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Automaticity of Social Behavior: Direct Effects of Trait Construct and Stereotype Activation on Action

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Previous research has shown that trait concepts and stereotypes become active automatically in the presence of relevant behavior or stereotyped-group features. Through the use of the same priming procedures as in previous impression formation research, Experiment 1 showed that participants whose concept of rudeness was primed interrupted the experimenter more quickly and frequently than did participants primed with polite-related stimuli. In Experiment 2, participants for whom an elderly stereotype was primed walked more slowly down the hallway when leaving the experiment than did control participants, consistent with the content of that stereotype. In Experiment 3, participants for whom the African American stereotype was primed subliminally reacted with more hostility to a vexatious request of the experimenter. Implications of this automatic behavior priming effect for self-fulfilling prophecies are discussed, as is whether social behavior is necessarily mediated by conscious choice processes.

For many years, social psychologists have studied the effects of priming on the individual's subsequent impressions of others. *Priming* refers to the incidental activation of knowledge structures, such as trait concepts and stereotypes, by the current situational context. Many studies have shown that the recent use of a trait construct or stereotype, even in an earlier or unrelated situation, carries over for a time to exert an unintended, passive influence on the interpretation of behavior (see Bargh, 1994; Higgins, 1989; Wyer & Srull, 1989, for reviews).

We argue here that such passive, automatic effects of priming need not be limited to social perception. Recent research has shown that attitudes and other affective reactions can be triggered automatically by the mere presence of relevant objects and events, so that evaluation and emotion join perception in the realm of direct, unmediated psychological effects of the environment (see Bargh, 1994, in press, for reviews). But assuming that behavioral responses to situations are also represented mentally, as are stereotypes and attitudes, they should also be capable of becoming automatically activated, by the same principles that govern the development of automaticity of other representations.

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Automaticity in Attitudes and Social Cognition

The extent to which one's own thought and behavior are or are not under one's own intentional control is a fundamental existential question (see Posner & Snyder, 1975; Uleman & Bargh, 1989). Indeed, over the past two decades, researchers in the area of attitudes and social cognition have documented that many of the phenomena they study are unintentional or automatic in nature (for reviews, see Bargh, 1994; Smith, 1994, in press; Wegner & Bargh, in press). Attitudes are discovered to become activated automatically on the mere presence of the attitude object, without conscious intention or awareness (i.e., preconsciously; see Bargh, 1989), to then exert their influence on thought and behavior (Bargh, Chaiken, Govender, & Pratto, 1992; Bargh, Chaiken, Raymond, & Hymes, 1996; Fazio, Sanbonmatsu, Powell, & Kardes, 1986). The self-concept (Bargh, 1982; Bargh & Tota, 1988; Higgins, 1987; Strauman & Higgins, 1987) is shown to become active automatically on the presence of self-relevant stimuli to affect self-perception and emotions. Stereotypes become active automatically on the mere presence of physical features associated with the stereotyped group (Brewer, 1988; Devine, 1989; Perdue & Gurtman, 1990; Pratto & Bargh, 1991), and categorizing behavior in terms of personality traits (e.g., Carlston & Skowronski, 1994; Winter & Uleman, 1984) and then making dispositional attributions about the actor's personality (e.g., Gilbert, 1989; Gilbert, Pelham, & Krull, 1988) have both been shown to occur automatically to some extent.

This growing evidence of automaticity in social psychological phenomena notwithstanding, it remains widely assumed that behavioral responses to the social environment are under conscious control (see review in Bargh, 1989). These responses might well be consciously chosen on the basis of automatically produced perceptions and feelings (especially when the individual was not aware of the potential for any such nonconscious influence; see Herr, 1986, and Neuberg, 1988), but the ultimate behavioral decisions themselves are believed to be made con-

sciously. Devine (1989), for example, argued for a two-stage model of prejudice in which the perceptual phase is automatic (i.e., activation of stereotypes by the target person's features), whereas the second phase of prejudiced behavior is a matter of conscious choice, driven by one's relevant values. Fiske (1989) argued that a person could "make the hard choice" and overcome stereotypic influences on behavior if sufficiently motivated to do so.

Indeed, the traditional rationale for the study of attitudes and social cognition is the belief (even faith) that choices of social behavior are based on the outcome of these processes—thus, it is social behavior that is the long-term focus of this research (i.e., "thinking is for doing"; Fiske, 1992). The historic purpose of attitude research has been that attitudes predicted behavior, and evidence to the contrary (e.g., LaPiere, 1934; Wicker, 1969) was cause for alarm, similar to the purpose of personality research (e.g., Mischel, 1968).

The impetus behind automaticity research is no different. Research into the automaticity of attitudes was first conducted because it was hypothesized that attitudes that became active automatically (preconsciously) in the presence of the attitude object would be more likely to influence behavior toward the object than those that depended on intentional conscious retrieval of the attitude (Fazio et al., 1986). The presumption behind studies of automatic influences in social perception, such as via primed or chronically accessible trait constructs (e.g., Bargh & Pietromonaco, 1982; Bargh & Thein, 1985), was that such preconscious influences would play a stronger than usual role in subsequent behavior toward the target person, as the perceiver would not be aware of the interpretive bias and so could not correct for it (Bargh, 1989). In a similar fashion, research into the automaticity of stereotyping has been motivated by a larger concern with the controllability of prejudicial behavior (Devine, 1989; Fiske, 1989).

Focusing the research spotlight on attitudes and perceptions as mediators of behavior, in the present view, has obscured the possibility that behavior need not always be so mediated. Although it is quite reasonable to assume that attitudes and social perceptual processes exist in the service of guiding behavior, this does not require the assumption that behavioral responses always require such services.

The Case for Automatic Social Behavior

We propose that social behavior is often triggered automatically on the mere presence of relevant situational features; this behavior is unmediated by conscious perceptual or judgmental processes. We turn next to a discussion of several lines of support, both theoretical and empirical, for this hypothesis.

Behavioral Responses Can Be Associated With Situational Features

Social-behavioral responses are represented mentally just as are trait concepts and attitudes. Thus, they should be capable of becoming activated automatically on the mere presence of relevant features in the environment by the same principles that produce automatic trait categorization and automatic attitude activation.

Several theorists have argued that behavioral responses are activated immediately by the situational context. Lewin's (1943) notion of the *psychological situation* considered it to consist of the totality of the individual's immediate reactions to the objective, external situation. Mischel (1973) further developed this concept as part of his social–cognitive model of personality. He noted that an individual can have all sorts of immediate reactions to a person or event, not limited to cognitive or perceptual ones but including (a) expectancies for what was going to happen next in the situation; (b) subjective evaluations of what was happening; (c) emotional reactions one has had in that situation in the past; and, most important to the present thesis, (d) the behavioral response patterns one has available within the situation based on one's past experience (see also Higgins, 1987).

There is no theoretical or conceptual reason why the effects of preconscious, automatic activation should be limited to perception and evaluation. Preconscious activation of mental representations develops from their frequent and consistent activation in the presence of a given stimulus event in the environment (Bargh, 1989; Shiffrin & Schneider, 1977). This is the mechanism behind the automaticity of trait construct activation given the mere observation of trait-relevant behavior, of attitudes in the mere presence of the attitude object, and of stereotypes on the mere presence of a stereotyped group member. To the extent that an individual repeatedly has the same reaction to a social stimulus event, the representation of that response should come eventually to be activated automatically on the mere occurrence of that event. Thus, if an individual consistently behaves the same way in response to a situation, that behavioral response should become automatically associated with those situational features. In harmony with this hypothesis, Mischel and Shoda (1995; Shoda, Mischel, & Wright, 1994) have provided several demonstrations of a high degree of consistency over time in an individual's behavioral responses to the same situations, when situations are defined in terms of specific, concrete sets of features.

