

## Mind the Gap: Increasing Associations Between the Self and Blacks With Approach Behaviors

Curtis E. Phills, Kerry Kawakami, Emmanuel Tabi,  
and Daniel Nadolny  
York University

Michael Inzlicht  
University of Toronto

Although perceived differences between outgroup social categories and the self are often cited as a major contributor to prejudice and intergroup tension, surprisingly few studies have examined ways to improve associations between the self and racial outgroups. The present research investigated one strategy to increase these associations—approach training. Specifically, 3 studies investigated the impact of training participants to conceptually approach Blacks on 3 separate measures: 2 response latency measures indexing the strength of association between the self and Blacks and a psychophysiological measure indexing brain activity in response to Blacks in the context of the self. A fourth study examined the link between earlier research on the impact of approach training on implicit prejudice against Blacks and the current results related to self–Black associations. Together, these findings provided consistent evidence that training in approaching Blacks increases associations between the self and Blacks that in turn reduce implicit prejudice against Blacks.

*Keywords:* approach, identification, self, prejudice, social cognition

The primary focus of current social cognitive research investigating strategies to improve intergroup relations is, for the most part, on changing evaluative and semantic associations with a particular group. For example, studies have sought to make attitudes toward specific social categories more positive (Dasgupta & Greenwald, 2001; Kawakami, Phills, Steele, & Dovidio, 2007; Olson, Kendrick, & Fazio, 2009; Wittenbrink, Judd, & Park, 2001) or to modify stereotypes and characteristics that are activated by these categories (Blair, 2002; Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000; Kawakami, Dovidio, & van Kamp, 2005, 2007; Rudman, Ashmore, & Gary, 2001). Recent findings, however, suggest that increasing associations between the target group and the self may also be an effective way of reducing bias (Galinsky, Ku, & Wang, 2005; Galinsky & Moskowitz, 2000). In particular, this research suggests that if people perceive a particular social

category to be similar to the self, they may be less likely to act or think negatively toward or about members of that category. In fact, a great deal of research has emphasized the importance of the self in determining how people understand, perceive, and interact with their social environment (Greenwald, Banaji, et al., 2002; Kihlstrom & Cantor, 1984) and the centrality of the self in their relationships with others (Aron, Aron, & Smollan, 1992). This is especially the case when those relationships are with people from different social categories (Dovidio et al., 2004; Gaertner & Dovidio, 2000). Accordingly, the focus of the present research was on an intervention that strengthens associations between the self and a target outgroup.

Recent research related to intergroup relations has demonstrated that integrating outgroups into the ingroup can reduce biases against former outgroup members. For example, Gaertner and Dovidio (2000) found that manipulations designed to create a common ingroup identity between Blacks and Whites reduced subsequent prejudice by Whites against Blacks. While these studies reveal the importance of overlapping social identities, the present research extends these findings by focusing on the personal self and modifying associations between the self and Blacks.

Recent research has suggested that perspective-taking, which induces self–other overlap, can successfully ameliorate intergroup biases like stereotypes (Galinsky & Moskowitz, 2000). For example, Galinsky and colleagues (2005) found that after taking the perspective of an elderly person, participants were less likely to apply elderly stereotypes like dependent to this category. Similarly, Dovidio et al. (2004) found that prejudice toward Blacks was

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Curtis E. Phills, Kerry Kawakami, Emmanuel Tabi, and Daniel Nadolny, Department of Psychology, York University, Toronto, Ontario, Canada; Michael Inzlicht, Department of Psychology, University of Toronto, Toronto, Ontario, Canada.

Daniel Nadolny is now at the Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada.

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Correspondence concerning this article should be addressed to Curtis E. Phills, Department of Psychology, York University, 4700 Keele Street, Toronto, Ontario, Canada, M3J 1P3. E-mail: phills@yorku.ca

reduced among participants instructed to imagine the victim's feelings while watching a series of incidents of racial discrimination. Furthermore, perspective-taking has been linked with increased behavioral mimicry and the facilitation of social bonds and rapport (Chartrand & Bargh, 1999; Galinsky et al., 2005).

Notably, while the perspective-taking research has focused, for the most part, on the impact of self–other overlap on reducing intergroup biases, surprisingly few studies have attempted to identify ways to create self–other overlap by building new associations between the self and the outgroup, a core initial step in this process. Because the focus of many perspective-taking studies is on how self–other overlap influences prejudice, manipulations often directly and explicitly instruct participants to identify with the outgroup social category. For example, participants are instructed to take “the perspective of the individual in the photograph and imagine a day in the life of this individual as if you were that person, looking at the world through her eyes and walking through the world in her shoes” (Galinsky, Wang, & Ku, 2008, p. 406). While this explicit method of increasing self–other overlap has proven to be effective in reducing biases, it is clear that investigating novel methods of creating new associations between the self and outgroup social categories is an important next step. Investigating alternative interventions that are less explicit and that build new associations with outgroup social categories will not only increase the understanding of self–outgroup overlap processes but also have important implications for the development of strategies to reduce prejudice. The primary goal of the present research was therefore to explore a new tactic to increase associations between the self and outgroups—approach training.

Approach behaviors are fundamentally related to pulling other objects and social categories closer to the self (Förster, 2001; Förster & Strack, 1997, 1998; Kawakami, Phillips, et al., 2007). Research has provided strong and consistent evidence that gestures related to approach and avoidance behaviors can influence attitudes toward mundane objects in a predictable fashion, with people generally evaluating objects and categories more favorably after approaching, as opposed to avoiding, the target (Förster & Strack, 1997, 1998; Neumann & Strack, 2000; Priester, Cacioppo, & Petty, 1996). For example, Cacioppo, Priester, and Berntson (1993) demonstrated that when participants flexed their muscles in an approach stance by placing their palms on the bottom of a table and lifting up toward the self, their ratings of neutral Chinese ideographs were more positive than when they extended their muscles in an avoidance stance by placing their palms on the top of a table and pushing down away from the self.

Recent research by Kawakami, Phillips, and colleagues (2007) indicates that similar attitudinal effects can be found when approaching social categories. Specifically, their studies demonstrated that non-Black participants trained to approach Blacks by pulling a joystick toward the self had significantly less implicit prejudice against Blacks than participants trained to avoid Blacks by pushing a joystick away from the self or participants trained to respond in a neutral way toward Blacks. Consistent with previous studies, these researchers found that training only changed preexisting biases when it provided participants with a new way of responding to outgroups. In particular, participants' level of implicit biases did not differ after training in avoiding Blacks (Kawakami, Phillips, et al., 2007) or in responding to Blacks in a stereotypic manner (Kawakami et al., 2000) from baseline levels

or neutral training conditions. Only participants trained to learn new associations that are not typical in society demonstrated less subsequent stereotyping and prejudice.

The present research extended this earlier work by exploring the possibility that approach training can also impact the working self-concept. In particular, we propose that extensive practice in approaching outgroup categories can strengthen associations between the self and those outgroups. In accordance with recent theorizing (Greenwald, Pickrell, & Farnham, 2002), we define the self-concept as the association of the concept of the self with one or more attribute concepts. Furthermore, the self is considered to be a complex cognitive representation that includes a variety of different types of information including personality traits and physical characteristics, evaluations, significant relationships, behavioral tendencies, and goals (Baumeister, 1998; Hetts, Sakuma, & Pelham, 1999; Niedenthal, Setterlund, & Wherry, 1992; Wheeler, DeMarree, & Petty, 2005). Most pertinent to the current research, theorists have also included associative links to social categories within the self-concept (Greenwald, Banaji, et al., 2002).

While the self-concept encompasses a wide variety of self-conceptions, at any given moment a subset of this universe, the working self-concept, can be activated and influence participants' thoughts, feelings, and behaviors (Markus & Kunda, 1986). The aim of the current research was to investigate an intervention based on approach behaviors that is designed to systematically build strong associations between the self and Blacks and thereby influence the working self-concept.

