintain that people who become linked to the self through arbitrarily defined ingroup membership are regarded favorably (Tajfel, 1969; Tajfel & Turner, 1979). Building on this theory, the Common Ingroup Identity (CII) model (e.g., Gaertner & Dovidio, 2000) posits that circumstances that change cognitive representations from two opposing groups to one, all-inclusive group lead individuals to expand their social identities to encompass the outgroup as part of a superordinate group, and this can improve attitudes and behaviors directed toward former outgroup members (e.g., Gaertner, Mann, Murrell, & Dovidio, 1989). Considerable research has accrued in support of the CII model, with common ingroups fostering improved intergroup explicit attitudes (Gaertner & Dovidio, 2000), and promoting prosocial behavior (Nier et al., 2001) and cooperation (Cunningham & Chelladurai, 2004). In contrast to the CII model, where multiple group members develop a shared identity, our focus is on establishing a connection between the self and a single outgroup member, and examining whether generalized prejudice reduction occurs. Furthermore, CII research, like much other contact research, typically has ingroups and outgroups engaging in cooperatively interdependent tasks. These tasks create multiple mediating mechanisms (see Dovidio, Gaertner, & Kawakami, 2003) that facilitate prejudice reduction (e.g., changes in functional relations, anxiety reduction, increased knowledge of the outgroup), so that we do not know whether a potent connection to the self is sufficient to foster prejudice reduction.

Researchers studying other variants of intergroup contact situations have also discussed connections to the self as an aspect of the contact situation that may facilitate prejudice reduction. Vicarious or extended contact (Wright, Aron, McLaughlin-Volpe, & Ropp, 1997) and the formation of cross-group friendships (see Davies, Tropp, Aron, Pettigrew, & Wright, 2011) involve complex conditions of contact that activate multiple mediating processes, with connections to the self being just one. More recently, imagined intergroup contact has been found to reduce intergroup bias (Crisp & Turner, 2009; Turner & Crisp, 2010), although here the critical mediator appears to be reduced anxiety about intergroup interaction.

In sum, previous prejudice reduction research focusing on intergroup contact has demonstrated that making connections to the self and including the other in the self can help the prejudice reduction process. What remains untested is whether linking the self to an outgroup member in a significant and potent way is sufficient for reducing prejudice, and how this might work at both the explicit and implicit levels.

**A Single Link: Powerful Enough to Change Pre-Existing Explicit Intergroup Attitudes?**

Explicit attitudes can be formed and changed based on fast-changing conscious processes involving syllogistic reasoning (Gawronski & Bodenhausen, 2006; Rydell & McConnell, 2006; Smith & DeCoster, 1998). Thus, when a member of a disliked outgroup becomes linked to the self, one may reason that this person is pleasant and likeable owing to the association with the self. Furthermore, because the person is a member of an outgroup, one may change previously held negative outgroup attitudes to be more positive. This sounds simple enough, but there are important obstacles to achieving change seamlessly. Explicit attitudes are dependent on our assessment of the truth value of associations (e.g., Gawronski & Bodenhausen, 2006), and people’s pre-existing negative attitudes may discourage them from simply concluding that they like targets and outgroups associated with the self. In other words, having a history of existing negativity toward the outgroup may create considerable resistance to attitude change. Although attitudes toward the specific target may become more positive, dislike for the outgroup as a whole may not wane. This possibility is reminiscent to findings in the stereotype subtyping literature, where group stereotypes fail to change upon exposure to group members who are atypical of the stereotyped group (e.g., Kunda & Oleson, 1995; Richards & Hewstone, 2001).

However, a crucial focus of our research is on establishing a potent link with an outgroup member, or a connection between the self and other that is very powerful owing to its meaningfulness and the closeness it inspires. Based on the close relationships literature (Aron et al., 2004), we expected that this type of connection would encourage participants to link the targets to themselves and consciously perceive the target other and associated outgroup as a part of the self. Indeed, this perceived inclusion of the target and outgroup in the self was expected to mediate the effect of linking the self with an outgroup member on generalized prejudice reduction. In sum, in the case of explicit attitudes, we did not expect a direct relation between self-linking and prejudice reduction. Rather, we expected a relation that was mediated by consciously appraising the target and outgroup as part of the self, owing to the potency of the link.

**A Single Link: Sufficient to Change Implicit Intergroup Attitudes?**

In contrast to explicit attitudes, implicit attitudes appear to reflect an associative system that is altered through a slower process of repeatedly pairing new evaluative associations with the attitude object (Gawronski & Bodenhausen, 2006; Rydell & McConnell, 2006; Smith & DeCoster, 1998). The associative system is not dependent on conscious assessment...
of the truth value of associations. For example, all else being equal, repeated activation of positive traits in relation to a particular outgroup will create positive implicit attitudes toward the outgroup.

A host of strategies for altering implicit intergroup attitudes have been explored during the past decade (for a review, see Monteith, Woodcock, & Gulker, in press). Many of these strategies involve extensive training paradigms with repetitive pairing of the outgroup with positive or counterstereotypic associations. The previous negative associations end up being weakened or intertwined with positive associations, so that implicit attitudes become more positive than prior to training. However, aside from recent findings reported by Woodcock and Monteith (2012; summarized below), we are unaware of prior research testing whether implicit intergroup attitudes can be shifted by establishing a link between the outgroup and the self.

