

Implicit Stereotyping in Person Judgment

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Three experiments demonstrated implicit gender stereotyping. A target's social category determined the use of previously primed stereotyped information, without Ss' awareness of such influence. After unscrambling sentences describing neutral or stereotyped behaviors about dependence or aggression, Ss evaluated a female or male target. Although ratings of female and male targets did not differ after exposure to neutral primes, Ss exposed to dependence primes rated a female target as more dependent than a male target who performed identical behaviors (Experiment 1A). Likewise, Ss rated a male, but not a female, target as more aggressive after exposure to aggression primes compared with neutral primes (Experiment 1B). Experiment 2 replicated the implicit stereotyping effect and additionally showed no relationship between explicit memory for primes and judgment of target's dependence.

I consider extremely fruitful this idea that social life should be explained, not by the notions of those who participate in it, but by more profound causes which are unperceived by consciousness, and I think also that these causes are to be sought mainly in the manner according to which the associated individuals are grouped.

—Emile Durkheim (1897, translation in Winch, 1958, pp. 23–24)

Essential to social psychology is the question of how people are evaluated. Hence, social psychologists have placed person judgment at the center of the research agenda of the discipline. Among the various components of person judgment is the process of stereotyping, whereby beliefs about a social group are used in judgments of the group or individual members of the group. Because stereotyped judgments simplify and justify social reality, they are among the most fundamental psychological events that determine the course of social relations.

Our approach to stereotyping draws on theoretical analyses of unconscious processes that have emerged in contemporary writing about cognition. In particular, we build on recent observations and experimental discoveries that (a) unconscious influences on behavior are common rather than rare (Greenwald & Banaji, 1993; Jacoby & Kelley, 1987), (b) examining the processes involved in unconscious learning and memory can advance the understanding of social behavior (Bargh, 1984; Lewicki & Hill, 1987; Smith, in press), and (c) stereotypes and attitudes can operate unconsciously (Banaji & Greenwald, in press; Bargh, 1992; Bargh, Chaiken, Gendler, & Pratto, 1992;

Brewer, 1988; Devine, 1989; Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Fiske, 1989; Gilbert & Hixon, 1991; Greenwald & Banaji, 1993; Perdue & Gurtman, 1990).

In the tradition of recent interest in unconscious social cognition, we expressly examine the phenomenon of implicit¹ stereotyping by showing that incidental exposure to stereotyped knowledge unconsciously, yet selectively, influences judgment. In particular, we theorized that incidental exposure to the same information will not influence judgments of all targets alike, but only those targets whose social category matches the social category of previously exposed information. Although we have placed our research in the tradition of general theories of unconscious cognition in social processes, the specific prediction we make about the importance of a match in social category derives from a long-standing hypothesis that may approach the status of a law in psychology. On a variety of measures of memory and judgment, and appearing under a variety of names (e.g., encoding specificity, transfer-appropriate processing, semantic priming, and applicability), research has confirmed the crucial role of a match between conditions that operate at learning or initial exposure and those that operate at retrieval or judgment. The nature of the match has been identified as deriving from context variables (Eich, 1980), procedures or process variables (Roediger, Weldon, & Challis, 1989; Smith, 1990; Tulving & Thomson, 1973), and content variables (semantic content: Brown, 1953; Erdley & D'Agostino, 1988; Higgins, Rholes, & Jones, 1977; Meyer & Schvaneveldt, 1971; Neely, 1977; Srull & Wyer, 1979; evaluative content: Bargh et al., 1992; Greenwald, Klinger, & Liu, 1989).

These theories, however, have not been concerned with the role of social category information in producing such effects. It

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¹ The term *implicit*, contrasted with *explicit*, is used to capture a distinction variously labeled as unconscious versus conscious, unaware versus aware, and indirect versus direct. To establish a connection between implicit memory and the role it plays in the stereotyping effect reported in this article, we borrow the term *implicit* from recent research on memory in which the term describes effects attributed to unreportable residues of prior experiences (Richardson-Klavehn & Bjork, 1988; Roediger, 1990; Schacter, 1987).

is not known, for example, whether social category information (which pervasively and effortlessly accompanies descriptions of people) is a dimension of knowledge that mediates the influence of prior information on subsequent judgments. Smith and Branscombe (1988), however, presaged the present experiments by commenting, "Past experiences with members of particular social groups . . . leave traces that may affect later reactions to similar others, perhaps without the perceiver being aware of the influence or even being able to retrieve the earlier experiences as explicit memories" (p. 502). In this article, we present direct evidence for implicit stereotyping.