We expected that training non-Black participants to approach Blacks with extensive practice in conceptually decreasing the distance between themselves and Blacks would increase associations between the self and Blacks. Because the proximal effect of approach behavior is to bring an object closer, after consistently exhibiting an approach orientation, we predicted that the psychological distance between the self and Blacks would be reduced (Lieberman, Trope, & Stephan, 2007). In particular, because approach behaviors imply a decrease in distance and increased physical closeness between the self and an object, approach orientations will result in accentuated psychological closeness between the self and the target (Nussinson, Seibt, Häfner, & Strack, 2010; Seibt, Neumann, Nussinson, & Strack, 2008).

In the present context, after approaching Blacks, non-Black participants may perceive a closer relationship between the self and Blacks and focus on similarities between the self and Blacks (Friedman & Förster, 2000; Förster, Liberman, & Kuschel, 2008). This more global processing style would suggest that after approach behaviors, Blacks may be perceived to be more similar to the self. This could result in stronger associations between the self and Blacks in general and also stronger associations between specific traits related to the self and Blacks. Because most people evaluate the self positively, approach behaviors could also result in more positive implicit attitudes toward Blacks because of strong self–Black associations (Cadinu & Rothbart, 1996; Gawronski, Bodenhausen, & Becker, 2007; Otten, 2003; Walther & Trasselli, 2003).

Recent research by Page-Gould and colleagues provides initial support that orientation toward outgroups can influence the relationship between the self and outgroups (Page-Gould, Mendoza-Denton, Alegre, & Siy, 2010). Specifically, these studies demonstrated that thinking about contact with an outgroup can increase associations between the self and a particular ethnic outgroup. As

an extension of this research, we examined the possibility that training in approaching a social category can increase associations between the self and the target category.

### Overview

The primary objective of the present set of four studies was to explore the possibility that approaching Blacks can increase associations between the self and Blacks. In particular, Study 1 examined whether training in approaching Blacks using a joystick enhanced general associations between the self and Blacks on an implicit association test (IAT; Greenwald, Banaji, et al., 2002; Greenwald & Farnham, 2000; Kawakami, Steele, Cifa, Phillips, & Dovidio, 2008; Nosek, Banaji, & Greenwald, 2002). A common assumption related to the IAT is that the stronger participants associate any two concepts, the faster they will categorize these concepts when they share a response key. We therefore expected that after training in approaching Blacks compared to avoiding Blacks or responding to Blacks in a neutral way, participants would be faster when the self and Blacks were categorized using the same response key.

Study 2 investigated the impact of an alternative approach training technique based on the inclusion of other in self studies, in which participants moved visual representations of the self and Blacks, on two indices of identification. This training technique utilized circles to visually represent the self and members of social categories (Aron et al., 1992; Wright, Aron, & Tropp, 2002). Specifically, participants were required to adjust a slider to move representations of the self and Blacks closer together or farther apart. While previous approach training tasks that utilized a joystick were related to specific pushing and pulling actions with and without explicit references to approach and avoidance, the latter slider task was related to a visual presentation of the self and Blacks approaching one another. In addition, Study 2 included not only an IAT related to general associations between the self and Blacks, as in Study 1, but also a second IAT that assessed associations between specific traits ascribed to the self and Blacks.

The main goal of Study 3 was to investigate whether a training procedure similar to that used in Study 1 could influence electrophysiological brain activity. In particular, we were interested in the extent to which approach training influenced responses on an oddball task. To achieve this goal, we examined the amplitude of a stimulus-locked event-related potential (ERP) component, the P300, to photographs of Blacks in the context of a series of self-images. The P300 has been shown to be sensitive to task-relevant categorization decisions (Cacioppo, Crites, Berntson, & Coles, 1993; Donchin, 1981; Ito & Cacioppo, 2000; Ito & Urland, 2003) as well as to the social context of the stimuli. Specifically, P300 amplitudes increase to stimuli that differ from preceding stimuli along task-relevant dimensions.

On the basis of previous findings (Ito & Urland, 2003), we predicted that in general, without training, our participants would respond to Blacks as psychologically different from the self and so would attend more to Blacks and have greater P300 amplitudes to Blacks relative to the self. We further expected, however, that training in approaching Blacks would reduce the amplitude of the P300 when responding to Blacks in the context of the self. Because of newly created associations between the self and Blacks via approach training, we expected a decrease in experienced psycho-

logical differences between the self and Blacks and therefore less attention to Blacks.

Finally, Study 4 investigated the relationship between our current findings on the impact of approach training on self-Black associations and past research on the effects of approach training on attitudes (Kawakami, Phillips, et al., 2007). In particular, this study examined whether one reason why training to approach Blacks results in more positive implicit racial attitudes (Gawronski & Bodenhausen, 2006; Gawronski et al., 2007) is because it creates stronger associations between the self and Blacks (Cadinu & Rothbart, 1996; Otten, 2003; Walther & Trasselli, 2003).

### Study 1

The primary goal of Study 1 was to provide an initial demonstration of the impact of training to approach Blacks on identification with Blacks using an IAT (Greenwald & Farnham, 2000; Kawakami et al., 2008; Nosek et al., 2002). Because previous research has demonstrated that the simple action of extending or flexing muscles by pulling and pushing a joystick is sufficient to influence implicit racial attitudes (Kawakami, Phillips, et al., 2007), we examined the possibility that associations between the self and social categories may also be influenced by similar embodied cognition processes (Barsalou, Niedenthal, Barbey, & Ruppert, 2003; Förster, 2001; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005). On the basis of a growing literature in social and cognitive psychology that examines interactions between the body and higher cognitions (Barsalou et al., 2003; Förster, 2003; Niedenthal et al., 2005; Niedenthal, Winkielman, Mondillon, & Vermeulen, 2009; Schwarz & Bless, 1991), we expected that bodily feedback related to pushing and pulling a joystick, independent of explicit semantic associations related to the concepts of approach and avoidance, would impact associations between the target category and the self. Thus, participants in this study were shown how to carry out these push/pull actions without approach or avoidance labels included in the instructions. A third group of participants who were instructed to respond to Blacks and Whites in a neutral manner by moving the joystick to the left and right rather than by pushing and pulling was also included.

Because previous research has found that participants trained to respond in ways that are congruent with current societal norms (e.g., avoiding Blacks or stereotyping skinheads) do not differ in their levels of implicit prejudice or stereotype activation from participants in neutral or no-training control conditions (Kawakami et al., 2000; Kawakami, Phillips, et al., 2007), we expected participants trained to avoid Blacks to show low levels of implicit identification with Blacks similar to participants in the left/right training condition. Participants trained to approach Blacks, alternatively, were expected to be faster to associate Blacks with the self than participants trained to avoid Blacks or respond in a neutral way to Blacks.

### Method

**Participants and design.** Fifty (35 female and 15 male) non-Black undergraduate students took part in the experiment for course credit. Participants came from diverse ethnic backgrounds reflecting the cultural environment and included 33 White, five East Asian (e.g., Japanese, Chinese, Korean), and 12 South Asian

(e.g., Pakistani, Indian, Bangladeshi) students. Participants were randomly assigned to training condition (approach Blacks vs. avoid Blacks vs. sideways control) in a between-subjects design.

**Procedure.** Upon arrival, participants were informed that they would be participating in a series of separate studies that in reality were all part of the same experiment. In the first study, participants were asked to respond to photographs of Blacks and Whites to ostensibly investigate theories of cognitive processes. In actual fact, this study was designed to train participants to approach, avoid, or respond in a neutral way to Blacks. In the second study, participants completed an identification IAT (Greenwald & Farnham, 2000) designed to assess the strength of association between the self and Blacks.

**Approach training task.** For this task, participants were seated in front of a personal computer and received instructions on how to push and pull a joystick in relation to photographs of Blacks and Whites presented on the computer screen. They were told that “you will be making two movements with the joystick—like this [the experimenter demonstrated by pulling the joystick] and like this [the experimenter demonstrated by pushing the joystick].”

