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Just Say No (to Stereotyping): Effects of Training in the Negation of Stereotypic Associations on Stereotype Activation

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The primary aim of the present research was to examine the effect of training in negating stereotype associations on stereotype activation. Across 3 studies, participants received practice in negating stereotypes related to skinhead and racial categories. The subsequent automatic activation of stereotypes was measured using either a primed Stroop task (Studies 1 and 2) or a person categorization task (Study 3). The results demonstrate that when receiving no training or training in a nontarget category stereotype, participants exhibited spontaneous stereotype activation. After receiving an extensive amount of training related to a specific category, however, participants demonstrated reduced stereotype activation. The results from the training task provide further evidence for the impact of practice on participants' proficiency in negating stereotypes.

Social categorization has often been shown to have a close (Dovidio, Evans, & Tyler, 1986) and automatic (Bargh, 1997) tie with what people see and how they judge others. Specifically, mere exposure to a category representation, whether it be an actual category member, a photograph of a category exemplar, or a written category label, may be sufficient for stereotyping to occur, often regardless of intention or awareness (Bargh, 1996). Recent studies have demonstrated that stereotyping related to such categories as race (Devine, 1989; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997), sex (Blair & Banaji, 1996; Macrae, Bodenhausen, & Milne, 1995; Moskowitz, Gollwitzer, Wasel, & Schaal, 1999), and age (Hense, Penner, & Nelson, 1995) is largely automatic. The present research further investigated the automaticity of stereotyping and whether and how this process can be reduced.

In examining the relationship between categorization and stereotyping, current theorists emphasize the importance of distinguishing between stereotype activation and application (Bargh, 1996; Devine, 1989; Fiske, 1989; Gilbert & Hixon, 1991). Stereotype activation is determined in part by the accessibility of information stored in memory and its fit to the target object. Stereotype application refers to using stereotypes in perceptual or evaluative operations.

With regard to the *application* of stereotypes, current research demonstrates that it may be possible to avoid using stereotypes when people are motivated to be nonprejudiced (Devine, Monteith, Zuwerink, & Elliot, 1991; Monteith, 1993; Monteith, 1996; Monteith, Devine, & Zuwerink, 1993; Monteith, Sherman, & Devine, 1998), experience heightened awareness of egalitarian norms and standards (Macrae, Bodenhausen, & Milne, 1997), or have goals that necessitate the acquisition of unique information about a group member (Erber & Fiske, 1984; Fiske & Neuberg, 1990; Neuberg & Fiske, 1987). In general, this research suggests that when motivated appropriately and when cognitive resources are sufficient (Devine, 1989; Fiske, 1989; Monteith & Voils, 1998), people may not apply stereotypes.

Research related to reducing stereotype *activation,* alternatively, is scarce and controversial (Bargh, 1999). Recent studies by Blair and Banaji (1996), which specifically examine the impact of task-relevant expectancy instructions on a person's ability to reduce automatic stereotype activation, are the exception. These researchers found that under automatic processing conditions, participants expecting stereotype-consistent combinations demonstrated the usual automatic stereotype activation. Participants expecting stereotype-inconsistent combinations, however, appeared to be able to reduce this activation. A reanalysis of Blair and Banaji's results, however, suggests that while the stereotype-consistent expectancy enhanced facilitation effects, the stereotype-inconsistent expectancy had no inhibitory effects on stereotype activation (Bargh, 1999).

Although evidence for the effects of immediate contextual factors on the inhibition of automatic activation is limited, recent research indicates that individual differences in automatic stereotype activation exist. For example, Kawakami, Dion, and Dovidio (1998) and Lepore and Brown (1997) found that under efficient and subliminal processing conditions, high but not low prejudice people may activate racial stereotypes. Likewise, Moskowitz and

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his colleagues (Moskowitz et al., 1999; Moskowitz, Salomon, & Taylor, in press) found that people with chronic egalitarian goals also fail to demonstrate the usual facilitation effects of category priming on automatic stereotype activation. The question remains, however, why or how these individuals exhibit lower levels of stereotyping.

Practice, which is a fundamental process in developing automaticity (Logan, 1988), may also be a critical factor for reducing it. Because low-prejudice people are motivated to avoid both the application and activation of stereotypes (Kawakami et al., 1998), it is possible that they have learned through practice to control stereotyping when presented with relevant social categories. Similarly, people with chronically accessible egalitarian motives may learn to inhibit stereotype activation (Moskowitz et al., 1999) and in its place automatically activate egalitarian thoughts (Moskowitz et al., in press). Thus, through learning and experience, people low in prejudice and those with chronic egalitarian motives may be able to inhibit or eliminate automatic stereotype activation, which is the dominant cultural response (Devine, 1989).

Whereas the studies of the moderating effects of prejudice and egalitarian motives implicate the influence of practice, the present research directly investigated the role of training in negating stereotypic associations on reducing stereotype activation. Consistent with this theorizing, we suggest that, through practice in denouncing stereotypes, people can learn to reduce the automatic activation of stereotypes. Specifically, we propose that if experience with repeatedly pairing certain characteristics with certain categories can produce stereotypic representations and increase the likelihood of automatic activation (Powell & Fazio, 1984), repeatedly negating these associations and simultaneously pairing other "new" characteristics with these categories can reduce the likelihood of automatic activation. In accordance with the skill-acquisition literature that reveals that extensive practice causes automatic responses to develop (Shiffrin & Schneider, 1977; Smith, 1990; Smith, Branscombe, & Bormann, 1988; Wyer & Hamilton, 1998), we expect this learning process to occur gradually through repeated experience. As the new response is strengthened through learning, it comes to dominate, and the old response to the stimuli, in this case automatic stereotype activation, may become weaker.

In summary, the primary aim of the present research was to examine whether sufficient training in negating stereotypic associations can enable individuals to avoid the activation of social stereotypes following category presentation, thereby breaking the "stereotype habit" (Devine & Monteith, 1993; Stangor, Thompson, & Ford, 1998). In particular, participants were presented with two types of tasks, one involving training and the other relating to the assessment of stereotypic activation. The goal of the training task was to allow participants to practice responding "NO" to stereotypic traits following category representations and "YES" to nonstereotypic associations. It is assumed that by repeatedly and consistently implementing this simple act of negating certain category–stereotype combinations while responding positively to other category–nonstereotype combinations, the presentation of the category will no longer automatically activate associated stereotypes.

Thus we executed three studies to investigate whether the automatic associative process between categories and stereotypic traits can be broken, how long this reduction in stereotype reduction persists, and whether the effect generalizes to different stereotypes and paradigms. Specifically, Study 1 examined the impact of extensive training to negate specific associations by comparing the same participants on a pretest and posttest of stereotype activation using the Stroop task. Study 2 examined the duration of training effects by testing the inhibition of stereotype activation in the Stroop task either immediately or 2, 6, and 24 hr later. Finally Study 3 explored the impact of extensive negation training on stereotype activation using a different measure of stereotype activation, the person categorization task. Although Studies 1 and 2 examined training in stereotype negation related to skinhead and elderly categories, Study 3 examined the generalizability of the training effect to racial stereotypes.

Study 1

Study 1 used a pretest–posttest design to test whether individuals who consistently and frequently negate stereotypes related to a specific group show a decrease in automatic stereotype activation. Specifically, participants first performed a pretest of the Stroop task followed by a training task and a posttest of the Stroop task. Although in the standard Stroop task (Stroop, 1935), participants are presented with a series of words in a variety of colors and are asked to name the color in which the word is presented, the present study preceded each color-naming trial with a social category prime (Warren, 1972, 1974). In general, cognitive psychologists have found that when the letters of the words spell a color name that is different than the color in which the word is printed or when semantic associations of the word are activated through priming, participants are slower at naming the color (MacLeod, 1991). Specifically, the degree of interference in naming ink colors is a function of the activation of the word's semantic meaning: The greater the activation level, the greater the amount of processing resources needed to inhibit it, which in turn results in slower responses in color naming (Bargh & Pratto, 1986; MacLeod, 1991). Results related to the Stroop task are considered to be indicative of automatic processing because semantic processing of the stimulus occurs despite the participants' processing goals (Bargh & Pratto, 1986; Pratto & John, 1991). Although participants have no intention to process the target word in the Stroop task, they are normally unable to eliminate the interference by ignoring the word and focusing on the color (MacLeod, 1991; Shiffrin, 1988).

In the present study, participants, following the presentation of SKINHEAD or ELDERLY category primes, were instructed to name the ink color of skinhead stereotypes (e.g., criminal) or elderly stereotypes (e.g., afraid) as quickly as possible. If stereotype activation is automatic in the pretest of the primed Stroop task and participants have not yet learned to inhibit this activation, participants will be slower at color-naming stereotypes because they are unable to ignore their content and focus on the naming of the ink colors (Kawakami, Dion, & Dovidio, in press). Specifically, a Prime (skinhead or elderly) × Type of Stereotype (skinhead or elderly) interaction was expected in which longer response latencies were predicted for skinhead stereotypes following skinhead primes compared with elderly primes and for elderly stereotypes following elderly primes compared with skinhead primes.

In the second phase of the procedure, participants received extensive training in negating specific stereotypes. Participants in

the Skinhead Stereotype Negation Condition were instructed to respond "NO" on trials in which they saw a picture of a skinhead paired with a skinhead stereotypic trait and "YES" on trials in which they saw a picture of a skinhead paired with a nonstereotypic trait. Participants in the Elderly Stereotype Negation Condition, alternatively, were instructed to respond "NO" on the trials in which they saw a picture of an elderly person paired with an elderly stereotypic trait and "YES" when they saw a picture of an elderly person with a nonstereotypic trait.

In the third phase of this study, participants were presented once more with the Stroop task, but they did *not* receive instructions to negate either skinhead or elderly stereotypes. The effect for prime (skinhead or elderly) in the posttest was expected to be reduced relative to the pretest for the participants trained to negate the specific stereotypes but not for those who did not receive such training. Specifically, in response to skinhead stereotypes on the posttest, participants trained to negate skinhead stereotypes were expected to no longer show lengthier response latencies following skinhead primes compared with elderly primes. Conversely, in response to elderly stereotypes on the posttest, participants trained to negate elderly stereotypes were expected to no longer show lengthier color-naming latencies following elderly primes relative to skinhead primes. Thus, the latencies in responding to skinhead stereotypes and elderly stereotypes were each expected to demonstrate Stereotype Negated × Prime × Pretest–Posttest interactions. Assuming that stereotypic activation is revealed on the pretest Stroop task for both skinhead stereotypes and elderly stereotypes, an overall Type of Stereotype × Stereotype Negated × Prime × Pretest–Posttest interaction was predicted.

Method

Participants and Design

Thirty-four (25 female and 9 male) undergraduate students in the Netherlands participated in the experiment receiving approximately U.S. $6.[1] Four independent variables were included in a 2 (time: pretest or posttest) × 2 (prime: skinhead or elderly) × 2 (type of stereotype: skinhead or elderly) × 2 (stereotype negated: skinhead or elderly) design. Only the Stereotype Negated factor was between subjects; all other factors were within subjects.

