Consequences of Automatic Evaluation: Immediate Behavioral Predispositions to Approach or Avoid the Stimulus

Mark Chen
John A. Bargh
New York University

Research on automatic attitude activation has documented a pervasive tendency to nonconsciously classify most if not all incoming stimuli as either good or bad. Two experiments tested a functional explanation for this effect. The authors hypothesized that automatic evaluation results directly in behavioral predispositions toward the stimulus, such that positive evaluations produce immediate approach tendencies, and negative evaluations produce immediate avoidance tendencies. Participants responded to attitude object stimuli either by pushing or by pulling a lever. Consistent with the hypothesis, participants were faster to respond to negatively valenced stimuli when pushing the lever away (avoid) than when pulling it toward them (approach) but were faster to respond to positive stimuli by pulling than by pushing the lever. This pattern held even when evaluation of the stimuli was irrelevant to the participants' conscious task. The automatic classification of stimuli as either good or bad appears to have direct behavioral consequences.

The relation between one's attitude and one's behavior toward the attitude object has long been a focus of social psychological research (for a review, see Eagly & Chaiken, 1993, pp. 155-218). One of the earliest and very influential definitions of attitude characterized it as a state of preparedness to respond to any and all related objects and situations (Allport, 1935, p. 810). Another popular view of attitudes also defined them as acquired tendencies to behave in certain ways toward the attitude object (Campbell, 1963). Attitude researchers, therefore, took quite seriously the growing criticisms by 1970 that the predictive relation between measured attitude and measured behavior was often weak or nonexistent (e.g., LaPiere, 1934; Wicker, 1969).

In the face of such evidence, several theoretical and methodological explanations were generated to account for the apparent inconsistency (see Eagly & Chaiken, 1993; Fazio, 1986). One approach was to improve the measurement of the attitude (the behavioral side of the equation). For instance, instead of predicting single instances of behavior, some researchers collected multiple measures of broad classes of behaviors to obtain higher attitude-behavior correlations (Fishbein & Azjen, 1974).

Another approach was to focus on potential moderators of the attitude-behavior relation to understand the conditions under which it was stronger versus weaker. Among the most prominent of the suggested moderators have been the strength of the attitude (e.g., Fazio, 1986; Fazio, Chen, McDonel, & Sherman, 1982); the clarity, confidence, and certainty with which the attitude is held (Fazio & Zanna, 1981); and behavioral intentions and plans (Fishbein & Azjen, 1975; Vallacher & Wegner, 1985).

All of these approaches to the attitude-behavior relation have assumed that the effect of the attitude is on the conscious choice of behavior in the situation. Even those models that propose that the attitude activation stage of the process can occur automatically (Fazio, 1986, 1989), as opposed to the attitude being intentionally retrieved from memory, have conceptualized the selection of behavioral response as being under conscious control. In a break from the traditional model, we propose here that

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the behavioral component of the equation can be automatic as well. That is, one important function of automatic attitude activation is to nonconsciously predispose behavior toward the attitude object.

AUTOMATIC ATTITUDE ACTIVATION

In his MODE model, Fazio (1986, 1990) proposed that one reason for the generally poor record of measured attitudes in predicting behavior is that attitudes vary in their likelihood of becoming active in the presence of the attitude object (see also Converse, 1970). According to this argument, the reason for the generally low attitude-behavior correlation is that some (i.e., strong) attitudes do show impressive correspondence with behavior, but others (i.e., weak) do not and dilute the overall correlation. Those that are stronger or more accessible from memory should be active a greater proportion of the time in the presence of the relevant attitude object compared to other attitudes. Consequently, these attitudes should manifest a more consistent influence on behavior across encounters with the attitude object under the assumption that behavioral choices are made based on the currently active, relevant information in memory. In several studies in which attitude accessibility was either manipulated (e.g., Fazio et al., 1982) or measured (e.g., Fazio & Williams, 1986), stronger and more accessible attitudes showed substantially higher correlations with behavior toward the attitude object (e.g., candidate preferences and voting behavior) (Fazio & Williams, 1986).

Fazio, Sanbonmatsu, Powell, and Kardes (1986) advanced this argument by proposing that some attitudes are so accessible in memory that they become active at the mere presence of the attitude object; these should show the strongest predictive relation to behavior toward the object. To test whether attitudes could be automatically activated, Fazio et al. (1986) adapted a sequential priming task used by Neely (1977). On each trial, the name of an attitude object (e.g., *beer, Monday*) was presented as a prime for a short duration (ca. 300 ms) prior to a target adjective (e.g., *phony, wonderful*). The participant was to evaluate the adjective as positive or negative in meaning by pressing the appropriate response button as quickly as possible.

To the extent that the attitude object prime activated its corresponding attitude in memory (i.e., evaluation as good or bad), this would facilitate making the same response to the target and interfere with making the opposite response (see Logan, 1980); for example, *puppy* (presumably good) as a prime should speed up responses of *good* to the target *wonderful* but slow down responses of *bad* to the target *disgusting*. Most important, because the duration of the attitude object prime was too short to permit any conscious set or expectancy concerning the valence of the upcoming adjective (this generally requires at least 500 ms; see Neely, 1977, 1989), any influence of the attitude object prime on latency to classify the target as good or bad could only occur if the attitude object name had automatically activated the attitude associated with it in memory.

