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After-affects: How automatic evaluations influence the interpretation of subsequent, unrelated stimuli ☆

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Abstract

Findings from three experiments suggest that participants' automatic evaluations of subliminally presented objects influenced how they interpreted subsequent, unrelated objects. Participants defined homographs (Experiment 1), categorized objects and people (Experiment 2), and made person judgments (Experiment 3) that all could be disambiguated in either a positive or negative way. Participants' responses to the ambiguous targets were evaluatively consistent with their automatic evaluations of preceding, semantically unrelated objects. The findings suggest that one's automatic evaluations can influence deliberate judgments of subsequent stimuli, even when the only shared dimension between the initially evaluated objects and the judged objects is an evaluative one. The implications of these findings are discussed with regard to possible mechanisms of evaluative priming as well as previous research concerning evaluative priming effects on social judgment.

Keywords: Social cognition; Evaluations; Evaluative priming; Automaticity; Priming; Impression formation; Judgment and decision-making

Introduction

Evaluative information about a stimulus is among the first types of knowledge that are activated, automatically, upon the initial perception of that stimulus (e.g., Bargh, Chaiken, Govender, & Pratto, 1992; Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Greenwald, Klinger, & Liu, 1989). That is, without intention, awareness, effort, or control (Balota, 1983; Bargh, 1989; MacLeod, 1991), one's evaluation of an object as good or bad becomes activated immediately upon the mere perception of the object. Evidence of such *automatic evaluations* of objects has been provided by evaluative priming paradigms (e.g., Fazio et al., 1986), the implicit association test (e.g., Greenwald, McGhee, & Schwartz, 1998), and brain imaging techniques (e.g., Cunningham, Johnson, Gatenby, Gore, & Banaji, 2003).

A central research question in this area concerns the degree to which such evaluations or attitudes have consequences for subsequent information processing and behavior (e.g., Banaji, 2001; Fazio, 2001). Whereas research has shown that one's automatic evaluation of a given stimulus can influence one's reactions toward that stimulus itself (e.g., Chen & Bargh, 1999; Fazio, Jackson, Dunton, & Williams, 1995; McConnell & Leibold, 2001), do such evaluations influence or shape one's interpretation of subsequent, unrelated stimuli? In other words, are there any after-effects of automatic evalua-

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tions for the interpretation and judgment of unrelated stimuli?[1]

Evidence from evaluative priming research

Research suggests that automatic evaluations can at least influence the *speed* of responses to unrelated stimuli. The literature on evaluative priming suggests that one's automatic evaluation of a prime stimulus makes one faster to respond to an unrelated target stimulus that is similarly versus dissimilarly valenced (e.g., Bargh et al., 1992; Fazio et al., 1986). For instance, a perceiver will respond faster to the target word *wonderful* when the preceding (and automatically evaluated) prime word is *sunshine* versus *garbage*.

Some researchers assume that such an effect emerges because the perception of *sunshine* renders accessible either a general concept of positivity (Fazio, 2001), or all positively valenced memories (Bargh, Chaiken, Raymond, & Hymes, 1996). Either way, this increased accessibility ostensibly allows the perceiver to process a similarly valenced target more quickly, either because the word *wonderful* is more accessible itself, or because it takes less time to evaluate *wonderful* as positive. Such a "spreading activation" type of account is consistent with explanations of semantic priming (e.g., see Neely, 1991), as well as widely held assumptions concerning the impact of accessible constructs on the facilitation of responses to construct-related stimuli.

According to the above explanation, one would predict that automatic evaluations of prime stimuli should also influence how perceivers *interpret* evaluatively ambiguous and unrelated targets. For example, if the perception of the prime *sunshine* renders the construct of positivity (or all positive memories) more accessible, then the perceiver should be more likely to automatically interpret the subsequently presented homograph *beat* as *rhythm* (its positive definition), rather than *a violent action* (its negative definition). The perception of *sunshine*, in other words, should introduce an automatic bias toward the positively versus negatively valenced interpretation of the target stimulus, and influence how the perceiver "sees" the stimulus.