Procedure

Phase 1: Pretest of stereotype activation. On entering the laboratory, participants were randomly assigned to either the Skinhead or the Elderly Stereotype Negation Conditions. In Phase 1, all participants were presented with a primed Stroop task to examine spontaneous stereotype activation. They were informed that they would be presented with a series of trials on a Macintosh Performa, which consisted of an initial asterisk and two words that would appear in sequence. They were further instructed to read the first word silently and to state the color of the second word into the microphone as quickly and as accurately as possible. Specifically, on each trial, participants were presented with an asterisk in the center of the computer screen for 300 ms to prepare them, followed by a blank screen for 500 ms. Next, the prime appeared for 950 ms, followed by a blank screen for 50 ms before the onset of the target word. Category primes consisted of the words "ELDERLY" or "SKINHEAD." The target array, which consisted of one of eight stereotypes of the elderly (e.g., weak) and eight stereotypes of skinheads (e.g., hostile; see Appendix for the complete lists of words used in all studies), was presented until the voice key was activated.[2] After the response latency was recorded, participants were presented with a blank screen for 2,000 ms before the next trial.

In the Stroop task, a total of 128 trials were randomly presented in which the elderly and skinhead primes were presented with each of the 16 traits in four different colors—red, blue, green, and yellow. Errors were recorded by the experimenter who was present throughout the experiment and were defined as stutters, mispronunciations, stating the wrong color, and inappropriate triggering of the voice key (e.g., when participants spoke too softly or exhaled heavily into the microphone). Before beginning the experimental trials, participants were presented with a practice block of 12 trials not used in the actual study.

Phase 2: Negation training. Phase 2 used a new negation training procedure in which participants were informed that they would be presented with a photograph with a trait below it on a computer screen. Participants in the Skinhead Stereotype Negation Condition were instructed to *try not to* think of cultural associations when seeing the photograph of the skinhead. Accordingly, they were asked to press "NO" on a button box when they saw the photograph of the skinhead and under it a word associated with skinheads. They were further instructed to press "YES" when they saw the photograph of the skinhead and a word not normally associated with skinheads. In short, these participants were required only to respond negatively to specific skinhead category–skinhead trait associations. When seeing the picture of the elderly person, alternatively, the same participants were instructed to *try to* think of cultural associations. When they saw the photograph of the elderly person and a word associated with the elderly, they were required to press "YES" and to press "NO" when they saw the photograph of the elderly person and a word not normally associated with the elderly.

The other half of the participants, those in the Elderly Stereotype Negation Condition, were given the opposite instructions. Specifically, they were instructed to *try not to* think of cultural associations when seeing the photograph of the elderly person. Accordingly, they were asked to press "NO" when they saw the photograph of the elderly person and a word associated with elderly. They were further instructed to press "YES" when they saw the photograph of the elderly person and a word not normally associated with the elderly. In short, these participants were required to respond negatively only to specific elderly category–elderly trait associations. When seeing the photograph of the skinhead, alternatively, the same participants were instructed to *try to* think of cultural associations. When they saw the photograph of the skinhead and a word associated with skinheads, they were required to press "YES," and to press "NO" when they saw the photograph of the skinhead and a word not normally associated with skinheads.

On each trial, participants were presented with a photograph for 500 ms before a word appeared under the photograph. Each photograph and word combination remained on the monitor until the participant responded. A blank screen was presented for 1,000 ms before the next trial. In each block, 20 stereotypes of skinheads and 20 stereotypes of the elderly were

[1] Although 36 students participated in Study 1, the data from 2 participants (1 participant with a lisp and 1 participant who spoke too softly) were excluded from the analyses because it was unclear if the voice key was being triggered at the appropriate times.

[2] Target traits in the primed Stroop task and the training task were chosen on the basis of a pilot study in which participants were asked to indicate the extent a series of traits were associated to skinhead and elderly categories. Judgments were made on a 9-point scale ranging from totally not associated (−4) to very much associated (+4). All target traits included in the present study had an association rating of +1 or more with the target category, an association of 0 or less for the other nonassociated category, and significantly differentiated ($p < .05$) between elderly and skinhead categories on paired t tests. Furthermore, care was also taken to equate target words on word length and valence.

presented with the skinhead photograph. These same 40 stereotypes were also presented with the elderly photograph. All trials in each block were presented in a random order.

To familiarize them with the procedure, we first presented participants with a practice set of 16 trials involving stimuli not used in the experimental trials. Then participants received 6 blocks of 80 trials. Participants were given breaks at the end of every two blocks and were instructed to press the mouse when they were ready to continue the experiment. Participants completed the 480 trials in approximately 45 min.

Phase 3: Posttest of stereotype activation. In Phase 3, the primed Stroop task was once more used to examine the effect of the training phase on subsequent stereotype activation. Although the same stimulus material was used in the pretest and the posttest Stroop task, the primes in these phases were category words and not photographs as in the negation training in Phase 2. Furthermore, the target words used in the training task were 20 "new" stereotypes of the elderly and skinheads not used in Phase 1 and 3. Because practice in negating specific stereotypes in Phase 2 is expected to transfer to other stereotypes, a reduction in the activation of the whole stereotype, not just specific components of the construct, was expected in Phase 3.

Results

Results related to the pretest of the Stroop task were analyzed first to examine the initial automatic activation of stereotypes. To assess the impact of the training session on changes in spontaneous stereotype activation, we then compared the pretest with the posttest Stroop results. Finally, we examined the response latency results in the training session to investigate the learning process related to stereotype negation.

Primed Stroop Task

Response latencies related to errors (4.11%) and larger than 3 standard deviations from the mean (2.16%) were classified as outliers and excluded from the analyses. In accordance with strategies by other researchers who have used voice-key paradigms (Bargh, Chaiken, Raymond, & Hymes, 1996; Pratto & John, 1991), response latencies less than 400 ms (3.81%) were also classified as outliers and excluded.[3] The remaining latencies were subjected to a logarithmic transformation (see Blair & Banaji, 1996; Ratcliff, 1993). For each participant, the mean of the transformed values associated with the naming latencies for ink colors for skinhead stereotypes and elderly stereotypes were computed for skinhead and elderly primes. This was accomplished by taking the mean of the four colors for each of the eight trait dimensions in each condition. All of the analyses were performed on the transformed data, but for illustrative purposes the untransformed means (in ms) are presented in the figures and reported in the text.

Test for initial automatic activation. To examine spontaneous stereotype activation before the training phase on the Stroop task, a 2 (elderly vs. skinhead prime) × 2 (elderly vs. skinhead trait) repeated-measures analysis of variance was performed on the mean color-naming latencies for only the pretest reaction latencies. A significant prime main effect was found, $F(1, 33) = 18.20$, $p < .001$. Participants were slower at responding to skinhead primes ($M = 621$) compared with elderly primes ($M = 609$). This effect, however, was qualified by a marginally significant Prime × Trait interaction, $F(1, 33) = 2.98$, $p = .09$. As expected, participants responded slower to skinhead stereotypes following a skinhead prime ($M = 624$) than an elderly prime ($M = 609$), $F(1, 33) = 22.29$, $p < .001$. Response latencies related to elderly stereotypes, however, did not differ as a function of elderly prime ($M = 609$) or skinhead prime ($M = 617$), $F(1, 33) = 2.75$, $p > .10$. As expected, when they have not yet received training in negating stereotypes, the results from the pretest demonstrate that following skinhead primes, the spontaneous activation of the skinhead stereotypes interfered with color naming. Inconsistent with our expectations, however, participants demonstrated no automatic activation of elderly stereotypes.

Effects of training on automatic activation. Because tests of the effects of negation training on reducing automatic activation are no longer meaningful if stereotype activation is not shown on the pretest (i.e., such as with the elderly stereotypes), the remaining analyses focus on the effects of training in stereotype negation on skinhead stereotypes for which automatic activation was demonstrated. Specifically, a 2 (elderly vs. skinhead stereotype negated) × 2 (pretest vs. posttest) × 2 (elderly vs. skinhead prime) analysis of variance was performed on only the mean color-naming latencies related to skinhead stereotypes. All variables except the Stereotype Negated factor were repeated measures.

A significant prime main effect was found, $F(1, 32) = 11.21$, $p < .01$. Overall, participants were slower at responding to skinhead stereotypes following skinhead primes ($M = 620$) compared with elderly primes ($M = 610$). A Pretest–Posttest × Prime interaction was also significant, $F(1, 32) = 6.56$, $p < .05$. Simple effects analysis demonstrated that participants were initially slower in the pretest at responding to skinhead stereotypes following skinhead primes ($M = 624$) than elderly primes ($M = 609$), $F(1, 33) = 22.29$, $p < .001$. However, with 480 trials of practice, the difference in color naming of skinhead stereotypes as a function of skinhead primes ($M = 615$) versus elderly primes ($M = 610$) was no longer significant, $F(1, 33) = 1.31$, $p > .20$.

As predicted, these effects were qualified by the type of negation training. A Stereotype Negated × Pretest–Posttest × Prime interaction was obtained, $F(1, 32) = 4.31$, $p < .05$. To explore the hypothesized effects of training, we performed Pretest–Posttest × Prime simple interaction analyses separately for Skinhead and Elderly Stereotype Negation Conditions. Simple effects analysis of the response latencies of participants instructed to respond "NO" to skinhead stereotypes following a skinhead prime in the Skinhead Stereotype Negation Condition demonstrated the predicted Pretest–Posttest × Prime interaction, $F(1, 16) = 16.31$, $p < .001$. As expected, these participants were initially slower in the pretest at responding to skinhead associations following a skinhead prime ($M = 618$) than an elderly prime ($M = 601$), $F(1, 16) = 12.38$, $p < .01$. However, with 480 trials of practice, the difference in color naming of skinhead stereotypes as a function of skinhead prime ($M = 598$) versus elderly prime ($M = 600$) was no longer significant, $F(1, 16) = 0.11$, $p > .70$. Moreover, as expected, while there was no change in response latencies to skinhead traits following elderly primes from posttest ($M = 600$) to pretest ($M = 601$), $F(1, 16) = 0.01$, $p > .90$, response latencies were faster to

[3] A 400-ms cutoff was chosen in the present studies because latencies related to the Stroop interference task are often longer than responses to pronunciation or lexical decision tasks. Furthermore, this method resulted in the recommended mean percentage outlier rate of approximately 5% (Ratcliff, 1993).