The results of the three experiments by Fazio et al. (1986) and many subsequent studies (Bargh, Chaiken, Govender, & Pratto, 1992; Bargh, Chaiken, Raymond, & Hymes, 1996) confirmed that attitude objects do activate their associated attitudes in an automatic, unintended, and immediate fashion. However, there is a theoretical difference of opinion over how general and pervasive this effect is across attitude objects (see Chaiken & Bargh, 1993; Fazio, 1993). Fazio et al. (1986) obtained the effect only for a participant's strong attitudes and not for his or her weak ones, with attitude strength operationalized in terms of how quickly a participant could consciously evaluate the attitude object as good or bad in a preliminary phase of the experimental session. Although Bargh et al. (1992) replicated this finding in their Experiment 1, modifications to the original procedure intended to more closely approximate real-world conditions of the mere presence of the attitude object resulted in obtaining the effect for all attitude object stimuli studied, regardless of attitude strength. These modifications included interpolating a 2-day delay between the attitude assessment and automaticity assessment tasks so that participants would not have recently given conscious thought about their attitudes (Bargh et al., 1992, Experiment 2; Chaiken & Bargh, 1993) and having participants pronounce the target stimuli rather than evaluate them in order to remove the conscious and intentional goal of evaluation from the automaticity task (Bargh et al., 1996, Experiments 1, 2, and 3).

Thus, in harmony with the findings of related research on automatic affect (Bornstein, 1989; Murphy, Monahan, & Zajonc, 1995; Murphy & Zajonc, 1993), the more the experimental task requires conscious and deliberate evaluation efforts, as in the original Fazio et al. (1986) studies, the weaker and more restricted are the effects obtained. Conversely, the less intentional and conscious involvement in the production of an affective response to a stimulus, as in the Bargh et al. (1996) pronunciation experiments, the stronger and more widespread the effect.

Our point is not that one set of findings is more valid than the other. We do acknowledge that there seem to be specifiable conditions under which automatic attitude activation is more versus less likely to occur. Often, people are consciously and intentionally evaluating themselves, other people, and other types of attitude objects while interacting with them, and under such conditions, variations in the strength of their attitudes should be more likely to matter in determining which attitudes will and which will not influence ongoing behavior. At times when people are not consciously and intentionally evaluating but have other purposes (and things on their minds), variations in attitude strength should not matter so much; rather, all relevant evaluations stored in memory should influence ongoing behavior.

From a functional perspective, why should this be so? Why should the automatic version of attitude activation be so general when the conscious goal of evaluation is not operative and less general when a person is meaning to evaluate? In our view, the automatic evaluation effect is an adaptive back-up system for those times when conscious processing is elsewhere or not focused on the goodness or badness of immediately present stimuli. A stronger version of the argument may be that the effects of automatic processing are the status quo and are only occasionally overridden by conscious intervention. Regardless, by itself, evaluation of a stimulus as good or bad does not provide a person any adaptive benefit—only if it immediately prepares appropriate responses to the stimulus would it be of any value. In other words, the automatic evaluation phenomenon is unlikely to be an isolated cognitive effect unconnected to further information processing or responses "downstream." Not surprisingly, then, the history of attitude research provides us with a likely candidate for one such downstream consequence of automatic evaluation: approach and avoidance behavioral tendencies.

ATTITUDES AS PREDISPOSITIONS FOR BEHAVIOR

Early theorists defined all attitudes as behavioral dispositions to respond in particular ways. Bogardus (1931) stated that "an attitude is a tendency to act toward or against something in the environment which becomes thereby a positive or negative value" (p. 62). Similarly, Allport (1935) stated that "an attitude is a mental and neural state of readiness . . . exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (p. 810). And Campbell (1963) posited that attitudes were comprised of acquired behavioral dispositions, in which learned states created an inclination for directional responding. Similarly, Triandis (1971) defined attitudes as "an idea charged with emotion which predisposes a class of actions to a particular class of social situations" (p. 2). Note that such behavioral components were ascribed to the nature of all attitudes regardless of centrality, importance, and so forth and also that (perhaps in keeping with the dominant behaviorism of the time) attitudes were said to directly affect behavior, without intervening factors such as conscious choice or deliberation.

From a different perspective, Lewin (1935, p. 62) argued that environmental objects (including people) and events acquire valences that steer behavior in the situation. He conceived of the external environment as directing one's behaviors through a series of dynamic fields that pushed or pulled one toward or away from various environmental stimuli. Positively valenced objects in the field were said to have "attraction motives" attached to them, and negatively valenced objects had "avoidance motives" attached to them (see also Miller, 1944).

Perhaps most relevant to the present argument is the early claim by Osgood (1953, p. 412) that the "sign" or mental representation of an object contains within it a representation of the behavior (approach or avoidance) that is typically elicited by that object. For Osgood, the reason why evaluation was by far the major component of semantic meaning of an object (as shown by his semantic differential measurement technique; see Osgood, Suci, & Tannenbaum, 1957) was because it served as a guide for behavior toward the object. More recently, the emotion-motivation model of Lang, Bradley, and Cuthbert (1990) similarly contends that the mere presence of a stimulus object results immediately in the activation of either a positive approach or a negative avoidance motivational system depending on stimulus valence.