The phenomenon of associative self-anchoring has been studied in other contexts. Associative self-anchoring involves forming an association between an object of the self, which results in the transfer of (typically positive) self-associations to the object (Cadinu & Rothbart, 1996; Otten, 2003). For instance, Gawronski et al. (2007) studied this phenomenon in the context of post-decisional attitudes. They found that choosing an object (thereby establishing a link with the self) resulted in more favorable implicit evaluations of the object than when it was not chosen. In the context of intergroup research, investigators have found that minimal group situations create implicit preferences for ingroups over outgroups (e.g., Ashburn-Nardo, Voils, & Monteith, 2001; Otten & Wentura, 1999). The pairing of people with the self by defining them as part of one’s ingroup creates implicit ingroup positivity where no bias previously existed. However, can self-linking alter implicit attitudes based on more meaningful group boundaries where pre-existing implicit biases already exist?

Woodcock and Monteith (2012) found that implicit prejudice toward Blacks was reduced when White participants repeatedly paired themselves with African American group members. Participants were introduced to their supposed group members for an upcoming task by seeing pictures of group members. Participants completed measures of self–other overlap for the adoptive and nonadoptive baby and that child's ethnic group; measures of self–other overlap. That is, in contrast to the expected results for explicit intergroup attitudes, the effect of self-linking on implicit attitude change was expected to be purely a consequence of associative training, and therefore a direct effect.

In sum, although self-linking has been implicated in a good deal of prior intergroup relations research, this potential facilitator of prejudice reduction has not been isolated and manipulated to determine whether a single potent connection can result in generalized prejudice reduction. Furthermore, our research is unique in examining the effect of self-linking on explicit and implicit attitudes, so that we can identify potentially different effects and underlying processes. By investigating these issues, we were able to provide a comprehensive test with the potential for theoretical and practical contributions.

**Experiment I**

Although many situations provide a strong connection to the self, we simulated intergroup adoption because it provides an appropriately potent circumstance for linking the self to an outgroup member. In addition, with international adoption, the child’s ethnicity, kin, and country of origin have saliency, thus making this context well suited to testing our self-linking hypothesis. White participants simulated adoption of a child from either China or Guatemala. Then, participants completed measures of self–other overlap for the adoptive baby and for that child’s ethnic group, and for the nonadoptive baby and that child’s ethnic group; measures of explicit attitudes toward the adoptive and nonadoptive ethnic groups; and measures of implicit attitudes toward the adoptive and the nonadoptive ethnic groups. We expected reports of self–other overlap (Aron, Aron, & Smollan, 1992) to be greater in relation to the adoptive child and her ethnic group relative to the nonadoptive child and her ethnic group,
and that participants’ conscious reports of this overlap would mediate explicit attitude change. Given the associative and slower learning nature of implicit attitudes (e.g., Rydell & McConnell, 2006), we were uncertain whether implicit attitude change would be observed. That is, we suspect that the mere association between the self and the adoptive child may not be sufficient for overcoming long-standing negative implicit associations, and that practicing the self–other association may be necessary (as examined in Experiments 2 and 3).

Method

Participants. Of the 91 participants, 34 were male, the mean age was 19 years, and all self-identified as White. Participants were Introductory Psychology students from Purdue University who received research credit for participating.

Procedure and Materials. Potential participants completed a mass testing session including questions about whether they would (a) consider having children at some point in their lives and (b) consider adoption. Respondents who had a score below the midpoint (i.e., 4 on a 7-point scale) were excluded as potential participants (less than 2% of the sample). The mass testing also included items for assessing pre-experimental attitudes toward Chinese and Guatemalan people (items noted below).

Participants completed the experiment individually and were informed on arrival that the researchers were from Family Studies and were interested in international adoption. Specifically, participants were told that because there is the long-standing problem with the birthrates and economic hardship, infants may need homes. They were also told that while international adoption rates were increasing, little was known about what makes a good adoptive parent. Then, participants were asked to develop the mind-set that they were adopting from China or Guatemala, depending on the condition to which they had been randomly assigned. Then, they were given a short form that asked questions such as, “Do you want to travel to receive your child or do you prefer your child to be escorted?” Afterwards, participants “met” their would-be adoptive child by seeing a photo and reading a brief description about the child. Then, the participants typed answers to questions designed to help link them to their adoptive child (e.g., “What qualities would you like your child to learn from you?”).

Self-linking. Participants rated the extent to which they felt that the baby they adopted was a part of them on a 1 (not at all) to 7 (very much) scale. Afterwards, participants completed Inclusion of Self in Other (IOS; Aron et al., 1992) scales, which measured how close they felt to four specified targets. The IOS scale includes seven pairs of circles representing the self and other. The first pair of circles is completely separate, and then they are depicted with progressively greater overlap, with the seventh pair almost entirely overlapping. Participants circled the reference pair that most closely represented how close they felt to each of four targets, with the order of the targets randomized across participants. Participants recorded two ratings relevant to their adoptive country condition and two ratings relevant to the other adoptive country. Specifically, the IOS targets were the Chinese baby used in the Chinese adoption condition, Chinese people in general, the Guatemalan baby used in the Guatemalan adoption condition, and Guatemalan people in general.