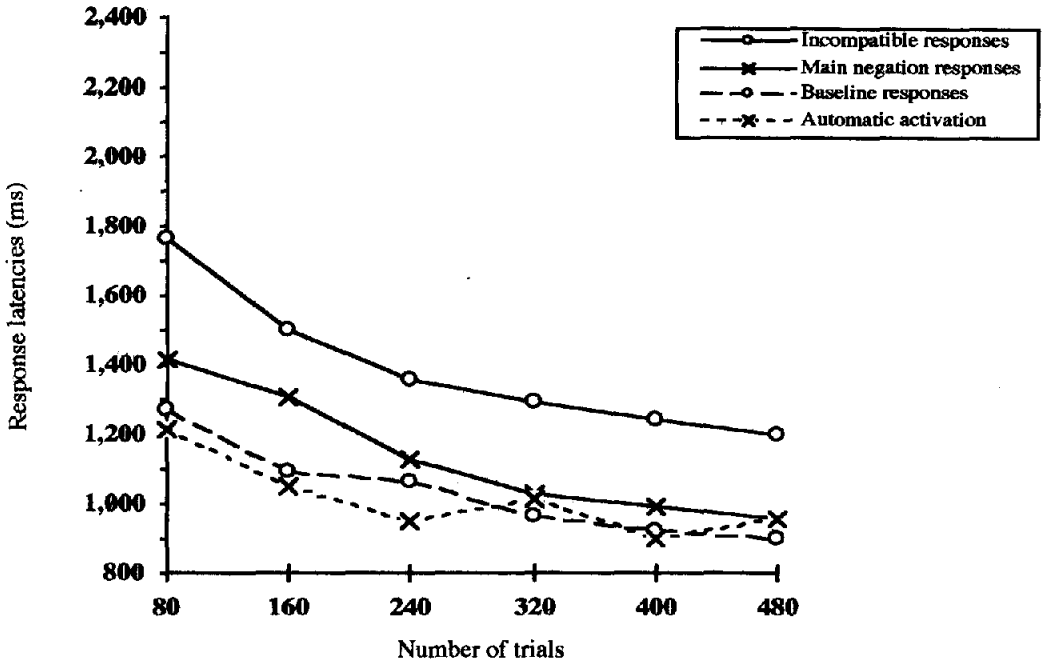

Figure 1. The effect of skinhead and elderly stereotype negation training on responses to skinhead traits in the training task in Study 1.

skinhead traits following skinhead primes after training in the posttest (M = 598) than in the pretest (M = 618), $F(1, 16) = 5.74$, $p < .05$. Thus participants who had received sufficient training in stereotype negation had learned to reduce stereotype activation, and therefore this activation no longer interfered with the color-naming task.

For participants who were not trained to negate skinhead stereotypic associations but to respond "YES" to skinhead prime–skinhead stereotypic trait associations and "NO" to elderly prime–elderly stereotypes in the Elderly Stereotype Negation Condition, the Pretest–Posttest × Prime interaction was not significant, $F(1, 16) = 0.09$, $p > .70$. As expected, and as indicated by the significant main effect for prime, $F(1, 16) = 6.03$, $p < .05$, these participants continued to show a general and persistent stereotype activation effect. Specifically, they responded slower to skinhead stereotypes following skinhead primes (M = 633) compared with elderly primes (M = 619) both before and after negation training.[4]

Negation Training

Although the primary dependent variable was the response latencies on the Stroop task, the participants' performance on the training task was examined to investigate the learning process in stereotype negation. Before the data were analyzed, however, response latencies in which participants gave incorrect answers (6.44%) and outlier latencies that were more than 3 standard deviations from the mean (1.63%) were excluded. Based on the above findings, the analyses of the training task focused on skinhead stereotypes. For each participant, the mean of the logarithmic-transformed values associated with the response latencies for skinhead stereotypes were computed for skinhead and elderly prime categories. This was accomplished by taking the mean for each of the 20 trait dimensions in each condition for each of the six blocks of trials.

To examine the effect of the amount of training on speed of responding, we performed a 2 (elderly vs. skinhead stereotype negated) × 2 (elderly vs. skinhead prime) × 6 (blocks) analysis of variance on the latencies related to skinhead stereotypes. All variables were repeated measures except the Stereotype Negation factor. The block variable was analyzed in terms of linear and quadratic trends.

In general, a significant linear and quadratic main effect for block was found on responses to skinhead stereotypes, $F(1, 32) = 95.45$, $p < .001$, and $F(1, 32) = 21.16$, $p < .001$. As illustrated in Figure 1, these effects nicely reflect the classic learning curve. In an idealized learning curve, response strength increases with each new trial. However, more is learned on any given trial than on the trial that succeeds it, until the curve rises to a final ceiling or asymptote (Gleitman, 1991). In the present study, the significant linear effect demonstrates that with more training, participants became faster in their responses to skinhead stereotypes. The quadratic effect, however, also shows that after a certain

[4] As with the pretest Stroop task results, no evidence was revealed on the posttest Stroop task for primed activation of elderly stereotypes. Participants responded somewhat *faster*, and comparably so, to elderly stereotypes following an elderly prime than following a skinhead prime, whether they were trained to negate elderly stereotypes (Ms = 613 vs. 627) or not (Ms = 587 vs. 594). In particular, the finding that responses to elderly stereotypes were not longer following the elderly prime than the skinhead prime for participants not trained to negate elderly stereotype provides further evidence, along with the pretest Stroop task, that participants in this sample did not spontaneously activate stereotypes of the elderly.

amount of training, this decrease in response latencies begins to level off.

A prime main effect was also found, $F(1, 32) = 11.17$, $p < .01$. Participants responded faster in the training phase to skinhead traits in association with skinhead primes (M = 1,062) than to elderly primes (M = 1,201). This finding, however, was qualified by a significant Stereotype Negated × Prime interaction, $F(1, 32) = 37.17$, $p < .001$. Simple effects analysis demonstrated a significant prime effect for participants in the Skinhead Stereotype Negation Condition, $F(1, 16) = 8.05$, $p < .01$. These participants were slower when responding "NO" to a skinhead stereotype associated with a skinhead prime (M = 1,096) than when responding "NO" to a skinhead stereotype associated with an elderly prime (M = 1,006). Simple effects analysis further demonstrated a significant prime effect for participants in the Elderly Stereotype Negation Condition, $F(1, 16) = 25.50$, $p < .001$. These participants were slower when responding "YES" to a skinhead stereotype presented with an elderly prime (M = 1,397) than when responding "YES" to a skinhead stereotype presented with a skinhead prime (M = 1,029). These findings suggest that it is more difficult for participants to respond negatively to existing stereotypes (main negation responses) than to nonstereotypes (baseline responses) and to respond positively to nonstereotypes (incompatible responses) than to skinhead stereotypes (responses consistent with the automatic activation of stereotypes).

Last, a Stereotype Negated × Prime × Block linear effect was found, $F(1, 32) = 9.55$, $p < .01$. This finding indicates that the pattern of results related to responding "YES" to skinhead stereotypes in association with skinhead primes (automatic activation of stereotype responses) was less influenced by successive learning trails than the three other types of responses. Compared with the former response, the linear trend was steeper when responding "YES" to elderly primes in combination with skinhead stereotypes (incompatible responses), when responding "NO" to skinhead primes in combination with skinhead stereotypes (main negation responses), or when responding "NO" to elderly primes in combination with skinhead stereotypes (baseline responses).

Furthermore, in examining only participants in the Skinhead Stereotype Negation condition, as expected, we found a Prime × Block linear effect, $F(1, 16) = 6.45$, $p < .05$. In examining the simple effects analysis in Block 1 only, participants were much slower in responding "NO" to skinhead stereotypes in combination with a skinhead photograph (main negation responses, M = 1,416) than in combination with an elderly photograph (baseline responses, M = 1,270), $F(1, 16) = 21.34$, $p < .001$. In examining the simple effects analysis in Block 6, however, the main negation responses (M = 955) and the baseline responses (M = 900) were not significantly different, $F(1, 16) = 1.14$, $p > .30$. A further examination of only the main negation responses demonstrates the very substantial learning that occurs, linear effect, $F(1, 16) = 72.42$, $p < .001$, and quadratic effect, $F(1, 16) = 8.88$, $p < .01$. In combination, these findings indicate that although participants are initially slow in responding "NO" to skinhead photographs in combination with skinhead stereotypes when instructed, they show marked improvement with practice.

Discussion

The aim of the present study was to examine the possibility of reducing automatic stereotype activation through practice in stereotype negation. Before participants received negation training, automatic activation of both elderly and skinhead stereotypes was predicted on the pretest Stroop task. The findings, however, provide evidence for the spontaneous activation of skinhead but not elderly traits. Because the primary goal of the present studies was to examine the effect of negation training on the automatic activation of stereotypes, we focused on only skinhead stereotypes that were demonstrated to be unintentionally activated in the pretest of the Stroop task. This allowed us to focus on the impact of the experimental manipulations by keeping the target traits constant while varying the priming category, thus controlling for differences in the stimulus material (i.e., word length, word frequency, valence).

In examining the findings related to the training phase, the results demonstrate that with practice, participants can become quite proficient stereotype negators. While participants initially were relatively slow in negating skinhead stereotypic associations, within a short period of time they became relatively adept in this response. Specifically, after 480 trials, responding "NO" to skinhead stereotypes in association with skinhead primes (main negation responses) reached levels of responding that were equal in speed to responding "NO" to skinhead stereotypes in association with elderly primes (baseline responses). These findings provide strong evidence for the significant impact of learning on cognitive processes in general (Shiffrin & Schneider, 1977; Smith, 1990; Smith et al., 1988) and processes related to stereotype negation in particular.

Furthermore, the results related to the posttest of the Stroop task provide support for the notion that training in responding "NO" to stereotypes can result in a decrease in stereotype activation on a subsequent measure of automatic activation. Following a session of concentrated training in stereotype negation, participants were able to direct their attention to naming the ink color of words so that the activation of the semantic meaning of the stereotypes no longer interfered with this task. Although participants who were instructed to negate skinhead stereotypes demonstrated automatic activation of these traits on the pretest Stroop task, after training, these participants demonstrated no difference in color naming for skinhead words as a function of elderly or skinhead primes. The other half of the participants, who were instructed to negate elderly stereotypes and not skinhead stereotypes, demonstrated spontaneous activation of skinhead stereotypic traits in both the pretest and the posttest Stroop tasks. The change between the pretest and posttest responses to the Stroop task clearly demonstrates that the effects related to negation training were based on a reduction in skinhead stereotype activation, not to an increase in elderly stereotype activation.