Thus, there is considerable precedent for the hypothesis that attitudes and evaluations may automatically evoke approach and avoidance behavioral tendencies. The present experiments were designed to provide a test of whether automatic stimulus evaluation directly produces such predispositions to respond. We hypothesized that stored evaluative information that is automatically activated initiates directive forces on motoric behavior. The most functional tendency, given the assumed need of the individual to be prepared to move immediately toward or away from the object based on its evaluation, would be manifested in positive evaluations resulting in muscular movements associated with approaching an object and negative evaluations producing muscular movements associated with avoiding an object. Furthermore, in line with our characterization of the general automatic evaluation effect as a default, nonconscious back-up system, we hypothesized that such a relation between evaluation and motoric action tendencies would not be moderated by variations in attitude strength but that automatic evaluation would produce behavioral tendencies for all stimuli.

EVALUATION AND MOTOR MOVEMENT

Recently, Cacioppo, Priester, and Berntson (1993) have demonstrated a link between evaluation and motor responses but in the reverse direction from that of our hypothesis. Specifically, they showed that a participant liked presented stimuli more when his or her arm was simultaneously in a state associated with approach reactions (flexing the arm, as when pulling something toward one) than if it was in a state associated with avoidance reactions (extending the arm, as when pushing something away). Participants were unaware of any relation between the position of their arm and the attitudes they formed of the stimuli. Likewise, Forster and Strack (1996) found that maintaining approach and avoidance arm positions during exposure to various stimuli influenced the likelihood of recall of information. Participants were more likely to remember information after having engaged in approach movements compared to after having engaged in avoidance movements. These results are consistent with the present hypothesis in that they show a relation between attitude formation and the muscle movements associated with approach/avoidance. However, our hypothesis is of the reverse causal direction: Automatic evaluation immediately activates these respective muscular tendencies.

Many years ago, a student of Osgood's (see, e.g., 1953) had tested the connection between evaluation and approach/avoidance motivation. Solarz (1960) presented stimulus words to his participants by means of a display box mounted on a response lever. A mechanical device would drop a card into a slot area visible to the participant, and at the same time, an electronic timer would be started. Half of the participants in the study were instructed to pull the lever toward them if they liked the object corresponding to the stimulus word and to push the lever away from them if they did not like the object; the remaining participants were given the opposite instructions. Consistent with the present hypothesis, participants were faster when pushing to indicate dislike of the named stimulus and were faster when pulling to indicate liking.

OVERVIEW OF THE EXPERIMENTS

The present experiments sought to replicate and extend this early demonstration by Solarz (1960). Experiment 1 was a conceptual replication of the Solarz study. Some participants were instructed to push the response lever away from them if the stimulus word presented on a given trial was positive in evaluation and to pull the lever toward them if the stimulus was negative in evaluation. The remaining participants received the opposite instructions. The positive and negative attitude object stimuli consisted of the same set of 92 attitude object names developed by Fazio et al. (1996, Experiment 2) and used in previous automatic attitude activation research (see Bargh et al., 1992, appendix).

It is important to note that whereas participants would be consciously and intentionally evaluating each of the stimuli (as in the Solarz, 1960, experiment)—so that attitude activation itself cannot be said to be automatic under this procedure—any effect of attitude activation on approach and avoidance behavioral tendencies would be automatic because participants do not intend to push or pull the lever faster or slower based on stimulus valence (and are not aware that they are doing so). Nonetheless, it is critical to test whether the entire sequence from stimulus presentation to approach/avoidance motoric behavior is nonconscious, that is, not requiring any deliberate conscious processing. Experiment 2 was therefore designed to remove the conscious evaluation task from the Solarz paradigm. Participants simply reacted to the presence of each positive or negative attitude object stimulus as quickly as they could by either pushing (in one block) or pulling (in the other) the lever. If the predicted effect of stimulus valence on pull versus push response speeds are obtained when the individual does not have the explicit conscious goal of evaluating the stimuli, we can conclude that automatic evaluation of stimuli in turn automatically predisposes approach and avoidance reactions to them.

As an ancillary hypothesis, in both experiments we expected that the congruency effect between motion direction and word valence would not be moderated by attitude strength. Previous theorists (e.g., Campbell, 1963; Lewin, 1935; Osgood, 1953) have always considered valence as the primary determinant of approach and avoidance behavior, and attitude strength as secondary. Consequently, we too do not expect attitude strength to play a primary role in the ability to enact behaviors at an automatic level.

EXPERIMENT 1

Method

Participants. Participating in the experiment to complete a course requirement were 52 introductory psychology students (14 males, 38 females) at New York University. Data from 10 participants were excluded from the analyses because they did not meet our language fluency criterion of learning English by age 10.

Materials and apparatus. The 2.7 m × 3 m experimental room contained a cathode ray tube (CRT) display under program control of an Apple II Plus microcomputer. The CRT was placed at the participant's eye level, approximately 68 cm from the face. Also, a lever 91 cm in length was connected to a electric switch at the base. This switchbox was connected to the computer through the serial port and enabled the collection of response times and directional responses.

