Automatic Activation of Stereotypes: The Role of Self-Image Threat

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Does self-image threatening feedback make perceivers more likely to activate stereotypes when confronted by members of a minority group? Participants in Study 1 saw an Asian American or European American woman for several minutes, and participants in Studies 2 and 3 were exposed to drawings of an African American or European American male face for fractions of a second. These experiments found no evidence of automatic stereotype activation when perceivers were cognitively busy and when they had not received negative feedback. When perceivers had received negative feedback, however, evidence of stereotype activation emerged even when perceivers were cognitively busy. The theoretical implications of these results for stereotype activation and the relationship of motivation, affect, and cognition are discussed.

> When we see a red-breasted bird, we say to ourselves "robin." When we see a crazily swaying automobile, we think, "drunken driver." . . . A person with dark brown skin will activate whatever concept of Negro is dominant in our mind.
> — Allport (1954, p. 20)

When we confront members of a stereotyped group, do we automatically stereotype them? As Allport (1954) might have put it, is prejudgment not only normal but unavoidable? The question of whether stereotype activation occurs spontaneously and is inevitable on mere exposure to members of stereotyped groups is critical to our understanding of stereotyping and prejudice. If particular environmental cues automatically activate stereo-

types regardless of individual differences in personality, motivation, and norms, then such stereotype activation can be seen as a consummate illustration of the role of cognitive processes in stereotyping and prejudice, and it would suggest the difficulty of reducing the incidence and consequences of stereotypes. As a growing literature has demonstrated, perceivers are often unaware of the subtle but significant influences that stereotype activation can have on their subsequent perceptions, judgments, and behaviors (e.g., Bargh, 1994, 1997; Bargh, Chen, & Burrows, 1996; Devine, 1989; Dovidio & Gaertner, 1991; Greenwald & Banaji, 1995).

An important question addressed in recent research is whether stereotype activation occurs spontaneously and inevitably. The answer to this question remains open to debate. Some theory and research indicate that when individuals perceive members of groups for which there are well-known stereotypes or when they are exposed to group or stereotype labels, stereotypes may be activated spontaneously and often without awareness (Bargh, 1997; Bargh et al., 1996; Devine, 1989; Fiske & Neuberg, 1990; Macrae, Bodenhausen, & Milne, 1995; Macrae,

Milne, & Bodenhausen, 1994; Winter & Uleman, 1984). Moreover, Devine (1989) proposed that although perceivers who are motivated to refrain from stereotyping may be able to suppress their application of stereotypes, they cannot avoid the automatic activation of the stereotypes.

Other research, however, suggests that although stereotypes can be activated unintentionally and outside of awareness, stereotype activation is not a fully automatic process in that other factors can inhibit it. More specifically, stereotype activation may depend on the availability of sufficient cognitive resources (Gilbert & Hixon, 1991), the strength and accessibility of the stereotype (Fazio, 1990, 1995; Fazio, Jackson, Dunton, & Williams, 1995; Lepore & Brown, 1997; Wittenbrink, Judd, & Park, 1997), and the absence of counterstereotypic expectations (Blair & Banaji, 1996). Gilbert and Hixon (1991), for example, found that although participants who had available cognitive resources did exhibit activation of the well-known Asian stereotype when exposed to a member of this stereotyped group, participants did not exhibit stereotype activation if their cognitive resources were taxed by simultaneous performance of some other cognitive task. In other words, these latter participants were too busy cognitively to activate their stereotype despite recognizing the target's group membership. Gilbert and Hixon argued that this disruption of stereotype activation demonstrates that stereotype activation is not automatic.

In the present research, we examine whether motivation can also affect the automatic activation of stereotypes. In particular, we examine whether the goal of self-image maintenance can lead to efficient activation of stereotypes. In previous research (Fein & Spencer, 1997), we have shown that self-image threat made participants more likely to evaluate a stereotyped target negatively, and this negative evaluation, in turn, raised the participants' state self-esteem. This research suggested that when people experience self-image threat, they may often stereotype others to restore their own threatened self-image. Fein and Spencer (1997) argued that because stereotypes are likely to be a salient and particularly effective means for people to restore a threatened self-image, stereotyping others may be a common way for people to seek to maintain a positive image of themselves.

But can a self-image maintenance goal lead to the automatic activation of stereotypes? We reason that it can. One model that provides a useful perspective concerning this issue is Bargh's auto-motive model (Bargh, 1997; Bargh & Gollwitzer, 1994). This model proposes that motives or goals that are repeatedly paired with an environmental cue can become automatically activated when that environmental cue is encountered. Bargh and

his colleagues have demonstrated that these automatically activated goals can operate at the preconscious level. Goals that are primed outside of awareness can lead to plans to achieve the goal that interacts with the information available in the environment. These nonconscious goals can have the same effects that consciously activated goals have on perceivers' evaluations of a target (Chartrand & Bargh, 1996). Thus, environmental cues can automatically trigger goals that can be achieved preconsciously without need of attentional resources.

We argue that threats to one's self-image trigger the goal of restoring the threatened self-image, and one mechanism by which individuals often restore their self-images is to activate and apply negative stereotypes of particular groups when they encounter members of these groups. Based on the reasoning underlying the auto-motive model, we argue that to the extent that the motivation to restore one's threatened self-image frequently and consistently leads to the use of stereotypes on exposure to members of particular stereotyped groups, the link between self-image threat and activation of available stereotypes may become automatic.

The present research examined whether self-image maintenance goals in the context of environmental cues relevant to stereotyping (e.g., the presence of a member of a stereotyped group) can automatically activate stereotypes. If, as Fein and Spencer (1997) suggest, self-image maintenance goals lead people frequently and consistently to use stereotypes when they encounter members of particular stereotyped groups, then in the presence of these group members (or related goal-relevant cues in the environment), the representation of the goal of self-image maintenance may form an automatic link with the representation of the cued stereotypes. Thus, we argue that when people experience self-image threat, they will have the goal to restore their self-image, and if they encounter a member of a group for which there is a readily available stereotype, they will be likely to stereotype that person even if this stereotyping occurs outside of their conscious awareness.