Other research, however, casts doubt on the tenability of the above prediction. Considerable disagreement exists about whether the evaluative priming effect can be explained by the aforementioned "spreading activation" account. Various researchers have proposed accounts that do not make any reference to increased accessibility of valence constructs, such as response competition accounts (e.g., see Klauer & Musch, 2003; Klinger, Burton, & Pitts, 2000; Wentura, 1999). According to these explanations, the evaluative priming effect should only emerge in priming paradigms in which participants have to generate responses to the targets that could potentially conflict with their evaluations of the primes, such as in an evaluation task when participants have to judge each target as GOOD or BAD. In such a task, participants presumably respond faster to targets that are preceded by similarly (vs. dissimilarly) valenced primes because their responses to the prime and the target are in agreement and do not provoke competition. Critically, when the task does not require participants to generate responses that could conflict with their evaluations of the primes, there should be no evaluative priming effect, and in fact, multiple studies support this assertion (e.g., Klauer & Stern, 1992; Klinger et al., 2000; Wentura, 2000). Because the interpretation of unrelated stimuli would not involve the generation of potentially conflicting responses (i.e., "GOOD" or "BAD"), a response competition account would not directly predict an evaluative priming effect on unrelated interpretation and judgment.

Evidence from research on social judgment

The literature on evaluative priming effects on social judgment also suggests that automatic evaluations may not, in general, influence the interpretation of unrelated stimuli. Numerous researchers have found that the evaluative implications of trait stimuli have no impact on unrelated person judgments (see also Bargh, Bond, Lombardi, & Tota, 1986; Devine, 1989; Erdley & D'Agostino, 1988; Higgins, 1996; Higgins, Rholes, & Jones, 1977; Sedikides, 1990). For example, Higgins et al. (1977) found that inapplicable primes such as *neat* did not influence participants' subsequent judgments about Donald's ambiguously *persistent* behavior, even though the two traits share the same (positive) valence. These findings are in accord with the general principle of applicability in priming research that a primed construct will only influence the interpretation of a target to the extent that there is overlap between the attended features of the primed construct and the attended features of the target (e.g., see Higgins, 1996; Stapel & Koomen, 2000).

Furthermore, the handful of researchers who have found an effect of evaluative priming on unrelated person judgment have had to induce participants to feel like experts in social judgment (possibly lowering their threshold for the usability of information; Croizet & Fiske, 2000), have participants directly experience or repeatedly practice their evaluations of the primes before the judgment task (Fazio, Powell, & Herr, 1983, Study

[1] Research suggests that the perception of stimuli can influence *evaluative* or *liking* judgments of subsequent unrelated stimuli through evaluative conditioning (e.g., Levey & Martin, 1975; Walther, 2002) and affective priming (e.g., Murphy & Zajonc, 1993); however, we are interested in whether automatic evaluations influence *non-liking* judgments and interpretation of unrelated stimuli.

2), or use broad and evaluatively extreme trait primes (e.g., *good*) rather than evaluatively moderate and narrow trait primes (e.g., *frugal*; Stapel & Koomen, 2000). These findings suggest that the effect of automatic evaluations of prime stimuli on the interpretation of unrelated stimuli might only emerge under certain circumstances.

Overview of experiments

To provide more evidence to the ongoing research concerning both the mechanism and robustness of evaluative priming, we tested whether automatic evaluations influence the interpretation and judgment of unrelated stimuli. Participants in each of three experiments were subliminally primed with positive, negative, or control prime stimuli, and then defined homographs (Experiment 1), categorized objects and people (Experiment 2), or judged people's personality traits (Experiment 3). In each experiment, the target stimuli were ambiguous in that they could be interpreted in both positive and negative ways. We hypothesized that participants would automatically interpret the unrelated target stimuli in a way that is evaluatively consistent with their automatic evaluations of the preceding primes.

Experiment 1

Overview

In this first experiment, we asked participants to define a set of words as quickly as possible. Embedded in these words were homographs that possessed definitions that differed in valence (e.g., *beat*). We expected that participants' automatic evaluations of the primes that preceded the homographs would lead them to "see" evaluatively consistent definitions of the unrelated homographs.