The 92 attitude object stimuli used in previous automatic attitude research (Bargh et al., 1992; Fazio et al., 1986) were also used in the present experiments and were presented to all participants in a single, random order.

Procedure. Participants were seated in front of the CRT display with the lever placed on a stand next to the participant's dominant hand. The participants were told that the experiment concerned how quickly they could classify words on the computer screen as good or bad in meaning. Participants were randomly assigned to one of two experimental conditions. In the incongruent condition, the participants were instructed to push the lever forward with their hand as quickly as possible when they judged the word as good and to pull the lever back toward them when they judged the word as bad. In the congruent condition, participants were given the opposite instructions: to pull the lever if the word was positive in meaning and to push the lever if the word was negative in meaning.

Participants then performed 10 practice trials with the experimenter present. After ensuring that the participant understood the directions, the experimenter pressed a computer key that began the experimental trials and then left the room.

Each attitude object stimulus appeared in the middle of the CRT screen and remained on the screen until the participant moved the lever sufficiently to close the response box switch. The computer automatically recorded the amount of time between when the word first appeared on the screen and when the participant made a movement of the lever of more than 10 degrees in a given direction for each trial. The computer also recorded whether the participant had pushed or pulled the lever on each trial. After a 4 s delay, the next trial began. The computer beeped after the final trial, signaling the experimenter to return to the room. All participants were then fully debriefed and thanked for their help with the study.

Results

All latencies greater than 4,000 ms (2.0%) were considered outliers and omitted from the analyses. These latencies appeared to occur mainly on trials in which participants believed they had responded, not realizing that they had moved the lever an insufficient distance to be detected by the computer. Also, evaluation latencies less than 300 ms (0.6%) were assumed to be anticipations and also omitted. A log transformation was conducted to eliminate the positive skew of the latency distribution prior to statistical analysis. (For ease of interpretation, all means are given in the original millisecond reaction latencies.)

For each participant, we computed the mean log-transformed response latency for each of the two congruency conditions of the design. A repeated measures analysis of variance (ANOVA) was then conducted with motion congruence (incongruent: push positive and pull negative vs. congruent: pull positive and push negative) as the between-participants factor and stimulus valence (good vs. bad) as the within-participants factor. As predicted, the congruency condition yielded faster response times (M = 1,683 ms) compared to participants in the incongruency condition (M = 1,950 ms), $F(1,40) = 8.06$, $p < .01$. Thus, participants were faster to pull than to push the lever when indicating a positive evaluation and faster to push than to pull the lever to indicate a negative evaluation (see Figure 1, left panel).

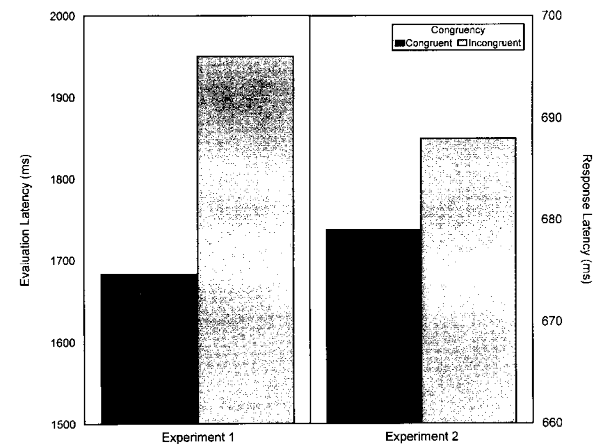

Figure 1 **Mean (untransformed) evaluation response latencies (in milliseconds) by response congruency (pull/good and push/bad vs. pull/bad and push/good) in Experiment 1 (left panel) and mean (untransformed) reaction time (in milliseconds) by congruency in Experiment 2 (right panel).**

The ANOVA also resulted in a significant main effect of stimulus valence such that response latencies for negative words were shorter overall than were latencies for positive words, $F(1,40) = 17.29$, $p < .001$. Because the Bargh et al. (1992) norming study showed that the positively and negatively evaluated attitude objects did not differ from each other on variables that could have artificially produced differences in response times—such as word frequency and length—this finding can be taken as further evidence of a greater automatic vigilance for or sensitivity toward negative information in the environment (e.g., Pratto & John, 1991; Taylor, 1991). No other significant effects were obtained (ps > .10).

To assess whether attitude strength moderated the obtained effect, we conducted further analyses based on the normative index of attitude strength (mean evaluation latency) from Bargh et al. (1992). We operationalized attitude strength in two different ways: one based on a median split and another including only the 25 fastest and 25 slowest evaluated attitude objects from