Participants in the approach Blacks condition were shown how to respond to photographs of Blacks with a demonstration of the exact joystick pulling motion. They were also shown how to respond to photographs of Whites with a demonstration of the exact joystick pushing motion. In contrast, participants in the avoid Blacks condition were given the opposite instructions. These participants were shown how to respond to photographs of Blacks by pushing a joystick and to respond to photographs of Whites by pulling a joystick. Participants in a sideways control condition, alternatively, were shown how to move the joystick to the left and right in response to photographs of Blacks and Whites. Specifically, half of participants in this condition were required to move the joystick to the left in response to Blacks and to the right in response to Whites, while the other half of participants were given the opposite instructions.

Each trial of the training task began with the presentation of a Black or White face on the computer screen. The face remained on the computer screen until participants responded with the joystick. After correct responses, participants were presented with a blank screen for 1,000 ms before the start of the next trial. After incorrect responses, participants were presented with a blank screen for 100 ms followed by a red X for 800 ms and another blank screen for 100 ms before the start of the next trial.

In total, participants completed 480 trials of training in 10 blocks of 48 trials each. Twenty-four unique photographs of Blacks and 24 unique photographs of Whites were randomly presented during each block. Before beginning the task, participants completed eight separate practice trials while the experimenter watched and corrected any mistakes to ensure that they fully understood the instructions.

**Implicit association test.** After completing the training task, participants were presented with an identification IAT to assess the strength of association between the self and Blacks. In this task, participants were required to categorize photographs of Blacks and Whites along with words related to the self and others. Specifically, participants were presented with six photographs of Blacks (three male and three female), six photographs of Whites (three male and three female), four self-related words (i.e., *I, me, mine,*

and *self*) and four other-related words (i.e., *they, them, their,* and *other*). Importantly, none of the stimuli presented during the IAT were used in the approach training task.

In accordance with standard IAT procedures (Greenwald, McGhee, & Schwartz, 1998), participants were presented with five blocks of trials. While three of these blocks were related to practice trials, two blocks were critical. The order of the critical blocks was counterbalanced across participants. In one critical block, participants were instructed to use one key to categorize Blacks and words related to the self and another key to categorize Whites and words related to others. In the other critical block, these pairings were reversed such that participants were instructed to use one key to categorize Whites and words related to the self and another key to categorize Blacks and words related to others. When participants made a correct response, they were presented with a blank screen for 1,000 ms before the start of the next trial. When participants made an incorrect response, however, they were presented with a blank screen for 100 ms followed by the presentation of a red X in the center of the screen for 800 ms and then another blank screen for 100 ms before the start of the next trial. Each critical block consisted of 60 trials. IAT *D* scores were calculated according to an algorithm recommended by Greenwald, Nosek, and Banaji (2003), with higher scores representing greater association between the self and Blacks.

Upon completion of the experiment, participants were probed for insights into the experimenters' hypotheses (Chartrand & Bargh, 1996). None of the participants were aware of the predicted impact of the training on their responses during the IAT.

## Results and Discussion

To analyze the impact of approach training on associations between the self and Blacks, a training (approach Blacks vs. avoid Blacks vs. sideways control) one-way analysis of variance was performed on the IAT *D* scores. A significant difference in associations between the self and Blacks across the three training conditions was found,  $F(2, 47) = 4.17, p < .03$ . As predicted, simple effects analyses demonstrated that participants trained to approach Blacks ( $D = -.04, SD = .26$ ) were faster to associate the self with Blacks in comparison to Whites than participants trained either to avoid Blacks ( $D = -.24, SD = .30, t(33) = 2.18, p < .04, d = .71$ ), or to respond in a neutral way to Blacks ( $D = -.29, SD = .23, t(30) = 2.89, p < .01, d = 1.02$ ). Furthermore, in accordance with previous results (Kawakami et al., 2000; Kawakami, Phills, et al., 2007), training participants to respond to social categories in ways congruent with cultural associations did not impact intergroup biases. Specifically, participants trained to avoid Blacks did not differ in the speed with which they associated the self with Blacks on the IAT from participants trained to respond in a neutral way to Blacks,  $t(31) = 0.48, p = .64, d = .19$ .

### Study 2

While the results from Study 1 provide an initial demonstration that extensive training in approaching Blacks can strengthen associations between the self and Blacks, the primary goal of Study 2 was to examine whether approach training also modifies the characteristics that are associated with Blacks (Galinsky et al., 2005). In particular, we investigated the extent to which extensive training in moving

representations of the self and Blacks closer together increased associations between self-traits and Blacks. For example, if participants perceived themselves to be kind, intelligent, and cheap, would these same traits also be associated more with Blacks after training to approach Blacks? To examine this possibility, in addition to an IAT measuring general association between the self and Blacks as in Study 1, Study 2 also included an IAT measuring associations between positive and negative traits participants strongly ascribed to the self and Blacks.

A further goal of Study 2 was to investigate a novel method of approach training. In particular, this training technique utilized circles representing the self and others (Aron et al., 1992; Wright et al., 2002) on a computer screen. While participants in the approach Blacks condition were instructed to move visual representations of themselves and Blacks closer using an on-screen slider, participants in the avoid Blacks condition were instructed to move the circles farther apart. We expected that participants would be faster to associate the self with Blacks and faster to associate traits strongly ascribed to the self with Blacks when they were trained to approach Blacks by reducing the distance between circles representing the self and Blacks than when they were trained to avoid Blacks by increasing this distance.

## Method

**Participants and design.** Seventy-six (17 male and 59 female) non-Black undergraduate students from diverse ethnic backgrounds (41 White, 22 East Asian, and 13 South Asian) took part in the experiment in exchange for course credit. Participants were randomly assigned to condition in a Training (approach Blacks vs. avoid Blacks)  $\times$  Agent (move the self vs. move the target) between-subjects design.

**Procedure.** Participants were first instructed to complete an online survey to assess the extent to which they ascribed specific traits to themselves. One week later, participants were presented with the main experiment in the laboratory. Although this latter study was composed of three interrelated studies, participants were informed that they would be completing a series of separate experiments that had been combined to make better use of the participant pool. The first task was designed to train participants to approach or avoid Blacks. Subsequent tasks, alternatively, were designed to assess associations between the self and Blacks and associations between traits ascribed to the self and Blacks.

**Personally descriptive traits questionnaire.** In an initial online survey, participants were asked to rate the extent to which they associated a series of traits with themselves from 1 (*not at all*) to 9 (*completely*). Twenty of these traits were positive (e.g., moral, loyal, reliable, kind) and twenty traits were negative (e.g., greedy, arrogant, boring, rude). In addition, participants were asked to provide three positive and three negative traits they believed best described themselves. For this latter response, students could include traits presented or not presented on the previous list.

**Approach training.** Approximately one week after this initial session, participants were seated in individual cubicles in front of a personal computer to complete the main experiment. In the first task, participants were trained to approach and avoid Blacks and Whites using an on-screen slider. Specifically, on each trial, participants were presented with a circle containing their own name that represented the self and a circle containing a head and shoul-

ders photograph that represented another student who was either Black or White. Dependent upon condition, the participants' task was to use an on-screen slider to move the two circles so that they either completely overlapped (approach) or were as far apart as possible (avoidance).

Importantly, on each trial of this task, one circle initially appeared in the center of the screen while the other appeared on the far left or right of the screen. The slider controlled the movement of the center circle, and dependent upon condition, the center circle represented either the participant or another student. Although we did not expect that the circle being moved (either the self or a Black or White target) would influence subsequent identification with Blacks, participants were randomly assigned to an agent condition. In the move the self condition, the center circle represented the self, and participants controlled the movement of the self toward or away from Blacks and Whites. In the move the target condition, alternatively, the center circle represented either the Black or White target, and participants controlled the movement of this target toward or away from the self.