Implicit attitudes. Next, participants completed a series of Implicit Association Tests (IATs) to assess implicit attitudes. The four IATs (presented in counterbalanced order) assessed attitudes toward Chinese babies versus White babies, Chinese adults versus White adults, Guatemalan babies versus White babies, and Guatemalan adults versus White adults. All IATs included 30 stimuli: 5 color photos of the target outgroup (e.g., Chinese babies) cropped to include the face only (one being the “adopted” baby), 5 color photos of White babies cropped to include the face only, 10 positive adjectives (e.g., wonderful), and 10 negative adjectives (e.g., disgusting). Standard IAT administration procedures were used (Greenwald, McGhee, & Schwartz, 1998), including seven blocks with 20 trials for the practice blocks and 40 trials for the test blocks. If the participant took longer than 750 ms to respond, the message “please respond faster” appeared on the computer screen.

Explicit attitudes. After completing the IATs, participants’ explicit attitudes toward Chinese and Guatemalan people were assessed as in the mass testing. Participants recorded ratings for five semantic differential items on 7-point scales (ugly–beautiful, honest–dishonest, awful–nice, good–bad, unpleasant–pleasant) for Chinese people and Guatemalan people (in counterbalanced order). Participants also completed feeling thermometers for both groups (e.g., “How warm do you feel toward Chinese people on a scale of 1-100?”). Before being debriefed, all participants were carefully probed for suspicion. No participants indicated any awareness of the true goals of the study.

Results and Discussion

Self-Linking. The item “Do you feel that the baby you adopted is a part of you?” was examined first to ensure that each
adoption condition produced equitable closeness. An independent samples t test revealed that the adoption condition effect was not significant, \( t(89) = 0.14, p > .85, \) with comparable ratings across the two conditions (\( M_{China} = 5.51, SD = 1.06; M_{Guatemala} = 5.54, SD = 1.17 \)).

The experimental manipulation was designed to create a connection between the participant and the adopted baby, which we expected to generalize to the ethnic category. Thus, we hypothesized that the participant would have higher IOS ratings for his or her adopted baby and people from his or her adoption country. Patterns of significance were identical when the analyses were conducted separately for the baby IOS and the adult IOS ratings, and baby and adult ratings were moderately correlated (Chinese: \( r = .49, \) Guatemala: \( r = .46, ts < .01 \)). Thus, we averaged ratings to create an overall IOS score for each country.

The IOS ratings were entered in a 2 (adoption condition: China vs. Guatemala) × 2 (rating type: Chinese vs. Guatemalan IOS score) mixed model analysis of variance, with adoption condition as the between-participants factor and rating type as the within-participants factor. The interaction between adoption condition and rating type was significant, \( F(1, 89) = 79.50, p < .001, \eta_p^2 = .47. \) Comparisons within adoption condition as a function of type of rating indicated that participants adopting from China felt closer to Chinese people (\( M = 4.66, SD = 0.90 \)) compared with Guatemalan people (\( M = 3.91, SD = 1.30, t(44) = 4.58, p < .001, d = .67 \)). Likewise, participants adopting from Guatemala felt closer to Guatemalan people (\( M = 4.54, SD = 1.09 \)) compared with Chinese people (\( M = 3.19, SD = 1.31, t(45) = 8.31, p < .001, d = 1.12 \)).

In sum, the findings suggested that our manipulation was successful in creating a sense of closeness with the adoptive baby and with people from the adoptive baby’s country.

**Explicit Attitudes.** Ratings for the five semantic differential items completed during the prescreening and the experimental session for Chinese people and for Guatemalan people were averaged to form four indices after reverse scoring so that higher scores reflect greater positivity (\( .94 > as > .83 \)). These indices correlated significantly with thermometer ratings (\( .63 > rs > .35, ps < .01 \)), so we standardized the scores within their respective distributions and combined them to create overall explicit attitude indices. Results are the same for the combined indices as when the two types of explicit measures are analyzed separately. Independent sample t tests predicting pre-scores for each country did not reveal significant effects for condition (\( ps > .51 \)).

The explicit attitude post-scores were entered in a 2 (adoption condition: China vs. Guatemala) × 2 (rating type: Chinese vs. Guatemalan people) mixed model analysis of variance, with adoption condition as the between-participants factor, rating type as a within-participant factor, and controlling for explicit attitude pre-scores. There was a significant interaction between adoption condition and rating type,
Implicit Attitudes. We used the scoring algorithm provided by Greenwald, Nosek, and Banaji (2003) to compute four implicit attitude scores: China-White baby, China-White adult, Guatemala-White baby, and Guatemala-White adult. As per standard, 11 participants’ IAT scores were excluded from analyses because their response times were less than 300 ms on at least 10% of the trials. Higher D scores indicate a negative association between the outgroup relative to Whites.