The Principle of Ideomotor Action

William James held that the mere act of thinking about a behavior increased the tendency to engage in that behavior; he called this the *principle of ideomotor action*: "We may lay it down for certain that every representation of a movement awakens in some degree the actual movement which is its object" (1890, p. 526). James's notion of awakening here is similar to modern notions of accessibility, in that the internal (through ideation) activation of a representation (i.e., through imagining the behavior) increases its accessibility of likelihood of activation. Modern research on construct accessibility has shown that mental representations can become activated from many sources, including one's goals, external environmental events, long-term use, and recent thought. Moreover, all of these possible sources increase the accessibility or ease of use of that representation in an interchangeable, additive fashion (Bargh, Bond, Lombardi, & Tota, 1986; Higgins & King, 1981). For James, imagining or thinking about a behavioral response had the same kind of priming effect on the likelihood of engaging in that response.

However, Lashley (1951), in a famous discourse on the sequential organization of behavior, was the first to use the term *priming* to describe the preparatory function of thought. Thinking has the function of preparing the body for action, and Lashley's given example of this was the production of fluent speech. To be able to speak words in an understandable, serial fashion, just as to act in a sequential manner, requires a prior organization of the representations that are to be used, in the intended sequence. The function of this preparation allows for the fluidity of spoken thoughts and ideas and the enactment of organized movements in the proper order. Thus, like James, Lashley argued for the necessity of a direct connection between thought and behavioral representations (N.B., not limited to those used in speech).

The automaticity of the ideomotor-action effect—that merely thinking about a behavior makes it more likely to occur, even if it is unintended—has been demonstrated recently in a series of studies by Wegner and his colleagues (see Wegner, 1994, for a review). Wegner's *ironic process* model contends that acts of intentional control over our thought and behavior involve an automatic monitoring of the presence of the unwanted state. When this automatic vigilance notices the to-be-controlled thought or response tendency, conscious processing can inhibit it from occurring. In this way, experimental participants can distract themselves from thinking about white bears (for example) by consciously thinking about something else. But this control over unwanted thoughts can occur only when there is sufficient attentional capacity available for the act of control. If the person is distracted, or is under attentional load, an ironic effect is likely to occur: The very thought or behavior one did not want to happen, does happen.

The irony of this effect is that the likelihood of this occurrence (under attentional load) is actually greater than if the person had not tried to stop that response. Thus, in one experiment, participants under attentional load who are trying not to make sexist completions to word fragments actually make more than participants not instructed to try to avoid sexism. According to the ironic process model, this occurs because the representation of the unwanted response is more accessible than usual because the person is watching out for its occurrence and has to keep it in mind to do so. For present purposes, the importance of these findings is that the mere act of thinking about a response, even when the thought involved is meant to help prevent that response, has the automatic effect of increasing the likelihood of that response. The principle of ideomotor action, to put it another way, operates in the absence of the person's intention to engage in that behavior and even when the person is trying to avoid that behavior.

Ansfield and Wegner (1996) applied the ironic process model to understanding the classic literature on automatisms, or behaviors that do not appear to be consciously produced, like the spinning table in seances, a divining rod, or the movement of the pendulum in Chevreuil's illusion. In the latter case, the pendulum held dangling above a table moves—apparently of its own accord—when the person is told to hold it completely still. In fact, the pendulum tends to move along the very axis along which the person is trying to prevent it from moving. Ansfield and Wegner showed in several experiments that this effect is produced by the very attempt to prevent the seance table or the pendulum from moving; participants are of course not aware of the automatic effect that the thoughts about the to-be-avoided movement have on their behavior and so cannot control it.

The Perception–Behavior Link

Just as the accessibility or likelihood of use of a concept increases no matter what the particular the source of that accessibility, the likelihood of a behavioral response may increase from thinking about that behavior, regardless of the source of that thought. Specifically, cognitions about a type of behavior can come not only from internal sources, as in the above examples, but also from external sources, such as perceiving that type of behavior enacted by others.

There is a strong historical precedent for postulating an automatic link between the representations used to perceive behavior and those used to engage in that behavior oneself. Imitation, for example, consists of performing an action that corresponds in its structure to the perceived action of another person. The capacity to imitate is present in early childhood (Piaget, 1946) and even in newborns (Meltzoff & Moore, 1977, 1983). Such scholars of imitative behavior as Koffka (1935), Piaget (1946), and Bandura (1977) all have proposed that imitation is made possible by a common or shared representational system for perceptual and action codes (see Prinz, 1990, for a review). Schank and Abelson's (1977) script theory argues that the same mental structures used to understand and anticipate the sequence of behavior in social situations also is used to generate appropriate responses to them. Theories of speech production have increasingly emphasized the mediational role played by the representations involved in speech perception (see Dell, 1986; Meyer & Gordon, 1984; Prinz, 1990). Also, Zajonc, Pietromonaco, and Bargh (1982) showed that people implicitly mimic the facial expressions of others, such that when this subtle imitation is prevented (i.e., by having them chew gum while the faces are presented), memory for the faces is impaired.

In 1984, Berkowitz reformulated his theory of how violence portrayed in the mass media increased the probability of aggression in the viewer by invoking James's principle of ideomotor action. Activation was said to spread in memory from representations of the violent acts perceived in the media to other aggressive ideas of the viewer, and this spreading activation occurred "automatically and without much thinking" (p. 410). Similar to Mischel's (1973) analysis, Berkowitz (1984) argued that behavioral responses as well as thoughts and emotions could all be activated automatically by aggressive stimuli: "The present conception does not stop with the individual's thoughts and memories. . .It holds that externally presented ideas can activate particular feelings and even specific action tendencies as well" (p. 410).

An experiment by Carver, Ganellen, Froming, and Chambers (1983) provided evidence in line with Berkowitz's (1984) ideomotor action model of the effect of aggressive cues on aggression. In a first experiment, some participants' concept of hostility was primed subliminally, following the procedure of Bargh and Pietromonaco (1982). Then, in what they believed to be an unrelated second experiment, participants were instructed to give shocks to another "learner" participant (actually a confederate) whenever he or she gave an incorrect answer. Com-

pared to participants who were exposed to neutral priming stimuli, those presented subliminally with hostility-related primes gave longer shocks. Carver et al. (1983) accounted for their results in terms of a behavioral schema for hostility and its close semantic associative ties to the "interpretive schema" used to perceive hostility. Because of the degree of semantic feature overlap between the two representations, the authors argued, activation will spread automatically from the interpretive to the behavioral schema, so that perceiving another person's hostilty increases the likelihood that one will behave in a hostile manner oneself.

The behavioral schema notion, which is a variant of the ideomotor action hypothesis, has the desirable ability to account for how the same priming manipulation can produce effects on impression formation in one study (Bargh & Pietromonaco, 1982) and behavior in another (Carver et al., 1983, Experiment 2). Because the only difference between the two studies was the particular dependent measure collected following the priming manipulation, the inescapable conclusion is that the activation of the concept of hostility had the simultaneous effects of making the participant both more likely to perceive hostility in another person and to behave in a hostile manner him- or herself.

To us, Carver et al.'s (1983) results are an intriguing clue that the influence of perception on behavioral tendencies is automatic, in that it is passive, unintentional, and nonconscious. Therefore, recent evidence of automatic influences in social perception, such as the automatic activation of stereotypes and priming effects on impression formation (see Bargh, 1994, for a review), when related to the foregoing discussion, implies that there may be behavioral consequences of automatic social perception for the perceiver. For it is precisely when the individual is not aware of a perceptual process that conscious control over it is not possible (Bargh, 1989; Strack & Hannover, 1996), maximizing the possibility of the passive perception–behavior effect.

The Present Experiments

From the various streams of evidence reviewed above, several principles can be derived concerning the conditions under which automatic social behavior will be produced. First, behavioral representations exist and can become activated. They can become active and accessible when one thinks about that kind of behavior, either actively or passively. The tendency to behave in line with the representation is increased when it is activated, whether the reason for that activation is (a) an intention to prepare to engage in that behavior (e.g., Lashley), (b) an intention not to engage in that behavior (e.g., Wegner), (c) merely thinking about that behavior without an intention to engage in it or not (e.g., James), or (d) merely perceiving that kind of behavior in another person (e.g., Berkowitz).