In the current studies, we investigated whether the presence of an Asian American or African American target would cause perceivers to automatically activate their stereotypes about these groups. We predicted that in the presence of cues about a stereotyped group, participants who experienced self-image threat, which should have primed a self-image maintenance goal, would be more likely to automatically activate their stereotype about this group than perceivers who did not experience self-image threat. To test for the automaticity of the stereotype activation, we examined whether cognitive load would disrupt the activation of the stereotype in the presence of the stereotyped group member

(Gilbert & Hixon, 1991). If self-image threat makes people more likely to automatically activate stereotypes in the presence of stereotype-relevant information in the environment, then the stereotype should be activated even in the face of cognitive load. In contrast, in the absence of self-image threat, cognitive load should interfere with stereotype activation.

EXPERIMENT 1

To test this prediction, Study 1 used some of the procedures and materials from Gilbert and Hixon (1991). Gilbert and Hixon exposed their primarily European American sample of participants to a videotape of a woman who appeared to be either of Asian or European descent. The videotape featured the woman—ostensibly an experimental assistant—holding a series of cards to the camera. Each card contained a word fragment, such as "s_y." For each word fragment shown on the videotape, participants indicated the first words that came to mind to complete the fragment (e.g., "say"). Some of these word fragments could be completed with words that are consistent with Asian American stereotypes (e.g., "shy" for "s_y"); other fragments were irrelevant to the stereotype (e.g., "p_st") and were included as fillers. Stereotype activation was measured by examining the extent to which perceivers were more likely to complete the relevant fragments with words consistent with the Asian American stereotype if the experimental assistant on the videotape was Asian American than if she was European American.

In addition to varying the race of the female assistant, Gilbert and Hixon (1991) also manipulated whether participants were under cognitive load. While attending to the videotape, some of the participants were distracted by having to perform another cognitive task (remembering an eight-digit number), whereas others were not given this distracting task. Gilbert and his colleagues have found that this and similar tasks are quite successful in depleting participants' cognitive resources necessary for various social judgment tasks (e.g., Gilbert, Pelham, & Krull, 1988).

Gilbert and Hixon (1991) found evidence for stereotype activation only among participants who were not under cognitive load. Even though participants in the Asian American condition saw the target person for several minutes and did successfully categorize her as Asian American, their word completions suggested that they did not activate the Asian American stereotype if they were cognitively busy with an unrelated task. These results suggested that stereotype activation required the allocation of sufficient cognitive resources.

The current study used a variant of this paradigm. The participants saw the same stimulus materials—that is, word fragments and an Asian American or European American woman—as seen by the participants in Gilbert and Hixon's (1991) study.[1] However, in the present study all of the participants were under cognitive load. In addition, half of the participants received negative, self-image threatening feedback just prior to the word-completion procedure, and half received positive, nonthreatening feedback. This manipulation was identical to that used in Fein and Spencer (1997, Study 3). Fein and Spencer found that this manipulation had a significant effect on participants' state self-esteem (Heatherton & Polivy, 1991).

If factors such as self-image threat lead to stereotype activation, then the participants who received negative feedback in the present study should have exhibited more stereotype activation than the participants who received positive feedback. That is, in the absence of negative feedback, the cognitive demands of the distracter task should have prevented participants from activating the Asian American stereotype when exposed to the Asian American woman. If the negative feedback leads to automatic stereotype activation, however, then participants who had just received such feedback should have been more likely to activate the stereotype despite the cognitive load.

Method

PARTICIPANTS AND DESIGN

Participating in the study for partial fulfillment of course credit were 62 undergraduate students (36 men and 26 women; 51 identifying themselves as European American, 3 as Asian American, 4 as African American, and 4 as Latino) from the University of Michigan. Because this study involved stereotypes about Asian Americans, and we were unable to recruit enough Asian Americans to include them as a factor in the design, we did not include the Asian American students in the analyses for this study. Nonetheless, the results are similar if these students are included. The experiment used a 2 (feedback condition: positive or negative) × 2 (race of assistant: European American or Asian American) factorial design. Participants were assigned randomly to experimental conditions.

PROCEDURE

Participants reported to the lab in groups of 2 to 4 to participate in two (ostensibly) different studies—one involving an intelligence test and one involving a word completion task. Each participant completed the first experiment together in a room with the other partici-

pants, after which he or she entered an individual cubicle and completed the second experiment alone.

Feedback manipulation. In the first experiment, the experimenter explained to the participants that the study concerned a new intelligence test that the researchers were using across a large sample of university students. The test and procedure were identical to those used in Fein and Spencer (1997, Study 3). The test consisted of matching vocabulary words to various pictures.

Half of the participants received positive false feedback about their test performance (i.e., a score of 26 out of 30 that ostensibly put them in the 89th percentile for the university), whereas the other half received negative false feedback (i.e., a score of 15 out of 30 that ostensibly put them in the 47th percentile—which participants in Fein & Spencer, 1997, and Stein, 1994, found to be quite negative). Fein and Spencer (1997) found that participants believed the feedback and that it significantly affected their state self-esteem.

After participants received their feedback, the experimenter thanked them for their participation and directed them to the word completion experiment, which was located in a separate lab room on the same floor.

Word completion task. When participants arrived at the word completion experiment, they were greeted by a different experimenter and escorted to individual cubicles. The European American male experimenter explained that the study concerned cognitive psychological processes. The experimenter told the participants, "We are interested in left and right brain functions and whether left and right brain tasks interfere with one another. Therefore, in this study you will be doing both verbal and nonverbal tasks simultaneously." The experimenter explained that the verbal task consisted of a word completion task, and he explained the procedure to the participants. The experimenter told the participants that the nonverbal task required them to try to remember an eight-digit number throughout the experiment. He then read the eight-digit number to each participant and rehearsed the number with the participants until they could remember it.

When each participant understood the instructions, the experimenter started the videotape and left the participant's cubicle. The two videotapes used in this study were copies of those used by Gilbert and Hixon (1991). Each videotape featured a series of 19 word fragments presented on posterboard cards that were held by a female assistant. The two videotapes were identical except that in one videotape the assistant who held the cards was Asian American and in the other she was European American. Participants were given 15 seconds to generate completions for each word fragment.

The participants stated their completions into an audiotape recorder. Gilbert and Hixon (1991) designated five completions as stereotypic in their experiment: s_y (shy), s_ort (short), ri_e (rice), poli_e (polite), and n_p (nip). They designated the rest of the word fragments as fillers.