A Procedure to Examine Implicit Stereotyping

Higgins et al. (1977) conducted a pioneer experiment on impression formation which introduced a method well-suited to our interest in implicit stereotyping. Subjects were exposed to positive or negative traits that were either semantically applicable or inapplicable to a story subjects subsequently read as part of an ostensibly unrelated experiment. Exposure to specific traits within a semantic category was hypothesized to "activate" the semantic category. The story described a person called Donald who performed behaviors ambiguous with respect to the trait categories. Previous exposure to positive, semantically applicable traits led subjects to rate Donald more positively, whereas previous exposure to negative, semantically applicable traits led subjects to rate Donald more negatively. Exposure to semantically inapplicable traits, whether positive or negative, did not affect judgments. This effect has been (a) replicated using an alternative method for initial trait exposure (Srull & Wyer, 1979, 1980), (b) obtained when the primed traits were presented subliminally (Bargh & Pietromonaco, 1982; Devine, 1989), (c) shown to not depend on a global evaluative response (Erdley & D'Agostino, 1988), and (d) shown to be sensitive to whether subjects remembered the primes or prime presentation event (Lombardi, Higgins, & Bargh, 1987; Strack, Schwarz, Bless, Kubler, & Wanke, 1993).

The finding that only applicable traits influence judgment takes on new meaning in the present research. Although research to date has used a variety of traits during priming (e.g., hostile and adventurous), the social category attributes of the target have not been manipulated. Perhaps this lack of manipulation has contributed to a tacit assumption that primed information influences judgments of any target, regardless of its social category (e.g., that prior exposure to hostility primes will equally influence the evaluation of both male and female targets). For instance, Devine (1989) subliminally exposed subjects to information stereotypically associated with Black Americans. Subjects judged a male target as more hostile when 80% of the primes were associated with the stereotype than when only 20% of the primes were associated with the stereotype. Because the target's race was unspecified, it remains to be seen whether this effect would be obtained for targets of all social categories.

Our interest in the procedure used by Higgins et al. (1977) stems from the opportunity it provides to observe directly the unconscious use of incidentally exposed stereotyped knowledge. We sought to test the hypothesis that the influence of a primed stereotype on subsequent judgment depends on the relationship between a target's social category and the stereotype.

Specifically, we propose that incidentally exposed stereotyped information will be used only if the social category of the target makes that information relevant to the judgment. For example, exposure to information about aggression will differentially influence judgments of ambiguously aggressive men and women, because aggression is stereotypical of men. Likewise, exposure to information about dependence should differentially influence judgments of ambiguously dependent women and men, because dependence is stereotypical of women. We refer to this dimension of match as *social category applicability*, which is consistent with the original assumption that the semantic applicability of information constrains the effect of prior exposure on subsequent person judgment (Higgins, 1989, 1990). In three experiments, we directly tested the hypothesis of social category applicability.

Experiments 1A and 1B

A target's social category was hypothesized to determine the implicit use of stereotyped information. We predicted higher ratings on the stereotyped trait for a target person whose social category was associated with the previously exposed stereotype. In particular, because dependence is stereotypically associated with women, a female target but not a male target will be judged to be more dependent after exposure to dependence primes than after exposure to neutral primes (an assimilation effect). Likewise, because aggression is stereotypically associated with men, a male target but not a female target will be judged to be more aggressive after exposure to aggression primes than after exposure to neutral primes (an assimilation effect).

On the other hand, when primed information is not stereotypical of the target's social category (e.g., when a male target is judged following exposure to dependence primes), more than one outcome is possible. In the previous literature, a lack of semantic applicability has been associated with the absence of an assimilation effect (Erdley & D'Agostino, 1988; Higgins et al., 1977; Srull & Wyer, 1979, 1980). On the basis of these findings, we predict no effect of prior exposure when a target's social category is irrelevant to or inconsistent with the primed stereotype. However, it is possible that if primes are negatively associated with a target's social category, a contrast effect may be obtained (Eiser, 1990). Finally, if the relationship between the primed stereotype and a target's social category is a function of the strength of applicability, weaker assimilation effects may be obtained. Because these experiments represent a first attempt to identify an effect of social category applicability, of primary importance to the present investigation is the prediction of a differential priming effect for targets who vary in no way except for their social category membership.