A one-sample t test was conducted on each of the IATs to test whether scores overall were significantly different from 0. All test yielded significant results (ps < .001), indicating that participants overall had significant bias favoring Whites on all the IATs.

A 2 × 2 (adoption condition: China vs. Guatemala) × 2 (IAT country: China vs. Guatemala) × 2 (IAT age: baby vs. adult) mixed model ANOVA was performed on the IAT D scores, treating the latter two variables as the within-participant factors. Also, pre-score explicit attitudes were used as covariates. The only significant effect was an interaction between IAT country and adoption condition, $F(1, 75) = 5.24, p < .05$, $\eta^2_p = .06$. However, the pattern of this interaction indicated that the mock adoption process was not successful in reducing implicit bias related to participants’ adoptive country (see Table 1). Participants in the China adoption condition showed slightly but not significantly greater IAT bias for Chinese people, $F(1, 41) = 1.12, p = .28$, $\eta^2_p = .03$. In contrast, participants in the Guatemalan adoption condition showed a non-significant trend toward greater IAT bias toward Guatemalan people than toward Chinese people, $F(1, 40) = 2.25, p = .14$, $\eta^2_p = .05$.

These results indicate that even with a potent link that was able to alter explicit attitudes, our manipulation was unable to sway implicit attitudes. To be sure, linking objects with the self can create positive associations with the linked stimuli (Gawronski et al., 2007; Walther, Nagengast, & Traselli, 2005). However, forging a single link to an outgroup member apparently cannot alter implicit attitudes when pre-existing, unfavorable implicit intergroup attitudes are involved. A main goal of Experiment 2 was to test whether conditioning the association between the self and target outgroup member would be more effective at reducing implicit intergroup bias.

Experiment 2

Experiment 2 sought to replicate the findings for explicit attitudes from Experiment 1 and test whether practicing the association between the self and an outgroup member would alter implicit attitudes. After the adoption paradigm was implemented, practice was provided for some participants by presenting pictures of babies across hundreds of trials, and having participants respond “my baby” when their adoptive baby appeared, and otherwise respond “not my baby.”

We modified other aspects of the experiment as well. With the addition of the training procedure, having participants complete four IATs would be very taxing. Thus, although participants imagined they were adopting a baby from either China or Guatemala, they completed the Chinese baby and Chinese adult IATs only. Performance on these IATs was compared across three adoption conditions. Some participants imagined adopting a baby from China and had no further training, just as in Experiment 1. A second group imagined they were adopting a baby from China and also completed the training exercise. Finally, to ensure that the effect of training was specific to practicing the association between the self and the Chinese baby, we included a condition in which participants imagined they were adopting a baby from Guatemala and they were trained to associate this baby with “my group.” If training to associate the adoptive baby with the self does reduce implicit bias, we should see lower Chinese IAT scores in the Chinese baby/train condition than the Guatemala train condition, with the no train condition likely falling between.

Method

Participants. Of the 99 participants, 40 were male, the mean age was 19 years, and all were self-identified White. Participants were Introductory Psychology students from Purdue University who received research credit.

Procedure and Materials. Participants were pre-selected for the study based on the same mass testing questions used in Experiment 1. The procedure was identical to Experiment 1 except for the nature of the adoption manipulation. Participants were randomly assigned to one of three experimental conditions: China-Train, Guatemala-Train, or China-Control. After participants in the China-Train condition saw the picture of their Chinese baby, they completed an additional computerized training procedure to condition the link between themselves and their adoptive Chinese baby. Specifically, they pressed a specified key to indicate “my baby” when a photo of his or her imagined adopted baby appeared.
Table 1. IAT Scores (Ds) as Function of Adoption Condition and IAT Country.

<table>
<thead>
<tr>
<th>Adoption condition</th>
<th>Chinese people</th>
<th>Guatemalan people</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experiment 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>.47 (.33)</td>
<td>.41 (.34)</td>
</tr>
<tr>
<td>Guatemala</td>
<td>.47 (.32)</td>
<td>.56 (.33)</td>
</tr>
<tr>
<td><strong>Experiment 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China-Train</td>
<td>.42 (.44)</td>
<td></td>
</tr>
<tr>
<td>China-Control</td>
<td>.50a (.34)</td>
<td></td>
</tr>
<tr>
<td>Guatemala-Train</td>
<td>.62b (.28)</td>
<td></td>
</tr>
<tr>
<td><strong>Experiment 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>.27a (.49)</td>
<td></td>
</tr>
<tr>
<td>China-Control</td>
<td>.36b (.39)</td>
<td></td>
</tr>
<tr>
<td>Guatemala-Train</td>
<td>.48b (.25)</td>
<td></td>
</tr>
</tbody>
</table>

Note: IAT = Implicit Association Test. Higher D scores indicate greater bias toward the specified outgroup relative to Whites. Participants in Experiment 2 completed the Chinese IATs only. For Experiments 2 and 3, means not sharing a subscript differ significantly at p < .05.