The present hypothesis is that social behavior should be capable of automatic activation by the mere presence of features of the current environment just as are social perceptions and attitudes. By the mere presence of environmental features, we mean that the activation of the behavioral tendency and response must be shown to be preconscious; that is, not dependent on the person's current conscious intentions (see Bargh, 1989, in press). By these criteria, none of the research reviewed above has demonstrated direct, automatic behavioral effects. The ironic process research has indeed shown automatic behavior in that it is unintended by the individual and even uncontrollable when attention is in short supply. These effects are goal dependent in that they are produced by an act of conscious intention (see Wegner, 1994, for a similar but more elaborate analysis) and would not occur without that intention in place.

Moreover, in all of the studies reviewed by Berkowitz (1984) that were in favor of the perception–behavior link, including Carver et al.'s (1983) experiments, participants were given the explicit, conscious goal to engage in the behavior that was shown to be affected by the priming manipulation. In Berkowitz and LePage's (1967) and Carver et al.'s (1983) studies, for example, participants were instructed to take the role of teacher and give shocks to a learner. These studies showed that the intentional behavior could be affected in intensity or duration by the aggression priming manipulation (the presence of guns or prior exposure to synonyms of aggression), but they did not show the behavior to be produced automatically, in the absence of that explicitly given intention.

Thus, although all of these lines of evidence are suggestive and supportive of the hypothesis of automatic social behavior, they have not demonstrated it. The three experiments we report in this article were designed to provide a definitive test of this hypothesis. In Experiment 1, participants were primed on the traits of either rudeness or politeness (or neither) with Srull and Wyer's (1979) scrambled-sentence test. In Experiment 2, we again used the scrambled-sentence priming manipulation but used it to activate the participants' stereotype of elderly people. In neither experiment were participants given any explicit conscious instructions to act in line with any of the trait dimensions being primed or measured. In fact, in both experiments the key dependent behavioral measures were taken at times when participants believed they were not currently engaged in an experimental task at all (i.e., in the hallway between parts of the experiment, or after they thought the experiment was over). In Experiment 3, a different priming manipulation—photographs of male African American faces—was used, and it was presented subliminally. This change was intended to extend the generality of the present findings to more realistic environmental stimuli and to effectively rule out any possible demand interpretations of the first two experiments.

Experiment 1: Behavioral Consequences of Trait Construct Priming

Method

Participants. A total of 34 students at New York University who were enrolled in the Introductory Psychology course participated in the experiment in partial fulfillment of a course research requirement. On their arrival at the laboratory waiting room they were randomly assigned to one of the three priming conditions.

Materials. The priming manipulation took the form of a "Scrambled Sentence Test" (Srull & Wyer, 1979), presented to participants as a test of language ability. For each of 30 items, participants are to use the five words listed to construct a grammatically correct four-word sentence as quickly as possible. The five words presented in a given test item are in scrambled order, such as "he it hides finds instantly."

Three versions of the scrambled-sentence test were constructed: One was intended to prime the construct *rude*, another the construct *polite*,

and a third was intended to prime neither trait (the neutral priming condition). For both the rude and the polite priming versions, 15 of the 30 items contained an adjective or verb semantically related to the trait in question. For the rude priming version, the critical priming stimuli were *aggressively, bold, rude, bother, disturb, intrude, annoyingly, interrupt, audaciously, brazen, impolitely, infringe, obnoxious, aggravating,* and *bluntly* (e.g., "they her bother see usually"). For the polite priming version, the 15 critical stimuli were *respect, honor, considerate, appreciate, patiently, cordially, yield, polite, cautiously, courteous, graciously, sensitively, discreetly, behaved,* and *unobtrusively* (e.g., "they her respect see usually"). In the neutral priming version, these 15 words were replaced by *exercising, flawlessly, occasionally, rapidly, gleefully, practiced, optimistically, successfully, normally, send, watches, encourages, gives, clears,* and *prepares* (e.g., "they her send see usually").

Procedure. Participants took part in the experiment one at a time. When they arrived at the central waiting area, they were greeted by the experimenter, who showed them into the first experimental room. They were told that the experiment was actually composed of two short studies having to do generally with language ability. After obtaining their consent to participate, the first study, ostensibly to do with construction of grammatical English sentences, was explained to them. The experimenter handed the participant an envelope that contained one of the three forms of the scrambled-sentence test. Which of the three versions (rude, polite, or neutral priming) the participant received had been randomly determined by another experimenter who did not have any contact with the participant, with the constraint that approximately equal numbers of participants received each of the forms. Neither the experimenter nor the confederate (see below) knew the priming condition to which a particular participant had been assigned until after the experimental session was over.

The participant was given the general instructions for the scrambled-sentence test. The experimenter told the participant that when the test had been completed (most participants took about 5 min to complete the 30-item test), he or she should come out into the hallway to find the experimenter, who would be at a different room around the corner. The experimenter said that at that time he would give the participant the next short experimental task to complete.

The experimenter then waited for the participant in the doorway of another laboratory room, located on the same hallway but around a corner from the first room. A confederate of the experimenter was seated in this second room, in sight of the experimenter but not of anyone coming from the direction of the first room, as she was seated behind a half-opened door. The confederate posed as another participant who was apparently having difficulty understanding how to complete a task. The experimenter and confederate engaged in a conversation, with the experimenter standing so that his body was open to the direction from which the participant would be coming down the hall, at about a 45° angle, while still facing the confederate in the room.

When the participant turned the hallway corner and became visible to the experimenter, without looking at the participant or acknowledging his or her presence the experimenter made a subtle prearranged sign to the confederate (i.e., touching his right pant leg). At this the confederate started a stopwatch. The experimenter and confederate continued their conversation as the participant approached and while he or she stood near the experimenter, waiting for the experimenter to acknowledge his or her presence and give him or her the next experimental task to complete.

Our dependent measure was the amount of time the participant would wait until interrupting the conversation between experimenter and confederate and ask to be given the next experimental task. Until he or she did so, the conversation continued, with the confederate asking questions and requesting clarification and just not getting it, and the experimenter repeating the instructions and clarifying if possible and also not turning to look at the participant or make eye contact with him or her. Our hypothesis was that participants in the rude prime condition would interrupt more quickly than neutral prime condition participants, and those in the polite prime condition would wait longer to interrupt than would neutral condition participants.

When the participant began to say anything to the experimenter, such as "Excuse me," or "Sorry, but. . ." the confederate stopped the stopwatch and recorded the elapsed time. We placed a 10-min limit on how long the participant would have to wait if he or she did not interrupt at all, reasoning that by that time he or she was not going to. When the participant interrupted, or at the end of the 10-min maximum waiting time, the experimenter showed him or her into a room adjacent to the one in which the confederate was seated and gave the participant a brief anagram puzzle task that took no more than 2 min to complete. After the participant had completed this task, he or she was partially debriefed and questioned concerning how they thought the first, scrambled-sentence test might have influenced them in the rest of the experiment. No participant showed any awareness or suspicion as to the scrambled-sentence test's possible influence on their interruption behavior; nearly all participants reported either no effect of the first task or that both it and the anagram task were related to language ability, which was the cover story.

At this point the experimenter thanked the participant for helping with the study, and the participant headed toward the elevator to leave the building. Waiting there was a second confederate, who posed as a department representative inquiring as to the participant's experience in psychology experiments. The confederate asked if the participant would mind completing a "Survey of Experimental Participants," and all but 3 participants agreed to do so. On the survey were six questions concerning whether the experiment was interesting and whether it was considered a valid educational experience. The last three items concerned the experimenter, whether he or she was on time, whether he or she explained the study and answered questions, and the critical item: "Was the experimenter courteous and polite to you?" This the participant responded to on a −3 to +3 scale that ranged from −3 (*not at all*) to +3 (*very much so*). This item served as our check for a potential alternative interpretation of our results, to be discussed below.

When the participant had completed the survey, he or she was fully debriefed as to the purpose and hypothesis of the experiment and was thanked again by the second confederate.

Results

Our primary dependent variable was the number of seconds the participants waited before interrupting the experimenter. A one-way analysis of variance (ANOVA) of these data, with priming condition as the single factor, revealed a significant main effect, $F(2, 33) = 5.76$, $p = .008$. Participants in the rude priming condition interrupted significantly faster ($M = 326$ s) than did participants in the neutral ($M = 519$ s) or polite ($M = 558$ s) priming conditions. Within the significant main effect, simple t tests revealed that the rude prime condition mean was significantly shorter than each of the other two means (both ps $< .04$), which were not reliably different from one another ($t < 1$).