Method

Participants

Participants were 129 undergraduates at New York University who participated in the experiment in exchange for course credit.[2]

Materials

Prime stimuli were selected from previous research (Bargh et al., 1992) and included *vacation*, *Friday*, *gift*, *sunshine*, and *music* as the positive primes and *Monday*, *bombs*, *cavities*, *bugs*, and *anchovies* as the negative primes. The control prime was a nonsense letter string ("MZNBVZXCVB").

Nine homographs were chosen according to the criterion that their definitions differed in valence (see Ferraro & Kellas, 1990), and included the words *jerk*, *well*, *club*, *deck*, *left*, *belt*, *mold*, *beat*, and *mean*. Participants defined a total of 28 words, including the nine target homographs. The primes were semantically unrelated to the homographs and control words.

Design

The valence of the primes presented before the nine homographs constituted a between-person variable. Participants received all positive primes, all negative primes, or the control prime before each of the homographs, and received primes of the opposite valence and the control prime before the control words. Participants were therefore ultimately exposed to all of the primes in each condition. There were two randomly generated orders of the 28 words and this order variable constituted the other between-person variable.

Procedure

Participants were seated at individual computers and told that they would be defining a series of words on the computer as quickly as possible. They were instructed that their performance would be timed, and to write down the first definition that came to mind for each word. Participants were told that before each definition word five flashes would appear in random locations on the screen and that they should indicate whether each flash appeared on the left or right side of the screen by pressing the appropriately labeled key.

In each trial, a fixation symbol (+) appeared in the center of the screen for 1600 ms, and then the first prime appeared in one of four parafoveal locations on the screen, at a visual angle of between 2° and 6° (see Bargh & Chartrand, 2000). The prime was presented for 70 ms and was followed by a 50-ms mask ("ZXCVB NMZXC"). A question mark then appeared in the center of the screen to prompt participants to respond. After participants indicated where the first flash appeared, each of the subsequent four primes was presented in the same fashion as the first. After the final prime, the definition word appeared in the center of the screen. Participants then wrote down a definition and pressed "1" to start the next trial. Participants completed five practice trials before the experimental trials. The inter-trial interval was 1000 ms.

After the computer task, participants were given a funnel debriefing (Bargh & Chartrand, 2000) in which they were asked increasingly specific questions about the nature of the study, as well as whether they saw

[2] Across the experiments, given the speeded and language-based nature of the dependent measures, those who were not native English speakers were not invited to participate. When such pre-screening was not possible, the data from such participants were discarded.

any words appear in the flashes. They were then thanked and fully debriefed.

Results

None of the participants guessed the hypothesis and only 4 out of 129 (3.1%) said that they thought they saw a word appear during the flash, although none of them could report a word so their data were included in the analyses. To classify the homograph definitions as positive versus negative, the experimenter and an uninformed judge assigned one (or more) meaning(s) of each homograph as relatively more positive and the other(s) as relatively more negative. The meanings of the homographs were evaluated with respect to each other rather than in isolation of any explicit referent. Our central hypothesis is that a participant's automatic positive evaluation (for example) of a prime stimulus will give an advantage to the response that is most positive *relative* to the other possible responses. The categorization of word meaning according to valence is presented in Table 1. There was inter-judge reliability (coefficient $\alpha = .88$) and discrepancies were resolved through discussion. Moreover, to gather empirical validation for the coding scheme, a normative study was conducted in which 14 participants were asked to classify all of the meanings of the homographs as relatively more positive or negative. The variance across participants in the classification for a given homograph definition was typically zero. Over 98% of the classifications were in accord with the original coding scheme.

The average proportion of positive definitions across the nine homographs was entered into a univariate ANOVA with priming condition (positive, negative, and control) and order of presentation (two orders) as the independent factors. A main effect of priming condition emerged, $F(2, 123) = 3.52$, $p = .03$, such that those in the positive priming condition ($M = .63$) gave significantly more positive definitions for the homographs than those in the negative priming condition ($M = .55$, $t(86) = 2.57$, $p = .01$). Those in the control condition did not generate a significantly different proportion of positive definitions than those in the positive or negative priming conditions. These results are presented in Fig. 1.