Results and Discussion

Self-Linking. The correlation between the baby IOS and the adult IOS was significant (Chinese: r = .49, Guatemalan: r = .66; ps < .01). Thus, as in Experiment 1, we combined them to create an overall IOS score for each country. Patterns of significance were identical when the analyses were conducted treating the baby and adult IOS scores separately.

The IOS ratings were analyzed in a 2 (IOS rating type: Chinese vs. Guatemalan IOS scores) × 3 (adoption condition: China-Train, China-Control, Guatemala-Train) mixed model ANOVA treating rating type as a within-participants' variable. We found significant main effects for rating type and adoption condition, ps < .05, which were qualified by a significant interaction between these variables, $F(2, 96) = 52.86$, $p < .001$, $\eta^2_p = .52$. Follow-up analyses indicated that participants in the China-Train condition felt closer to Chinese ($M = 3.90$, $SD = 1.25$) than Guatemalan people ($M = 2.45$, $SD = 1.18$), $t(29) = 7.54, p < .001$, $d = .51$. This was also the case for participants in the China-Control condition ($M = 4.48$, $SD = 1.25$; $M = 3.44$, $SD = 1.49$), $t(34) = 4.77, p < .001, d = .35$. Training did not appear to enhance feelings of closeness in the China-Train condition, as these participants' IOS scores were actually somewhat lower than the IOS scores of participants in the China-Control condition, $t(62) = 1.87, p = .07$. In contrast, participants in the Guatemala-Train condition reported feeling significantly closer to Guatemalan people ($M = 4.66$, $SD = 1.34$) than to Chinese people ($M = 3.14$, $SD = 1.30$), $t(34) = 6.17, p < .001, d = .50$. These findings are consistent with Experiment 1 and further indicate that the associative training we used apparently did not heighten a conscious feeling of closeness beyond that of the China-Control condition. This pattern is consistent with our assumption that the IOS reflects deliberative judgments about self–other overlap.

Explicit Attitudes. Ratings for the five semantic differential items were averaged to form pre-scores and post-scores for Chinese and Guatemalan people after reverse scoring so that higher scores reflect greater positivity (.91 > $\alpha$s > .81). As in Experiment 1, the correlation between the semantic differentials and the thermometer ratings were significant (.66 > rs > .42), so we standardized the attitude scores within their respective distributions and combined them to create overall explicit attitude ratings. Results were the same when the two types of explicit measures were analyzed separately. Participants' explicit attitude pre-scores from the mass testing did not vary by condition ($ps > .33$).

The composite explicit attitude post-scores were entered into a mixed model analysis of variance with adoption condition as the between-participants factor, rating type as the
within-participants factor, and controlling for pre-scores. There was a significant interaction between adoption condition and rating type, $F(2, 94) = 16.50, \ p < .001, \ \eta^2_p = .26$, which is shown in Figure 3. Comparison within adoption condition as a function of rating type indicated that participants in the China-Train condition had significantly more positive attitudes for Chinese people ($M = 0.08, SD = 0.97$) compared with Guatemalan people ($M = -0.31, SD = 0.97$), $F(27) = 11.24, p < .01, \ \eta^2_p = .29$. Participants in the China-Control condition did not differ significantly in their attitudes toward Chinese ($M = 0.15, SD = 0.76$) and Guatemalan ($M = 0.02, SD = 0.91$) people, $F(31) = 1.70, p = .20, \ \eta^2_p = .05$, although the pattern was in the expected direction. Participants in the Guatemala-Train condition had significantly more positive attitudes toward Guatemalan ($M = 0.24, SD = 0.77$) compared with Chinese ($M = -0.21, SD = 0.98$) targets, $F(32) = 15.46, p < .001, \ \eta^2_p = .33$.

In sum, the overall pattern of findings suggest that establishing a single link with an outgroup member shifted explicit attitudes to be more favorable, although the comparison of explicit attitudes toward Chinese versus Guatemalan people was not significant in the China-Control condition. Note, however, that this lack of effect seemed to be due to the rather unexpectedly positive attitudes toward Guatemalan people in the China-Control condition. When we compare attitudes toward Chinese people in the China-Train versus China-Control conditions, we see similar levels of positivity ($p = .88$). Thus, the overall pattern indicates that forming a link with a single outgroup member encouraged positive intergroup attitudes as in Experiment 1, and to a similar degree whether or not that link was subsequently conditioned.

Mediational Analysis for Explicit Attitudes. To determine whether IOS mediated the effect of adoption country on explicit attitudes, we first created a predictor variable where the China-Train and China-Control conditions were coded as 0 and the Guatemala-Train condition was coded as 1. We created a difference score for explicit attitudes as in Experiment 1 by subtracting the Guatemalan explicit post-scores from the Chinese explicit post-scores, which served as the dependent variable. Finally, we created a difference score for the IOS by subtracting the IOS Guatemalan score from the IOS China score, which served as our mediating variable. Bootstrapping based on 5,000 resamples (Preacher & Hayes, 2008) indicated that the total effect of adoption country and explicit attitudes (total effect = $-0.70, p < .001$) became nonsignificant when the IOS mediator was included in the model (direct effect = $-0.19, ns$). Furthermore, the analyses revealed with 95% confidence that the indirect effect was estimated to lie between $-0.9773$ and $-0.2443$. As 0 is not included in this confidence interval, IOS ratings significantly mediated the association between adoption country and explicit post-scores at $p < .05$ (see Figure 4).