When presented with a circle that represented a Black student, participants in the approach Blacks condition were required to move the center circle until the circles representing the self and the Black student completely overlapped. In contrast, when presented with a circle that represented a White student, these participants were required to move the center circle until the circles that represented the self and the White student were as far apart as possible. Participants in the avoid Blacks condition, alternatively, were given the opposite instructions. In particular, when presented with a circle that represented a Black student, these participants were required to move the center circle until the two circles were as far apart as possible. Conversely, when presented with a circle that represented a White student, these participants were required to move the center circle until the two circles completely overlapped.

In summary, in the approach Blacks conditions, participants were always instructed to move circles that represented the self and Blacks closer together and to move circles that represented the self and Whites farther away. This activity could occur by the participant moving either the circle that represented the self or the circle that represented the other student. In the avoid Blacks condition, alternatively, participants were always instructed to move circles that represented the self and Blacks farther away and to move circles that represented the self and Whites closer together. Again, this could occur by moving either the circle that represented the self or the circle that represented the other student. It is important to note that participants were not instructed to approach or avoid any targets during this task. Instead, we assumed that approach and avoidance processes would be activated by perceiving the self and target social categories as either moving together or apart.

In total, all participants completed 240 trials in which 10 blocks of 24 trials were presented. In each block, participants were randomly presented with 12 unique photographs of Blacks and 12 unique photographs of Whites. When participants made correct responses, they were presented with a blank screen for 1,000 ms before the start of the next trial. In contrast, when participants made incorrect responses, they were presented with a blank screen for 100 ms followed by a screen with a red X in the center for 800

ms and finally a blank screen for 100 ms before beginning the next trial.

**Implicit association tests.** After the training session, all participants were presented with two IATs. The order of presentation of the IATs was counterbalanced across participants. One IAT was designed to assess the strength of association between the self and Blacks and was identical to the one utilized in Study 1. The other IAT was designed to assess the strength of association between traits participants strongly ascribed to the self and Blacks.

Specifically, in this latter task, participants were required to categorize six photographs of Blacks (three male and three female), six photographs of Whites (three male and three female), and six traits strongly ascribed to the self and six traits weakly ascribed to the self. In particular, each participant completed a unique IAT that contained three positive and three negative traits that participants had previously rated as most strongly descriptive of themselves on the rankings and the scale ratings and three positive and three negative traits participants had rated as least descriptive of themselves.

Along with three practice blocks of trials, participants were presented with two critical blocks of trials, the order of which was counterbalanced across participants. In one critical block, participants were instructed to use the same key to categorize Blacks and traits strongly descriptive of the self and another key to categorize Whites and words weakly related to the self. In the other critical block, these pairings were reversed such that participants were instructed to use one key to categorize Whites and traits strongly related to the self and another key to categorize Blacks and traits weakly descriptive of the self. Presentation times and error feedback were the same as in the previous IAT, and each critical block consisted of 72 trials. IAT  $D$  scores were calculated with higher scores representing greater association between traits ascribed to the self and Blacks (Greenwald et al., 2003).

Detailed interviews with the participants upon completion of the experiment indicated that none of the participants were aware of the predicted relationship between the training and responses to either IAT.

## Results and Discussion

To analyze the impact of approach training on associations between the self and Blacks, a Training (approach Blacks vs. avoid Blacks)  $\times$  Agent (move the self vs. move the target) analysis of variance was performed on identification IAT  $D$  scores. As expected, a significant main effect for training was found,  $F(1, 72) = 5.33, p < .03, d = .51$ . Participants trained to approach Blacks ( $D = -.04, SD = .18$ ) were faster to associate the self with Blacks than participants trained to avoid Blacks ( $D = -.15, SD = .25$ ). Furthermore, as predicted, the main effect for agent,  $F(1, 72) = 0.15, p = .70, d = .03$ , and the two-way interaction,  $F(1, 72) = 1.64, p = .21$ , were not significant.

A second Training (approach Blacks vs. avoid Blacks)  $\times$  Agent (move the self vs. move the target) analysis of variance was performed on IAT  $D$  scores related to associations between traits participants identified as strongly descriptive of themselves and Blacks. Once again, a significant main effect for training was found,  $F(1, 72) = 11.30, p < .02, d = .81$ . Participants trained to approach Blacks ( $D = .02, SD = .17$ ) were faster to associate the specific traits that they ascribed to the self with Blacks than

participants trained to avoid Blacks ( $D = -.13, SD = .20$ ). Furthermore, as expected, the main effect for agent,  $F(1, 72) = 0.04, p = .85, d = .11$ , and the interaction,  $F(1, 72) = 1.64, p = .21$ , were not significant.<sup>1</sup>

Additional analyses demonstrated that participant scores on the IATs that assessed self-Black associations and associations between personally descriptive traits and Blacks were correlated ( $r = .34, p < .01$ ). The moderate size of this correlation suggests that the two IATs measured to some extent distinct aspects of participants' self-concepts—a general association between the self and Blacks and associations between specific traits that are associated with the self and Blacks.

Together, these results replicate the findings of Study 1 and provide further evidence that training in approaching Blacks facilitates associations between the self with Blacks. Importantly, these effects were found with a new type of training procedure that involved moving visual representations of the self, Blacks, and Whites toward or away from one another and with a different IAT. In particular, the results demonstrate that approach training increased not only general associations between the self and Blacks but also associations between specific characteristics that participants had identified as personally descriptive of the self and Blacks.

## Study 3

While Studies 1 and 2 demonstrated that training in approaching Blacks increased associations between the self and Blacks utilizing reaction time tasks, the primary goal of Study 3 was to extend these findings by examining the effects of approach training on electrocortical responses. In particular, an oddball task was used in which we examined the amplitude of a stimulus-locked ERP component, the P300, to photographs of Blacks in the context of self-images. The P300 has been shown on this task to be influenced by task-relevant categorization decisions (Cacioppo, Crites, et al., 1993; Donchin, 1981; Ito & Cacioppo, 2000; Ito & Urland, 2003) as well as the social context of the stimuli. Importantly, past research has demonstrated that the P300 is sensitive to both self-relevant stimuli (Gray, Ambady, Lowenthal, & Deldin, 2004) and racial categorization processes (Ito & Bartholow, 2009; Ito & Cacioppo, 2000).

In Study 3, we utilized an oddball task in which participants were presented with a series of photographs, with the majority of the stimuli being self-relevant. Within this context, a variety of oddball stimuli were presented that were different from the self (i.e., Blacks, Whites, or ethnic ingroup members). Research has demonstrated that P300 amplitudes increase when stimuli are psychologically different from preceding stimuli along task-relevant dimensions (Bartholow & Amodio, 2009; Donchin, 1981;

<sup>1</sup> We further examined the impact of trait valence on response latencies on IAT scores related to associations between traits identified as strongly descriptive of the self and Blacks. In particular, we conducted a repeated measures analysis of variance with trait valence (positive vs. negative) as a within-subjects factor and type of training and agent as between-subjects factors. Importantly, there were no main effect or interaction effects for trait valence (all  $ps > .38$ ). This analysis supports our conclusion that after training to approach Blacks, participants associated both positive and negative personally descriptive traits with Blacks.

Ito & Bartholow, 2009). In the present context, participants were required to categorize each image according to whether the person in the photograph represented “me” or “not me.” On the basis of previous findings (Ito & Urland, 2003), we predicted that in general, participants would respond to Blacks as psychologically different from the self and that approach training would decrease this difference. Specifically, we expected that after training in approaching Blacks, participants would show decreased P300 amplitudes when responding to Blacks in the context of the self rather than in a control training condition.