Although this result supports our hypothesis that social interaction behavior can be primed, the time-to-interruption distribution varied considerably from normality. Fully 21 of the 34 participants did not interrupt at all in the 10 min available to them, so that the time variable suffered from a severe ceiling effect. Thus, we reanalyzed the data in terms of the percentage of participants in each priming condition who interrupted at all during the 10-min period. These percentages are shown in Figure 1.

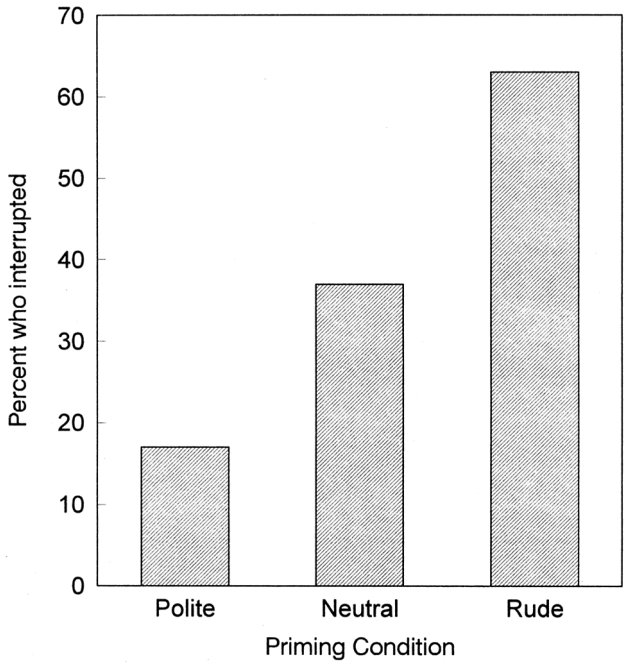


Figure 1. Percentage of participants who interrupted the experimenter within the 10-min period, by trait priming condition (Experiment 1).

Because we made a specific directional prediction regarding the ordering of the three percentages, rather than an omnibus prediction of any difference among the three, we applied the test for a linear trend in proportions (Snedecor & Cochran, 1980, pp. 206–208). The specific hypothesis tested was that the proportion of participants who interrupted the experimenter would increase as a function of the trait concept primed, from politeness through no priming to rudeness. In support of the hypothesis, the test revealed a reliable linear trend ($Z = 2.32$, $p = .02$, two-tailed). Participants whose concept of rudeness had been surreptitiously activated in the scrambled-sentence test subsequently were more likely to interrupt the conversation between the experimenter and confederate than were the other participants, and those whose concept of politeness had been activated were the least likely to interrupt.

Whereas our interpretation of this result is that the priming manipulation produced a direct, preconscious effect on the participants' subsequent behavior in a social interaction, an alternative explanation in terms of the social perceptual effects of priming must be considered. This alternative centers on how the participant may have interpreted or perceived the experimenter's behavior during his conversation with the confederate. If the experimenter's behavior was ambiguous enough to permit different impressions of him, depending on the relative accessibility of the participant's relevant trait constructs (e.g., Higgins & King, 1981), it is possible that rude-primed participants were more likely to perceive the experimenter as rude because he was ignoring them and attending to the confederate, whereas polite-primed participants were more likely to perceive the experimenter as polite because he so patiently dealt with the confederate's questions. The participants' own behavior to the experimenter (i.e., whether they interrupted him) might have been based on these differential perceptions (as has been demonstrated in studies by Neuberg, 1988, and Herr, 1986) instead of as a direct effect of the priming manipulation.

It is important to note, however, that we did not design or intend the experimenter's behavior to be ambiguous in this way, because our intention was to demonstrate an effect of priming on behavior that was not mediated by differential interpretations of the experimenter's behavior. In previous category accessibility research, some studies have sought to examine features of accessibility other than its effect on interpretation. Bargh and Thein (1985), for instance, studied the ability of accessible constructs to pick up relevant behavioral information under attentional overload. In this study, the construct-relevant behaviors were unambiguous and clearly diagnostic of the trait in question, and accessibility of the trait concept did not influence impressions of the target (though it did affect ability to process the information). The top-down effects of accessibility should influence impressions only when the informational input is sufficiently ambiguous (i.e., a relatively weak bottom-up effect; see Higgins, 1989).

To assess whether the priming manipulations had resulted in differential perceptions of the experimenter's politeness, we examined the ratings participants made on the "Experimental Participation Survey." On the critical item having to do with the experimenter's politeness, which ranged from −3 (*not at all polite*) to +3 (*very polite*), there was no reliable difference in the ratings made in the three priming conditions, $F(2, 28) < 1$ (polite prime condition M: = 0.6, rude prime condition: M = 0.4, neutral prime condition: M = 0.8). Apparently, the fact that the experimenter essentially ignored participants (focusing his attention on the confederate and her questions) while they waited in the hall led all of them to perceive him as equivalently nonpolite (but not impolite either).

The fact that the behavioral measure showed quite strong effects of the priming manipulation, whereas the effect on the judgment measure was nonexistent, argues against the alternative interpretation of our findings. It was not the case that the priming manipulation affected consciously made judgments about the experimenter, which then determined behavioral responses to him. The results instead point to a direct effect on behavior that is not mediated by conscious perceptual or judgmental processes. In fact, the present priming effect on behavior is much more substantial than the typical priming effect in impression formation research (cf. Bargh et al., 1986; Srull & Wyer, 1979). The powerful effects of priming on behavioral relative to perceptual dependent variables is a topic to which we return in the General Discussion.

Discussion

In this first experimental test of whether trait construct priming would produce differences in behavior as it has been shown to do for perceptual interpretation, participants primed with rudeness-related stimuli in an ostensibly unrelated first experiment interrupted a conversation reliably faster and, as a group, more frequently than did other participants. Those whose concept of politeness was surreptitiously activated interrupted the least often. Behavior in social interaction, like social perception

and evaluation, apparently can be driven directly by environmental stimuli—that is, preconsciously and automatically.

The results of Experiment 1 showed that the passive, automatic activation of a trait concept results in traitlike behavior by the individual, but there are two ways in which trait concepts can be activated directly by the environment. One is a direct activation by the presence in the environment of trait-relevant behavior; several lines of research show that behavior relevant to a trait automatically activates that trait concept (Newman & Uleman, 1989; Srull & Wyer, 1979). Another way in which a given trait concept can be activated automatically, however, is by its membership in a larger schema, such as a stereotype. Stereotypes of social groups consist, in part, of constellations of interrelated trait concepts (e.g., Brewer, 1988; Devine, 1989; Fiske & Neuberg, 1990) that become active in an all-or-none fashion (see Hayes-Roth, 1977) in the presence of the features of a group member.

Devine's (1989) Experiment 2 demonstrated the all-or-none activation feature quite clearly. She primed the stereotype of African Americans (as held by White Americans) subliminally using a set of stereotype-related stimuli (e.g., musical, athletic) that did not include any item related to hostility, though hostility had been shown by pretesting (and much prior research) to participate in the stereotype. However, Devine (1989) showed that the concept of hostility had indeed become activated by the priming manipulation, because primed participants subsequently rated a target person's ambiguously relevant behavior as more hostile than did a control group (just as had participants in Bargh & Pietromonaco's [1982] study who were primed directly with hostile-related stimuli). The only way this result could have been obtained was if the concept of hostility had become active (and thus temporarily more accessible for use in interpreting the target's behavior) by its participation in the activated stereotype.

Thus, research has shown that the priming or automatic activation of both single trait concepts (e.g., Bargh & Pietromonaco, 1982; Srull & Wyer, 1979) and stereotypes (Devine, 1989) influences social perception without the individual being aware of or intending this influence. The present Experiment 1 has shown that priming a single trait concept influences subsequent social behavior as well. The deduction that follows naturally from these two sets of findings is that the priming or automatic activation of stereotypes should make the perceiver him- or herself more likely to act in accordance with the trait concepts that participate in that stereotype. We designed Experiments 2 and 3 to test this hypothesis in the context of two distinct stereotypes: one for elderly people and one for African Americans.