In general, the findings from Study 1 provide preliminary support for the effectiveness of negation training in reducing automatic stereotype activation. In accordance with the cognitive therapy of emotional disorders (Beck, 1976; Beck, Rush, Shaw, & Emery, 1979) and skill-acquisition literature (Shiffrin & Schneider, 1977; Smith, 1990; Smith et al., 1988; Wyer & Hamilton, 1998), people are able to reduce automatic stereotype activation with practice. Also as suggested by the skill-acquisition literature,

extended practice in which stereotypic associations are unlearned or weakened is necessary. In related research, for example, Kawakami, Dovidio, Moll, and Hermsen (1999) found that simply instructing participants not to stereotype with only limited practice (80 trials instead of 480 trials) in negating stereotypic associations is not sufficient to reduce automatic stereotype activation. These findings indicate that the reduced stereotype activation in Study 1 is not readily attributable to instructions and immediate efforts to "not stereotype" per se, but it requires considerable, extended practice.[5]

Study 2

Although the results from Study 1 underscore the importance of extensive training for reducing stereotype activation, it is unclear how long the effects of the training last. We executed a second study, therefore, to replicate the previous findings and to examine the durability across time of the effects of training in negating stereotypic associations on subsequent stereotype activation. Because the results of the pretest Stroop task in Study 1 and results by Kawakami, Dovidio et al. (1999) failed to provide sufficient evidence for automatic stereotype activation related to the elderly, all participants in Study 2 were instructed to negate only the skinhead stereotype and respond positively to the elderly stereotype. Specifically, Study 2 used a between-subjects design wherein participants in the No Stereotype Negation Condition were presented with the Stroop task at the beginning of the first session and participants in the Skinhead Stereotype Negation Condition received the Stroop task only after completing 480 trials in negating skinhead stereotypes. To examine the durability of the training effect, we presented all participants with the Stroop task on three additional occasions and up to 24 hr subsequent to the first session.

On the basis of earlier findings, we predicted that participants need sufficient training for a reduction in the automatic activation of stereotypes to occur. A Stereotype Negated × Prime interaction was therefore expected for the Stroop results. In accordance with the pretest findings in Study 1, a main effect for prime was expected for participants who did not receive training in negating skinhead stereotypes. Specifically, participants in the No Stereotype Negation Condition were expected to activate skinhead stereotypes spontaneously and therefore were predicted to respond slower when naming the ink color of skinhead stereotypes following a skinhead prime compared with an elderly prime. In accordance with the posttest findings in Study 1, no main effect for Prime was expected for participants in the Skinhead Stereotype Negation Condition. Specifically, after six blocks of negation training, no difference in naming the ink color of skinhead stereotypes was expected following skinhead primes compared with elderly primes. Furthermore, this pattern of findings was not expected to be qualified by the time of the Stroop task. Regardless of when the Stroop task was presented to the participants, immediately following the training or 24 hr later, participants who received 480 trials of negation training were expected to demonstrate a reduced level of stereotype activation related to the skinhead category.

Method

Participants and Design

Twenty-nine (13 female and 16 male) undergraduate students in the Netherlands participated in the experiment receiving approximately U.S. $6.[6] Four independent variables were included in a 4 (time of Stroop task: 0, 2, 6, or 24 hr subsequent to the initial session) × 2 (prime: elderly or skinhead) × 2 (type of stereotype: elderly or skinhead) × 2 (stereotype negated: skinhead or no stereotype) design. Only the Stereotype Negated factor was between subjects; all other factors were within subjects.

Procedure

The experimental procedure was similar to Study 1, except that participants in the No Stereotype Negation Condition received no training, only the primed Stroop task. Participants in the Skinhead Stereotype Negation Condition, alternatively, after initially receiving the full six blocks of trials in negating skinhead stereotypes, were presented with the primed Stroop task. In each block of the training phase, 20 stereotypes of skinhead and 20 stereotypes of the elderly, which were similar to those in Study 1, were presented with the skinhead photograph and the elderly photograph in a random order. During the 480 trials, these participants were instructed not to stereotype skinheads and to stereotype the elderly. Specifically, they were instructed to respond "NO" to skinhead stereotypes following the skinhead photograph and to respond "YES" to nonassociated traits (i.e., elderly stereotypes) following the skinhead photograph. These same participants were also instructed to respond "YES" to elderly stereotypes following the elderly photograph and to respond "NO" to nonassociated traits (i.e., skinhead stereotypes) following the elderly photograph. All participants completed the primed Stroop task at four separate intervals. These intervals were either immediately at the beginning of the first session for the No Stereotype Negation Condition or directly after the training for the Skinhead Stereotype Negation Condition, followed by a repeated Stroop task 2, 6, and 24 hr subsequent to the first session.

Results

Primed Stroop Task

Response latencies related to errors (4.14%) and outlier latencies that were less than 400 ms (4.32%) or more than 3 standard deviations from the mean (0.96%) were excluded from the analyses. Once again the focus of the analyses was on skinhead stereotypes. The mean of the logarithmic transformed values associated with the latencies for skinhead stereotypes for each participant were calculated for skinhead and elderly primes.

To examine the effects of training on the activation of skinhead stereotypes, we performed a 4 (0 vs. 2 vs. 6 vs. 24 hr time of Stroop task) × 2 (no stereotype vs. skinhead stereotype negated) × 2 (elderly vs. skinhead prime) analysis of variance. All variables except the Stereotype Negated factor were repeated measures. A significant main effect for prime was found, $F(1, 27) = 4.41$, $p < .05$. Participants were slower at color naming following skinhead primes ($M = 606$) compared with elderly primes ($M = 601$). A significant main effect for time of Stroop task was also found, $F(1, 81) = 8.38$, $p < .001$. Participants were faster 24 hr after the initial session ($M = 580$) than 2 hr after the initial session ($M = 601$), 6 hr after the initial session, ($M = 608$), or than in the actual first session ($M = 624$). There was no main effect for stereotype negation condition ($p < .55$);

[5] Details of the Kawakami, Dovidio et al. (1999) study are available from Kerry Kawakami.

[6] Although 31 students participated in Study 2, the data from 2 participants—1 participant whose responses included more than 20% errors in the training phase (96 errors in six blocks of trials) and 1 participant because of a computer malfunction—were excluded from the study.

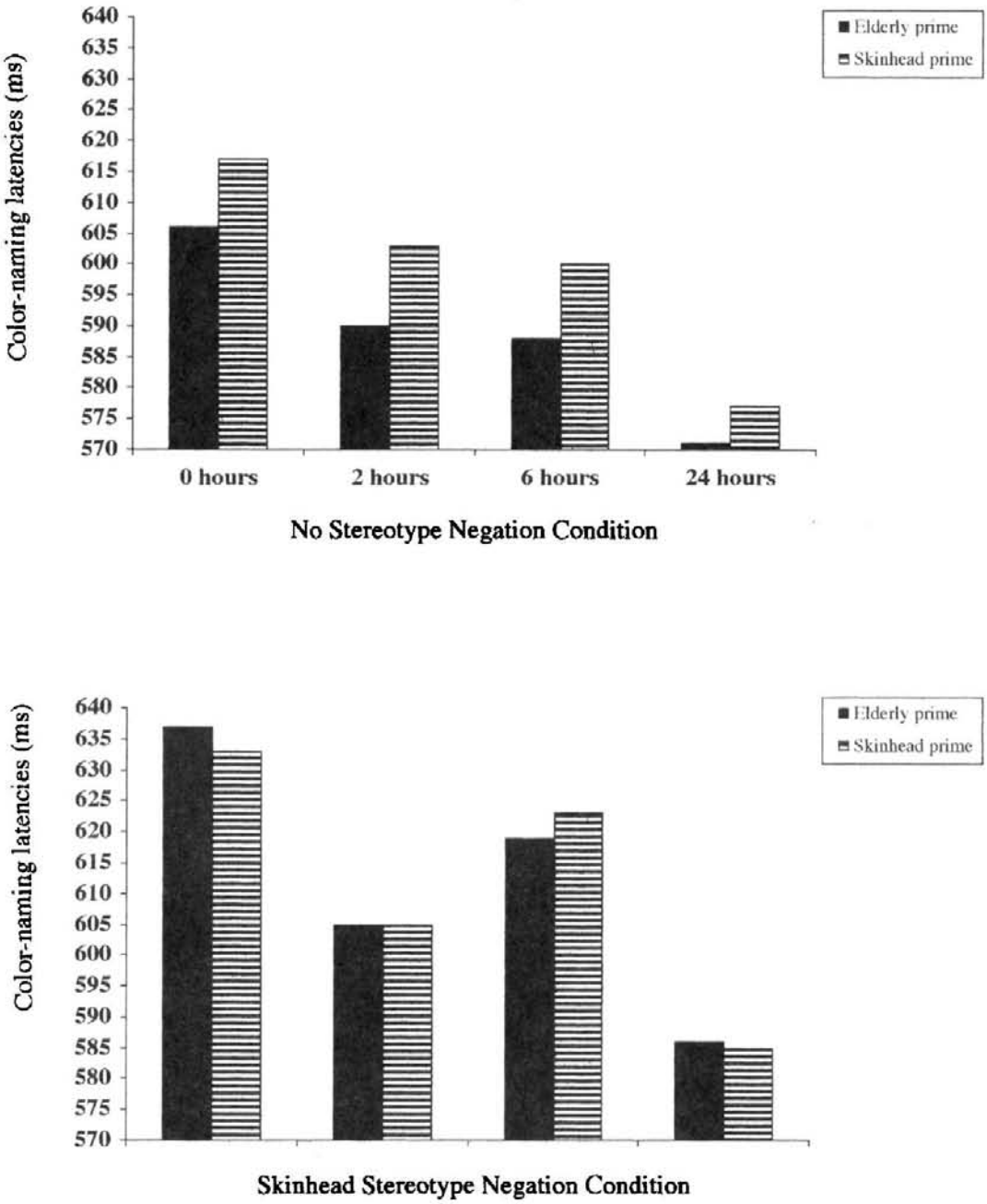

Figure 2. The effect of no stereotype and skinhead stereotype negation training on color naming of skinhead traits in the Stroop Task in Study 2.

overall, speed of responding was similar in the No Stereotype and Skinhead Stereotype Negation Conditions.