It should be noted that the manipulation of feedback concerning the intelligence test should not have been related semantically to the stereotype examined in this study. Learning that they scored above or below average on an intelligence test should not have primed participants through any semantic links to increase significantly the accessibility of words such as *shy, short, rice, polite,* and *nip.*

After the word completion task, participants were asked to recall the eight-digit number and to indicate the race of the experimental assistant shown on the videotape. Participants were then probed for suspicion about the feedback on the intelligence test, debriefed thoroughly, and dismissed. The debriefing used in the studies reported in this article, similar to those in Fein and Spencer (1997), used a process debriefing procedure that emphasized the random nature of assignment to feedback conditions, the details that the experimenters created to make the testing procedure and feedback seem as believable and plausible as possible, and the possibility of belief perseverance (e.g., Ross, Lepper, & Hubbard, 1975) and why such beliefs are erroneous.

Results and Discussion

MANIPULATION CHECKS

All but 4 participants reported that they believed the feedback from the intelligence test. Each of these 4 participants had received positive feedback—2 in the Asian American assistant condition and 2 in the European American assistant condition. To be conservative, we included the data from these 4 participants in the analyses reported below. However, the analyses yield similar results if their data are excluded. Participants' ability to recall correctly the eight-digit number or to recall the race of the assistant did not vary by condition, $Fs < 1$. Five of the participants incorrectly recalled more than half of the items in the eight-digit number. Following Gilbert and Hixon (1991), we excluded the data from these 5 participants in subsequent analyses. Also following Gilbert and Hixon (1991), we included the data from the participants who did not recall correctly the race of the assistant.[2] Finally, the data from 3 participants were dropped from subsequent analyses because the tape recorder that recorded their responses malfunctioned. Thus, the subsequent analyses include data from 51 participants.
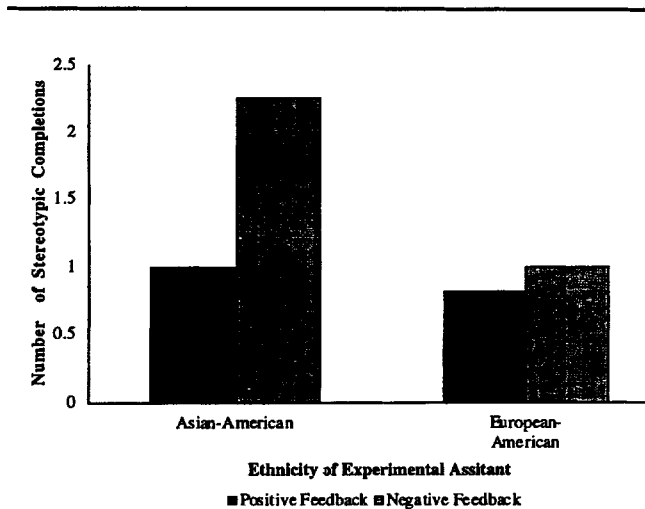
Figure 1   Number of stereotypic completions as a function of feedback and ethnicity of the experimental assistant.

STEREOTYPIC COMPLETIONS

Gilbert and Hixon (1991) found no difference in the number of stereotypic completions made as a function of the race of the experimental assistant seen on the videotape when participants were cognitively busy. In our study, all of the participants were cognitively busy. We predicted that the participants in the present study who had just received positive feedback on the intelligence test would similarly show no evidence of stereotype activation. In contrast, for the participants who had just received negative feedback, we predicted that the race of the assistant would have an effect; that is, these participants would make more stereotypic completions if they were exposed to the Asian American rather than the European American woman. Figure 1 illustrates that the results conformed to this prediction.

A 2 (feedback condition: positive or negative) × 2 (race of assistant: European American or Asian American) analysis of variance (ANOVA) was conducted on the number of stereotypic completions made by the participants in their first completions of the relevant fragments.[3] The ANOVA revealed significant main effects for the manipulations of feedback, $F(1, 47) = 7.38, p < .01$, and the race of the assistant, $F(1, 47) = 7.38, p < .01$. More important, these main effects were qualified by a significant interaction, $F(1, 47) = 4.11, p < .05$. As can be seen in Figure 1, participants who received negative feedback and saw the Asian American assistant were particularly likely to indicate stereotypic completions relative to all other conditions. A planned contrast revealed that the predicted difference between this cell and all others was significant, $t(49) = 4.67, p < .01$. Simple-effects analyses showed further that the race of the assistant had a sig-

nificant effect on participants' stereotypic completions if they had received negative feedback, $F(1, 47) = 11.09$, $p < .01$, but not if they had received positive feedback, $F < 1$, and the manipulation of feedback had a significant effect on participants' stereotypic completions if they saw the Asian American assistant, $F(1, 47) = 12.68, p < .01$, but not if they saw the European American assistant, $F < 1$.

Separating positive and negative stereotypic completions. Stereotyping others to restore a threatened self-image is most likely to be effective if the stereotype of another group is negative. Therefore, our account implies that activation of a negative stereotype should be more likely to be triggered by self-image threat than activation of positive stereotypes, although it certainly is possible that even positive stereotypes typically have negative connotations (such as the negative, antisocial connotations of *smart* as a stereotypic attribute of Jews and Asians) or that they at least serve to help discriminate against an outgroup. The stereotypic completions examined in the present study consisted of words that were relatively positive, negative, and neutral. To test the prediction that negative stereotypic attributes would be more likely to result from self-image threat than positive stereotypic attributes, we ran a series of analyses to examine the positive and negative attributes separately.

Of the five stereotypic completions, the most clearly positive was *polite.* We considered *rice* to be neutral. *Short* and *nip* seemed the most clearly negative. *Shy* could be seen as negative or neutral;[4] we ran analyses with and without *shy* included as a negative attribute. There were no significant effects of our manipulations on participants' likelihood of completing the word *polite*; participants who received self-image threat and saw the Asian American assistant were no more likely to say "polite" than were the participants in the other conditions, $t < 1$. In contrast, however, participants who received self-image threat and saw the Asian American assistant were significantly more likely to say "short" or "nip," or "shy," "short," or "nip," than were participants in the other conditions, $t(49) = 2.84, p < .01$, and $t(49) = 2.82, p < .01$, respectively.

Summary

The results for the participants who had received positive feedback on the intelligence test replicated the results of Gilbert and Hixon (1991): While cognitively busy, participants showed no evidence of stereotype activation on exposure to an Asian American target person. Among the participants who had received negative feedback, however, evidence for stereotype activation did emerge. Thus, after negative feedback, stereotype activation occurred automatically on exposure to a member of a stereotyped minority group. Moreover, this stereo-

type activation could not be explained by the semantic content of the feedback because the stereotypic words were unrelated to the feedback.