Method

Overview

Subjects participated in two ostensibly unrelated studies. During the "first study," subjects unscrambled sentences that were neutral or that described behaviors stereotypical of dependence or aggression. In the second study, subjects formed impressions of a target person as part of a reading comprehension task. The target paragraphs described a male

or female target who performed behaviors weakly related to the primed behaviors. Subjects then evaluated the target on several trait dimensions.

This procedure was replicated in two conceptually identical experiments. The first experiment involved the trait dimension *dependence* (Experiment 1A) and the second one involved *aggression* (Experiment 1B). These traits were selected because of their stereotypical association with women and men, respectively. We label the experiments 1A and 1B because although they were conducted concurrently, they are reported separately for clarity of presentation. Each subject was assigned to a condition in one of two 2×2 between-subjects designs: Experiment 1A (dependence): 2 (Prime Type: dependent or neutral) $\times$ 2 (Target Gender: male or female) or Experiment 1B (aggression): 2 (Prime Type: aggressive or neutral) $\times$ 2 (Target Gender: male or female).

Subjects

Two hundred twenty-two subjects (118 women and 104 men) participated in two experiments. Eighty-one subjects (46 women and 35 men) participated in Experiment 1A, and 141 subjects (72 women and 69 men) participated in Experiment 1B. One hundred sixty-three subjects were introductory psychology students who received course credit for their participation, and 59 subjects were recruited from the university undergraduate community and received \$5 for their participation. Subjects participated either individually or in small groups.

Materials

Priming stimuli development. On the basis of previous research on gender stereotypes, we selected the traits *dependent* and *aggressive* because each is strongly associated with female and male stereotypes, respectively (Bem, 1974; Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1970). To obtain an initial pool of stereotyped behaviors, 10 pretest subjects (7 women and 3 men) generated two lists of behaviors—one list “characteristic of aggressiveness in males” and a second list “characteristic of dependence in females.” Behaviors representing a range of negativity were described in five- or six-word sentences. From the pool of behaviors generated, a list of 180 aggressive and dependent behaviors was compiled. Each behavior description was transformed into a three-word phrase (e.g., *never backs down*; *won't go alone*). An independent sample of 22 pretest subjects (11 women and 11 men) rated each of the 180 behaviors on one of two dimensions: (a) the negativity of each behavior, or (b) the gender typicality of each behavior. Half the subjects (5 men and 6 women) rated negativity using a scale ranging from 1 (*not at all negative*) to 7 (*extremely negative*). The other half (6 men and 5 women) rated the gender typicality of each item on a scale ranging from 1 (*completely female*) to 7 (*completely male*), with a rating of 4 denoting a behavior equally characteristic of men and women.

Aggression and dependence items were selected according to the following criteria: (a) The mean ratings for male and female raters did not differ by more than 1.0 on ratings of either negativity or gender typicality, (b) all items were rated greater than or equal to 4.0 on negativity, (c) aggressive items were rated 5.0 or greater on gender typicality, and (d) dependent items were rated 3.0 or lower on gender typicality. A separate set of neutral behaviors unrelated to either aggression or dependence was also constructed. To create the scrambled sentences for the priming task, a fourth word was added to each three-word phrase, and the order of the four words was scrambled. Each set of scrambled words was preceded by an initial, understood by subjects to represent the name of the actor of each behavior. Initials were used instead of names to avoid priming as a function of actor's gender. A meaningful sentence could be constructed only by eliminating the incorrect fourth

word (e.g., *R read book by the, P alone cannot manage a, and M at shouts others of*). Adapted from a procedure established by Srull and Wyer (1979), the priming task consisted of marking the three words, besides the initial, that formed a complete sentence. The following three priming conditions were created by varying the content of the sentences subjects unscrambled: aggression (30 aggressive behaviors and 15 neutral behaviors), dependence (30 dependent behaviors and 15 neutral behaviors), and neutral (45 neutral behaviors). Aggressive behaviors consisted of items such as *belongs to NRA*, *threatens other people*, and *accelerates when passed*. Dependent behaviors consisted of items such as *can't make decisions*, *never leaves home*, and *stays unhappily married*. Neutral behaviors consisted of items such as *crossed the street*, *answered the phone*, and *set the date*.

Target paragraph development. The target paragraph described a series of activities involving the target to be judged and was designed to convey a minimal amount of trait-related information about the target. Experimenters first generated separate but similar stimulus stories for the aggression and dependence conditions. For each story, pretest subjects (11 for dependence and 12 for aggression) evaluated multiple versions of individual behaviors used in the stories for degree of representativeness of the target traits. These ratings were used as guides to create two similar stimulus stories that included behaviors only weakly related to the relevant trait embedded among neutral behaviors. The social category of the target was manipulated by making the target of the story either male (Donald) or female (Donna).