As indicated in Figure 2 and as predicted, a Stereotype Negated × Prime interaction was found, $F(1, 27) = 3.88$, $p < .06$. This interaction was not qualified by the time of the Stroop task, $F(1, 81) = 0.24$, $p > .80$. In accordance with the pretest in Study 1, simple effects analysis of the response latencies of participants in the No Stereotype Negation Condition demonstrated a Prime main effect, $F(1, 13) = 6.14$, $p < .05$. As expected, these participants were slower at responding to skinhead associations following a skinhead prime ($M = 599$) than an elderly prime ($M = 589$). However, in accordance with the posttest results of Study 1, the simple effects analysis of the response latencies of participants in the Skinhead Stereotype Negation Condition who were trained to respond negatively to skinhead stereotypes and positively to nonstereotypes in association with skinhead primes demonstrated no difference in color naming of skinhead stereotypes as a function of skinhead prime ($M = 611$) versus elderly prime ($M = 612$), $F(1, 14) = 0.01$, $p > .90$. When participants have

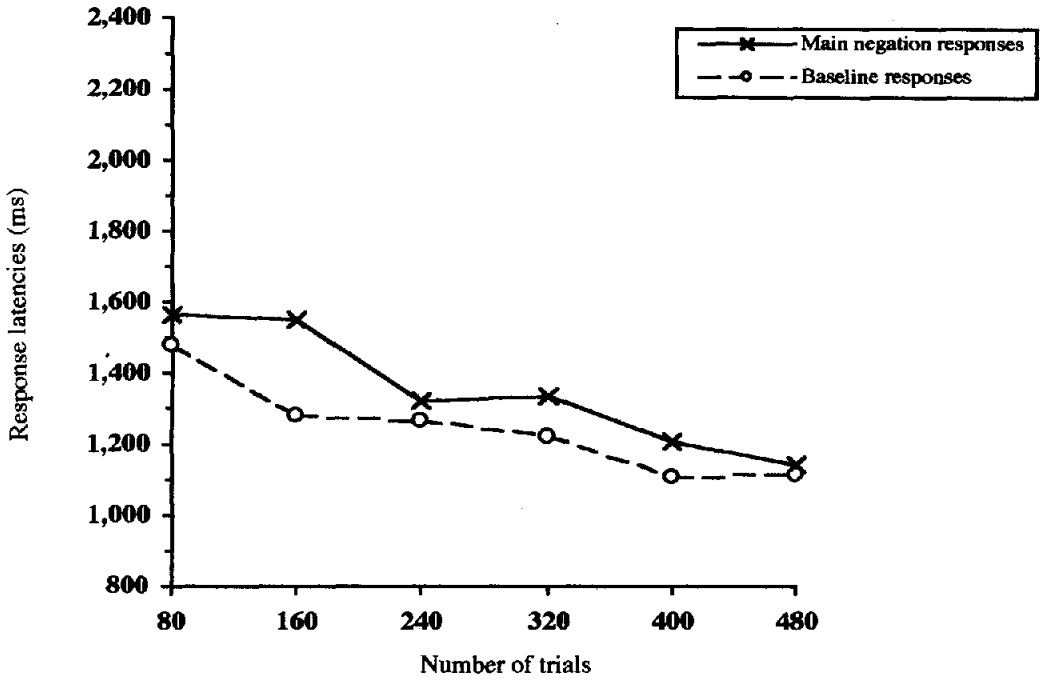

Figure 3. The effect of skinhead stereotype negation training on responses to skinhead traits in the training task in Study 2.

received 480 trials of practice in negating stereotypic associations, stereotype activation is diminished and no longer interferes with the color-naming task. In addition, this effect appeared to be relatively enduring, at least within the 24-hr time frame covered by the study. An examination of only participants in the Skinhead Stereotype Negation Condition did not demonstrate a Prime × Time interaction, $F(3, 42) = 0.26, p > .85$.[7]

Negation Training

The training data from participants who had received practice in negating skinhead associations in Study 2 replicates the results from Study 1. As with previous analyses, we excluded response latencies in which participants gave incorrect answers (8.39%) and outlier latencies that exceeded 3 standard deviations from the mean (1.54%). For each participant, the mean of the logarithmic transformed values related to latencies for skinhead stereotypes were computed for skinhead and elderly prime categories for each of the six blocks of trials.

To examine the effect of the amount of practice on responses in the training task, we performed a 2 (elderly vs. skinhead prime) × 6 (blocks) repeated-measures analysis of variance on the mean response latencies related to only the skinhead stereotypes. The block variable was analyzed in terms of linear and quadratic trends.

As evident in Figure 3, a significant linear effect, $F(1, 14) = 46.79, p < .001$, but not quadratic effect, $F(1, 14) = 0.67, p > .42$, for block was found. With more training, participants continued to become faster in their responses. The prime main effect was also significant, $F(1, 14) = 13.70, p < .01$. Participants instructed to negate skinhead stereotypes were faster at responding "NO" to skinhead stereotypes associated with the elderly photograph (baseline responses, $M = 1{,}244$) than when responding "NO" to skinhead stereotypes associated with the skinhead photograph (main negation responses, $M = 1{,}352$).

Although a Prime × Block linear effect was not significant, $F(1, 14) = 1.54, p < 0.24$, in accordance with Study 1, separate analyses of response latencies to skinhead stereotypes in Block 1 and Block 6 following skinhead and elderly photographs were carried out. As expected, in examining response latencies in Block 1 only, participants were slower in responding "NO" to skinhead stereotypes in combination with a skinhead photograph (main negation responses, $M = 1{,}561$) than in combination with an elderly photograph (baseline responses, $M = 1{,}479$), $F(1, 14) = 4.90, p < .05$. In examining response latencies in Block 6, however, participants did not differ in their speed in the main negation responses ($M = 1{,}141$) and the baseline responses ($M = 1{,}116$), $F(1, 14) = 1.58, p > .23$. Once again, when examining the pattern of findings for only the main negation responses, we found a highly significant linear effect, $F(1, 14) = 45.43, p < .001$, demonstrating a steep, continual improvement in the participants' ability to negate skinhead stereotypes.

[7] Supplementary analyses on responses to the elderly stereotypes provided once again no evidence for the automatic activation of these traits. Overall, participants did not respond more slowly in naming the color of elderly stereotypes following elderly primes than following skinhead primes, both $Ms = 603$, $F(1, 27) = .06, p > .80$. Comparable results were obtained separately for participants in the control condition, $Ms = 595$ and 594, $F(1, 13) = .27, p > .61$, and for participants trained to negate skinhead stereotypes, $Ms = 610$ and 611, $F(1, 14) = .01, p > .94$.

Discussion

The results related to both the negation training and the Stroop task in Study 2 provide a clear replication of the findings in Study 1. Specifically, the results related to the training phase demonstrate once more that with extensive practice, participants become quite efficient at negating skinhead stereotypes. Although participants were initially faster when responding "NO" to nonstereotypes in combination with skinhead photographs (baseline responses) than when responding "NO" to skinhead stereotypes in combination with skinhead photographs (main negation responses), by the last block of trials this difference was minimal.

The results related to the Stroop task demonstrate once more that when participants received no training in negating skinhead stereotypes, stereotype activation interfered with the color-naming task. These participants were slower at naming the color of skinhead traits following a skinhead prime than following an elderly prime. However, when participants received sufficient training in negating skinhead stereotypes, interference due to stereotype activation was diminished. No difference in color naming of stereotypes was found following elderly or skinhead primes. Furthermore, not only in the first session, but 2, 6, and 24 hr after the initial Stroop task, participants who did not receive training in the No Stereotype Negation Condition consistently demonstrated the spontaneous activation of skinhead traits and participants who did receive training in the Skinhead Stereotype Negation Condition consistently demonstrated reduced stereotype activation.

Study 3

The unexpected absence of stereotypic trait activation for the elderly in the previous studies raises questions concerning the generalizability of the training effect. Although it remains unclear why the present studies provide evidence for the automatic activation of skinhead but not elderly stereotypes, it is possible that differences in the nature and structure of these stereotypes, or methodological factors in the present study may have influenced these findings (Devine, 1998; Kawakami & Dovidio, in press).

With regard to the nature of the stereotype, Devine (1998) emphasized the importance of the specific target group in processes related to automatic and controlled stereotype activation. Because the structure of elderly stereotypes may be more complex (e.g., subtypes; see Brewer, Dull, & Lui, 1981) and their activation and use may be more susceptible to public censure and personal condemnation (Devine, 1998), elderly primes may produce different responses among different participants, reducing the likelihood of automatic activation. Furthermore, different priming techniques may be differentially sensitive to different types of stereotype activation (Wittenbrink, Park, Judd, & Wolsko, 1998). Because participants in the present Stroop task were primed per trial with varying categories, only clearly defined stereotypes may produce evidence for automatic activation (Kawakami, Dion, & Dovidio, 1998). Alternative measures of implicit stereotyping that focus on other qualities of automaticity (Bargh, 1994), such as unawareness, have demonstrated automatic activation of elderly stereotypes. For example, a study by Kawakami, Young, and Dovidio (1999) demonstrated that participants automatically activated elderly stereotypes on an ostensibly unrelated lexical decision task after deciding in a 5-min priming task whether people in a series of photographs were elderly or not.

On the basis of these discrepancies, it is unclear whether negation training is effective only in reducing stereotype activation related to skinheads or whether it is also effective in reducing stereotype activation related to other groups and for other techniques for assessing activation. Furthermore, because all of the stimuli in the pretest or posttest stereotype assessment phases of the previous studies involve priming with verbal labels and measuring responses to stereotype associations, it is possible that our results are restricted to semantic priming. This could mean that the training effects may not generalize to issues in social categorization that take place when perceivers encounter members of the group. Finally, because both skinhead and elderly traits used in the previous studies were negatively valanced, it is possible that the observed training effects may be specifically related to only negative stereotypes. The main goal of Study 3 was to address these issues and to explore the generalizability of the results of Study 1 using positive and negative racial stereotypes and a different measure of stereotype activation.

To achieve this goal, the present experiment involved three phases. To examine the initial automatic activation of racial stereotypes, we required participants to perform the pretest of a primed person categorization task. In a task adapted from research by Banaji and her colleagues (Banaji & Hardin, 1996; Blair & Banaji, 1996), participants are presented with stereotypes and nonstereotypes as primes and asked to make a simple decision about the subsequent target stimulus. The target stimuli in the present studies were photographs of Black or White students, and participants were simply instructed to indicate whether the race of the person in the photograph was Black or White. With this paradigm, a Stereotype Prime × Type of Face interaction would provide evidence for an implicit racial stereotyping effect. Specifically, White stereotypes were expected to facilitate the categorization of White faces relative to Black faces, and Black stereotypes were expected to facilitate categorization of Black faces relative to White faces.

In the second phase, participants received extensive training in either negating or maintaining racial stereotypes. In accordance with earlier studies, participants in the Stereotype Negation Condition were instructed to respond "NO" on the trials in which they saw a picture of a Black or a White person paired with an associated stereotype and to respond "YES" on trials in which a photograph of a Black or White person was paired with a nonstereotype. Participants in the Stereotype Maintain Condition, alternatively, were instructed to respond "YES" on trials in which they saw a photograph of a Black or White person with an associated stereotype and to respond "NO" on trials in which they saw a Black or White person with a nonstereotype.

In the third phase of this study, participants performed the posttest of the primed person categorization task. We hypothesized that extensive negation training would reduce stereotype activation. Specifically, we predicted that whereas participants in the Stereotype Maintain Condition would continue to exhibit the automatic activation of racial stereotypes, those in the Stereotype Negation Condition would decrease this activation. Evidence for these predictions would be reflected in a Stereotype Negated × Pretest–Posttest × Stereotype Prime × Type of Face interaction. Whereas all participants were expected to show automatic activation of racial stereotypes on the pretest of the person categorization task, only participants in the Stereotype Maintain Condition were

predicted to show this pattern on the posttest. Specifically, in the posttest, a Stereotype Prime × Type of Face interaction, similar to that anticipated on the pretest, was expected for participants in the Stereotype Maintain but not the Stereotype Negation Condition.