These results demonstrate that self-image maintenance goals can lead perceivers to activate stereotypes when they encounter members of a stereotyped group even under conditions that otherwise make stereotype activation unlikely.

EXPERIMENT 2

Consistent with the findings of Gilbert and Hixon (1991), the results of Study 1 support the idea that cognitive load can influence whether a stereotype is activated by exposure to a member of the stereotyped group. More noteworthy, however, these results demonstrate that the consequences of receiving self-image threatening feedback can also play an important role in stereotype activation, leading perceivers to activate a stereotype despite being under cognitive constraints that would otherwise inhibit such activation.

The next pair of studies investigated these issues further by examining activation of a stereotype that may be stronger and more chronically accessible to participants and by making participants' exposure to the member of the stereotyped group much more subtle.

Some reviews of the relevant literature (e.g., Bargh, 1994; Hamilton & Sherman, 1994; von Hippel, Sekaquaptewa, & Vargas, 1995) have questioned whether Gilbert and Hixon's (1991) participants exhibited no stereotype activation under cognitive load because the stereotype used was relatively weak, particularly compared to the African American stereotype—which Devine's (1989) research suggested was likely to be automatically activated. Of course, the relative strength of the stereotype is likely to depend on a number of factors, including the participant population (cf. Lepore & Brown, 1997). In any case, we felt it was important to examine the African American stereotype, which might provide a stronger test of whether the activation of overlearned stereotypes can be moderated. Studies 2 and 3, therefore, examined this stereotype.

A second goal of Studies 2 and 3 was to examine stereotype activation in a more subtle context—one in which participants would have little or no idea that they were even exposed to a member of a stereotyped group. Devine (1989) found that exposing participants to subliminal presentations of words relevant to the African American stereotype caused the perceivers to activate the stereotype despite their lack of awareness of either the exposure itself or the effects of the exposure. Other research has also demonstrated automatic activation of concepts due to exposure to subliminally presented primes (e.g., Bargh, Chen, & Burrows, 1996; Chen & Bargh, 1997; Perdue, Dovidio, Gurtman, & Tyler, 1990; for re-

views, see Bargh, 1994; Greenwald, 1992). In addition to subliminal presentations, stereotypes and stereotype-relevant concepts have been primed through subtle procedures, such as having participants unscramble sentences that contain words relevant to a stereotype or concept (e.g., Banaji, Hardin, & Rothman, 1993; Bargh, 1997; Srull & Wyer, 1979).

Although the stereotype or concept activation in these studies typically is unintentional and occurs outside of participants' awareness, it is not clear if the activation is truly automatic in the sense that it is inevitable and efficient enough not to be inhibited by competing cognitive demands. One question raised by the results of Study 1 and by the results of Gilbert and Hixon's (1991) research is whether cognitive load would interfere with stereotype activation in response to very subtle priming cues that typically lead to such activation. If this unintended and primarily nonconscious stereotype activation depends on the availability of sufficient attentional resources, then cognitive busyness should moderate stereotype activation. A second question, then, would be whether self-image threat can moderate this stereotype activation as well.

Study 2, therefore, examined whether participants would be more likely to show stereotype activation after very brief exposure to an African American face than to a European American face and whether cognitive busyness would inhibit this effect. The moderating effects of self-image threat would be tested in Study 3.

Method

PARTICIPANTS AND DESIGN

Volunteering for this study were 65 undergraduate students (37 men and 28 women; 50 identifying themselves as European American, 9 as Asian American, 2 as African American, and 2 as Latino, plus 2 who did not identify their race) from Williams College. Because this study involved stereotypes about African Americans, and we were unable to recruit enough African Americans to include them as a factor in the design, we did not include the African American students in the analyses for this study. Nonetheless, the results are similar if these students are included. The experiment used a 2 (cognitive busyness: busy or not busy) × 2 (race of prime: African American or European American) factorial design. Participants were assigned randomly to the conditions.

PROCEDURE

Participants were run individually in small cubicles. One of two female European American experimenters met each participant and seated him or her in front of a Macintosh computer. Participants read the experimental instructions, which presented a similar cover story as that used in Study 1. Participants read that the study

concerned left- and right-brain functioning and that they would have to do both left- and right-brain tasks in the experiment. The participants in the cognitive-busy condition read that one such task would require them to try to remember a 10-item alphanumeric string.[5] Participants in the not-busy condition did not receive this task.

All participants were then given instructions for the word-stem completion task. They learned that the word-stem completion task would begin with the presentation of an asterisk in the center of the computer screen, which would be followed by a visual distracter presented somewhere on the screen, which in turn would be followed by a word stem—that is, a few letters and a blank line to indicate the beginning of an uncompleted word—presented in the center of the screen. The instructions emphasized that participants should focus their gaze on the center of the screen at all times during the task. In addition, participants learned that they should complete each word stem as quickly as possible by saying as many different English words as they could generate from the stem until they saw the asterisk again in the center of the screen, which signaled that the next trial was about to begin.

When participants understood the instructions, those in the not-busy condition began the word completion task. In the busy condition, the experimenter gave the participants the 10-item alphanumeric string, rehearsed it with them until they could remember it, and then presented the word-stem completion task.

WORD-STEM COMPLETION TASK

The word-stem completion task was developed using materials and a computer program developed by Dovidio and his colleagues (e.g., Dovidio & Fazio, 1991).[6] This task consisted of 20 trials. It was presented on a Macintosh computer set at the standard 640 × 480 dots per inch resolution and that had a refresh rate of 67 hertz. The color depth of the monitor was set to monochrome, and the background was set to white.

Participants sat approximately 20 centimeters from the computer screen. Each trial began with a 1-second presentation of an asterisk on which participants were instructed to focus. In the next screen refresh after the presentation of the asterisk, a European American or African American male face or a nonsense prime (scribbled lines) flashed briefly in the parafoveal field for approximately 17 milliseconds. The primes were presented in one of eight randomly selected areas that were 7.6 centimeters from the fixation point. This should have placed each face entirely outside of the foveal visual field and within the parafoveal visual field (Bargh et al., 1986; Nelson & Loftus, 1980; Rayner, 1978). The prime was followed by a set of nonsense scribbles that masked the prime. This mask appeared for 102 milliseconds in the

exact spot where the prime had been presented. Following the mask, the word stem appeared foveally for 7 seconds. Each trial presented a different word stem.