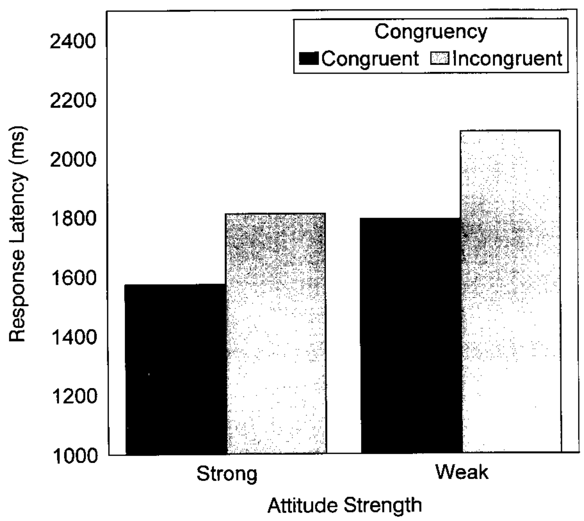

Figure 2 Mean (untransformed) evaluation response latencies (in ms) by response congruency (pull/good and push/bad vs. pull/bad and push/good) and attitude strength (strong vs. weak) in Experiment 1.

those norms. Two-way repeated measures ANOVAs were then conducted on the log-transformed response latencies, with congruency and attitude strength as the independent variables. This analysis showed that attitude strength (regardless of how it was operationalized) did not moderate the reliable congruency main effect, both $ps > .19$[1] (see Figure 2).

Discussion

The results of Experiment 1 are consistent with the hypothesis that the process of evaluation is automatically linked to motoric approach and avoidance responses. The (conscious and intentional) evaluation of a stimulus as good results in a concurrent relative facilitation of the arm muscles involved in pulling an object toward oneself, and the evaluation of an object as bad facilitates the extensor or pushing arm muscles, although the participant does not intend to pull or push faster for one stimulus versus another and is not aware he or she is doing so. This effect of evaluation on response readiness held equally for all attitude objects studied across a wide range of attitude strengths and regardless of clear differences between the strong and weak attitude object sets across all normative indexes of strength (see Bargh et al., 1992, appendix). This latter finding supports our hypothesis that link between evaluation and immediate behavioral readiness holds evenly for all stimuli.

As in the original Solarz (1960) study, our Experiment 1 participants had the conscious and strategic processing goal of evaluating each attitude object. To test the hypothesis that behavioral predispositions are automatically initiated by nonconscious evaluation, Experiment 2 removed the task instructions to evaluate the attitude object stimuli. We hypothesized that the link between evaluation and motoric action should not require the strategic goal to evaluate. Because the automatic evaluation effect itself does not require an operative conscious goal to evaluate (Bargh et al., 1996), the adaptive consequences of the effect (i.e., immediate approach and avoidance tendencies) should not either. Thus, approach and avoidance response tendencies to stimuli should occur even when the individual is not intentionally evaluating those stimuli.

EXPERIMENT 2

Method

Participants. To fulfill a course requirement, 56 introductory psychology students (23 males, 33 females) at New York University participated in the experiment. Data from 6 participants were excluded from the final analyses because those participants did not meet the language requirement criterion of learning English by age 10.

Materials, apparatus, and procedure. Everything was the same as in Experiment 1, with one exception. Instead of asking participants to evaluate each of the stimuli by moving the lever, the instructions were to either always push (or always pull) the lever as quickly as possible in reaction to each stimulus presentation. No mention of evaluation was made; participants believed the experiment concerned speed of reaction only. To facilitate this cover story, the program was further modified so that on each trial there was a random delay of from 2 to 7 s before the stimulus word appeared, so that the participant had to remain vigilant and could not anticipate the word presentation.

For each participant, halfway through the 92 trials, a new set of instructions was presented on the computer screen and orally by the experimenter. The direction of the lever movements was changed so that those who had pushed the lever during the first 46 trials were now to pull it and vice versa for the remainder of the trials. The order of presentation of stimulus words in both conditions was the same for all participants.

Results

Because in this experiment participants simply reacted to the attitude object as quickly as possible and were not required to make any (explicit) judgments concerning it, the response latencies were generally faster than in Experiment 1. Those that exceeded 1,500 ms (1.5%) were deleted as outliers. Also, response latencies that were below 300 ms (0.2%) were again deleted as anticipations. Finally, a log transformation was conducted on the remaining reaction times to eliminate positive skew in the distribution of raw scores. Once again, for ease of interpretation, all subsequent means are discussed in terms of the original ms reaction latencies.

For each participant, a log-transformed mean response latency was computed for each congruent (push negative, pull positive) and incongruent (push positive, pull negative) cell of the within-participants design. Because the participants did not make an evaluative judgment, stimuli were classified as to valence according to the results of the Bargh et al. (1992) norming study. Because the order factor—whether participants pushed or pulled the lever during the first half of the trials—made no difference to any of the reliable findings, this factor is not discussed further.

Once again, the predicted congruency main effect was significant, $F(1, 49) = 4.16$, $p < .05$. Participants were faster to pull (versus push) the lever in response to the presence of positive objects and to push (versus pull) the lever in response to the presence of negative objects (see Figure 1, right panel). As in Experiment 1, there was also a significant effect of valence, $F(1,49) = 5.35$, $p < .05$, such that negatively valenced words (M = 679 ms) yielded faster overall response latencies compared to positively valenced words (M = 688 ms).