Method

Participants and Design

Forty (21 female and 19 male) White undergraduates in the United States participated to partially satisfy one option of a course requirement.[8] Five independent variables were included in a 2 (time: pretest or posttest) × 2 (stereotype prime: Black or White) × 2 (valence of prime: positive or negative word) × 2 (type of face: Black or White) × 2 (stereotype negated: stereotype negation or stereotype maintain) design. Only the Stereotype Negated factor was between subjects; all other factors were within subjects.

Procedure

Phase 1: Pretest of stereotype activation. In Phase 1, we used a person categorization task (Blair & Banaji, 1996) to measure automatic stereotype activation. Participants were informed that the experiment examined how individuals categorize people and "concerns your speed and accuracy in identifying photographs." Participants were also told that they were in the distractor condition and that before each photograph a distractor word that was unrelated to the categorization task would "appear for a short time." They were asked to read the word silently and "to judge as quickly and accurately as possible whether the person in the subsequent photograph is Black or White and to press the appropriate key."

The beginning of each trial was signaled by an asterisk (*) presented in the center of the screen for 500 ms followed by a trait prime presented for 250 ms. The trait primes included 8 positive and 8 negative stereotypes for Blacks (e.g., athletic, poor) and Whites (e.g., ambitious, uptight) and 16 filler traits (e.g., friendly, confused). The filler traits consisted of words unrelated to either Black or White stereotypes and were used to divert the participants' attention from the true purpose of the task by diluting the percentage of racial stereotypes (Macrae et al., 1995).[9] Next, a blank screen appeared for 50 ms before the onset of a photograph. Forty-eight portraits of Black men and 48 portraits of White men scanned from college yearbooks were presented in a 4.85 × 3.75-in. format on the computer screen until the participant responded. Finally, a blank screen appeared for 750 ms before the next trial.

Participants were presented with two blocks of trials. Each block consisted of 48 trials in which each positive and negative stereotypical trait and each filler trait was presented once. Within a given block, 24 photographs of White and Black men were presented. Across blocks, pictures of Black and White men were paired once with the 8 positive and 8 negative Black and White stereotypical traits and the 16 filler traits, resulting in a total of 96 trials. Over all trials, each photograph was presented only once; each trait was presented twice, paired once with a Black and White photograph. Participants were given rest periods at the end of each block and indicated when they were ready to proceed with the study. Before the experimental trials, participants were presented with a practice block of 12 trials not used in the main experiment.

Phase 2: Stereotype negation training. The procedure and instructions for the training task were virtually identical to those used in Study 1. Participants' responses, however, were recorded on the keyboard (M or Z) not a button box. Participants were informed that they would be presented on the computer screen simultaneously with a photograph of a Black or a White person and a Black or White stereotype underneath it. We used 48 photographs of White males, 48 photographs of Black males, and 48 target traits, which included 12 positive and negative White stereotypes and 12 positive and negative Black stereotypes.

In the previous studies all participants were instructed to negate stereotypes related to a specific category (e.g., skinhead photograph–skinhead stereotypes) and to respond affirmatively to associations not stereotypic of that same category (e.g., skinhead photograph–elderly stereotypes). Furthermore, these same participants were instructed to respond positively to stereotypes related to a different category (e.g., elderly photograph–elderly stereotypes) and to respond negatively to associations not stereotypic of that category (e.g., elderly photograph–skinhead stereotypes). The purpose of this somewhat complicated design was to prevent participants when negating stereotypes from using simple heuristics such as mentally switching the "YES" and "NO" labels on the button boxes to perform the task. As demonstrated by the typical learning curve (Gleitman, 1991) in the results related to the training task in Study 1 and 2, no evidence for such a ploy was found. In the present study, we decided to simplify the design by instructing half of the participants to negate stereotypes related to both Black and White categories and half of the participants to not negate stereotypes related to these categories.

Thus participants in the Stereotype Negation Condition were instructed to negate racial stereotypes by responding "NO" when presented with a photograph of a White person and a White stereotype or a photograph of a Black person and a Black stereotype. They were also told to respond "YES" to stereotype-inconsistent word–picture pairings. Conversely, participants in the Stereotype Maintain Condition were instructed to respond "YES" when they were presented with a photograph of a White person and a White stereotype or a photograph of a Black person and a Black stereotype. They were also told to respond "NO" to stereotype-inconsistent word–picture pairings. In total, 384 trials were presented consisting of four blocks of 96 trials in which the 48 words were paired with a photograph of a White and Black person. Participants were given the opportunity to rest between blocks.

Phase 3: Posttest of stereotype activation. In Phase 3, a posttest of the person categorization task was used to examine the effect of the training phase on subsequent stereotype activation. Once again, the stereotypes and photographs in the pre- and posttest of the categorization task were the same, but different from the stimuli in the training task in Phase 2.

Results

In accordance with Study 1, the results related to the pretest person categorization task were analyzed first to examine the initial automatic activation of stereotypes followed by an examination of the effects of negation training on spontaneous stereotype activation, which compared pretest–posttest latencies. Finally, an analysis of the response latencies related to the training task investigated the learning processes involved in stereotype negation.

Person Categorization Task

We excluded errors in categorizing faces as Black or White (2.85%) and outlier response latencies more than 3 standard deviations beyond each participant's mean (2.20%) from the analysis. The means of the logarithmic transformed values associated with

[8] Although 42 students participated in Study 3, the data from 2 participants were lost because of equipment failure.

[9] All traits used in both the person categorization task and training task in Study 3 were selected on the basis of pilot studies (Kawakami et al., 1998; Wittenbrink, Judd, & Park, 1997). Traits that significantly distinguished between Blacks and Whites (in terms of the percent of these groups estimated to possess the trait) were selected as stereotypes for each group and matched on valence and word length.

each of the eight trait primes in each of the four Black and White, positive and negative stereotype conditions were computed separately for Black and White photographs.

Test for initial automatic activation. To examine initial stereotype activation, we performed a 2 (Black vs. White stereotype prime) × 2 (positive vs. negative prime) × 2 (Black vs. White face) repeated-measures analysis of variance on the transformed response latencies. Consistent with the hypothesis of automatic activation of racial stereotypes, a Stereotype Prime × Type of Face interaction was obtained, $F(1, 41) = 22.05$, $p < .001$. Following White stereotype primes, participants categorized White faces ($M = 501$) faster than Black faces ($M = 514$), $F(1, 41) = 5.90$, $p < .05$. Following Black stereotype primes, participants categorized Black faces ($M = 509$) faster than White faces ($M = 545$), $F(1, 41) = 9.42$, $p < .01$. This effect was not moderated by the valence of the prime; the Stereotype Prime × Valence of Prime × Type of Face interaction did not approach significance, $F < 1$. These results provide consistent evidence for the initial automatic activation of racial stereotypes.

Effects of training on automatic stereotype activation. To examine the effect of training on subsequent stereotype activation, we conducted on the response latencies a 2 (stereotype negation vs. stereotype maintain) × 2 (pretest vs. posttest) × 2 (Black vs. White stereotype prime) × 2 (positive vs. negative prime) × 2 (Black vs. White face) analysis of variance, with repeated measures on the last four factors. This analysis produced a stereotype prime main effect, $F(1, 40) = 5.42$, $p < .05$. Participants responded faster following White stereotypes ($M = 512$) than following Black stereotypes ($M = 523$). As expected, a Stereotype Negated × Pretest–Posttest × Stereotype Prime × Type of Face interaction was also obtained, $F(1, 40) = 8.37$, $p < .01$. Pretest–Posttest × Stereotype Prime × Type of Face analyses of variance were performed separately for the Stereotype Negation and Stereotype Maintain Conditions.

Participants in the Stereotype Maintain Condition who were not trained to negate stereotypes demonstrated a Stereotype Prime × Type of Face interaction, $F(1, 20) = 10.66$, $p < .01$. As expected, the Stereotype Prime × Type of Face × Pretest–Posttest interaction was not significant, $F < 1$. Across both the pretest and posttest administrations of the task, White stereotypes tended to facilitate categorization of White faces ($M = 499$) relative to Black faces ($M = 511$), $F(1, 20) = 2.13$, $p < .16$, and Black stereotypes facilitated categorization of Black faces ($M = 500$) relative to White faces, ($M = 535$), $F(1, 20) = 7.78$, $p < .01$.

In contrast to these results, participants in the Stereotype Negation Condition who were extensively trained to negate racial stereotypes demonstrated a significant Stereotype Prime × Type of Face × Pretest–Posttest interaction, $F(1, 20) = 18.66$, $p < .001$. Whereas a significant Stereotype Prime × Type of Face interaction was obtained on the pretest for participants in this condition, $F(1, 20) = 11.13$, $p < .01$, this interaction was not significant on the posttest, $F(1, 20) = 2.49$, $p < .13$. On the pretest before the negation training, these participants categorized White faces ($M = 512$) faster than Black faces ($M = 520$) after White stereotypes, $F(1, 20) = 3.06$, $p < .09$, and Black faces ($M = 508$) faster than White faces ($M = 532$) after Black stereotypes, $F(1, 20) = 7.08$, $p < .01$. Following the training on the posttest, however, the response latencies in categorizing White faces ($M = 527$) compared with Black faces ($M = 515$) following White stereotypes, $F(1, 20) = 0.98$, $p < .35$, and categorizing Black faces ($M = 539$) compared with White faces ($M = 531$) following Black stereotypes, $F(1, 20) = 1.10$, $p < .31$, were no longer significant. These findings provide further evidence that extensive training in stereotype negation can alter the automatic activation of stereotypes and suggests the generalizability of the previous findings to other social groups and measures of automatic stereotype activation.

Negation Training

As in previous studies, we examined response latencies in the training phase to investigate the effect of practice on stereotype negation. Before the data were analyzed, trials on which participants gave an incorrect response (8.90%) and outlier latencies more than 3 standard deviations from the mean (1.52%) were excluded. The means of the logarithmic transformed data associated with Black and White categorizations were computed for Black and White stereotypes for each of the four blocks.

To examine the effect of training on response latencies, we performed on stereotype and nonstereotype associations a 2 (stereotype negation vs. stereotype maintain) × 2 (stereotypic vs. nonstereotypic type of association) × 4 (blocks) analysis of variance, with repeated measures on the last two variables. All variables except the Stereotype Negation factor were repeated measures. The block variable was analyzed in terms of linear and quadratic trends.