Implicit Attitudes. IAT D scores were computed for the China-White baby and China-White adult. As per standard, 7 participants’ IAT scores were excluded from analyses because their response times were less than 300 ms on at least 10% of the trials. Higher D scores indicate a negative association with the outgroup relative to Whites. A one-sample t test conducted on each IAT showed that all differed significantly from 0 ($p < .001$), indicating significantly more favorable implicit attitudes toward White than Chinese people.

The IAT D scores were analyzed in a 2 (IAT age: baby vs. adult) × 3 (adoption condition) mixed model ANOVA, controlling for pre-test explicit attitudes. We found a marginally significant effect for condition, $F(2, 88) = 2.61, p < .08, \ \eta^2_p = .06$. As shown in Table 1, participants in the China-Train condition showed the least bias against Chinese people relative to White people, followed by participants in the China-Control condition, and participants in the Guatemala-Train condition.
had the most bias. To test our hypotheses more specifically, we compared the China-Train and Guatemala-Train conditions and found, as expected, that the difference was significant, $F(56) = 4.76, p < .05, \eta^2_p = .08$. There were no significant differences between the China-Control and either the China-Train condition, $F(57) = 0.49, p > .48, \eta^2 = .01$, or the Guatemala-Train condition, $F(63) = 1.98, p < .16, \eta^2 = .03$.

In sum, these findings show a stair-step pattern for implicit attitudes. Strengthening the connection between the Chinese adoptive baby and the self through the conditioning procedure was the most effective route for fostering more favorable implicit bias toward Chinese people, with this group's scores being significantly less negative than the implicit bias scores among participants in the Guatemala-Train condition. Implicit bias was somewhat but not significantly reduced in the China-Control condition, as these participants' IAT fell between but did not differ significantly from either of the other adoption conditions. Overall, the findings suggest that conditioning a link that has been established between the self and a single outgroup is necessary for reducing implicit bias in relation to the outgroup.

**Mediational Analysis for Implicit Attitudes.** We tested whether the significant difference between the China-Train and Guatemala-Train conditions found for implicit Chinese attitudes could be accounted for by participants’ conscious reports of how close they felt to Chinese people. Bootstrapping with 5,000 resamples (Preacher & Hayes, 2008) was performed using the two training conditions as the independent variable, Chinese IOS scores as the mediator and Chinese implicit attitudes as the outcome variable. As expected, we did not find evidence of mediation. Rather, the direct effect was significant ($r = .20$, $p < .05$) and comparable with the total effect ($r = .19$, $p < .05$). Moreover, the confidence interval included 0 ($[-.04, .11]$). These findings clearly indicate that the effects of the training procedure on implicit attitudes could not be accounted for by a conscious indicator of felt closeness to the outgroup. Instead, the results suggest a direct effect of training on extent of implicit intergroup bias.

**Experiment 3**

Experiment 3 had two main goals. First, we sought to replicate the stair-step pattern observed for implicit attitudes in Experiment 2 to establish with greater confidence the necessity of training self-other associations for reducing implicit intergroup bias. Second, we wanted to replicate the explicit attitude findings from Experiments 1 and 2 while separating the adoption portion of the experiment from the explicit attitude assessment. This helped us to minimize the possibility that demand characteristics were operating, such that participants felt pressured to report less-explicitly prejudiced attitudes toward the group to which their adoptive baby belonged.

**Method**

**Participants.** Of the 115 participants, 75 were male, the mean age was 19.6 years, and all were self-identified White. Participants were Introductory Psychology students from Purdue University who received research credit.

**Procedure and Materials.** The procedure was identical to Experiment 2 with three exceptions. First, mass testing data were not available for pre-selecting participants based on their openness to adoption and for measuring pre-experimental explicit attitudes. Second, we focused on Chinese but not Guatemalan IOS, explicit attitudes, and implicit attitudes to simplify and minimize suspicion (i.e., as participants might figure out we were looking for a difference based on their adoption conditions). Third, the explicit attitude measures were separated from the rest of the experimental context. Specifically, after participants completed all adoption-related tasks, they were asked to step outside the laboratory and wait for the experimenter to set up the computers for the last half of the experiment. During this time a “frazzled methods student” came up to the participants and pleaded with them for assistance on a nearly late homework assignment for her or her methods class that involved having people fill out a few surveys. All participants agreed to complete the surveys. Embedded in the surveys were the same semantic differential items and feeling thermometer about Chinese people that were used in Experiments 1 and 2. No participant expressed suspicion that the “frazzled student” was part of our experiment when probed.