As in Experiment 1, we tested whether attitude strength as operationalized by normative evaluation latency moderated the congruency main effect. Again, we performed the analysis both using a median split on the normative attitude strength (mean evaluation latency) measure and by including only the top and bottom 25 attitude objects. Results were the same in both analyses, indicating that the two-way interaction was not significant, both ps > .20. If anything, the direction of the interaction is in the opposite direction to that which would be expected if attitude strength moderated the obtained effect, because the effect was (nonsignificantly) larger for weak rather than strong attitudes[2] (see Figure 3).

Discussion

The results of Experiment 2 demonstrate that in the absence of any conscious processing goal save to react as quickly as possible to the presentations of the stimulus words, response latencies continued to be a function of the congruency of the evaluative meaning of the stimuli with the particular motoric response called for by the experimental task. Across variations in attitude strength, the automatic evaluation of the 92 attitude objects produced immediate approach and avoidance motoric predispositions.

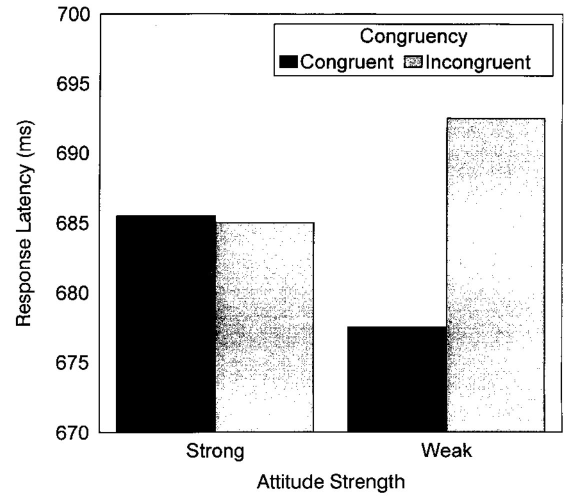

Figure 3 Mean (untransformed) evaluation response latencies (in milliseconds) by response congruency (pull/good and push/bad vs. pull/bad and push/good) and attitude strength (strong vs. weak) in Experiment 2.

GENERAL DISCUSSION

Taken together, the results of the two experiments support the hypothesis that the automatic evaluation effect has behavioral and motivational consequences. In both experiments, the interaction between motion direction and word valence indicated that approachlike muscle movements are relatively faster in the presence of positively valenced stimuli and relatively slower in the presence of negatively valenced stimuli. Avoidance-like muscle movements are relatively faster in the presence of negatively valenced stimuli and relatively slower in the presence of positively valenced stimuli. Experiment 2 further demonstrated that this automatic link between evaluation and behavioral tendency is entirely nonconscious, because (as is true of the automatic evaluation effect itself) it does not depend on the individual concurrently having the conscious and intentional goal of evaluating the stimuli.

The demonstrated existence of a direct link between automatic evaluation and approach/avoidance behavior is in harmony with the present proposal that automatic evaluative processes exist to prepare the individual for appropriate action toward stimuli that are not currently the focus of conscious, goal-directed processing. The immediate and efficient nature of the preparedness effect seems to make good adaptive sense, because it is able to occur when conscious goal-directed thought is elsewhere or when attentional resources are in short supply. Depending entirely on generally slow and capacity-limited conscious processes to notice and evaluate everything in sight and then prepare and initiate action would seem to be a less reliable and adaptive system for creating behavioral predispositions.

In both experiments, the automatically generated approach and avoidance tendencies occurred with equal probability for strong and weak attitudes, at least as defined at the normative level. Whereas these findings are inconsistent with models that call for attitude strength to moderate the accessibility of attitudes even at the automatic activation level (Fazio, 1989; Roskos-Ewoldsen & Fazio, 1992), in our view there is greater functionality in a nonconscious evaluation mechanism that reacts to all attitude objects. Because Fazio et al. (1986) operationally defined attitude strength in terms of how quickly a participant can consciously retrieve the attitude from memory, it makes sense for the conscious, goal-directed mode of attitude activation to be moderated by differences in attitude strength. However, it appears from the present findings that the activation of behavioral approach and avoidance tendencies occurs for all stimuli (at least, all that were presented in the present studies based on a set of 92 attitude objects created by Fazio et al., 1986, for the express purpose of spanning a wide range of attitude strengths) and independently of the conscious goal to evaluate—occurring both with (Experiment 1) and without (Experiment 2) that goal in place.

If the purpose of an attitude is to guide behavior toward the object, then the purpose of automatic evaluation should be to predispose the individual to behave in some way. The pervasiveness and nonconsciousness of automatic evaluation (Bargh et al., 1996) suggests that its purpose is to prepare the individual to react appropriately to all stimuli independently of the individual's goal-directed cognition.

However, because Lewin's (1943) earliest conjectures classified the effects of the psychological situation within the mind and not the external environment, it may be possible to generate quite different effects within the same paradigm. We would not rule out the possibility that, in some cases, the automatic behavioral responses observed in the current studies are somehow produced by the particular instructions provided to the participants. A reframing of the instructions could well have produced the opposite relationship between attitude and behavior as long as laws within the psychological situation remain intact. For instance, withdrawing from a stimulus is the natural response to being suddenly surprised, even though in the current experiments we conceptualize those same biceps flexion responses as approach behaviors. Similarly, in the Forster and Strack (1996) studies, we would expect that cultures in which head nodding was consistent with disagreement and head shaking was a sign of agreement would generate the opposite pattern from their observed findings. We rely on the psychological definition of approach and avoidance and the resulting mappings between the attitude and the behavior to generate our results. It is not the objectively observed behavior that is significant but, instead, the internal ramifications to the actor that are to be measured. From this perspective, it may be possible to reconcile how seemingly opposite fight and flight responses could both be produced by exposure to negatively valenced objects. Different social situations call for different responses, although both responses can be construed as avoidance. Although the scope of the current experiments is not designed to address these issues, they are necessary avenues of further research.