Discussion

The findings support the hypothesis that those who received subliminally presented positive (vs. negative) primes before the homographs would be significantly more likely to "see" the words in terms of their positive (vs. negative) meaning. These results suggest that automatic evaluations of stimuli can unintentionally influence the interpretation of subsequently presented, semantically unrelated stimuli. We sought to replicate this finding in the next two experiments.

Table 1
Classification of meanings for homographs in Experiment 1 as positive or negative

Homograph	Definition	Valence classification
Beat	Rhythmic stress in poetry or music	Positive
	To overcome, win	Positive
	To strike repeatedly	Negative
Belt	A strip of flexible material worn esp. around the waist	Positive
	Thrash; strike; hit	Negative
Club	An association of persons for some common object	Positive
	Nightclub	Positive
	A heavy usually tapering staff esp. of wood used as a weapon	Negative
	To beat or strike with	Negative
Deck	A flat floored roofless area adjoining a house	Positive
	A pack of playing cards	Positive
	To knock down forcibly	Negative
Jerk	A single quick motion of short duration	Positive
	An annoyingly stupid or foolish person	Negative
Left	The location or direction of the left side	Positive
	Past and past participle of *leave*; to be forgotten	Negative
Mean	Average; intermediary	Positive
	Intend; to have in the mind as a purpose	Positive
	Characterized by petty selfishness or malice	Negative
Mold	To give shape to	Positive
	A fungus	Negative
Well	With skill or aptitude; justly; rightly	Positive
	A pit or hole sunk into the earth for water	Negative

Note. Definitions paraphrased from Webster's Collegiate Dictionary, Tenth Edition; only those definitions reported by participants are presented.

Experiment 2

Overview

We tested whether participants' automatic evaluations of prime stimuli would influence their categorization of ambiguous target stimuli. For the target stimuli, we constructed stimulus triads that consisted of an evaluation object and two possible categorizations. Objects were either evaluatively ambiguous in that their categorizations strongly differed in valence (e.g., Mike Tyson could be categorized as a *boxer* or a *rapist*; Smith, Fazio, & Cejka, 1996), or were unambiguous

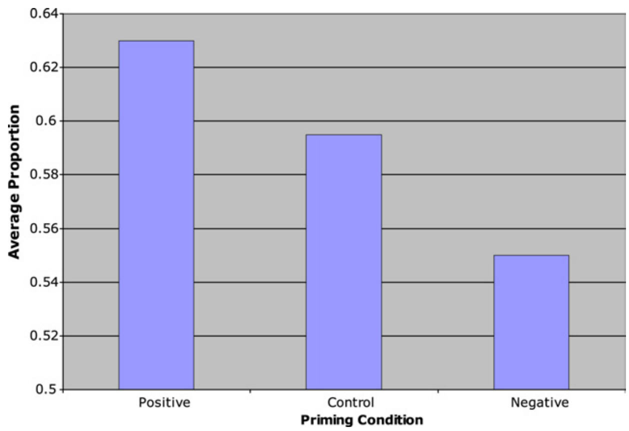

Fig. 1. Average proportion of positive definitions as a function of priming condition.

in that their categorizations did not strongly differ in valence (e.g., Madonna could be categorized as a *mother* or a *musician*). Each triad was preceded by subliminally presented positive, negative, or control prime stimuli. We expected that participants' evaluations of the preceding primes would lead them to categorize the ambiguous objects in an evaluatively consistent manner.

Method

Participants

Participants were 86 undergraduates at Cornell University who participated in the experiment in exchange for course credit, or on a voluntary basis.

Materials

Prime stimuli were selected from previous research (Bargh et al., 1992) and included 10 positive (*music*, *summer*, *birthday*, *dancing*, *flower*, *gift*, *holiday*, *cake*, *movies*, and *sunshine*) and 10 negative (*bombs*, *cancer*, *roach*, *death*, *disease*, *funeral*, *garbage*, *germs*, *rats*, and *virus*) non-trait words, as well as a nonsense stimulus ("DSNPXOWJH").

The target stimuli included 14 ambiguous object triads and 20 control object triads.[3] Whereas the categorizations of the objects in the ambiguous triads differed in valence, the categorizations of the objects in the control triads did not strongly differ in valence (see Table 2).