Half of the participants were primed with either of two African American male faces, and the other half were primed with either of two European American male faces. The faces were created using a computer graphics program, which allowed the creation of two pairs of nearly identical African American and European American faces. Each African American face was darker than the corresponding European American face, and the noses and brows of the faces were varied to better simulate African American and European American features. Each face was otherwise identical to the corresponding face.[7]

Six of the 20 word stems were chosen because they could be completed with words relevant to the African American stereotype but that would be unlikely to result in ceiling effects (i.e., due to the large majority of participants saying these words first). The African American or European American face prime appeared before each of these word stems. In addition to these 6 word stems, 14 irrelevant word stems were included as fillers. The African American or European American face prime appeared before half of these filler stems, and the nonsense prime appeared before the other half.

The relevant stems were presented in the following order (separated from one another by two irrelevant, filler stems): hos__ (hostile), dan__ (dangerous), wel__ (welfare), jan__ (janitor), ste__ (steal), and stu__ (stupid).

After finishing the 20 trials, participants in the cognitive-busy condition were asked to recall the alphanumeric string. All participants then completed a questionnaire designed to check for suspicion or awareness of the primes. Participants were then debriefed thoroughly and thanked for their participation.

Results and Discussion

MANIPULATION CHECKS

We were interested in examining the effects of very subtle exposure to stereotype-relevant cues in this study; the issue of whether the presentation of the faces was truly subliminal or merely suboptimal (see Murphy & Zajonc, 1993) was not very important to us in this context. We therefore did not conduct the entire set of tests needed to determine the subliminality of the presentations. Nevertheless, we did recruit separate groups of participants from the same population for some relatively conservative tests of our priming procedure.

We exposed 30 participants to the primes used in this study and asked them to make on-line guesses about what was flashed before the masks. Only 3 of these participants made a correct guess in any of the 20 trials

(2 for the African American face prime and 1 for the European American face prime). In addition, we randomly assigned another group of 80 participants to be exposed to one of the four faces used in this study for 20 trials. We then told them that we may have flashed an object before the mask and asked them to make a series of guesses about what the object might have been. On the critical question, we told them that a face may have flashed before the prime. We then asked the participants to guess which of the four faces they thought was presented before the prime. Participants exposed to an African American face guessed one of the European American faces 56.8% of the time. Participants exposed to one of the European American faces guessed one of the European American faces 57.4% of the time. This difference is not statistically significant, $t < 1$. These two results provide at least some evidence that the prime was outside of participants' awareness.

At the conclusion of the study, none of the participants in the study itself could identify the primes that appeared just before the masks. In addition to checking the manipulation of prime, we also checked to see if participants who were given the alphanumeric string to rehearse remembered the string at the conclusion of the word-stem completion task. Three of the participants incorrectly recalled more than half of the items. Following Gilbert & Hixon (1991), the analyses reported below excluded the data from these participants, but the results are very similar if they are included. Thus, the subsequent analyses include data from 60 participants.

STEREOTYPIC COMPLETIONS

The principal questions addressed in this study were (a) whether participants' word-stem completions would reveal activation of the African American stereotype if they had been exposed very briefly to African American faces, even if the participants were not consciously aware of this exposure, and (b) whether cognitive busyness would reduce or eliminate this effect. To the extent that activation of the African American stereotype requires conscious awareness, then there should have been little or no stereotype activation. To the extent that it is automatic and inevitable on exposure to cues relevant to the category or stereotype, then stereotype activation should have been evident whether participants were cognitively busy. To the extent that it can be spontaneous and nonconscious but requires sufficient attentional resources, then stereotype activation should have been evident primarily among participants who were not cognitively busy. The results supported this latter hypothesis.

As in Study 1, we examined the first words indicated by the participants to complete the word stems. Based on the criteria used by Gilbert and Hixon (1991), we dropped two of the six stereotype-relevant word stems
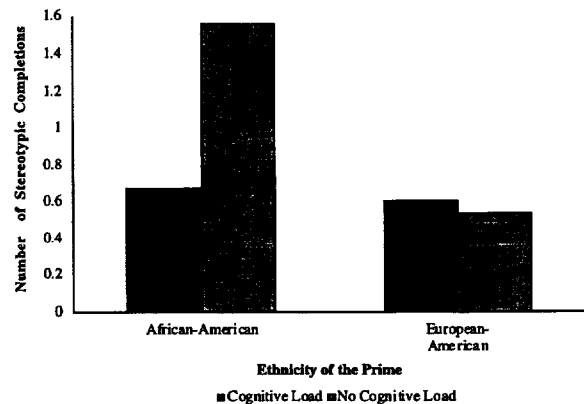

Figure 2   Number of stereotypic completions as a function of cognitive load and ethnicity of prime.

from the analyses because virtually none of the participants indicated the stereotypic response. Only 3 participants said "hostile" in response to "hos__" (almost all of the participants in the study added only one letter to the stem and said "host" or "hose"), and only 1 participant said "welfare" in response to "wel__" (almost all participants said "well" or "welcome"). This left four relevant stems and their stereotypic completions: dan__ (dangerous), jan__ (janitor), ste__ (steal), and stu__ (stupid).

A 2 (cognitive busyness: busy or not busy) × 2 (race of prime: African American or European American) ANOVA was conducted on the number of stereotypic completions made by the participants in their first completions of the relevant fragments. The ANOVA revealed a significant main effect for the manipulation of race, $F(1, 56) = 4.97, p < .05$, and a marginally significant main effect for the manipulation of cognitive busyness, $F(1, 56) = 3.14, p < .10$. More important, both of these main effects were qualified by a significant interaction, $F(1, 56) = 4.20, p < .05$. As can be seen in Figure 2, activation of the African American stereotype in response to the brief exposures to the African American face primes was evident only if the participants were not cognitively busy. A planned contrast revealed that the predicted difference between this cell and all others was significant, $t(58) = 3.57, p < .01$.

Simple-effects analyses revealed that participants who were not cognitively busy with the task of rehearsing the alphanumeric string were more likely to indicate stereotypic completions if they were exposed to the African American face primes than if they were exposed to the European American face primes, $F(1, 56) = 9.47, p < .01$, but this difference did not emerge if the participants were cognitively busy, $F < 1$. Simple-effects analyses also showed that the manipulation of cognitive busyness affected the completions made by the participants ex-

posed to the African American face primes, $F(1, 56) = 7.29$, $p < .01$, but not by the participants exposed to the European American face primes, $F < 1$.