The second point to underscore is that the pervasive automatic evaluation effect (Bargh et al., 1996) has now been found to have an important purpose and function. It is linked directly to the basic motivational states of approach and avoidance and, presumably through such motivations, to actional tendencies. It makes sense that if people immediately classify most or all incoming stimuli as either good or as bad without meaning to or knowing that they are doing so, there must be a reason and purpose. But the consequences of the automatic evaluation effect are by no means necessarily limited to such motivational and behavioral effects. Other potential candidates for downstream effects of automatic evaluation are mood and emotion, and impression formation and social judgment biases.

The results of these experiments may have interesting implications for other literatures as well. For instance, establishing the existence of automatic evaluation effects on physical behavior may in turn result in further evolution of one's attitudes through postural stances such as those seen in previous studies (Cacioppo et al., 1993; Forster & Strack, 1996; Strack, Martin, & Stepper, 1988). More specifically, recursive mechanisms may exist that capitalize on the effects of attitudes on behavior and the effects of behavior on attitudes. And the effects of such recursive mechanisms may explain phenomena such as the strength and persistence of stereotypes and anchoring effects in attitudes and judgments. Furthermore, it might also be possible that the results of previous facial feedback studies can be generated by the inhibition or facilitation of those behaviors from evaluation activation. Although our results may be one possible path of previous effects, insightful research designs will be required to adequately disentangle the cyclical nature of the mechanisms.

Thus, the initial automatic evaluations of people, places, and things may—without the individual's knowledge of this bias—predispose the perceiver to categorize subsequent events involving that object in ways consistent with the immediate evaluation. As Allport (1954) wrote on the topic of stereotypes, "The qualities admired in Abraham Lincoln are deplored in the Jews" (p. 189). Although there are certainly many possible reasons for this state of affairs (see Hilton & von Hippel, 1996), one such possibility is the immediate increase in accessibility of those social categories that are consistent in valence with the initial automatic evaluation of the social group, resulting in the identical social behaviors being given either an opaque positive or negative spin as the case may be. More generally, the present finding of important behavioral consequences for the automatic evaluation effect suggests to us that pursuing other possible ramifications is a potentially fruitful avenue of research.

NOTES

1. There was also a significant main effect of attitude strength, F = (1, 40), $p < .05$, indicating that strong attitude objects were responded to faster (M = 1,691 ms) compared to weak attitude objects (M = 1,941 ms). This finding was to be expected given that attitude strength is defined in terms of conscious evaluation latencies, so that the strong and weak sets were selected based on relative evaluation latencies (see Bargh, Chaiken, Govender, & Pratto, 1992, appendix).

2. The main effect of attitude strength on response times found in Experiment 1 was not replicated in Experiment 2, $F(1, 49) < 1$, consistent with the interpretation that the two sets of stimuli differ in terms of how quickly they are consciously evaluated but not how quickly they are responded to in general.

REFERENCES

Allport, G. W. (1935). Attitudes. In C. Murchison (Ed.), *Handbook of social psychology* (pp. 798-844). Worcester, MA: Clark University Press.

Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Addison-Wesley.

Bargh, J. A., Chaiken, S., Govender, R., & Pratto, F. (1992). The generality of the automatic attitude activation effect. *Journal of Personality and Social Psychology, 62*, 893-912.

Bargh, J. A., Chaiken, S., Raymond, P., & Hymes, C. (1996). The automatic evaluation effect: Unconditionally automatic attitude activation with a pronunciation task. *Journal of Experimental Social Psychology, 32*, 104-128.

Bogardus, E. S. (1931). *Fundamentals of social psychology* (2nd ed.). New York: Century.

Bornstein, R. F. (1989). Exposure and affect: Overview and meta-analysis of research 1968-1987. *Psychological Bulletin, 106*, 265-289.

Cacioppo, J. T., Priester, J. R., & Berntson, G. G. (1993). Rudimentary determinants of attitudes: II. Arm flexion and extension have differential effects on attitudes. *Journal of Personality and Social Psychology, 65*, 5-17.

Campbell, D. T. (1963). Social attitudes and other acquired behavioral dispositions. In S. Koch (Ed.), *Psychology: A study of a science* (Vol. 6, pp. 94-172). New York: McGraw-Hill.

Chaiken, S., & Bargh, J. A. (1993). Occurrence versus moderation of the automatic attitude activation effect: Reply to Fazio. *Journal of Personality and Social Psychology, 64*, 759-765.

Converse, P. E. (1970). Attitudes and non-attitudes: Continuation of a dialogue. In E. R. Tufte (Ed.), *The quantitative analysis of social problems* (pp. 168-189). Reading, MA: Addison-Wesley.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich.