**Results and Discussion**

**Self-Linking.** The Chinese baby and adult IOS scores were combined ($r = .62, p < .001$) to create an overall IOS score. Consistent with Experiments 1 and 2, there was a significant main effect of condition, $F(2, 112) = 16.07, p < .001$. Participants in the China-Train ($M = 3.76, SD = 1.37$) and China-Control ($M = 3.50, SD = 1.57$) conditions felt closer to Chinese people compared with participants in the Guatemala-Train condition ($M = 2.10, SD = 1.22$), $t(74) = 5.58, p < .001$ and $t(78) = 4.47, p < .001$, respectively.

**Explicit Attitudes.** As in Experiments 1 and 2, we standardized the semantic differentials and thermometer ratings within their respective distributions and combined them to create an overall explicit attitude score, $r(107) = .68, p < .001$. The composite explicit attitude scores were entered in an ANOVA examining the effect of adoption condition. There was a significant main effect of condition, $F(2, 96) = 3.66, p < .03$, with participants in the China-Train ($M = 0.21, SD = 1.07$) and China-Control ($M = 0.18, SD = 0.77$) conditions reporting significantly more positive attitudes for Chinese people compared with participants in the Guatemala-Train condition ($M = -0.32, SD = 0.91$), $t(58) = 2.09, p < .05$ and
t(71) = 2.57, p < .02, respectively. Thus, although the explicit attitude measure was collected by a person different from the experimenter and in a different context, the results of Experiment 3 replicate the findings from our other experiments and support the conclusion that establishing a single potent link with an outgroup member significantly improves intergroup attitudes.

**Mediational Analysis for Explicit Attitudes.** Bootstrapping based on 5,000 resamples (Preacher & Hayes, 2008) was conducted to determine if the Chinese explicit attitude rating main effect was mediated by the IOS rating, as shown in Experiments 1 and 2. The total effect of adoption country and explicit attitudes (total effect = −.28, p < .02) became nonsignificant when the IOS mediator was included in the model (direct effect = −.02, ns). Furthermore, the indirect effect was estimated to lie between −.45 and −.16 with 95% confidence. As 0 is not included in this confidence interval, IOS ratings significantly mediated the association between adoption country and explicit post-scores ratings at p < .05.

**Implicit Attitudes.** The analysis of the IAT D scores revealed the same stair-step pattern as was observed in Experiment 2 (see Table 1). As in Experiment 2, the omnibus main effect for condition was not statistically significant, F(2, 93) = 2.37, p < .10. However, participants in the China-Train condition (M = 0.27, SD = 0.49) had significantly lower IAT scores than participants in the Guatemala-Train condition (M = 0.48, SD = 0.25), t(62) = −2.18, p < .04. Again supporting the idea that training of the self–other link was necessary for implicit bias change, the China-Control condition (M = 0.36, SD = 0.39) did not differ from either the Guatemala-Train or China-Train conditions (ps > .45).

Although we replicated the stair-step pattern across Experiments 2 and 3, some readers may be troubled by the fact that our overall F for the linear effect did not reach significance in either experiment. We performed a meta-analysis across Experiments 2 and 3 on the overall linear effect of condition on implicit attitudes following procedures outlined by Lipsey and Wilson (2001). This analysis revealed a combined mean effects size of −.38 (z = 3.76, p < .01) with a 95% confidence interval between −.5753 and −.1809. Also, a test of homogeneity performed by calculating the Q statistic was not significant (Q = 1.92, p > .05), indicating that the variability across effect sizes did not exceed what would be expected based on sampling error. In sum, considering the linear effect across Experiments 2 and 3, we did obtain statistical significance.

**Mediational Analysis for Implicit Attitudes.** Consistent with Experiment 2, implicit attitudes were not mediated by IOS scores, 95% confidence interval = [−.0492, .0651]. Again, these findings indicate that the effects of the training procedure on implicit attitudes could not be accounted for by a conscious indicator of felt closeness to the outgroup. Instead, the results suggest a direct effect of training on implicit intergroup bias.

**General Discussion**

Our results suggest that establishing a potent link with a single outgroup member can produce generalized prejudice reduction in relation to the outgroup as a whole, and can reduce implicit prejudice with extensive practice of the link between one’s self and the outgroup. The findings go well behind demonstrating a simple associative self-anchoring effect by showing that explicit prejudice toward an outgroup (and not just toward the outgroup member) is reduced through self-linking and that explicit and implicit attitudes can change but through different underlying processes.

More specifically, our findings for explicit attitudes showed that participants who formed a connection with an outgroup member perceived greater overlap between themselves and this person and also with the outgroup as a whole. This perceived overlap was the critical mediator of explicit attitude change. These results extend past intergroup contact research (see Dovidio et al., 2003), which has posited a role of self–other linking in the prejudice reduction process, but has not tested for this effect in isolation of other contributing factors (e.g., establishing cooperative intergroup interdependence). We can also contrast these results with work on vicarious (Wright et al., 1997) and imagined contact (Crisp & Turner, 2009), where changing ingroup or outgroup norms and reducing anxiety are the important mediators, respectively. In sum, our research uniquely demonstrates that reframing the self to connect to an outgroup member can reduce intergroup bias and that the mediating process is the conscious perception of greater self–other overlap.