Experiments 2a and 2b: Behavioral Effects of Activating the Elderly Stereotype

Method

Overview. The method and procedure for Experiments 2a and 2b are identical and so are described together. Experiment 2b is a replication of 2a. The present experiments were designed to study the effect of activation of the elderly stereotype on behavior. Participants were instructed to work on a scrambled-sentence task as part of a language proficiency experiment. The scrambled-sentence task contained words relevant to the elderly stereotype in the elderly priming condition, but all references to slowness, which is a quality stereotypically associated with elderly people, were excluded. The neutral priming condition scrambled-sentence task contained age-non-specific words in the place of elderly stereotyped words.

After completing the task, each participant was partially debriefed and thanked for his or her participation. A second experimenter then surreptitiously recorded the amount of time the participant took to walk down the corridor after exiting the laboratory room. Subsequently, participants were debriefed once again with a complete explanation of the purpose of the experiment. The main hypothesis was that participants who had been primed with the elderly stereotype would walk more slowly compared to participants who had not been primed with the stereotype-relevant stimuli.

Participants. Thirty male and female New York University undergraduates who were enrolled in Introductory Psychology participated in Experiment 2a, and a different sample of 30 participated in Experiment 2b, to partially fulfill a course requirement. In both experiments, participants were randomly assigned to either an elderly prime condition or a neutral prime condition. The experimenter kept himself blind to condition by prepackaging the various scrambled-sentence tasks and picking packets randomly when the participant arrived at the laboratory waiting area.

Materials. As in Experiment 1, the priming manipulation took the form of a scrambled-sentence task presented to participants as a test of language proficiency. We constructed two versions of the scrambled-sentence task: one elderly prime version, which contained words related to the elderly stereotype, and another, neutral version. For the elderly prime version, the critical stimuli were *worried, Florida, old, lonely, grey, selfishly, careful, sentimental, wise, stubborn, courteous, bingo, withdraw, forgetful, retired, wrinkle, rigid, traditional, bitter, obedient, conservative, knits, dependent, ancient, helpless, gullible, cautious,* and *alone*. These prime words were obtained from previous research that examined the components of the elderly stereotype (Brewer, Dull, & Lui, 1981; Harris & Associates, 1975; McTavish, 1971; Perdue & Gurtman, 1990). In the neutral version, the elderly prime words were replaced with the words unrelated to the elderly stereotype (e.g., thirsty, clean, private).

Procedure. Participants took part in the experiment one at a time. The participant was informed that the purpose of the study was to investigate language proficiency and that he or she was to complete a scrambled-sentence task. The task consisted of 30 sets of five word combinations. The participant was instructed to write down a grammatically correct sentence using only four of the five words given. Participants were also informed that the task was self-paced. After giving the instructions, the experimenter left the room so that the participant could complete the task in privacy.

After the participant completed the task and notified the experimenter, the experimenter re-entered the lab room and partially debriefed the participant. He or she was informed that the experiment was concerned with how individuals use words in various, flexible ways. Waiting until the participant had gathered all of his or her belongings, the experimenter told the participant that the elevator was down the hall and thanked him or her for participating.

Using a hidden stopwatch, a confederate of the experimenter, who was sitting in a chair apparently waiting to talk to a professor in a nearby office, recorded the amount of time in seconds that the participant spent walking a length of the corridor starting from the doorway of the experimental room and ending at a broad strip of silver carpet tape on the floor 9.75 m away.

Afterward, the experimenter caught up with the participant near the elevator and gave the complete debriefing, explaining the experimental hypotheses verbally as well as giving the participant an accompanying written version. Participants were also informally asked (prior to this

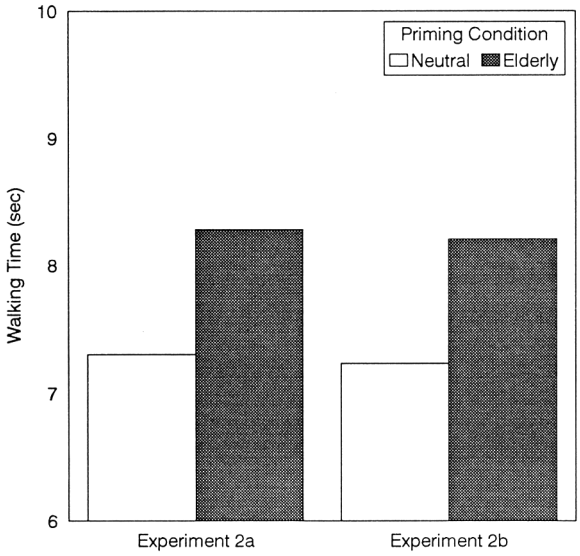


Figure 2. Mean time (in seconds) to walk down the hallway after the conclusion of the experiment, by stereotype priming condition, separately for participants in Experiment 2a and 2b.

final debriefing) whether they thought the scrambled-sentence task might have affected them in any way, and if they had known that the task contained words relevant to the elderly stereotype. No participant expressed any knowledge of the relevance of the words in the scrambled-sentence task to the elderly stereotype. Furthermore, no participant believed that the words had an impact on his or her behavior.

Results

Experiment 2a. A t test was computed to ascertain the effect of the priming manipulation on walking speed. Participants in the elderly priming condition (M = 8.28 s) had a slower walking speed compared to participants in the neutral priming condition (M = 7.30 s), $t(28) = 2.86$, $p < .01$, as predicted.

Experiment 2b. In the replication, analyses revealed that participants in the elderly priming condition (M = 8.20 s) again had a slower walking speed compared to participants in the neutral priming condition (M = 7.23 s), $t(28) = 2.16$, $p < .05$. Thus, across both studies, passively activating the elderly stereotype resulted in a slower walking speed (see Figure 2).

Discussion

The results of the present experiments suggest that exposing individuals to a series of words linked to a particular stereotype influences behavior nonconsciously. How the activated stereotype influences behavior depends on the content of the activated stereotype itself, not the stimulus words actually presented. Because there were no allusions to time or speed in the stimulus materials, the results of the study suggest that the elderly priming stimuli activated the elderly stereotype in memory, and participants subsequently acted in ways consistent with that activated stereotype.

Awareness Check Study

The crucial factor in concluding that these results show automatic effects on behavior derives from the perceiver's lack of awareness of the influence of the words. Previous research (see review in Bargh, 1992) has indicated that it is not whether the primes are presented supraliminally or subliminally, but whether the individual is aware of the potential influence of the prime that is critical; diametrically opposite effects on judgments are obtained if the participant is aware versus not aware of a possible influence by the priming stimuli (see Lombardi, Higgins, & Bargh, 1987; Strack & Hannover, 1996). We conducted a subsequent study to explicitly test whether the participants were aware of the potential influence of the scrambled-sentence task. Our conclusions in terms of automatic social behavior depend on the participants' not being aware of this influence.

Method. Nineteen male and female undergraduate students at New York University participated in the experiment to partially fulfill course credit. On arrival at the laboratory waiting room, participants were randomly assigned to either the elderly stereotype priming condition or the neutral priming condition.

Participants took part in the experiment one at a time. They were informed that the purpose of the study was to investigate language proficiency and that they would complete a scrambled-sentence task. Participants were randomly administered either the version of the task containing words relevant to the elderly stereotype or the neutral version containing no stereotype-relevant words. Immediately after completion of the task, participants were asked to complete a version of the contingency awareness funnel debriefing, modeled after Page (1969). This contingency awareness debriefing contained items concerning the purpose of the study, whether the participant had suspected that the purpose of the experiment was different from what the experimenter had explained, whether the words had any relation to each other, what possible ways the words could have influenced their behavior, whether the participants could predict the direction of an influence if the experimenter had intended one, what the words in the scrambled-sentence task could have related to (if anything), and if the participant had suspected or had noticed any relation between the scrambled-sentence task and the concept of age. Afterward, the experimenter explained the hypotheses to the participants and thanked them for their help.

Results and discussion. Inspection of the responses revealed that only 1 of the 19 participants showed any awareness of a relationship between the stimulus words and the elderly stereotype. However, even this participant could not predict in what form or direction their behavior might have been influenced had such an influence occurred. Thus, it appears safe to conclude that the effect of the elderly priming manipulation on walking speed occurred nonconsciously.