As in Study 1 a significant linear and quadratic effect for Block was obtained, $F(1, 38) = 70.13$, $p < .001$, and $F(1, 38) = 36.18$, $p < .001$. As illustrated in Figure 4 and reflecting a typical learning curve, participants responded faster with each block, but the impact of practice decreased in later blocks. Main effects were also found for Stereotype Negation, $F(1, 38) = 5.43$, $p < .025$, and Type of Association factors, $F(1, 38) = 15.03$, $p < .001$. Participants in the Stereotype Negation Condition generally took longer to respond ($M = 1{,}594$) than did those in the Stereotype Maintain Condition ($M = 1{,}289$), and participants responded in general faster to stereotypic trait and photograph associations ($M = 1{,}419$) than to nonstereotypic trait and photograph associations ($M = 1{,}465$). Furthermore, a Stereotype Negated × Block linear effect was demonstrated, $F(1, 38) = 8.78$, $p < .01$. The findings indicate that responding "YES" to stereotypic associations and "NO" to nonstereotypic associations in the Stereotype Maintain Condition was less influenced by training over time than responding "NO" to stereotypic associations and "YES" to nonstereotypic associations in the Stereotype Negation Condition.

In accordance with Study 1, when examining only negation responses, a Stereotype Negated × Block linear effect, $F(1, 38) = 10.19$, $p < .001$, and quadratic effect, $F(1, 38) = 5.53$, $p < .05$, were found. Furthermore, the simple effects analysis in Block 1 demonstrated that participants in the Stereotype Negation Condition were much slower in responding "NO" to stereotypes (main negation responses, $M = 2{,}107$) than participants in the Stereotype Maintain Condition were in responding "NO" to nonstereotypes (baseline responses, $M = 1{,}538$), $F(1, 38) = 13.21$, $p < .001$. No difference in the simple effects analysis in Block 4, however, was found between the main negation responses ($M = 1{,}255$) and the baseline responses ($M = 1{,}179$), $F(1, 38) = 0.55$, $p > .46$. A further examination of only the main negation responses demonstrates the substantial learning that oc-

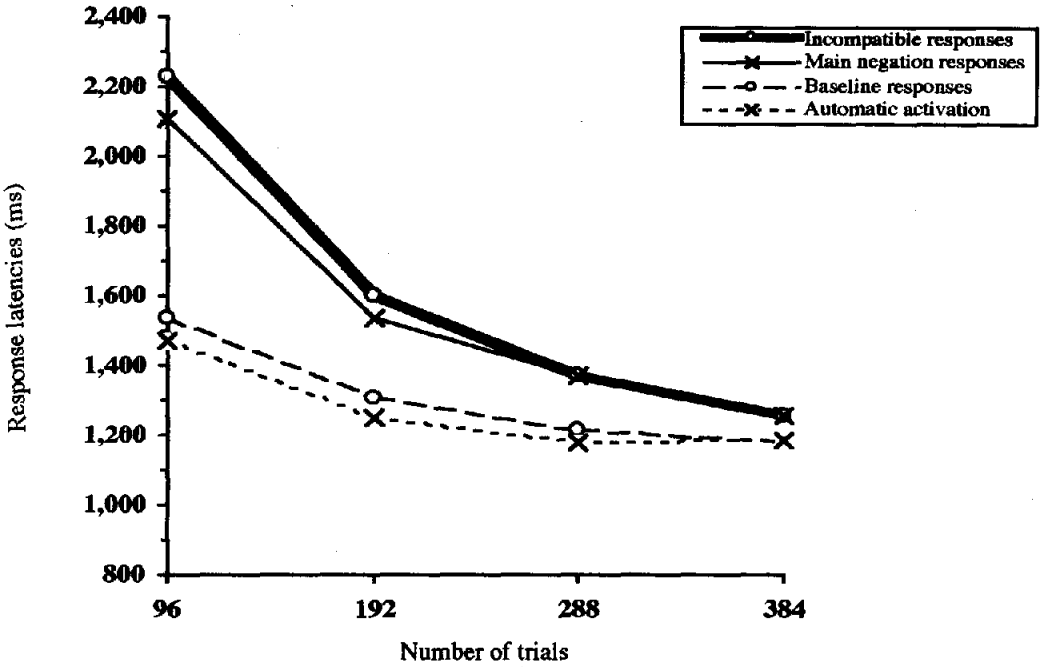

Figure 4. The effect of stereotype maintain and stereotype negation training on responses to consistent and inconsistent traits in the training task in Study 3.

curs when participants are asked to respond "NO" to stereotypes, linear effect, $F(1, 18) = 37.85$, $p < .001$, and quadratic effect, $F(1, 18) = 21.38$, $p < .001$.

Discussion

Because initial automatic activation, as assessed by the Stroop task, occurred for skinhead but not elderly stereotypes in previous studies, the generalizability of the effects of negation training for stereotypes related to groups other than skinheads was unclear. Study 3 allays these concerns by offering convergent evidence for the earlier findings with different stereotypes and a different measurement of automatic stereotype activation. Specifically, the results demonstrate that training in negating racial stereotypes can moderate the subsequent automatic activation of these stereotypes on a person categorization task. Whereas participants in the Stereotype Maintain Condition showed an equivalent level of automatic stereotype activation on the pretest and posttests, participants in the Stereotype Negation Condition displayed a significant reduction in automatic stereotype activation. These effects were independent of the positive versus negative valence of the characteristics. Including photographs of group members as stimuli rather than relying on verbal labels of the groups also suggests that our findings extend beyond simply semantic priming to address issues in social categorization and social construal processes.

Once again, the results related to the training task demonstrated that participants can become efficient stereotype negators with extended practice. Furthermore, the findings related to this learning curve, despite modifications in the training task, suggest that participants did not use a simplifying heuristic but became progressively more proficient at negating stereotypes.

We acknowledge, however, basic procedural differences in the assessment of automatic stereotype activation in Studies 1 and 2 compared with Study 3. Although in Studies 1 and 2, a Stroop task was used in which participants were first primed with the category and then color named stereotypes, in Study 3, participants were presented first with stereotypes and then asked to make categorization judgments. In this paradigm, because the presentation of a photograph can automatically activate the social category and its stereotypic associations (Zarate & Smith, 1990), social categorization decisions are expected to be facilitated by traits associated with the category.

Although there is precedent for both types of priming techniques and both are rooted in assumptions about spreading activation, attribute–category links may be expected to be weaker than category–attribute links simply because attributes do not necessarily determine category membership (Andersen & Klatzky, 1987). Thus, it is theoretically possible, and in fact quite probable, that category and stereotype priming are not entirely equivalent, structurally or functionally (see Lepore & Brown, 1997). Nevertheless, empirically, category prime–trait response techniques (e.g., Moskowitz et al., 1999; Wittenbrink, Judd, & Park, 1997) and trait prime–categorization response procedures (e.g., Blair & Banaji, 1996) have produced similar evidence of implicit stereotyping. With respect to racial stereotypes in particular, we have found convergent evidence of implicit racial stereotyping of comparable magnitude using these two techniques (Kawakami & Dovidio, in press). Moreover, one reason why training in negating stereotypic associations may have been effective in Study 3 in reducing automatic activation is that during this training the photograph of a category member and the characteristic to be negated were

presented *simultaneously*. The effectiveness of our negation training for reducing automatic stereotype activation in both category–trait and trait–category priming procedures suggests its robustness and generalizability. Nevertheless, because of the fundamental differences among different techniques for assessing automatic stereotype activation, future research should consider more fully the theoretical and empirical relationships among these techniques (see Brauer, Wasel, & Niedenthal, in press; Wittenbrink et al., 1998), as well as when and how different types of practice in negating stereotypes may differentially influence automatic activation on these measures.

General Discussion

The main goal of the present research was to examine whether people can learn to reduce automatic stereotype activation through extended training in negating these associations. Across a series of studies, participants who received only cursory training (in Kawakami, Dovidio et al., 1999) or no prior training (in the present research) in negating stereotypic associations demonstrated automatic stereotype activation, whereas participants who received extensive training in negating stereotypes were able to reduce this stereotype activation. These results were obtained even when participants were no longer instructed to "not stereotype," under predominantly automatic processing conditions, and, importantly, for stereotypic traits that were not directly involved in the negation training phase. Thus, stereotype activation, *in general,* was reduced. Furthermore, these findings were related to two distinct categories (i.e., skinhead and racial stereotypes) and were consistent on two separate indexes of stereotype activation (i.e., the primed Stroop and person categorization tasks). Finally, this reduced activation level continued to operate for extended periods of time and was still clearly visible 24 hr following the training session.

Additionally, the pattern of results in the training tasks indicates that although this process of negating stereotypic associations is initially quite demanding and time consuming, with sufficient practice, participants can become efficient at responding "NO" to skinhead and racial stereotypes in association with skinhead and racial photographs. In accordance with the procedural efficiency literature (Shiffrin & Schneider, 1977; Smith, 1990; Smith et al., 1988), these findings provide support for the assumption that with instruction and repetition, individuals can become adept at responding negatively to stereotypes. In short, practice does make perfect—or at least very good—stereotype negators (Monteith et al., 1998).

One critical conceptual issue to consider in the present research, as well as in future work, is the process by which effective stereotype reduction occurs. How does negation training work to reduce subsequent stereotype activation? There are at least three possible processes that can account for these effects: (a) cognitive effects involving the strengthening and weakening of category–trait associations, (b) motivational effects involving the internalization of a motive not to stereotype, and (c) a combination of both cognitive and motivational effects.

With respect to cognitive processes, it is possible that negation training modifies the strength of the association between the stereotype and the category construct. Because only relatively strong associations are automatically triggered by category or stereotypic trait primes (Fazio, 1993; Stangor & Lange, 1994; cf. Chaiken & Bargh, 1993), consistently negating stereotypes may work to reduce automatic stereotype activation by weakening the associative strength of the components of the cognitive representation. It is also possible, however, that to reduce stereotype activation, an individual may not only need to modify old, well-learned stereotypic associations but must also develop new associations between nonstereotypic thoughts and category representations (Devine, 1989; Monteith, 1993; Moskowitz et al., in press). In particular, the training task in the present study may not only weaken traditional stereotypic associations through practice in responding "NO" to well-established stereotypes in association with photographs of category members but it may also have produced new ways of responding to category members through practice in responding "YES" to nonassociated traits.

In contrast to the strong and consistent findings related to negating stereotypes on the subsequent reduced activation of stereotypes, no clear evidence for the importance of building new associations was found on the subsequent enhanced activation of nonstereotypes. Specifically, following extensive training in building new associations between nonstereotypes and the skinhead and racial categories, the results failed to demonstrate an increased activation of nonstereotypes after skinhead primes on the Stroop task in Study 1 and Study 2 or facilitated categorization of photographs after nonstereotypes on the person categorization task in Study 3. It remains conceivable, however, that the learning of new associations may have produced, through stereotype dilution or fan effects, reduced stereotype activation (Baddeley, 1997; Squire, 1992). For example, by increasing the number of characteristics associated with the category, the training may have reduced the likelihood that any one specific traditional stereotypical association or new nonstereotypical association was activated (Stangor & Lange, 1994).