Fazio, R. H. (1986). How do attitudes guide behavior? In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (Vol. 1, pp. 204-243). New York: Guilford.

Fazio, R. H. (1989). On the power and functionality of attitudes: The role of attitude accessibility. In A. R. Pratkanis, S. J. Breckler, & A. G. Greenwald (Eds.), *Attitude structure and function* (pp. 153-179). Hillsdale, NJ: Lawrence Erlbaum.

Fazio, R. H. (1990). Multiple processes by which attitudes guide behavior: The MODE model as an integrative framework. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 23, pp. 75-109). New York: Academic Press.

Fazio, R. H. (1993). Variability in the likelihood of automatic attitude activation: Data reanalysis and commentary on Bargh, Chaiken, Govender & Pratto (1992). *Journal of Personality and Social Psychology, 64*, 753-758.

Fazio, R. H., Chen, J., McDonel, E. C., & Sherman, S. J. (1982). Attitude accessibility, attitude-behavior consistency, and the strength of the object-evaluation association. *Journal of Experimental Social Psychology, 18*, 339-357.

Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology, 50*, 229-238.

Fazio, R. H., & Williams, C. J. (1986). Attitude accessibility as a moderator of the attitude-perception and attitude-behavior relations: An investigation of the 1984 presidential election. *Journal of Personality and Social Psychology, 51*, 505-514.

Fazio, R. H., & Zanna, M. P. (1981). Direct experience and attitude-behavior consistency. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 14, pp. 161-202). San Diego, CA: Academic Press.

Fishbein, M., & Azjen, I. (1974). Attitudes towards objects as predictors of single and multiple behavioral criteria. *Psychological Review, 81*, 59-74.

Fishbein, M., & Azjen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Forster, J., & Strack, F. (1996). Influence of overt head movements on memory for valenced words: A case of conceptual-motor compatibility. *Journal of Personality and Social Psychology, 71*, 421-430.

Hilton, J. L., & von Hippel, W. (1996). Stereotypes. *Annual Review of Psychology, 47*, 237-271.

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1990). Emotion, attention, and the startle reflex. *Psychological Review, 97*, 377-395.

LaPiere, R. T. (1934). Attitudes vs. actions. *Social Forces, 13*, 230-237.

Lewin, K. (1935). *A dynamic theory of personality*. New York: McGraw-Hill.

Lewin, K. (1943). Defining the "field at a given time." *Psychological Review, 50*, 292-310.

Logan, G. D. (1980). Short-term memory demands of reaction time that differ in complexity. *Journal of Experimental Psychology: Human Perception and Performance, 6*, 375-389.

Miller, N. E. (1944). Experimental studies of conflict. In J. M. Hunt (Ed.), *Personality and the behavior disorders* (Vol. 1, pp. 431-465). New York: Ronald Press.

Murphy, S. T., Monahan, J. L., & Zajonc, R. B. (1995). Additivity of nonconscious affect: Combined effects of priming and exposure. *Journal of Personality and Social Psychology, 69*, 589-602.

Murphy, S. T., & Zajonc, R. B. (1993). Affect, cognition, and awareness: Affective priming with optimal and suboptimal stimulus exposures. *Journal of Personality and Social Psychology, 64*, 723-739.

Neely, J. H. (1977). Semantic priming and retrieval from lexical memory: Roles of inhibitionless spreading activation and limited-capacity attention. *Journal of Experimental Psychology: General, 106*, 226-254.

Neely, J. H. (1989). Semantic priming effects in visual word recognition: A selective review of current findings and theories. In D. Besner & G. Humphreys (Eds.), *Basic processes in reading: Visual word recognition*. Hillsdale, NJ: Lawrence Erlbaum.

Osgood, C. E. (1953). *Method and theory in experimental psychology*. New York: Oxford University Press.

Osgood, C. E., Suci, G. S., & Tannenbaum, P. H. (1957). *The measurement of meaning*. Urbana: University of Illinois Press.

Pratto, F., & John, O. P. (1991). Automatic vigilance: The attention-grabbing power of negative social information. *Journal of Personality and Social Psychology, 61*, 380-391.

Roskos-Ewoldsen, D. R., & Fazio, R. H. (1992). On the orienting value of attitudes: Attitude accessibility as a determinant of an object's attraction of visual attention. *Journal of Personality and Social Psychology, 63*, 198-211.

Solarz, A. (1960). Latency of instrumental responses as a function of compatibility with the meaning of eliciting verbal signs. *Journal of Experimental Psychology*, *59*, 239-245.

Strack, F., Martin, L. L., & Stepper, S. (1988). Inhibiting and facilitating conditions of the human smile: A nonobtrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology*, *54*, 768-777.

Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin*, *110*, 67-85.

Triandis, H. C. (1971). *Attitudes and attitude change*. New York: John Wiley.

Vallacher, R. R., & Wegner, D. M. (1985). *A theory of action identification*. Hillsdale, NJ: Lawrence Erlbaum.

Wicker, A. W. (1969). Attitudes versus actions: The relationship of verbal and overt behavioral responses to attitude objects. *Journal of Social Issues*, *25*, 41-78.

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