Table 2
Ambiguous and control objects and their associated categorizations; Experiment 2

Ambiguous objects	Categorization	
	Positive	Negative
Beach	Summer	Sunburn
Bill Clinton	Politician	Adulterer
Cake	Dessert	Fat
Chocolate	Food	Calories
Dentist	Doctor	Drill
John F. Kennedy	Leader	Assassination
Landlord	Owners	Rent
Mike Tyson	Boxer	Rapist
Pete Rose	Baseball	Gambling
Snow	Skiing	Cold
Storms	Nature	Damage
Television	Relaxation	Commercials
Vodka	Party	Hangover
Worms	Fisherman	Slime
Control objects	Categorization (no obvious difference in valence)	
Apple	Red Delicious	Granny Smith
Cereal	Breakfast	Crunchy
Chair	Sit	Furniture
Clock	Time	Alarm
Computer	Typing	Processing
Ghandi	Leader	Peacekeeper
Juice	Fruit	Sweet
Letter	Writing	Communication
Madonna	Mother	Musician
Mother Teresa	Humanitarian	Catholic Nun
Pencil	Lead	Writing
Popcorn	Butter	Movies
Princess Diana	Royalty	Mother
Reading	Knowledge	Words
Soap	Clean	Bubbles
Sweater	Fashion	Fabric
Teeth	Cleaning	Chewing
Tom Brokaw	Newscaster	Professional
Tree	Climbing	Branches
Yogurt	Dairy Product	Health Food

Design

The valence of the primes presented before the ambiguous objects constituted a between-person variable. Participants received either four positive primes, four negative primes, or four presentations of a nonsense stimulus before each of the 14 ambiguous objects, and received primes of the opposite valence and the nonsense stimulus before the control objects. The primes were semantically unrelated to the objects and associated possible categorizations.

Procedure

Participants were seated at individual computer stations and told that in each trial they would first see an object, and then two possible categorizations of that object. They were told to choose the categorization that seemed to best fit the object as fast as possible by press-

[3] Twenty ambiguous object triads were initially developed by the experimenters or taken from previous research (Smith et al., 1996). To ensure that these objects were ambiguous, 32 participants were asked to choose the best categorization for each of the objects. Six objects were categorized in the same way by over 90% of participants and thus were discarded, leaving 14 objects to be included in the present experiment as ambiguous objects.

ing the appropriately labeled key, and that their responses would be timed.

They were also told that in order to see how people perceive objects under time pressure and while doing multiple tasks, they would complete addition tasks in between the categorization trials. They were told that in each addition trial, they should sum the numbers that would sequentially appear at random intervals in the center of the screen. They were told that flashes would appear in the periphery of the screen but that they should keep their attention on the addition task. Within each trial, a total of either 5 or 6 presentations of the number 1 or 2 would appear, and the sums were always between 6 and 9. At random intervals while the numbers were appearing, the primes and masks were presented in one of the four quadrants of the screen. Each prime appeared for 40 ms (followed by an 80-ms mask, "FBXSDTVMJ"). Out of the 10 positive (negative) primes, four positive (negative) primes were assigned to each of the 14 target objects.

In each trial, after participants entered the sum, the categorization task immediately began with the object appearing by itself at the top of the screen for 1500 ms. Two words then appeared for 4000 ms at the bottom of the screen, one on the left side and the other on the right side. After participants pressed the "RIGHT" or "LEFT" key, the inter-trial interval of 5000 ms began. For the ambiguous objects, the location of the positive categorization (right or left side of the screen) was counterbalanced across trials. The 34 trials were randomly presented to each participant.

After completing the computer task, participants were given a funnel debriefing questionnaire, and then were thanked and fully debriefed. After participants were fully debriefed, 12 randomly selected participants were asked to complete some of the addition trials again, and after each flash to write down whether they thought a word was presented, and to identify the word if possible.

Results

None of the 12 participants reported seeing a word in the awareness check. Additionally, none of the participants guessed the hypothesis on the funnel debriefing sheet. Eight participants suspected that they were being subliminally primed in the addition task, but none suspected that they might have been primed with positivity or negativity, and thus their data were included in the analyses.