Alternatively, the negation training in the present studies may not have changed cognitive representations of the categories (or more specifically the associative strength between the category node and the stereotypic traits), but the accessibility of the motivation to stereotype. According to this perspective, by frequently and consistently activating a goal "to not stereotype," participants may have learned spontaneously to implement a self-regulatory process (Bargh, 1990; Bargh & Barndollar, 1996; Bargh & Gollwitzer, 1994; Moskowitz et al., 1999). This motivational explanation for the effects of training on reduced stereotype activation is closely related to the auto-motive model by Bargh and his colleagues (Bargh, 1990; Bargh & Gollwitzer, 1994; Chartrand & Bargh, 1996). According to this model, "because goals and motives must be represented in the mind just as are other knowledge structures, they should be capable of becoming automatically associated with representations of those environmental features they are consistently paired with, just as do other automatic associations. Thus if an individual nearly always pursues the same goal within a given situation, that goal will come eventually to be preconsciously activated within that situation, independently of the individual's conscious purposes at that later time" (Bargh, 1997, pp. 30–31). With regard to our findings, this would suggest that through repeated practice, goals to not stereotype may become automatic. Thus when subsequently confronted with a member of a specific category (e.g., a skinhead or a Black person), participants may have automatically activated both the group stereotype

and the motivation to be egalitarian (Bargh, 1999), which may in turn have initiated inhibition processes to reduce the activation of stereotypes (Gollwitzer & Moskowitz, 1996; Moskowitz et al., 1999; Stangor et al., 1998).

The finding that negation training reduced the automatic activation of traits associated with the stereotype but not included in the training phase is supportive of this motivational explanation. In particular, learning to activate the goal "to not stereotype" automatically transfers to other stereotypic traits because the learning task is not simply related to controlling specific category–stereotypic trait links but to activating a more general inhibitory processing strategy. Nevertheless, we also acknowledge that this generalizing effect does not necessarily critically distinguish between motivational and cognitive explanations. Specifically, according to the cognitive perspective, the learning of new category associations could reduce the activation of traits not directly involved in the training phase by diluting or decreasing the association between the category and the stereotype overall by weakening the individual category–stereotypic trait links.

Last, the effects of negation training in the present studies may reflect a process that incorporates both cognitive and motivational components. This theorizing is consistent with current models of prejudice and stereotype reduction, which suggest that people can learn to automate their response patterns in line with their goals and motivations. In particular, Devine and Monteith (Devine, 1995; Devine & Monteith, 1993; Monteith, 1993) proposed that individuals who are committed to maintaining egalitarian standards have learned to reject old stereotypical ways of responding and have adopted new nonprejudiced ways because of associations they have developed between the target category and negative affect as a consequence of prejudiced responding.

In accordance with this theorizing, it is possible that one of the reasons why people who are low in prejudice demonstrate lower levels of automatic stereotype activation associated with Blacks (Kawakami et al., 1998; Lepore & Brown, 1997) is that these individuals have learned to automate through experience their explicit desires to be egalitarian (Moskowitz et al., 1999)—specifically, because they have developed a strong associative link between this goal and specific target categories. On meeting a representative of that category, they may activate this goal without need of conscious control and inhibit the unwanted stereotype activation. Furthermore, gradually by consistently and frequently inhibiting the activation of cultural stereotypes and possibly also concurrently developing and using new associations that are consistent with their egalitarian beliefs, their cognitive representations may actually change. Because of automatic goals to not stereotype and *long-term* experience in inhibiting stereotype activation, low-prejudice people may differ from high-prejudice people not only because they are less likely to automatically activate stereotypes (Kawakami et al., 1998; Lepore & Brown, 1997) but also because they have developed over time a genuinely nonprejudiced cognitive representation of specific social groups (Devine & Monteith, 1993; Stangor et al., 1998).

Although it is typically empirically difficult, and often futile, to distinguish definitively between cognitive and motivational theories (Tetlock & Levi, 1982; but see Bargh, 1997), future research might productively pursue a number of specific avenues to disentangle these potential influences. For example, researchers may wish to investigate differences in the effectiveness of negation training in reducing stereotype activation between high- and low-prejudice people. Specifically, because of the proposed different motivational forces for high- and low-prejudice people (Devine & Monteith, 1993; Moskowitz et al., 1999), the effects of negation training might be observed more quickly and endure longer for low-prejudice people. Although this finding would not rule out cognitive effects entirely, it would highlight the importance of motivational processes. Alternatively, developing a paradigm that is specifically aimed at building new associations and is largely independent of strengthening egalitarian goals, such as a modified paired associative learning task (Baddeley, 1997), would highlight the importance of cognitive processes in reducing stereotype activation.

To examine the overall efficacy of negation training, future research must also examine the effectiveness of this strategy in decreasing the application of stereotypes. Although our results indicate that practice in negating stereotypes can reduce stereotype activation, it is imperative to find out how this process influences the actual use of stereotypes in interaction with and evaluation of category members. In contrast to previous research that demonstrates that to reduce stereotype application, both motivation and cognitive capacity or time are necessary (Devine, 1989; Fiske & Neuberg, 1990; Monteith & Voils, 1998), the present findings suggest the possibility that with the right motive and the right practice people can learn to decrease their reliance on stereotypes.

Although future research is clearly necessary, our analyses suggest that while stereotype activation related to some categories may be automatic, it is not necessarily inevitable or uncontrollable (Devine, 1989; Fiske, 1989): Stereotype activation can be reduced. These findings have direct implications for understanding the nature of contemporary forms of prejudice and ways of reducing these biases. Specifically, they provide possible process-based explanations for how people may or may not develop disassociations between their explicit egalitarian standards and their implicit and automatically activated stereotypes (Devine, 1989; Dovidio & Gaertner, 1998; Gaertner & Dovidio, 1986; Moskowitz et al., 1999). So in conclusion, we agree with Devine and Monteith (1993) that, "although it is not easy and clearly requires effort, time, and practice, prejudice appears to be a habit that can be broken" (p. 336). We further propose that one strategy to combat the implicit bases of prejudice is to continually and frequently negate specific associations with social categories—to just say "NO" to stereotyping.

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(Appendix follows)

Appendix

Experimental Stimulus Words

Stereotypic Stimulus Words From Study 1

Elderly traits in negation training

miserly (*gierig*)	decrepit (*gebrekkig*)
afraid (*bang*)	needy (*hulpbehoevend*)
poor eyesight (*slechtziend*)	old-fashioned (*ouderwets*)
conservative (*conservatief*)	absent-minded (*verstrooid*)
slow (*langzaam*)	worrisome (*overbezorgd*)
rigid (*stijfjes*)	stiff (*houterig*)
frightened (*angstig*)	boring (*saai*)
square (*tuttig*)	passive (*passief*)
hesitant (*twijfelachtig*)	complaining (*zeurderig*)
timid (*schuw*)	cheap (*krenterig*)

Skinhead traits in negation training

criminal (*crimineel*)	boastful (*blufferig*)
loud (*luidruchtig*)	quarrelsome (*ruzieachtig*)
mean (*gemeen*)	noisy (*rumoerig*)
liar (*leugenachtig*)	bullying (*treiterig*)
crude (*grof*)	vulgar (*vulgair*)
malicious (*kwaadaardig*)	immoral (*immoreel*)
impertinent (*brutaal*)	cunning (*doortrapt*)
heartless (*harteloos*)	dangerous (*gevaarlijk*)
thoughtless (*onnadenkend*)	shameless (*schaamteloos*)
gaudy (*opzichtig*)	mean-spirited (*lafhartig*)

Elderly traits in Stroop task

traditional (*traditioneel*)	dependent (*afhankelijk*)
sluggish (*traag*)	thrifty (*zuinig*)
weak (*zwak*)	vulnerable (*kwetsbaar*)
lonely (*eenzaam*)	forgetful (*vergeetachtig*)

Skinhead traits in Stroop task

cruel (*wreed*)	nasty (*akelig*)
hostile (*vijandig*)	inhospitable (*ongastvrij*)
aggressive (*agressief*)	hateful (*hatelijk*)
vandal (*vandalistisch*)	anti-social (*asociaal*)

Stereotypic Stimulus Words From Study 2

Elderly traits in negation training

miserly (*gierig*)	decrepit (*gebrekkig*)
afraid (*bang*)	frail (*broos*)
anxious (*bezorgd*)	traditional (*traditioneel*)
forgetful (*vergeetachtig*)	absent-minded (*verstrooid*)
worn out (*versleten*)	worrisome (*overbezorgd*)
stiff (*stijfjes*)	fragile (*breekbaar*)
decrepit (*afgeleefd*)	boring (*saai*)
worn out (*afgetakeld*)	passive (*passief*)
rigid (*star*)	complaining (*zeurderig*)
sluggish (*traag*)	narrow-minded (*bekrompen*)

Skinhead traits in negation training

criminal (*crimineel*)	nasty (*akelig*)
malicious (*boosaardig*)	quarrelsome (*ruzieachtig*)
mean (*gemeen*)	noisy (*rumoerig*)
liar (*leugenachtig*)	bullying (*treiterig*)
crude (*grof*)	threatening (*bedreigend*)
malicious (*kwaadaardig*)	resentful (*haatdragend*)
impertinent (*brutaal*)	noisy (*lawaaierig*)
coarse (*ruw*)	dangerous (*gevaarlijk*)
impudent (*onbeschoft*)	cruel (*wreed*)
stupid (*dom*)	gaudy (*opzichtig*)

Elderly traits in Stroop task

conservative (*conservatief*)	poor eyesight (*slechtziend*)
slow (*langzaam*)	thrifty (*zuinig*)
old-fashioned (*ouderwets*)	frightened (*angstig*)
lonely (*eenzaam*)	needy (*hulpbehoevend*)

Skinhead traits in Stroop task

short-tempered (*opvliegend*)	recalcitrant (*tegendraads*)
hostile (*vijandig*)	inhospitable (*ongastvrij*)
aggressive (*agressief*)	hateful (*hatelijk*)
vandal (*vandalistisch*)	anti-social (*asociaal*)

Stereotypic Stimulus Words From Study 3

Black traits in negation training		White traits in negation training		Black traits in categorization task		White traits in categorization task	
ignorant	aggressive	boastful	exploitative	poor	loud	weak	boring
dishonest	complaining	stubborn	conceited	angry	tough	greedy	uptight
violent	promiscuous	stuffy	dull	bitter	hostile	arrogant	gullible
shiftless	superstitious	conventional	callous	unemployed	intimidating	conventional	materialistic
lazy	dangerous	naive	conservative	musical	athletic	educated	patriotic
threatening	reckless	selfish	sheltered	strong	colorful	hopeful	wealthy
playful	sensitive	intelligent	organized	muscular	humorous	ambitious	practical
amusing	charming	competitive	successful	religious	rhythmic	trusting	industrious
fashionable	loyal	scientific	progressive				
merry	cheerful	efficient	smart				
outgoing	expressive	responsible	nationalistic				
streetwise	proud	ethical	independent				

Note. The original Dutch stimulus words are shown in parentheses.

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