Trait ratings. Subjects rated the target person described in the target paragraph on a series of semantically and evaluatively related and unrelated traits using 10-point scales ranging from 1 (*not at all*) to 10 (*extremely*). For both experiments, semantically related and unrelated traits within evaluative valence were equated on ratings of likability (Anderson, 1968) and word frequency (Kucera & Francis, 1967).

Experiment 1A (dependence). The following 17 traits were selected for the judgment task: 1 target trait (*dependent*), 4 semantically related and evaluatively positive traits (*cooperative*, *polite*, *sympathetic*, and *thoughtful*), 4 semantically related and evaluatively negative traits (*inhibited*, *insecure*, *passive*, and *weak*), 4 semantically unrelated and evaluatively positive traits (*cultured*, *educated*, *neat*, and *talented*), and 4 semantically unrelated and evaluatively negative traits (*absent-minded*, *impractical*, *superstitious*, and *unhealthy*).

Experiment 1B (aggression). The following 17 traits were selected for the judgment task: 1 target trait (*aggressive*), 4 semantically related and evaluatively positive traits (*ambitious*, *confident*, *independent*, and *vigorous*), 4 semantically related and evaluatively negative traits (*argumentative*, *dominating*, *hot-headed*, and *stubborn*), 4 semantically unrelated and evaluatively positive traits (*careful*, *cultured*, *curious*, and *neat*), and 4 semantically unrelated and evaluatively negative traits (*boring*, *superficial*, *superstitious*, and *unhealthy*).²

Procedure

On arrival, subjects were informed about participating in two separate studies to be conducted by different experimenters. The first experimenter instructed subjects to complete several tasks unrelated to this study and to complete the sentence unscrambling priming task. Then, a second experimenter distributed a new packet of materials printed in a different font from those of the “first study.” Both manipulations—the different experimenters and different fonts—were used to ensure that the two studies were experienced as unrelated events by subjects. During the “second study,” subjects completed a reading comprehension task in which they read a story and answered questions

² All materials used in these experiments may be obtained by writing to the authors.

about the target. The story referred to either a male target (Donald) or a female target (Donna) who performed a series of behaviors weakly related to the target trait. After a filler task lasting approximately 10 min, subjects rated the target on the traits. After the trait ratings, tasks unrelated to the present experiment were completed. Finally, subjects were screened for awareness of the hypothesis and were debriefed. One subject (in Experiment 1B) expressed suspicion of a connection between the priming and judgment tasks and was excluded from all analyses.

Results

Data from Experiments 1A and 1B were analyzed separately. For ease of exposition, results are described separately as well. For each experiment, judgments on 16 traits other than the target trait were analyzed by the following categories: *related negative, related positive, unrelated negative, and unrelated positive*. Ratings on the four traits within each trait category were averaged to yield a single score. Each data set was analyzed as a three-way, between-subjects factorial: 2 (Prime Type: dependent (or aggressive) or neutral) $\times$ 2 (Target Gender: male or female) $\times$ 2 (Subject Gender: male or female). Small discrepancies between indicated degrees of freedom and relevant *ns* occur because a few subjects provided incomplete data.

Experiment 1A: Dependence

Analysis of variance (ANOVA) revealed no reliable main effects of subject sex, target gender, or prime type on any of the dependent variables. On the primary dependent variable, ratings on the trait *dependent* indicated a reliable Prime Type $\times$ Target Gender interaction, $F(1, 73) = 10.99, p < .001$. As shown in Table 1, the gender of the target determined the influence of previous exposure to dependence primes. Ratings of *dependent* for female and male targets were statistically equivalent for subjects exposed to neutral primes, $t(39) = 1.46, ns$, but mean ratings of *dependent* differed reliably for male versus female targets after exposure to dependence primes, $t(38) = 3.15, p = .003$. Ratings of the female target on *dependent* were higher for subjects exposed to dependence primes ($M = 8.25$) than neutral

primes ($M = 6.26$), $t(33) = 2.39, p = .02$. In contrast, ratings of the male target on *dependent* were lower for subjects exposed to dependence primes ($M = 5.83$) than neutral primes ($M = 7.22$), $t(44) = 2.26, p = .03$.