The categorizations for the target objects were selected by the experimenters to be either positive or negative in valence. The proportion of positive categorizations across the 14 target objects was entered into a univariate ANOVA with priming condition (positive, control, and negative) as the independent factor. A main effect of priming condition emerged, $F(2, 84) = 5.43$, and $p = .006$, such that those in the positive priming condition ($M = .70$) selected a significantly higher proportion of positive categorizations for the target objects than those in the control condition ($M = .60$, $t(84) = 2.16$, $p = .03$), and those in the negative priming condition ($M = .55$, $t(84) = 3.20$, $p = .002$). Those in the control condition did not select a significantly higher proportion of positive categorizations that those in negative priming conditions, $p = .3$. These results are presented in Fig. 2.

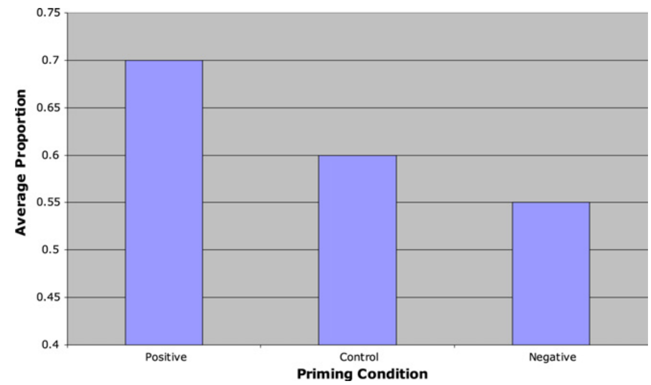

Fig. 2. Average proportion of positive categorizations as a function of priming condition.

Discussion

The current results replicate the findings from Experiment 1, and suggest that participants' automatic evaluations of the prime stimuli automatically influenced how they categorized the subsequent, unrelated social (e.g., Bill Clinton) and nonsocial (e.g., cake) objects. Participants who were presented with positive primes were significantly more likely to categorize the ambiguous objects in a positive manner, compared to those who received negative primes, and those who received control primes. In the next experiment, we tested the influence of automatic evaluations on deliberate judgments of people's personality.

Experiment 3

Overview

Participants were asked to view a series of photographs of men and women and decide the extent to which each person seemed to possess a certain personality trait. Each photograph was preceded by subliminally presented positive, negative, or control prime stimuli. As in the previous experiments, participants were randomly assigned to the priming conditions and were exposed to the same set of positive, negative, and control primes.

Method

Participants

Participants were 86 undergraduates at Cornell University who participated in the experiment in exchange for course credit.

Materials

Prime stimuli were the same as those in the previous experiment. Positive and negative personality traits were chosen as target stimuli and included the three positive traits *sincere*, *creative*, and *wise* and the three negative traits *mean*, *selfish*, and *rude.* There were also control personality traits that were included (*boring*, *loud*, *lazy*, *nice*, *neat*, and *helpful*). The target and control personality traits were selected according to a normative study in which 17 participants were asked to rate a series of people in photographs on the 12 personality traits according to an 8-point scale (1 = trait does not fit person at all, 8 = trait fits person very well). The six target traits with the highest variance were chosen as the target traits.

Design

The valence of the primes presented before the photographs with the target traits was a between-person variable. The sex of the person in the photograph constituted a within-person variable. Participants viewed a total of 48 photographs of men and women (24 men). The valence of the trait was the second within-person variable.

All of the people in the photographs had neutral expressions, and were photographed from the shoulders up. Each of the 12 traits was paired with four different photographs (two men, two women). The primes were semantically unrelated to all of the traits.

Procedure

Participants were seated at individual computers and told to decide whether each of a series of people might possess a particular personality trait. They were instructed that they would see a photograph appear in the center of the screen, and that a trait would appear in the lower right hand corner of the photograph. Their task was to indicate, using a scale of 1 (trait does not fit person at all) to 8 (trait fits person very well), the degree to which the trait seemed to fit the person in the photograph. They were instructed to use their first response and decide as quickly as possible, as their responses would be timed. Instructions about the "flashes" and the timing and location of the prime stimuli were identical to the procedure of Experiment 1, except that only four primes were used in each trial in the current experiment.