EXPERIMENT 3

The results of Study 2 demonstrated that activation of the African American stereotype can be spontaneous and nonconscious but that it can be inhibited by cognitive load. In other words, the automaticity of the activation of this stereotype may depend on perceivers having sufficient attentional resources. This was evident even though the African American stereotype is particularly strong and well-known.

Can self-image threat, however, make cognitively busy perceivers more likely to activate this stereotype despite the activation-suppressing cognitive load? Study 3 addressed this question. If participants who had just experienced self-image threat would overcome this cognitive load and show evidence of stereotype activation anyway, this would replicate the results of Study 1 but with a different stereotype and with the exposure to the member of the stereotype group occurring without perceivers' awareness.

Method

PARTICIPANTS AND DESIGN

Participating in this study to receive credit for their introductory psychology class were 110 undergraduate students (79 men and 31 women; 61 identifying themselves as European American, 32 as Asian American, 11 as African American, 4 as Latino, and 2 as other) from the State University of New York at Buffalo. Because this study involved stereotypes about African Americans, and we were unable to recruit enough African Americans to include them as a factor in the design, we did not include the African American students in the analyses for this study. Nonetheless, the results are similar if these students are included. The experiment used a 2 (feedback: positive or negative) × 2 (race of prime: African American or European American) factorial design. Participants were assigned randomly to the conditions.

PROCEDURE

As in Study 1, participants learned that they would be participating in two different experiments. As in Study 1, participants first took the bogus intelligence test and received false feedback—half receiving positive feedback and half receiving negative feedback. Participants then went to the ostensibly unrelated second experiment. From this point, the procedures and materials were identical to those used in Study 2, with the following exceptions. First, in the present study all participants were made cognitively busy by rehearsing an eight-digit number. Second, on the basis of pretesting conducted

on participants from the population used in Study 3, we used a slightly different set of word stems, which is described below.

WORD STEMS

Because so few participants gave stereotypic completions to hos__ (hostile) and wel__ (welfare) in Study 2, we did not include these stems in the present study but instead replaced them with neutral stems designed to be fillers. In addition, pretesting indicated that participants in the population used in Study 3 were much more likely to indicate the stereotypic completion to ste__ (steal) than the alternative completions and so we replaced this stem with one that pretesting suggested would better satisfy the criteria used by Gilbert and Hixon (1991): du__ (dumb). Thus, the present study used four word stems that had stereotypic completions: dan__ (dangerous), jan__ (janitor), du__ (dumb), and stu__ (stupid), and 10 word stems served as fillers.

As in Study 2, a drawing of an African American or European American male face flashed briefly before the (four) stereotype-relevant stems and before half of the irrelevant stems, and a nonsense prime flashed before the remaining half of the irrelevant stems.

Results and Discussion

MANIPULATION CHECKS

None of the participants could identify the primes that appeared just before the masks. Furthermore, all but 6 of the participants reported that they believed the feedback from the intelligence test. Two of these 6 participants received positive feedback and were exposed to the Black face prime, 2 received positive feedback and were exposed to the White face prime, and 2 received negative feedback and were exposed to the Black face prime. To be conservative, we included the data from these 6 participants in the analyses reported below. However, the analyses yield similar results if their data are excluded. Twelve of the participants incorrectly recalled more than half of the items in the eight-digit number. Following Gilbert & Hixon (1991), the analyses reported below excluded the data from these participants, but the results are very similar if they are included. The subsequent analyses, therefore, include data from 87 participants.

STEREOTYPIC COMPLETIONS

The principal question addressed in this study was whether participants' word-stem completions would be more or less likely to indicate activation of the African American stereotype as a function of the manipulation of feedback on the intelligence test. We predicted that given the cognitive load, the participants who had just received positive feedback on the intelligence test would show no evidence of stereotype activation. For the par-
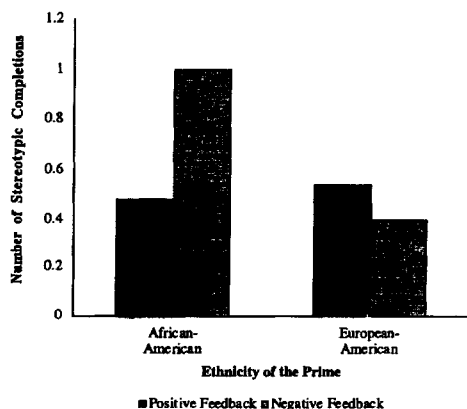
Figure 3 Number of stereotypic completions as a function of feedback and ethnicity of the prime.

ticipants who had just received negative feedback, in contrast, we predicted that the race of the prime would have an effect despite the cognitive load; that is, these participants would make more stereotypic completions if they were exposed to the African American rather than to the European American face. Figure 3 illustrates that the results conformed to this prediction.

As in Studies 1 and 2, we examined the first words indicated by the participants to complete the word stems. A 2 (feedback: positive or negative) × 2 (race of prime: African American or European American) ANOVA on this measure revealed a significant interaction between the manipulation of feedback and the race of the prime, $F(1, 83) = 3.91$, $p = .05$. No other effects obtained significance, $Fs < 1.6$, $ps > .20$. As can be seen in Figure 3, participants who received negative feedback and were exposed to the African American face were particularly likely to indicate stereotypic completions relative to all other conditions. A planned contrast revealed that the predicted difference between this cell and all others was significant, $t(85) = 2.69$, $p < .01$. Simple-effects analyses showed further that the race of the prime had a significant effect on participants' stereotypic completions if they had received negative feedback, $F(1, 83) = 5.35$, $p < .05$, but not if they had received positive feedback, $F < 1$, and the manipulation of feedback had a significant effect on participants' stereotypic completions if they were exposed to the African American face, $F(1, 83) = 5.18$, $p < .05$, but not if they were exposed to the European American face, $F < 1$.

To ensure that the negative feedback in the Black prime condition activated negative stereotypes about African Americans and not simply negative words in general, we conducted a series of analyses on participants' completions of the filler fragments. These analy-

ses revealed that the total number of negative completions and the ratio of negative completions to positive completions did not differ as a function of feedback or prime condition, $Fs < 1$. These results suggest that self-image threat led to activation of stereotypes about African Americans on exposure to the African American face but did not increase the overall negativity of participants' responses.