Judgments of the target on dependence-related, negative traits followed a similar pattern. An ANOVA revealed a reliable Prime Type $\times$ Target Gender interaction, $F(1, 73) = 5.58, p = .02$. Again, subjects in the neutral prime condition did not differ in ratings of female and male targets on dependence-related, negative traits, $t(39) = 1.59, ns$. However, subjects exposed to the dependence primes rated the female target somewhat higher than the male target on dependence-related, negative traits, $t(38) = 1.78, p = .07$. Ratings of the female target on dependence-related, negative traits were higher for subjects exposed to dependence primes ($M = 6.8$) than neutral primes ($M = 5.4$), $t(33) = 1.95, p = .06$. On the other hand, ratings of the male target did not differ as a function of priming condition (neutral and dependent M s = 6.4 and 5.7, respectively), $t(44) = 1.28, ns$. In contrast to this result, an ANOVA revealed no Prime Type $\times$ Target Gender interaction on dependence-related, positive traits. Furthermore, no reliable interactions as a function of the target and prime manipulations were found on ratings of dependence-unrelated traits, whether positive or negative (all F s < 1).

Experiment 1B: Aggression

The main findings of Experiment 1B replicated those of Experiment 1A. The predicted Prime Type $\times$ Target Gender interaction on the target trait *aggressive* was obtained, although marginally reliable, $F(1, 125) = 3.22, p = .07$.³ Paralleling the pattern observed in Experiment 1A, exposure to aggression primes influenced judgment of only a male (stereotype-consistent) target. As Table 2 shows, ratings for female and male targets were statistically equivalent in the neutral prime condition, $t(58) < 1$, although the effect of prior exposure to aggression primes differed as a function of the gender of the target. Ratings of the male target on *aggressive* were higher for subjects exposed to aggression primes ($M = 7.68$) than neutral primes ($M = 6.45$), $t(69) = 2.84, p = .006$. As expected, ratings of the female target on *aggressive* did not differ when subjects were exposed to aggression primes ($M = 7.05$) or neutral primes ($M = 7.0$), $t(60) < 1$. For subjects exposed to the aggression primes, ratings on *aggressive* were marginally higher for the male target than for the female target, $t(71) = 1.64, p = .10$. In addition, a reliable main effect of prime type on ratings of *aggressive* was obtained (aggression $M = 7.4$ vs. neutral $M = 6.7$), $F(1, 120) = 3.82, p = .05$. No comparable effects were obtained on semantically and evaluatively related traits. Consistent with the results from Experiment 1A, no reliable Prime Type $\times$ Target Gender

Table 1
Mean Rating of Dependent As a Function of Prime Type and Target Gender (Experiment 1A)

Target gender	Prime type	
	Neutral	Dependence
Female		
<i>M</i>	6.26 _a	8.25 _b
<i>SD</i>	2.64	2.17
<i>n</i>	19	16
Male		
<i>M</i>	7.22 _a	5.83 _c
<i>SD</i>	1.50	2.49
<i>n</i>	22	24

Note. Means should be compared horizontally and vertically. Means that differ reliably ($p < .05$) have different subscripts. All means were calculated from 10-point Likert scales, with higher numbers indicating greater dependence.

³ Seven subjects were excluded from the analysis because their mean ratings collapsed across positive and negative traits identified them as outliers. The criterion commonly adopted is based on Tukey's (1977) recommendation of computing an "outside" value. These subjects were distributed across all four cells, and excluding their data did not alter the pattern of results.

Table 2
Mean Rating of Aggressive As a Function of Prime Type and Target Gender (Experiment 1B)

Target gender	Prime type	
	Neutral	Aggression
Female		
<i>M</i>	7.00 _a	7.05 _{a,b}
<i>SD</i>	2.09	1.78
<i>n</i>	27	35
Male		
<i>M</i>	6.45 _a	7.68 _b
<i>SD</i>	2.15	1.47
<i>n</i>	33	38

Note. Means should be compared horizontally and vertically. Means that differ reliably ($p < .05$) have different subscripts. All means were calculated from 10-point Likert scales, with higher numbers indicating greater aggression.

interactions were obtained on ratings of aggression-related, positive traits or aggression-unrelated, positive or negative traits.⁴

Summary and Discussion

Two experiments confirmed the hypothesis that a target's social category will determine the implicit influence of stereotyped information on judgment. Incidental exposure to a stereotype influenced subsequent evaluations of a stereotype-consistent target. In Experiment 1A, subjects exposed to primes that described dependent behaviors judged a female target as more dependent than subjects who rated the same target after exposure to neutral primes (an assimilation effect). However, subjects exposed to the same dependence primes judged a male target as less dependent than subjects who rated the target after exposure to neutral primes (a contrast effect). In Experiment 1B, subjects exposed to primes describing aggressive behaviors judged a male target as more aggressive than subjects who rated the same target after exposure to neutral primes (an assimilation effect), whereas exposure to aggression primes had no influence on judgments of a female target. Together, Experiments 1A and 1B show that if a target's social category matches the social category associated with a previously exposed stereotype, the course of person judgment is altered.⁵