Importantly, research has found that the amplitude of the P300 to target stimuli during the oddball task is related to how these stimuli are categorized rather than how they are physically perceived (Chong et al., 2008). The P300, in other words, is driven not only by bottom-up processes, such as how physically different the target stimulus is from its context, but also by top-down processes, such as the social context or the psychological meaning of the target stimulus (Chong et al., 2008). Earlier ERP components such as the N200, alternatively, have been associated with more general processing related to physical properties of the specific stimuli such as attentional biases for Black relative to White faces. These effects have been found to occur regardless of the specific task instructions or the more complex relationship between the target stimuli and the context (Chong et al., 2008; Ito & Urland, 2003). In the present study, we expected that despite the fact that Black stimuli would continue to be visually very distinct from the preceding context of non-Black self-images, training to approach Blacks would primarily influence later processes such as the P300 rather than earlier N200 waves.

In particular, because of newly created associations between the self and Blacks, we predicted approach in comparison to avoidance training would result in lower P300s in response to Black targets. On the basis of our findings from Studies 1 and 2 and previous results (Kawakami, Phillips, et al., 2007), we predicted that approach training would not influence P300 amplitudes in response to photographs of Whites or ethnic ingroup members. Research by Kawakami, Phillips, et al. (2007), for example, showed that approach training does not impact responses to comparison nontarget social category members. These results demonstrated that training to approach Blacks regardless of whether the nontarget social category presented during the training was Whites or Asians reduced negative associations related to Blacks relative to Whites on an IAT.

## Method

**Participants and design.** Twenty-seven (14 male and 13 female) non-Black undergraduate students from diverse ethnic backgrounds (eight White, 12 East Asian, and seven South Asian) completed the experiment for course credit. Participants were randomly assigned to training condition (approach Blacks vs. avoid Blacks) in a between-subjects design.

**Procedure.** As in Studies 1 and 2, upon entering the laboratory, participants were told that they would be participating in a series of separate studies, but in reality, the studies were actually all part of the same experiment. Although participants were informed that the first experiment was about examining various theories of cognitive processes, this study was in fact designed to train participants to approach or avoid Blacks. While participants

were informed that the second experiment was about investigating processes related to the self, the real purpose was to examine the impact of the training on neural processing of Black stimuli in the context of the self. Before beginning the main experiment, all participants posed for 10 photographs that would later be used in the oddball task.

**Approach training task.** To complete the training task, participants were seated in front of a personal computer and asked to respond to photographs of Blacks and Whites presented on a computer screen with a joystick. While this training was similar to the task used in Study 1, the instructions were modified. In accordance with earlier research by Kawakami, Phillips, et al. (2007), participants in the approach Blacks condition were explicitly instructed to “approach Blacks by pulling the joystick toward yourself” when presented with photographs of Blacks and to “avoid Whites by pushing the joystick away from yourself” when presented with photographs of Whites. Conversely, participants in the avoid Blacks condition were explicitly instructed to “approach Whites by pulling the joystick toward yourself” when presented with photographs of Whites and to “avoid Blacks by pushing the joystick away from yourself” when presented with photographs of Blacks. In total, participants completed 480 trials of training in 10 blocks of 48 trials each.

**Oddball task.** After the training, all participants completed a modified version of an oddball task while an electroencephalograph (EEG) recorded their electrocortical responses (Donchin, 1981; Gray et al., 2004; Ito & Urland, 2003). During this task, participants were required to categorize photographs of themselves and fellow students as “me” or “not me” with a button box. This task included 10 photographs of the student taken at the beginning of the session in standardized poses along with similar photographs of five Black students and five White students. For South Asian and East Asian students, ingroup stimuli were included that comprised five photographs of South Asian students or five photographs of East Asian students, respectively. For Whites, ingroup stimuli comprised five additional photographs of White students.<sup>2</sup> All images were head-and-shoulder photographs of students with a neutral facial expression looking in various directions. Specifically, in one photograph, students looked straight ahead; in six photographs, students turned their heads 22.5, 45, and 90 degrees to the left and then 22.5, 45, and 90 degrees to the right; and in the final three photographs, students turned their heads 45 degrees upward and then to the right, to the left, and straight ahead.

Participants were presented with the photographs one at a time in sequences of five. Each photograph remained on the screen for 1,000 ms followed by a blank screen for 1,000 ms during which time the participants’ task was to categorize the preceding photo-

<sup>2</sup> White participants, therefore, were presented with 10 photographs of the self, five photographs of Blacks, and 10 photographs of Whites as oddball targets, and South and East Asian participants were presented with 10 photographs of the self, five photographs of Blacks, five photographs of Whites, and five photographs of ingroup members (other South Asians or East Asians, respectively) as oddball targets. While we acknowledge that these groups were presented with a different number of White oddball targets, the primary focus of this study was on responses to Black oddball targets in the context of the self. Notably, responses to White and ingroup oddball targets were similar and differed from the pattern of responses to Black targets.

graph as either “me” or “not me” using the button box. Importantly, each sequence began with the presentation of two photographs of the participant, and the remaining photographs included two photographs of the participant and one target photograph. In control sequences, the target stimulus was another photograph of the participant. In oddball sequences, the target stimulus was a photograph of another student (i.e., a Black student, a White student, or a student belonging to the participant’s ethnic ingroup). In both control and oddball sequences, target stimuli were presented as either the third, fourth, or fifth photograph.

Participants completed 240 sequences of five photographs in four blocks of 60 sequences each. All four types of target sequences (i.e., self, Black, White, and racial/ethnic ingroup) were randomly presented throughout the task such that each stimulus type was presented an equal number of times in total (60 presentations) and in each target position (20 presentations in the third, fourth, and fifth positions). None of the stimuli presented during the oddball task were used in the approach training task.

Participants were given feedback on the screen when they made incorrect responses during the oddball task (Ito & Cacioppo, 2000). Specifically, if participants responded while the photograph was still on the screen, they were presented with the words *Too Early!* for 1,000 ms followed by a blank screen for 1,000 ms. If participants responded incorrectly (i.e., categorizing a photograph of themselves as “not me” or a photograph of another student as “me”), they were presented with a red X for 400 ms followed by a blank screen for 1,000 ms. Before the start of the main experiment, participants initially completed five separate practice sequences while the experimenter watched and corrected any mistakes to ensure that the participants fully understood the instructions.

While participants completed the oddball task, EEG was recorded from 32 Ag/AgCl sintered electrodes embedded in a stretch-lycra cap. Vertical eye movements (VEOG) were monitored via a supra- to suborbital bipolar montage. EEG and VEOG recordings were digitized at 560 Hz using ASA acquisition hardware (Advanced Neuro Technology B.V., Enschede, the Netherlands) with average-ear references and a forehead ground. Electrode impedance was kept below 5 kOhm for all recordings. The continuous EEG recordings were corrected offline for eyeblinks using the VEOG channel and the second-order blind identification procedure, which is a signal-processing method for isolating and removing ocular artifacts (Tang, Liu, & Sutherland, 2005). Frequencies below one Hz and above nine Hz were digitally filtered (24 dB, zero-phase shift). The signal was baseline corrected by subtracting the average voltage occurring 400 to 200 ms before stimulus presentation. Movement artifacts were automatically detected with a  $-75 \mu\text{V}$  and  $75 \mu\text{V}$  threshold. Oddball trials for the photographs of the self, Blacks, Whites, and racial/ethnic ingroup members were averaged separately with an epoch from 200 ms prestimulus to 800 ms poststimulus. The P300 was quantified as the peak maximum deflection occurring between 350 and 900 ms poststimulus at the parietal midline electrode (Ito & Urland, 2003).

Upon completion of the experiment, participants were probed for insights into the experimenters’ hypotheses. None of the participants were aware of the predicted impact of the training on their responses during the oddball task.