Does Mood Mediate the Effect of Priming on Walking Speed?

One alternative explanation that can be offered for the effect of the elderly-stereotype-related stimuli on walking speed is that, in general, the words relating to the elderly stereotype are more likely than control words to induce in participants a sad mood, which might then be the reason they walked more slowly.

Method. A total of 33 undergraduate men and women from New York University participated in the experiment in order to partially fulfill course credit. On arrival at the experimental waiting area, partici-

pants were randomly assigned to either the elderly or the neutral priming conditions.

Each participant completed the version of the scrambled-sentence task corresponding to their assigned priming condition: either the prime version containing elderly-stereotype-relevant words, or a neutral version without the elderly-stereotype-relevant words. Immediately after they completed the task, a modified version of the Affect–Arousal Scale (Salovey & Birnbaum, 1989) was administered to each participant. This questionnaire contained eight bipolar items differentiating feelings of emotion and arousal on scales ranging from −8 to +8. The emotion dimensions were *bad–good, disappointed–satisfied, sad–happy*, and *displeased–pleased*. The arousal dimensions were *calm–excited, tired–energetic, down–elated*, and *sedate–aroused*. Participants responded to each dimension in terms of how they felt at that moment. After completion of the scales, participants were debriefed and thanked for their cooperation.

Results. We conducted a multivariate analysis of variance (MANOVA) using priming condition as the independent variable and the average of the four emotion scales and the average of the four arousal scales as the dependent measures. Analyses revealed that the main effect of priming condition was not significant across the two dependent measures, $F(1, 31) < 1$. Furthermore, there was no interaction between priming condition and the two dependent measures of emotion and arousal, $F(1, 31) < 1$. If anything, participants in the elderly priming condition were in a more positive mood ($M = 1.7$) than control participants ($M = 0.3$) and were more aroused or energetic as well (Ms = −0.5 and −1.2, respectively). Thus, participants who were exposed to the elderly stereotype stimuli were not more likely to be sad or less aroused compared to participants who were not exposed to the stereotype-related stimuli. The alternative explanation for our findings in terms of a mediating effect of mood caused by the elderly stereotype primes appears untenable.

Experiment 3: Behavioral Effects of the African American Stereotype

The results of Experiment 2 showed that the automatic activation of the elderly stereotype has direct and nonconscious effects on behavior in line with the content of the stereotype. Experiment 3 was intended to assess the generality of these results to an entirely different stereotype—that for African Americans. As discussed above, Devine (1989) already showed that this stereotype becomes active automatically to influence perceptions of a target's hostility. Therefore, according to the present model, this automatic activation should also produce a tendency toward hostile behavior in the perceiver.

Another important change in procedure from Experiment 2 was that the priming stimuli were presented subliminally, completely ruling out experimenter demand or other explanations of our results in terms of conscious, strategic processes.

Method

Overview. The present experiment was designed to study the effect of activation of an African American stereotype on social behavior. Participants were instructed to work on a computerized visual task that pretesting had shown was considered to be very boring and tedious. Immediately before each trial, the computer flashed a subliminal picture of a young African American male face or a picture of a young Caucasian male face. On the 130th trial, the computer alerted the participant of an ostensible data-saving failure and also informed the participant that he or she would have to do the entire computer task again. A hidden video camera was placed in the lab room to capture participants' facial reactions to the ostensible computer error and news that the task would have to be redone. Also, the experimenter rated the hostility of the participant's reaction. The hypothesis was that participants presented subliminally with African American faces would react with greater hostility to the computer error, compared to participants primed with Caucasian faces.

Participants. Participants were 41 non-African-American undergraduate students from New York University who participated in the experiment to partially fulfill course credit.

Apparatus. A Gateway 486 computer with a VGA color monitor was used to administer the priming manipulation. A Visual Basic program was created that allowed the experimenter to be blind to priming conditions, gave participants directions about an odd–even task, and administered the experimental trials. When the experimenter entered the participant's ID number into the computer, the computer randomly assigned the participant to a condition, keeping the participant's condition from the experimenter's knowledge. During the experimental phase, each participant was subliminally exposed to black-and-white photographs of African American or Caucasian faces. On a given trial, the face photograph was followed by two different pattern masks in rapid succession. The first pattern mask was composed of a black-and-white pattern of diagonal cross-hatches. The second mask, presented immediately after the first, was conceptually similar but not identical to the target picture, which was composed of from 4 to 20 colored circles on a gray background. Pretesting had shown that the masking procedure was effective in that individuals were not aware of the presence of the face photographs.

The presentation speed of each subliminal picture (faces and masks) was bounded by the computer hardware. Specifically, the 76 Hz monitor screen refresh rate resulted in a minimum presentation time of 13 ms and a maximum of 26 ms. Each target picture was then presented for 3 s before it disappeared and the participant was asked to make the odd or even response.

Participants were videotaped throughout the odd–even task by means of a hidden video camera. The video camera allowed a clear view of facial expressions while the participant completed the computer task and was exposed to the ostensible computer error.

Procedure. Each participant completed the experiment individually. When brought into the experimental room, he or she was informed that the experimenter was interested in how individuals use different aspects of a picture to make quick judgments. Pictures of 4–25 different colored circles would appear inside a small box drawn on the screen for a few seconds at a time. For each picture, the participant was to make a decision as to whether the picture contained an odd or an even number or circles. Although each target picture was on for only 2 or 3 s, the participant was asked to make the most accurate judgment possible. The experimenter left the room after the participant completed the practice trials and when the experimenter was sure the participant understood the directions.

At the end of the 130th trial, the computer program beeped and displayed an error message stating "F11 error: failure saving data." After the experimenter clicked on the screen response button "OK" the computer displayed another message: "You must start the program over again." The participant was then instructed to get the experimenter. The experimenter came back into the room and fiddled with the computer, finally announcing "I'm sorry, but you'll have to do the experiment over again." After more fiddling, the experimenter concluded "Actually, it looks like the computer did save your data. You don't have to do it over again." The critical dependent measures were the participant's videotaped reactions to the news that he or she might have to do the task

over again and the experimenter's rating of the participant's degree of hostility.

Subsequently, participants were asked to fill out two questionnaires: the Racial Ambivalence Scale (Katz & Hass, 1988) and the Modern Racism Scale (McConahay, 1986). Participants were informed that the scales were just part of a pilot pretest in preparation for some future experiments and were not linked to the previous experiment. When the experimenter left the room to allow the participant to fill out the surveys in private, the experimenter recorded her own ratings of the participant's irritability, hostility, anger, and uncooperativeness on 10-point unipolar scales based on her interaction with the participant.

Finally, participants were probed for suspicion and then debriefed. Participants were asked if they had seen anything unusual in the computer pictures, if they thought the presence of any pictures could have changed their behavior in any way, and to describe how. Only 2 of the participants actually reported seeing faces in the computer task. However, those participants could not identify whether the faces were Caucasian or African American, and the participants could not guess that the study was about race in any way. Furthermore, no participants were suspicious that completing the two race scales had anything to do with the present experiment. Participants were informed that they had been videotaped to obtain facial reactions to the computer error.

Two coders who were blind to experimental conditions and hypotheses rated all the videotaped facial expressions from the 41 participants on a 5-point unipolar scale of hostility ranging from 0 (*not at all hostile*) to 10 (*extremely hostile*). The correlation between the two raters was .64, and discrepancies between the two sets of ratings were resolved by averaging the two sets into an overall hostility index.

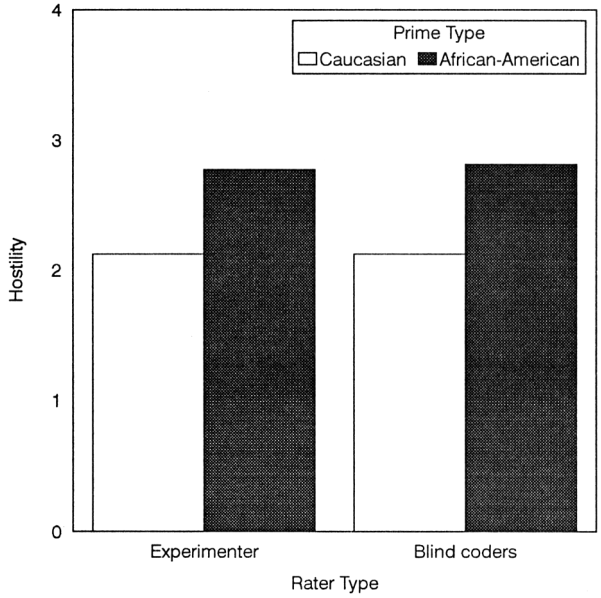


Figure 3. Mean hostility ratings of the participants' reactions to the computer error, by stereotype priming condition, separately for the experimenters' and the blind coders' ratings (Experiment 3).