GENERAL DISCUSSION

The results of the three experiments demonstrate that the activation of stereotypes about minority groups in the presence of minority group members occurs automatically when people experience self-image threat but is not fully automatic when people do not experience self-image threat.

More specifically, Study 1 replicated Gilbert and Hixon's (1991) finding that cognitively busy participants who were exposed incidentally to an Asian American woman showed no evidence of activation of the Asian American stereotype. More important, however, Study 1 also demonstrated that if the participants had just received bogus, self-image threatening negative feedback, they did show evidence of stereotype activation despite the cognitive load. Moreover and consistent with our emphasis on self-image maintenance process, this effect occurred exclusively with the negative stereotypic words. These words should have been more likely to be activated automatically than positive stereotypic words because they would better satisfy the self-image maintenance goal of restoring the participants' threatened self-image. It is also worth noting that this stereotype activation could not be explained by the semantic content of the feedback because the stereotypic words were unrelated to the feedback.

Studies 2 and 3 extended the first study by testing activation of the African American rather than Asian American stereotype. In addition, Studies 2 and 3 examined the effects of cognitive load and self-image threat on stereotype activation in a much more subtle situation—in which the perceivers were not even aware that they were exposed to a cue that could activate the African American stereotype. Study 2 demonstrated that participants did activate this stereotype but only if they were not cognitively busy. Participants who were cognitively busy showed no evidence of stereotype activation. This finding suggests that cognitive busyness can moderate the activation of stereotypes about African Americans. Study 3 replicated this effect of cognitive load inhibiting stereotype activation among participants who did not experience self-image threat. Study 3 extended previous research, however, by demonstrating that self-image threat facilitated activation of the African American stereotype despite the cognitive load.

Taken together, this research provides strong evidence that self-image maintenance goals can lead to the automatic activation of stereotypes about minority group members in response to stereotype-relevant cues in perceivers' environments. These findings suggest that people's motivations can affect the activation of stereotypes even when this stereotypic activation occurs automatically. Specifically, these results provide evidence of a new route to automatic stereotype activation: stereotyping in the service of self-image maintenance. We believe that these findings suggest that motivation can play a more central role in stereotype activation than has been previously acknowledged.

Self-Image Maintenance Goals and the Automatic Activation of Stereotypes

The findings reported in this article support our contention (Fein & Spencer, 1997) that when people experience self-image threat, one powerful and widely available strategy to restore their self-image is to stereotype others. As discussed before, Bargh's (1997) automotive model posits that any two mental representations that are repeatedly paired with one another will form an automatic link. In light of this model and the research that supports it, the stereotype activation demonstrated in the present studies suggests the presence of a strong link between the goal to restore one's self-image in the face of self-image threat and the activation of stereotypes in the presence of stereotype-relevant albeit very subtle cues in the environment. This link between threat and stereotype activation was demonstrated in the present studies under conditions that otherwise inhibit stereotype activation. These findings imply, therefore, that the processes of self-image maintenance can play a critically important role in moderating the activation of stereotypes when individuals encounter a member of a stereotyped group.

In addition to highlighting the role of self-image maintenance processes, the current research also highlights the power of the situation to provoke both particular goals and participants' goal-relevant responses. Information available in the participants' environment triggered self-image maintenance threat, thereby inducing the affect and motivation prompted by the threat. Participants' responses to this threat were, in turn, shaped by the goal-relevant information in the environment—the presence or absence of stereotype-relevant cues. Participants who had received self-image threatening information did not simply become more negative in their responses. Rather, they were negative selectively in response to the cues present in the situation. If cues associated with stereotypes that people frequently use in response to a threatened self-image were available, then the participants used the cues and exhibited stereotype

activation. In the absence of these cues, neither specific stereotype activation nor general negativity was evident.

Sinclair and Kunda (1997) recently reported evidence that adds support to this account. They found that when an African American in the role of a manager evaluated participants negatively, the participants automatically activated negative stereotypes about African Americans. This automatic activation did not occur when the manager was European American or when the African American manager provided positive feedback. Their results, similar to ours, illustrate the interaction of the self and the information available in the environment in moderating stereotype activation.

Another contribution of the current research is that it shows that this interaction can affect not only conscious but preconscious processes. The goal of self-image maintenance has been shown to have strong effects on a number of conscious processes (e.g., Spencer, Josephs, & Steele, 1993; Steele, 1988; Tesser, 1988; Tesser & Cornell, 1991), and in Study 1 of this article, this goal facilitated stereotype activation in response to a stereotype-relevant cue of which participants were aware. In Study 3, however, this goal interacted with a preconscious stereotype-relevant cue to produce stereotype activation. An intriguing question raised by these results concerns whether goals affect preconscious and conscious processes in the same or contrasting ways. Self- image maintenance goals in the current research had similar effects on stereotype activation whether the stereotypic cues were at the preconscious or conscious levels. On the other hand, some goals, such as the goal to be egalitarian and not to stereotype or discriminate (e.g., Blair & Banaji, 1996; Devine, 1989; Dovidio & Gaertner, 1991; Fazio et al., 1995; Monteith, Zuwerink, & Devine, 1994), might have independent or even opposing effects as a function of awareness.

The role of conscious awareness in stereotype activation is not limited to awareness of stereotype-relevant cues in the environment. Even if the cue is there to be seen clearly by the perceivers, such as the race of the person with whom they are interacting, the perceivers may be unaware of the connection between that person's race and their own word-fragment completions or even their own evaluations of that person on a number of dimensions. If activation of even very well-known and strong stereotypes is not always fully automatic, as the present research suggests, perceivers' goals may have important and very different moderating effects on stereotype activation as a function of this kind of awareness. For example, if perceivers are made aware of the link between a target person's race and their word-stem completions, the potentially self-image restoring effect of stereotype activation may be subverted. For some people, believing that they easily activate stereotypes about other groups would be at least as threatening as

receiving negative performance feedback. Can the motivation not to stereotype interfere with the strong link between self-image threat and stereotype activation in the presence of stereotype-relevant cues? Addressing this kind of question in future research could provide important insights into the relationships among motivation, preconscious, and conscious processes relevant to stereotyping.