After completing the computer task, participants were given a funnel debriefing questionnaire and then were fully debriefed and thanked for their participation. After participants had been fully debriefed, 21 randomly selected participants were asked to complete an awareness check identical to the one used in Experiment 2.

Results

None of the participants guessed the hypothesis. Regarding the data from the awareness check, one participant (4.76%) accurately saw five of the primes presented. Additionally, 10 (11.6%) participants reported on the funnel debriefing sheet seeing at least one prime word (and wrote at least one word down). These 11 participants were excluded from data analysis.

Participants' judgments of personality (higher numbers indicate higher trait ratings) were entered into a repeated measures ANOVA with prime valence as a between-person variable (positive, control, and negative), sex of the person in the photograph as a within-person variable (male and female), and trait valence as a within-person variable (positive and negative). As predicted, a significant interaction between prime valence and personality trait valence emerged, $F(2,72) = 4.39$, $p = .016$. This interaction was not further qualified by the sex of the person in the photograph. As illustrated in Fig. 3, whereas those in the positive priming condition judged the target persons significantly higher on the positive traits ($M = 4.8$) compared to the negative traits ($M = 4.1$, $t(24) = -3.70$, and $p = .001$), those in the negative priming condition judged those same target persons significantly higher on those same negative traits ($M = 4.91$), compared to those same positive traits ($M = 4.5$, $t(24) = 2.24$, and $p = .035$). Those in the control condition did not judge the target persons higher on the positive ($M = 4.54$) versus the negative traits ($M = 4.5$ and $t < 1$).

Discussion

The results from this experiment suggest that participants' automatic evaluations of prime stimuli automati-

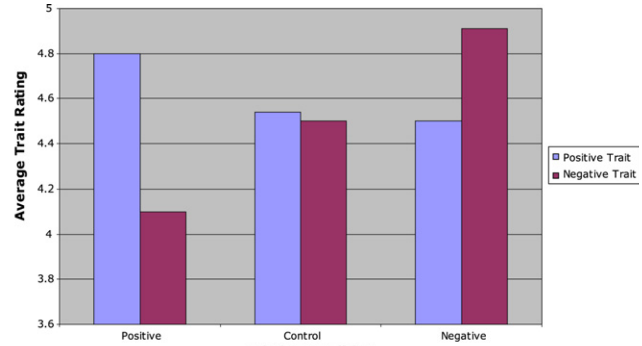

Fig. 3. Average trait judgment ratings as a function of personality trait valence and priming condition.

cally influenced their deliberate trait judgments about other people. Participants in all three priming conditions saw the same target persons, and judged them on the same personality traits. Nevertheless, those who received positive primes before the photographs rated the target persons significantly higher on the positive traits than the negative traits, whereas those who received negative primes before the photographs rated those same target persons as significantly lower on the positive traits than the negative traits. These results replicate the central finding from the previous two experiments that automatic evaluations of objects can unintentionally influence the interpretation of subsequently encountered, unrelated stimuli.

General discussion

These three experiments together show that automatic evaluations have "after-affects" that influence the deliberate interpretation and judgment of social and non-social stimuli. Specifically, participants' homograph definitions (Experiment 1), categorizations of objects and people (Experiment 2), and deliberate trait judgments (Experiment 3) tended to be evaluatively consistent with participants' automatic evaluations of immediately preceding, semantically unrelated prime stimuli.

Implications for a mechanism of evaluative priming

The findings are consistent with a "spreading activation" explanation of evaluative priming. According to this account, the perception and automatic evaluation of a prime stimulus should render more accessible a general construct of valence (or similarly valenced memories) that then affords an advantage in processing time for similarly valenced stimuli. This proposed accessibility also explains the current findings concerning the interpretation of unrelated, ambiguous stimuli. For instance, the accessibility that ensues from the perception of *sunshine* might introduce a slight bias toward the selection of the positively valenced interpretation of the homograph *beat.* Although a "spreading activation" metaphor is useful here as an explanatory tool, how might such a process actually be implemented?