## Results and Discussion

To examine whether approach training influenced neural processing related to Blacks relative to the other groups, a Training (approach Blacks vs. avoid Blacks)  $\times$  Oddball Target (Black vs. White vs. ethnic ingroup vs. self) analysis of variance was performed on the P300 amplitudes, with the last factor repeated. The predicted two-way interaction was close to significant,  $F(3, 23) = 2.91, p < .06$ . As illustrated in Figure 1, simple effects analyses demonstrated that participants trained to approach Blacks had significantly lower P300 amplitudes to Blacks ( $M = 3.51, SD = 1.44$ ) than participants trained to avoid Blacks ( $M = 5.69, SD = 3.36$ ),  $t(25) = 2.22, p < .04, d = .84$ . In contrast, no significant differences in P300 amplitudes to Whites were found between the approach Blacks ( $M = 4.40, SD = 2.44$ ) and avoid Blacks ( $M = 4.67, SD = 2.90$ ) conditions,  $t(25) = 0.26, p = .80, d = .10$ . Similarly, no significant differences in P300 amplitudes in response to ethnic ingroup members were found between the approach Blacks ( $M = 4.57, SD = 3.22$ ) and avoid Blacks ( $M = 4.74, SD = 3.32$ ) conditions,  $t(25) = 0.13, p = .90, d = .05$ . Finally, the approach Blacks ( $M = 4.40, SD = 2.02$ ) versus avoid Blacks ( $M = 4.32, SD = 3.59$ ) manipulation had no effect on P300 amplitudes to self photographs,  $t(25) = 0.22, p = .94, d = .03$ .

To further examine our prediction that approach training reduces electrocortical differentiation of Blacks relative to the self, but not to Whites or the ingroup relative to the self, we compared training conditions on a P300 difference score, subtracting self from the type of oddball target (i.e., Black, White, or ethnic ingroup). This Training (approach vs. avoid)  $\times$  Oddball Target (Black vs. White vs. ethnic ingroup) between-subject analysis of variance, with the last factor repeated, on P300 self-difference scores demonstrated a significant interaction,  $F(2, 24) = 4.37, p < .03$ . Simple effects analyses on difference scores between the self and Blacks indicated that participants in the approach Blacks condition had lower P300s ( $M = -0.97, SD = 2.00$ ) compared to participants in the avoid Blacks condition ( $M = 1.38, SD = 3.53$ ),  $t(25) = 2.08, p < .05, d = .83$ . In contrast, this effect of approach training was not significant when examining the difference scores between the self and Whites,  $t(25) = 0.08, p = .94, d < .01$ , or the difference scores between the self and ingroups,  $t(25) = 0.15, p = .89, d < .01$ .

Alternative analyses related to an examination of an early ERP component, the N200, showed a different pattern of findings. In particular, a Training (approach Blacks vs. avoid Blacks)  $\times$  Oddball Target (Black vs. White vs. ethnic ingroup vs. self) analysis of variance performed on the N200 amplitude (defined at Cz, between 200 and 400 ms poststimulus) demonstrated no significant main effect for training,  $F(1, 25) = 1.95, p = .18$ , or for the Training  $\times$  Oddball Target interaction,  $F(3, 23) = 0.68, p = .57$ . Furthermore, when specifically examining this component for Black targets, participants trained to approach Blacks ( $M = -4.01, SD = 3.16$ ) did not differ on the N200 from participants trained to avoid Blacks ( $M = -5.38, SD = 3.89$ ),  $t(25) = 1.02, p = .32, d =$

<sup>3</sup> Consistent with research by Gray and colleagues (2004), we found that participants showed a robust P300 to photographs of the self regardless of training to approach or avoid Blacks. This effect presumably occurs because self-referential stimuli are motivationally relevant (Brédart, Delchambre, & Laureys, 2006).



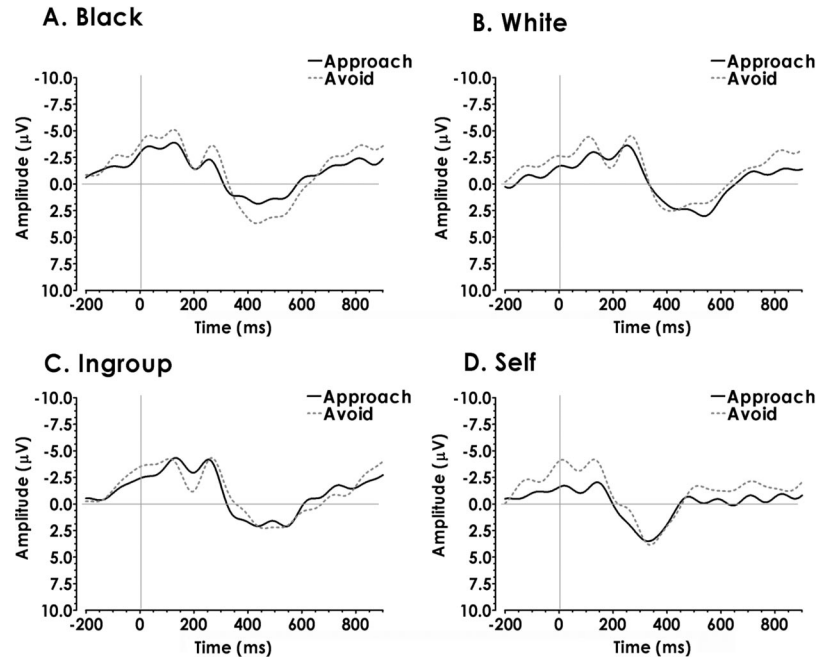


Figure 1. P300 amplitude when the oddball target were photographs of Blacks (Panel A), Whites (Panel B), ethnic ingroup members (Panel C), or the self (Panel D) during the oddball Task as a function of approach Blacks versus avoid Blacks training.

.39. This analysis, however, did reveal a main effect for target,  $F(3, 23) = 9.72, p < .01$ , indicating that the N200 for the self (a nonoddball target) was less prominent than for the presentation of Black, White, or ethnic ingroup members (all oddball targets).

Although interpretation of the P300 has been debated (Bartholow & Amodio, 2009; Donchin, 1981; Ito & Bartholow, 2009), in general, when studied with an oddball task, increases in amplitude of this component have been associated with targets that differ from a given social context and have been interpreted as reflecting contextual updates along motivationally relevant dimensions. In the present study, we examined participants' responses to Blacks in the motivationally relevant context of the self (Gray et al., 2004) and found that approach training influenced these responses. In particular, when responding to "me" and "not me" categorizations, participants demonstrated smaller P300 amplitudes to Black stimuli in the context of the self after approaching rather than avoiding Blacks. This pattern of findings was not demonstrated with other oddball targets.

Although it is possible that our findings related to the P300 may have been driven by people's concerns about appearing prejudiced in the avoid Black condition (because this manipulation may have made them especially vigilant for Black faces), our earlier findings suggest that this was probably not the case. In particular, the results from Study 1 and previous experiments (Kawakami, Phillips, et al., 2007) consistently demonstrated that the impact of avoidance training does not differ from more neutral training conditions on measures of self-Black associations, racial prejudice, and behavior toward Blacks. Because there is no reason to believe that responding in neutral ways to Blacks should increase concerns about being prejudiced, this alternative explanation is unlikely.

Notably, similar changes in an earlier ERP component, the N200, were not found. These results suggest that the effects of

training in approaching and avoiding Blacks were not simply related to mere vigilance or differential perceptions of Blacks in general. If that was the case, we would have demonstrated context-independent effects related to early processing waves such as the N200. Instead, our results were associated with operations associated with a later process, the P300. This latter component has consistently been shown to be sensitive to stimuli that differ in psychologically significant ways from the preceding contextual stimuli along task-relevant dimensions (Cacioppo, Crites, et al., 1993; Ito & Cacioppo, 2000). In the present study, because the context was the self and the task relevant categorizations were related to "me" versus "not me," these findings suggest that the relationship between the self and Blacks may have changed. In accordance with the results from Studies 1 and 2, which demonstrated that training to approach Blacks increased associations between the self and Blacks, these findings provide further evidence that approach training can alter how Blacks are categorized and elicit attention when presented amid the context of the self.