The relationships among motivation, affect, and cognition are also clearly implicated as an important set of issues to be pursued in extensions of the present research. Previous research has focused primarily on how these factors affect the application of stereotypes to impression formation, judgments, or behavior. The present research suggests that more basic processing of information may be affected by such factors as well. More specifically, self-image threat in the current studies affected perceivers' activation of stereotypes under circumstances in which the perceivers were cognitively busy and in which their exposure to stereotype-relevant information was quite minimal. These findings suggest that the activation of stereotypes may be a more complex process and may include more factors, such as motivation and affect, than has previously been acknowledged.

Mediational Accounts

A question that needs to be addressed by future research is how such effects are mediated. We have emphasized the processes relevant to the auto-motive model of Bargh and his colleagues (e.g., Bargh, 1997). In conjunction with Fein and Spencer (1997), we argue that it is common for self-image threats to lead perceivers to derogate members of stereotyped groups when the environment provides readily available stereotype-relevant cues. Perceivers may learn to activate these stereotypes spontaneously, efficiently, unintentionally, and without awareness when their self-image has been threatened and when they are exposed to cues identifying a stereotyped group.

A second mediational account is that motivation and affect may prime the content or valence of perceivers' thoughts, and this may, in turn, facilitate activation of stereotypes that are consistent with these thoughts. Forgas and Fiedler (1996), for example, discuss how mood can affect cognition through selective priming of information that is similar in valence (Bower, 1991; Clark & Isen, 1982; Forgas & Bower, 1988; Isen, 1984) or through the use of heuristic strategies to infer one's thoughts (Forgas, 1995; Schwarz & Clore, 1983). Thus, mood and affect and perhaps motivation as well may lead to the activation of thought processes that are congruent with the content of the stereotypes about certain groups. For example, when people are in a negative mood, this negative mood may facilitate the activation of negative aspects of certain stereotypes.

A third account is that motivation and affect moderate the cognitive resources that perceivers dedicate to a task. Research has suggested that individuals try to regulate their moods by engaging in more or less processing of information. People in a good mood, for example, may exhibit more stereotyping and intergroup discrimination because they process information more heuristically to maintain their positive mood (Bodenhausen, 1993; Clark & Isen, 1982; Forgas & Fiedler, 1996). People in a negative mood may exhibit more stereotyping and intergroup discrimination because they engage in highly motivated processing in an attempt to repair their affective state (Forgas & Fiedler, 1996). Thus, motivation and affect may lead individuals to deploy attentional resources that facilitate stereotype activation.

These various accounts suggest some potentially exciting questions for future research to address. It is plausible that each of these accounts explains some of the ways in which motivation and affect mediate stereotype activation. At a broader level, the present research is part of a growing body of recent research that reflects a fuller integration of sociocultural, motivational, and cognitive factors in stereotyping and prejudice (Devine, 1989; Dovidio & Gaertner, 1991; Esses & Zanna, 1995; Mackie & Hamilton, 1993).

The Relevance of Stereotype Activation

But why study stereotype activation in the first place? It may seem that activation of stereotypes, especially the activation of stereotypes outside of perceivers' awareness, is a far cry from discrimination and prejudice against the targets of these stereotypes. However, a considerable literature suggests that when stereotypes are activated, they often become the lens through which targets of stereotypes are perceived and the catalyst by which targets are discriminated against. When stereotypes are activated outside of people's awareness, they can bias judgment and lead to action without the perceiver acknowledging or censoring their impact. For example, Bargh and his colleagues (Bargh et al., 1996; Chen & Bargh, 1997) have shown that even preconsciously activated stereotypes can have profound effects on social interactions. This work finds that preconsciously activated stereotypes can cause perceivers to act in ways that elicit confirmation of the stereotype when interacting with members of stereotyped groups. Because these perceivers do not see the influence they had on the interaction, the target's behavior is seen as unambiguously confirming the stereotype.

In addition, the current research demonstrates that stereotype activation may be influenced by some of the same factors that influence stereotype application. More

specifically, this research suggests that stereotype activation can be affected by motivational factors, whereas previous analyses of stereotype activation have focused solely on cognitive factors. Thus, a more complex set of factors may influence stereotype activation than has been acknowledged previously. This raises the question of whether there are additional factors that not only can facilitate stereotype activation but also can inhibit it. Motivational factors therefore may play a critical and heretofore unexamined role in determining when stereotypes are more or less likely to be activated. How these factors affect stereotype activation, application, and the interaction between them should be a provocative question for further research.

NOTES

1. We thank Daniel Gilbert and Gregory Hixon for their generosity in sharing their stimulus materials with us.

2. A higher percentage of participants failed to correctly recall the assistant's ethnicity in our study (26%) compared to Gilbert and Hixon's (1991) studies (6% and 11% in their two studies). In any event, we obtained similar results—the two-way interaction and the contrast and simple-effects comparisons remained statistically significant—when participants who could not identify the experimental assistant's ethnicity were excluded from the analyses. Furthermore, we obtained similar results if we included the data from the participants who incorrectly recalled more than half of the items in the eight-digit number.

3. We analyzed the completions in a slightly different manner than did Gilbert and Hixon (1991). Instead of analyzing the total number of stereotypic completions that participants generated, we analyzed the number of times that participants said the stereotypic word as their first completion. Given that some of the stereotypic words were generated by almost all participants in every condition, this seemed to us to be a more valid and precise measure of stereotype activation. Moreover, it would allow us to be more consistent with the procedures used in the subsequent studies reported in this article. Nevertheless, we obtained similar results (i.e., the two-way interaction and the contrast and simple-effects comparisons remained statistically significant) when we used the same measure that Gilbert and Hixon (1991) used.

4. Research by Bargh et al. (1986) tested the affective valence of shyness and found evidence that it was judged to be affectively neutral. Thus, *nip* and *short* are the completions that probably are best represented as negative in valence. Nevertheless, we reported both analyses to show that the inclusion of *shy* as a negatively valenced word does not alter the results.

5. Pilot testing revealed that the task used in Study 1 and in Gilbert and Hixon (1991) of asking participants to remember an eight-digit number was not taxing enough for the participants in this population.

6. We thank John Dovidio for his generosity in providing the computer program used in this experiment.

7. A separate group of 23 participants used 7-point scales to rate the attractiveness and likeability of either the two African American faces or the two European American faces, which were each presented on a computer screen for 15 seconds, and they also indicated the race of the individuals depicted. There were no differences in the ratings as a function of race, and all participants identified the race of the individuals consistent with the intent of the manipulation.

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