As has been argued by some researchers (Wentura, 2000), parallel distributed processing (PDP) models (e.g., Anderson & Rosenfeld, 1988; McClelland, Rumelhart, & PDP Research Group , 1986) might explain evaluative priming effects, at least when the target stimuli are unambiguous. For example, Smith (1997, 2000) proposed that a modular connectionist system dedicated to evaluation might consist of two separate submodules, one responsible for identifying "goodness" and one for identifying "badness" across semantic patterns of activation (in line with Cacioppo & Berntson, 1994). Importantly, these evaluative submodules are hypothesized to be able to recognize common valence among representations that are otherwise unrelated. From this perspective, it seems possible that such an evaluative module could scan the representations of possible interpretations of an ambiguous target stimulus (e.g., Mike Tyson), and then "capture" the representation that shares the most recently activated valence (i.e., that of the prime). Further research toward this possibility would be valuable.

Whereas the current findings directly follow from a "spreading activation" account, they are not directly predicted by response competition accounts of evaluative priming (e.g., Klinger et al., 2000), which hold that evaluative priming effects should not emerge when responses to the target stimuli would not conflict with the evaluation of the primes (see Klauer & Musch, 2003 for a review). In none of the present experiments did participants explicitly evaluate the target stimuli, and yet a priming effect nevertheless emerged in all three experiments. These findings are therefore consistent with studies (e.g., Bargh et al., 1996; Hermans, DeHouwer, & Eelen, 1994) demonstrating that evaluative priming occurs even in non-evaluative tasks, which primarily supports a spreading activation account. The findings therefore speak to the importance of considering a "spreading activation" account for evaluative priming under certain circumstances. As some researchers have asserted (e.g., Fazio, 2001), evaluative priming effects may ultimately be explained by various mechanisms, according to perhaps the set of constraints in place at the time of perception and judgment, and the characteristics of the prime and target stimuli.

Automatic evaluations and social judgment

Previous research suggests that inapplicable primes will only influence unrelated judgment if participants feel like experts in the area (Croizet & Fiske, 2000), have direct or repeated experience with the primes (Fazio et al., 1983), or if the primes consist of evaluatively extreme and broad traits (Stapel & Koomen, 2000). The present pattern of results extends this research by showing that the automatic evaluation of subliminally presented (and therefore undetected) non-trait words can influence the interpretation of a variety of subsequent ambiguous stimuli, regardless of the applicability of the primes. For example, the findings suggest that one's automatic evaluation of *sunshine* can lead one to interpret the word *beat* as meaning rhythm versus a violent action, think of Bill Clinton as a politician rather than an adulterer, and judge other people as more sincere, and less selfish.

Why did such pervasive inapplicable priming effects emerge in this set of experiments? One possible reason for the difference in findings between the current research and previous research is the time lapse between the priming episode and the response (judgment) task. In previous studies in this area (Croizet & Fiske, 2000; Fazio et al., 1983; Higgins et al., 1977; Stapel & Koomen, 2000), at least several minutes elapsed between the presentation of the prime stimuli and the subsequent judgment task. In contrast, in the present experiments the target stimuli were presented immediately after the priming episode. One explanation for the importance of this difference is that with sufficient time, the influence of automatic evaluations of the primes might become diluted by the activation of evaluations of intervening stimuli between the priming episode and the judgment task. Indeed, Fazio et al. (1986) and others have found that the evaluative priming effect on response speed emerges only when the SOA is less than 300 ms, and not at longer SOAs. Apparently, although automatic evaluations of objects can influence unrelated judgments that occur minutes later under select conditions (e.g., Croizet & Fiske, 2000), a more pervasive effect of automatic evaluations on the interpretation of subsequent, unrelated stimuli occurs for ambiguous stimuli that are encountered immediately after the evaluated stimuli.

Conclusions

The present findings suggest that automatic evaluations of stimuli have immediate "after-affects" that can have relatively long-lasting repercussions for one's understanding of the world. That is, a fleeting, spontaneous, and unintentional appraisal of a given stimulus can impact the conscious and deliberate interpretation of a subsequently encountered (yet semantically unrelated) stimulus, with this interpretation potentially stored in memory and thus likely to then impact future decisions regarding that object. In this way, the current findings suggest that automatic evaluations of objects have important "downstream" consequences for social inferences and judgments, influencing the way in which we interpret subsequent social and nonsocial stimuli.

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