#### Study 4

The results from Studies 1–3 provide evidence that training in approaching Blacks can change the relationship between the self and Blacks. The primary goal of Study 4 was to investigate the link between previous research related to approach orientations and prejudice and the current findings.

In particular, recent theorizing has suggested that after forming new associations between a chosen object and the self, evaluations related to the self may transfer to the object (Cadinu & Rothbart, 1996; Gawronski et al., 2007; Otten, 2003; Walther & Trasselli, 2003). Because people's self-evaluations are generally highly positive (Bosson, Swann, & Pennebaker, 2000; Greenwald & Farn-

ham, 2000), this process of self-anchoring should accordingly lead to more positive evaluations of the object. For example, Zhang and Chan (2009) found that evaluations of paintings became more positive after repeatedly pairing the paintings with words about the self but not with words about general others. In accordance with the associative-propositional evaluation (APE) model (Gawronski & Bodenhausen, 2006), these findings suggest that this type of evaluative conditioning involves the associative transfer of the evaluation of the unconditioned stimuli (i.e., the self) to the conditioned stimuli (i.e., the paintings) on an implicit level.

In the present context, this theorizing suggests that by increasing associations between the self and Blacks through approach training, evaluative associations related to the self may transfer to Blacks. Because implicit self-evaluations are predominantly positive (Bosson et al., 2000; Greenwald & Farnham, 2000), this process would imply that Blacks would therefore also become more positive because of this newly created association. Notably, the results from Study 2, which demonstrated that after approach training, personal characteristics associated with the self (e.g., smart, cheap) transfer to Blacks, are consistent with self-anchoring processes (Otten & Wentura, 2001). In particular, this study demonstrated that after extensive training in approaching Blacks, participants were faster to associate both positive and negative self-traits with Blacks. The main goal of Study 4 was to extend these findings by demonstrating that this process of self-anchoring also occurs for more general evaluative associations. Specifically, after training in approaching Blacks, participants were expected to associate the self more with Blacks, which in turn would cause the positive valence of the self to transfer to Blacks.

To investigate this possibility, participants in Study 4 were presented with two dependent measures following the approach training procedure. The purpose of one task was to measure associations between the self and Blacks, and the purpose of the other task was to measure implicit prejudice toward Blacks. In accordance with the results from Studies 1–3, we expected that training in approaching Blacks would increase associations between the self and Blacks. In accordance with previous results (Kawakami, Phillips, et al., 2007), we also expected that approach training would increase positive associations with Blacks. In addition, we expected that the impact of approach training on implicit prejudice would be mediated by the extent to which participants associated the self with Blacks.

## Method

**Participants and design.** Sixty-one (16 male and 45 female) non-Black undergraduate students from diverse ethnic backgrounds (29 White, 11 East Asian, and 21 South Asian) took part in the experiment in exchange for course credit. Participants were randomly assigned to training condition (approach Blacks vs. sideways control) in a between-subjects design.

**Procedure.** Upon entering the laboratory, participants were informed that they would be participating in a series of separate studies that had been combined to make better use of the participant pool. Although each study was actually an interrelated component of one experiment, participants were informed that the first study was about examining various theories of cognitive processes. In fact, the purpose of this study was to train participants to approach or respond in a neutral way to Blacks. While participants

were informed that the second study was about categorization processes, its purpose was actually to examine the impact of training on implicit identification with and prejudice against Blacks.

**Approach training task.** The approach training in Study 4 was identical to Study 3. In particular, participants were seated in front of a personal computer and asked to respond to photographs of Blacks and Whites presented on the computer screen with a joystick. Specifically, participants in the approach Blacks condition were required to approach Blacks by pulling the joystick toward the self and to avoid Whites by pushing the joystick away from the self. While participants in the control condition in Study 3 avoided Whites and approached Blacks, a sideways control condition was utilized in Study 4. In particular, half of participants in this condition were required to move the joystick to the left when presented with Blacks and to move the joystick to the right when presented with Whites; the other half of participants in this condition were required to move the joystick to the right when presented with Blacks and to move the joystick to the left when presented with Whites. In total, participants completed 480 trials of training in 10 blocks of 48 trials each.

**Implicit association tests.** After the training session, all participants were presented with two IATs. The order of presentation of the IATs was counterbalanced across participants. One IAT was the same as in Study 1 and was used to assess the strength of association between the self and Blacks. The other IAT was designed to assess the strength of association between Blacks and positive concepts (Greenwald et al., 1998; Kawakami, Phillips, et al., 2007).

Specifically, in this latter implicit attitudes task, participants were required to categorize photographs of Blacks and Whites along with positive and negative concepts. The stimuli included six photographs of Blacks (three male and three female), six photographs of Whites (three male and three female), four positive concepts (i.e., *love, cheer, peace, and happy*), and four negative concepts (i.e., *evil, pain, vomit, and hate*).

Specifically, along with three practice blocks of trials, participants were presented with two critical blocks of trials, the order of which was counterbalanced across participants. In one critical block, participants were instructed to use the same key to categorize Blacks and positive concepts and another key to categorize Whites and negative concepts. In the other critical block, these pairings were reversed such that participants were instructed to use one key to categorize Whites and positive concepts and another key to categorize Blacks and negative concepts. Presentation times and error feedback were the same as in previous IATs, and each critical block consisted of 60 trials. In accordance with our previous studies (Kawakami, Phillips, et al., 2007), IAT *D* scores were calculated with higher scores indicating greater implicit prejudice against Blacks (Greenwald et al., 2003).

Detailed probing of the participants for insights into the experimenters' hypotheses upon completion of the study indicated that none of the participants were aware of the predicted impact of the training on responses to either IAT.

## Results and Discussion

We first examined the impact of the approach training on identification with Blacks. Consistent with earlier results in Stud-

ies 1 and 2, participants trained to approach Blacks ( $D = -.11$ ,  $SD = .18$ ) were faster to associate the self with Blacks than participants trained to respond in a neutral way to Blacks ( $D = -.21$ ,  $SD = .17$ ),  $t(59) = 2.18$ ,  $p = .03$ ,  $d = .57$ .

Next, we analyzed the impact of the approach training on implicit prejudice against Blacks. As expected, participants trained to approach Blacks ( $D = .24$ ,  $SD = .26$ ) had lower implicit prejudice than participants trained to respond in a neutral way to Blacks ( $D = .39$ ,  $SD = .28$ ),  $t(59) = 2.25$ ,  $p = .03$ ,  $d = .56$ . Thus, in accordance with the findings in Studies 1 and 2 and previous research (Kawakami, Phillips, et al., 2007), approach training increased associations between the self and Blacks and positive associations with Blacks.

To examine whether self-Black associations mediated the impact of approach training on implicit evaluations of Blacks, self-Black associations (the mediator) and implicit prejudice (the dependent variable) were regressed separately on type of training (the independent variable). As suggested by the analyses of variance, training significantly predicted self-Black associations ( $\beta = -.27$ ,  $p = .03$ ) and implicit prejudice ( $\beta = .28$ ,  $p = .03$ ). Furthermore, self-Black associations (the proposed mediator) significantly predicted implicit prejudice (the proposed dependent variable;  $\beta = -.32$ ,  $p = .01$ ). When implicit prejudice was regressed simultaneously on type of training (the independent variable) and self-Black associations (the proposed mediator), self-Black associations predicted implicit prejudice ( $\beta = -.26$ ,  $p = .01$ ), and the effect of the training was no longer significant ( $\beta = .21$ ,  $p = .10$ ).

To test the significance of the indirect path, we used a bootstrapping procedure recommended for small samples (Clark & Wegener, 2008; Preacher & Hayes, 2004). In particular, 95% confidence intervals (CIs) were created to test whether the true value of this effect differed from zero. The results demonstrated that the estimate of the indirect effect ( $a \times b = .04$ ) was significantly different from zero, 95% CI [.01, .11], suggesting that approach training increased positive evaluations with Blacks to some extent because of increased associations between the self and Blacks.