Results

We conducted a MANOVA using an average of the experimenter's hostility ratings across the four trait scales and an average of the two videotape coders' hostility ratings as dependent measures, and priming condition as the independent measure. The MANOVA revealed a significant effect of priming condition across both indexes of hostility, $F(1, 39) = 6.95$, $p < .05$, such that participants primed with photographs of African American faces behaved in a more hostile fashion ($M = 2.79$) compared to participants primed with Caucasian faces ($M = 2.13$; see Figure 3). Furthermore, codings of hostility did not significantly differ by source of rating (experimenter vs. blind coders), $F(1, 39) < 1$, and there were no interactions between rating source and priming condition, $F(1, 39) < 1$.

To examine the possibility that our effects could have been moderated by attitudes toward African Americans, we calculated correlations between the averaged hostility measure across rater type and the participant's level of racism as measured by the Racial Ambivalence Scale and the Modern Racism Scale for each priming condition separately. None of the correlations between hostility and racism as measured by either scale were significant for either priming condition (all $rs < .25$, $ps > .35$). Thus, participants who were low in racist attitudes toward African Americans were just as likely to behave in a hostile manner as participants who were high in racist attitudes, regardless of priming condition.

This finding corresponds to that of Devine (1989, Experiment 2), who found that the automatic effect of the African American stereotype on social perception did not vary as a function of level of consciously expressed prejudice, as measured by the Modern Racism Scale. More recently, Fazio, Jackson, Dunton, and Williams (1995) also found no moderation by Modern Racism scores of their obtained effect of racial attitudes on behavior (but see Lepore & Brown, 1996).

General Discussion

Across three experiments, the activation of a trait construct or a stereotype in one context resulted in behavior consistent with it in a subsequent unrelated context. The participants were not aware of the influence or potential influence of the priming events on their behavior. The same priming techniques that have been shown in prior research to influence impression formation produce similar effects when the dependent measure is switched to social behavior.

One explanation for the present results is in terms of situationally linked behavior; that is, that a person has behavioral responses (e.g., assertiveness, anger, patience) that are associatively linked to particular situations (e.g., being made to wait by another person, losing one's work because of another's mistake). That people have automatic behavioral as well as perceptual responses to the social environment is congruent with the proposal by Lewin (1943), Mischel (1973), Berkowitz (1984), Higgins (1987), and others that immediate psychological reactions to the environment are not only cognitive or affective in nature but also include motivational and behavioral responses. The present results show that these behavioral responses become automatically linked to representations of social situations just as previous research has found perceptual trait constructs, stereotypes, and attitudes to become automatically activated.

Although the present results are consistent with the hypothesis that behavioral representations are linked directly to the representations of social situations, another theoretical perspective

consistent with the present findings is that of an automatic perception–behavior link (e.g., Berkowitz, 1984; Carver et al., 1983). Because our studies used the same kind of trait and stereotype priming manipulations that have been shown by prior research to affect impression formation (e.g., Devine, 1989; Srull & Wyer, 1979), we now know the identical priming manipulations result simultaneously in automatic perceptual and behavioral effects.

Thus, our results are in harmony with those of Carver et al. (1983), who advanced a "behavioral schema" model as an explanation for modeling effects. According to the behavioral schema model, the perceptual and actional representations of the same type of behavior share many features in common and thus develop strong connections. As a result, if one has just perceived another person acting in a generous or an aggressive way, for example, one's behavioral schema for generosity or aggression is activated and accessible, and so one is more likely to behave that way oneself in subsequent situations for which generosity or aggression is a relevant response.

Under What Conditions Will Behavior Be Automatic?

To many, we presume, the present findings conjure up images of the old subliminal advertising debate. In the stock example, frames of Pepsi bottles or boxes of popcorn were flashed in the middle of a movie and were supposed to create a mad rush to the concession counter. That kind of ploy did not and does not work (see Kihlstrom, Barnhardt, & Tataryn, 1992; Moore, 1982). Why, then, were we able to prime behavior nonconsciously in the present studies?

For one thing, our priming stimuli directly activated trait concepts, either directly as in Experiment 1 or by virtue of their inclusion in all-or-none stereotypic representations, as in Experiments 2 and 3. As described above, these representations contain the knowledge of what it means to act in the traitlike manner, as well as the mechanisms for producing that kind of behavior (see Carver et al., 1983; Prinz, 1990). We have gone directly to the behavior representation, in other words; but a picture of a bottle of Pepsi would directly activate only the "Pepsi" representation, or the "soft drink" or "cola" representation. Unlike the present priming manipulations, it takes an additional step for "Pepsi" activation to spread to a behavioral representation such as "to drink" or "to buy."

For the sake of argument, however, let us assume that because drinking it is what one usually does with a bottle of Pepsi, there exists an automatic link between the Pepsi representation and the "drink" behavior representation, so that the picture of a bottle of Pepsi does activate the "drink" behavior representation. Why, then, do people not act on that automatic behavior activation? Consideration of this question highlights another difference between the present experimental situations and the movie theater: the ease or relevance of the automatic behavior to the person's current situational goals.

We constructed the "interruption" situation so that both of the primed behaviors—rudeness/assertiveness or politeness/patience—were relevant responses to it. Similar to walking down the hall after the session in Experiment 2 was ostensibly over, one can walk to the elevator as quickly as one wishes. In Experiment 3, the hostility that we assume was activated as part of the primed stereotype was one of the appropriate responses to the computer error and seeming loss of the last 10 minutes' work. In short, the primed behavior was relevant and appropriate for the experimental situation into which we placed the participant. In accessibility logic, the representation of that behavior was applicable to the situational information (Higgins, in press).

Not so with the movie situation. One is there to watch the movie, and getting up and leaving one's seat conflicts with that. It also conflicts with another goal inherent in the theater situation, that of not disturbing the others in the audience also trying to watch the film. The subliminal message would affect behavior only for those in the audience for whom getting up to buy a soda or popcorn is a behavior they have associated with that situation, that is, a behavioral representation linked to the situational features. For those of us who buy concessions only on the way in to our seats, and not after the movie starts, there is nothing there to prime. Automatic activation can occur only if the individual has that behavioral representation available in the first place.

Thus, automatic social behavior may occur only if the behavioral representation that is activated is already associated with that situation by the individual. In the present experiments, it is likely that all primed behaviors were in the participants' repertoire for those situations. Lewin's (e.g., 1943) field theory holds that although you might be able to affect a person's behavior by making some motivations more salient than others, you cannot give the person a motivation that he or she does not already have and make him or her do something for which he or she has no motive base (Cartwright, 1959). It is doubtful, for example, that the participants in Experiment 2 left our building to go buy condos in Florida.

Relative Strength of Priming Effects on Behaviors Versus Impressions

The limited range of behavioral options that participants had in our experimental situations may also account for the strength of the findings, especially in Experiment 1 in which participants' responses appeared polarized toward either the rude or the polite option. But in general, across the three experiments, obtaining priming differences on these behavioral measures was considerably easier than in our laboratory's previous research on social judgment measures (e.g., Bargh et al., 1986; Bargh, Lombardi, & Higgins, 1988; Bargh & Pietromonaco, 1982). This may be surprising news to those who might assume that because judgments and perceptions mediate behavior, if anything the impression effects should be stronger.

Although ultimately one cannot really compare the strength of priming effects on behavioral versus judgmental measures, because there are too many differences between the experimental situations to allow for a meaningful comparison, we can point to some differences that are likely to produce greater or lesser priming effects. The major difference, we believe, is that public behavior such as we measured here is more constrained than are subjective judgments along personality scales; there is less variability, and so effects are easier to detect.