We obtained a different picture for implicit attitudes. Establishing a connection with an outgroup member was insufficient for shifting implicit bias (Experiment 1). In contrast, Experiments 2 and 3 showed that participants who repeatedly practiced the self + outgroup connection had lower levels of implicit bias toward the target outgroup, relative to participants who practiced a connection to a different ethnicity. Practicing the self–other association was necessary for changing implicit associations, and unlike with explicit attitudes, conscious perceptions of self–other overlap were not a mediator. Our finding that implicit associations were modified only when participants repeatedly practiced the self–other link is consistent with work positing that implicit association modification requires an element of conditioning, and not merely establishing a consciously mediated association with the outgroup (Gawronski & Bodenhausen, 2006; Gregg, Seibt, & Banaji, 2006; Rydell & McConnell, 2006).

Moreover, the present work extends prior research by nature of the type of conditioning used. Other paradigms for conditioning alternative associations typically involve direct
training of descriptive or evaluative associations to counter pre-existing outgroup associations. For example, with the counterstereotyping paradigm, participants learn to associate an outgroup with specific traits (e.g., intelligent) that are opposite to their pre-existing stereotypic associations (e.g., unintelligent) (Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000; Kawakami, Dovidio, & Van Kamp, 2005). In contrast, participants in the present research practiced associating a single outgroup member with the self.

We did not assess whether our training procedure altered specific stereotypic associations with the outgroup but rather focused on evaluative associations. This begs the question of whether stereotypes (e.g., Chinese people are bad drivers) would likewise be affected by forming self–outgroup associations. Other recent work from our lab found evidence of evaluative but not stereotypic change upon linking the self with multiple outgroup members and conditioning this link (Woodcock & Monteith, 2012). Future research should examine whether specific stereotypes will change only to the extent that the content is highly associated with the self. For example, if the self is strongly associated with extraversion, then the outgroup may also come to be viewed as extroverted.

Other boundary conditions for bias reduction based on linking an outgroup member to the self should also be investigated in future research. The extent of change and indeed whether it occurs at all is likely to be dependent on the extent of pre-existing outgroup animosity and also features of the relationship that is formed. Our paradigm created a link that we anticipated would be especially potent: thinking of a baby as a family member. That said, it was an imagined link rather than one experienced in “real life,” and yet attitudes did change. We are sanguine about the possible generalizability of the observed effects beyond our paradigm to other situations, such as the formation of an intergroup friendship, relationships with neighbors, and when students work closely with or share lodging with a student of another ethnicity (see West, Pearson, Dovidio, Shelton, & Trail, 2009).

Future research should also examine change across time. Whether change is maintained may depend on the extent to which the outgroup member continues to be viewed as a representative of the ethnic or group category, rather than being dissociated from his or her group, being viewed in entirely individuated ways, and/or being subtyped as a unique category of the larger group (Hornsey & Hogg, 2000; Kunda & Oleson, 1995; Richards & Hewstone, 2001; Rothbart & John, 1985).

There are other reasons for preserving distinctive social identities. The literature on dual identities and multicultural approaches to intergroup relations shows that trying to ignore people’s distinctive social identities is associated with a variety of negative outcomes. For example, Apfelbaum, Sommers, and Norton (2008) found that when Whites tried to ignore race, their nonverbal behavior toward Blacks was more negative (due to reduced capacity for inhibitory control), and greater prejudice was perceived (see also Richeson & Nussbaum, 2004). Plaut, Thomas, and Goren (2009) found in a workplace setting that minority’s psychological work engagement was positively predicted by the extent to which majority members agreed with multicultural beliefs and negatively predicted by their adherence to color-blind beliefs. Furthermore, other research suggests that extinguishing dual identities can dampen awareness of intergroup disparities and discourage social action (Saguy, Tausch, Dovidio, & Pratto, 2009). In sum, the literature is unequivocal about the advantages of maintaining group identities.

Conclusions

According to the counsel of Buddha, to see with an impartial eye, people must blend the self with all things. This age-old snippet of wisdom rang true in our empirical investigation focusing on the effects of establishing a connection between the self and an outgroup member. This connection increased perceptions of perceived self–other overlap, which in turn mediated explicit prejudice reduction toward the outgroup as a whole. It also resulted in implicit bias reduction in relation to the outgroup when the link was cognitively reinforced through conditioning. These findings extend what was previously known about reducing prejudice through self-linking by revealing the power of a single potent link. Given the many situations in which people have opportunities for experiencing single outgroup connections, we hope that the research provides a springboard for future studies on the topic and practical applications.

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Note

1. We initially included gender in all analyses in all experiments. The only significant finding that emerged was an interaction between adoption country and gender in Experiment 1 when predicting explicit attitudes, $F(1, 85) = 4.10, p < .05, \eta^2 = .05$. Male and female participants in the China adoption condition reported comparable explicit attitudes ($M_s = 0.01$ and $-0.02,$ $s = 0.01$ and $-0.02,$
respectively). However, male participants in the Guatemala condition reported less favorable explicit attitudes than female participants (Ms = 0.34 and 0.26, respectively). As this finding is of little theoretical interest and it was the only effect involving gender, we eliminated gender from all analyses reported.

References