It is important to note that we also tested an alternative model in which implicit prejudice against Blacks was proposed to mediate the impact of approach training on identification with Blacks. The results from a bootstrapping procedure on this model demonstrated that the estimate of the indirect effect ( $a \times b = -.03$ ) did not significantly differ from zero, 95% CI [-.07, .01]. Although these findings suggest that implicit prejudice does not mediate the relationship between approach training and self-Black associations, caution is recommended when interpreting these analyses. Although mediation results for our predicted model and not the alternative model were significant, the 95% confidence interval for the alternative model was close to excluding zero.

In summary, the present findings provide a clear replication of previous results related to the impact of approach training on associations between the self and Blacks from Studies 1 and 2 and on implicit prejudice (Kawakami, Phillips, et al., 2007). Furthermore, in accordance with recent theorizing related to the APE model (Gawronski & Bodenhausen, 2006) and self-anchoring (Cadinu & Rothbart, 1996; Gramzow & Gaertner, 2005; Otten, 2003; Walther & Trasselli, 2003), these results provide further evidence that after creating new associations between the self and

social objects, positive evaluations associated with the self will transfer to these objects (Gawronski et al., 2007; Zhang & Chan, 2009). In particular, the present findings suggest that approaching social categories fundamentally changes the relationship between the self and target group members and that these changes in turn reduce implicit prejudice. Just as previous research has demonstrated that perspective-taking and self-other overlap reduce automatic biases (Galinsky et al., 2008), these results provide additional evidence for the relationship between identification with target social categories and lowered implicit prejudice and the process by which it occurs.

## General Discussion

Current research has consistently demonstrated that while strong and automatic evaluative and semantic biases against Blacks are common among Whites (Greenwald et al., 1998; Kawakami, Dion, & Dovidio, 1998; Kawakami & Dovidio, 2001), a number of strategies exist that can successfully reduce these types of negative implicit racial associations (Blair, 2002; Kawakami et al., 2000; Kawakami, Phillips, et al., 2007; Wittenbrink et al., 2001). Few studies, however, have investigated strategies to strengthen associations between the self and Blacks. Given the importance of the self-concept and identification with outgroups in determining behavior toward these categories (Dovidio et al., 2004; Galinsky et al., 2005; Greenwald, Banaji, et al., 2002), discovering ways to increase these associations may be critical to understanding and improving intergroup relations.

The present research is the first to examine the impact of approach behaviors on associations between the self and outgroup social categories. Four studies, featuring distinct methods of approaching social categories and different ways of measuring self-Black associations, demonstrated that training in approaching Blacks increases self-Black overlap.

Specifically, participants in three studies were instructed to move a joystick toward or away from themselves with (Studies 3 and 4) or without (Study 1) specific reference to the concepts of approach and avoidance in the training task (Kawakami, Phillips, et al., 2007). Alternatively, participants in Study 2 were instructed to move circles representing the self, Blacks, and Whites closer together or farther apart on the computer screen (Aron et al., 1992). Despite these significant differences in the training procedures, the results consistently demonstrated that after practice in approaching Blacks, participants had stronger associations between the self and Blacks in general (Studies 1, 2, and 4) and between specific traits ascribed to the self and Blacks (Study 2). Furthermore, these studies also provide evidence that even in the absence of any explicit reference to approach and avoidance, simple body movements associated with approach and avoidance (Study 1) and conceptually approaching Blacks without any corresponding body movements (Study 2) were both effective in changing self-Black associations. This consistent pattern of results related to these variations in training procedures suggests that approach orientations can be induced not only by arm movements related to flexing muscles and pulling levers and joysticks toward the self (Chen & Bargh, 1999; Förster, 2001) but also by using visual representations and perceptions of distance that are independent of physical movements (Neumann & Strack, 2000).

While the present set of studies provides converging evidence for the positive impact of various types of approach training, a fruitful avenue for future research would be to examine in more detail and with increasing sophistication modifications in these approach paradigms. For example, while the current studies utilized moving circles with names and photographs as representations of the self, programs that utilize animated avatars of the self and others in an immersive environment would allow for more realistic but controlled contexts in which to investigate the impact of perceiving the self approaching target group members. Rather than simply pushing and pulling joysticks or sliding circles closer and farther apart, participants could simulate approach and avoidance by systematically moving their avatars toward or away from agents representing different social categories.

A variety of measures of self-Black association were also included in the present research. While Studies 1, 2, and 4 used an IAT to assess general associations between the self and Blacks, Study 2 utilized an IAT to measure associations between personal characteristics and Blacks. Study 3, alternatively, utilized a measure of brain activation, P300 amplitudes, to assess the attention elicited by Blacks in the context of the self. The latter results provide the first evidence for the impact of approach training on reduced attention to Blacks when making self-categorizations using a psychophysiological measure of brain activation. By demonstrating a conceptually similar impact of approach training on three measures related to the relationship of Blacks and the self, a strong case can be made for the robustness and replicability of this effect. It is important to note that the inclusion of measures that are less susceptible than traditional measures to controlled responding such as the IAT is important in the present context (Derks, Inzlicht, & Kang, 2008; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Greenwald et al., 1998; Kawakami et al., 1998) because of social desirability concerns related to low identification with Blacks and being labeled a racist (Sommers & Norton, 2006).

Notably, our research also provides initial evidence that change in implicit prejudice through approach training is at least partially mediated by self-associations with social categories. In particular, Study 4 provides evidence that training in approaching Blacks may create a link between the self and Blacks that causes evaluations related to the self to transfer to Blacks. Because associations with the self are generally positive (e.g., Bosson et al., 2000; Greenwald & Farnham, 2000), Blacks are also evaluated more positively because of the new link between the self and Blacks created by approach training (Gawronski et al., 2007; Otten, 2003; Walther & Trasselli, 2003).

Although a variety of training procedures were used in the current research, an important aspect related to this training is that participants were required to both approach Blacks and avoid Whites or vice versa. This aspect raises the possibility that the effects in this article may have been partially driven by training in avoiding Whites rather than approaching Blacks. However, based on the fact that research has shown that training in approaching Blacks is effective at reducing implicit prejudice against Blacks relative to Whites regardless of the specific social category participants have been trained to avoid (Kawakami, Phillips, et al., 2007), this alternative explanation is unlikely. In particular, findings from previous studies demonstrate that participants were less prejudiced toward Blacks relative to Whites on an IAT both when they were trained to approach Blacks and avoid Asians and when they were trained

to approach Blacks and avoid Whites. These results suggest that the key component in the training may be approaching Blacks rather than avoiding a specific comparison group. Nonetheless, because this past research was related to implicit prejudice rather than self-associations, future research should specifically investigate whether responses to comparison groups influence the impact of approach training on identification with Blacks.

In closing, the current research has addressed the gap between the personal self and Blacks that exists for most non-Blacks in society. Specifically, it has outlined procedures for systematically building new associations between the self and Blacks that not only can reduce this gap but also can decrease implicit prejudice. While it is recommended that future studies investigate the possible implications of these findings for intergroup contact and interracial settings (Dovidio, Gaertner, & Kawakami, 2003; Pettigrew & Tropp, 2006), these results suggest that simple, straightforward interventions where people approach members of another social category, either conceptually or physically, can improve race relations (Page-Gould et al., 2010; Page-Gould, Mendoza-Denton, & Tropp, 2008). For example, Kawakami, Phillips, et al. (2007) demonstrated that after approach training, participants interacted in more positive ways with a Black confederate. The next step for this research, however, would be to test these procedures in a more applied setting. For example, one possible strategy is to have schools implement morning welcome activities in which students from different ethnic/racial groups approach one another. These activities not only may strengthen the extent to which students identify with members of other social categories but also may increase their sense of belonging and academic achievement (Jones, 1997). Although simple, these types of interventions may have lasting effects (Kawakami et al., 2005; Walton & Cohen, 2007) and create opportunities for further approach behaviors.

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