Does Social Perception Always Mediate Social Behavior?

However, the greater variability and freedom that people have in perceiving others' behavior also suggests that social perception will be less of a mediating influence on behavior than many might assume. Perceptions may play a role, but they are one of several influences, and it is clear from the present results that behaviors can be triggered directly without being mediated by impressions or judgments of the person with whom one is interacting. In Experiment 1, impressions of the experimenter were not affected by the priming manipulation, whereas behavior strongly was.

One might argue that our impression measure lacked enough sensitivity to detect the presence of the mediation. In response to that we would first point out that the means on the impression measure were in a different direction than the behavior measure. But more important, to those who hold to the mediational model, it must be noted that the evidence for such conscious mediation of behavior by attributions or judgments is historically weak, that when behaviors and mediators are measured in the same study it is the behavioral measure that shows the clear, predicted difference and the mediator that shows weak or nonexistent differences, just as in the present Experiment 1 (see Bargh, in press; Bem, 1972, pp. 50–51). As Bem (1972) put it, although it seems intuitively plausible that changes in perceptions will be reflected in changes in behavior:

> There seems to be only one snag. It appears not to be true. It is not that the behavioral effects sometimes fail to occur as predicted; that kind of negative evidence rarely embarrasses anyone. It is that they occur more easily, more strongly, more reliably, and more persuasively than the attribution changes that are, theoretically, supposed to be mediating them. (p. 50)

Bem supported this statement by reviewing several classic studies in which measures were taken both of the behavior and the presumed mediator (e.g., Valins & Ray, 1967; Zimbardo, Cohen, Weisenberg, Dworkin, & Firestone, 1969); in all of them, well-designed and conducted as they were, the behavioral measure showed clear predicted effects, and the evidence of the "mediator" was nonexistent. In others (e.g., Darley & Latané, 1968), the assumed mediator (e.g., diffusion of responsibility) was not measured at all but was inferred from the behavioral measure (e.g., likelihood of helping).

By no means are we arguing here that social perceptions and judgments do not mediate behavior. Our point is merely that they need not and, moreover, we should hold the assumption of mediation to the same standards of proof and evidence to which we hold the hypothesis of direct, nonmediated behavior instead of assuming mediation by default. Reviews of the evidence of such mediation, in fact, find it in short supply (Bargh, in press).

Can Automatic Behavior Be Controlled?

If, as the ideomotor principle has it, the mere thought of behaving in a certain way increases the tendency to so behave, and if, as the perception–behavior link notion has it, merely perceiving the behavior of others (in the media as well as real life) activates tendencies to behave in the same way, then automatic behavioral impulses are occurring with great frequency and regularity. Add to this those situations commonly enough experienced so that we have behavioral responses strongly associated with them, and the probability of automatically triggered behavior becomes even greater.

The question is not, therefore, how often such automatic behavioral effects occur, but whether and how often they are controlled or overridden by some conscious intention and purpose. Control over automatic influences requires three things: (a) awareness of the influence or at least the possibility of the influence, (b) motivation to exert the control, and (c) enough attentional capacity (or lack of distractions) at the time to engage in the control process (see Bargh, 1989; Wegner, 1994). Awareness of the automatic effect is necessary for the motivation to be engaged, and for the motivation to operate to control the automatic impulse it must be supported by sufficient processing capacity. Given that control requires all three of these features to be in place, it is not difficult to see that there are many real-world circumstances in which not all three are present. Even with the best of underlying intentions, one cannot control an influence if one is not aware of its operation, or at least its potential for operating (viz. Devine, 1989, Experiment 2). Moreover, even if one is aware of the influence it is possible to slip up if one is not paying enough attention, as in ironic failures of control (Wegner, 1994) and action slips (e.g., Norman, 1981).

One notable feature of the present demonstrations is that many of the behaviors automatically triggered—rudeness, slowness, and hostility—are negative and so run counter to norms for socially appropriate behavior. That these effects occurred despite the general situational norms against them underscores the strength of the automatic behavior effect. At the same time, one can imagine situations in which consequences for negative behavior are sizable enough that motivations would be strong enough to overcome them—as when the person making you cool your heels in the hallway is your boss or supervisor. Nonetheless, we believe the individual's lack of awareness of the source of the automatic behavior impulses usually translates into a lack of monitoring or attempt to control them—as well as a tendency to misattribute them to possible (and justifiable) causes of which the individual is aware (e.g., Nisbett & Wilson, 1977)—which will also increase the likelihood that the activation of automatic behavior responses will find expression.

Implications for Stereotype Confirmation and Empathic Reactions

One important message to be taken from the results of Experiments 2 and 3 is that there may be an automatic, nonconscious basis for self-fulfilling prophecy effects (e.g., Snyder, Tanke, & Berscheid, 1977). If the automatic activation of a stereotype by the physical features (including speech accent, skin color, gender, and age-related features) of another person causes the perceiver him- or herself to behave in line with the stereotype first, the perceiver's own initial behavior to the target could well produce similar behavior in the stereotyped individual. In the case of the African American stereotype, for example, the nonconscious influence of the activated stereotype could cause the perceiver to behave in a hostile manner to African Americans he or she encounters and produce behavioral confirmation of the stereotype (i.e., a hostile response in reaction). It is im-

portant to note that the perceiver would be unaware of the role his or her own initial hostility had played in this sequence, because the effect of the stereotype on behavior was nonconscious—the perceiver would have no conscious experience of choosing that mode of behavior. Thus, the perceiver's subjective, phenomenal experience, and hence memory of the event, would be of the stereotyped group member's unprovoked initial hostility.

Another important implication is the automatic creation of empathic reactions. When in the normal course of interacting with another person, one perceives his or her friendliness or honesty or anger, and the same kind of behavior in response is made more likely merely by the ideomotor function, nonconsciously producing empathic behavioral and emotional reactions (see Hodges & Wegner, in press). The perception–behavior link may be an important ingredient in the "glue" that binds two (or more) interaction partners, keeps them on the same wavelength, and helps to bring each partner a sense of validation by others of their experience.

This is not to say that an automatic effect of perception on behavior is necessarily entirely beneficial for social interaction. Dodge and Crick's (1990) research on the social cognition of aggressive children shows that they are both more likely to perceive another child's action as aggressive in nature and to respond themselves with aggression. Although Dodge's account of these and related findings is in terms of a conscious deliberate choice of aggression based on a perceived aggressive provocation by the other, it also is possible, on the basis of the present results, that conscious choice may play less of a role in producing the aggression. It may be that the mere accessibility of the mental category of aggression increases the likelihood of aggressive behavior, via the passive perception–behavior link. Moreover, the automatic effect of priming on behavior that we have documented is further reason to believe that aggression in the mass media does produce aggressive tendencies in the viewer (e.g., Berkowitz, 1984)—perhaps even more insidiously and pervasively than previously believed.

Conclusions

Our central message is that social behavior can be triggered automatically by features of the environment. In Experiment 1, the same trait-priming manipulations that have exerted a nonconscious influence over social perceptual processes in previous research were shown to produce traitlike behavior as well. Experiments 2 and 3 showed that traitlike behavior is also produced via automatic stereotype activation if that trait participates in the stereotype. The major implications of the findings are, first, the apparent degree to which social behavior occurs unintentionally and without conscious involvement in the production of that behavior. Second, the findings point to the possibility that the automatic activation of one's stereotypes of social groups, by the mere presence of group features (e.g., African American faces in Experiment 3), can cause one to behave in line with that stereotype without realizing it (e.g., with hostility of facial expression or tone of voice). By this first strike, therefore, one may elicit that very type of behavior in response. But because one is not aware of one's own role in provoking it, one may attribute it to the stereotyped group member (and, hence, the group).

As a first demonstration of automatic social behavior, the limits and parameters of these effects remain to be established. However, an important theoretical point can already be made: Social behavior is like any other psychological reaction to a social situation, capable of occurring in the absence of any conscious involvement or intervention. The implications for many social psychological phenomena—among them conformity, emotional and behavioral contagion, empathy, imitation and modeling, and the behavioral confirmation of stereotypes—would appear to be considerable.

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