Three possible effects of prior exposure to a stereotype on judgment of stereotype-inconsistent targets were noted. On the basis of previous research, prior exposure versus no exposure to a stereotype was predicted to produce no effect on judgment of stereotype-inconsistent targets. Experiment 1B showed the predicted effect. However, Experiment 1A revealed an alternative pattern in which the male target was rated lower on *dependent* compared with the neutral prime condition. Although this pattern was not predicted, it may be of considerable theoretical importance if it is replicable. It would suggest that primed stereotyped information may, under certain conditions, act as a standard with which a stereotype-inconsistent target is compared and contrasted.

Experiment 2

In Experiments 1A and 1B, exposure to stereotyped information differentially influenced judgments of male and female

targets. Previous research has demonstrated that the differential use of primed information can be accounted for in terms of differences in memory for the primes. Lombardi et al. (1987) found that subjects who could recall any of the primes produced lower ratings of a target than subjects who recalled no primes (but see Herr, 1986; Martin, 1986; Martin, Seta, & Crelia, 1990; Schwarz & Bless, 1992). It is possible that the differential ratings of male and female targets in the stereotyped prime conditions may be accounted for by the degree of subjects' explicit memory for the primes. However, subjects' memory for the priming stimuli should not be confused with their awareness of the relationship between the priming episode and the subsequent judgment of the target. In all experiments of this type, it is critical that subjects are not aware that the priming event is related to the judgment of the target (e.g., Higgins et al., 1977; Srull & Wyer, 1979, 1980). To examine the hypothesis that the implicit stereotyping effect is mediated by differences in explicit memory for the primes, we replicated Experiment 1A, adding a test of explicit memory for the primes.

Method

Overview

Experiment 2 used the identical procedure as Experiment 1A except that incidental memory for the scrambled sentences was assessed after

⁴ Some unpredicted effects were obtained, particularly on traits unrelated to aggression. On unrelated, positive traits a Prime Type $\times$ Subject Sex interaction was obtained, $F(1, 125) = 7.43, p = .007$. Female subjects tended to rate all targets less favorably when exposed to neutral primes. In addition, a Subject Sex $\times$ Target Gender interaction was obtained on ratings of unrelated, positive traits in which male subjects tended to rate female targets more positively, $F(1, 125) = 6.50, p = .01$. A reliable Subject Sex $\times$ Target Gender interaction was also obtained on ratings of related, positive traits, $F(1, 125) = 4.24, p = .04$. Subjects rated targets of the opposite gender more positively than targets of the same gender. Finally, a main effect of target gender was obtained on ratings of unrelated, negative traits, $F(1, 125) = 6.15, p = .01$. Male targets were rated more negatively than female targets.

⁵ Although the predicted implicit stereotyping effect was obtained in both experiments, it was appreciably stronger for dependence than aggression. Although several factors may have produced this difference, we speculate about two possible explanations that seem most plausible. First, differences in the effectiveness of the stimulus materials may have been responsible for the weaker effect in the aggression experiment. A post hoc reanalysis of subjects' ratings in Experiment 1B revealed that the aggressive target was judged reliably more positive than negative on related traits (7.71 vs. 6.12), $t(132) = 11.98, p = .0001$. This overall difference remained reliable in separate analyses of each of the four conditions of the experiment. The higher ratings on positive than negative traits suggests that the target may have been perceived as more assertive than aggressive. Alternatively, the smaller effect for aggression may have arisen because the counterstereotype (or subtype) of the aggressive woman is more prominently used than the stereotype of the dependent man. Students in an introductory psychology class were asked to judge which of these two stereotypes is more prominently used in contemporary American culture. Ninety-three out of 95 students judged the stereotype of the aggressive woman to be used more prominently than that of the dependent man. The greater perceived use of the stereotype of the aggressive woman may have allowed aggression primes to influence subjects' ratings of the female target, thereby attenuating the difference between ratings of the female and male target in the aggression prime condition.

the completion of the trait ratings. Each subject was assigned to a condition in a 2 (Prime Type: dependent or neutral) $\times$ 2 (Target Gender: male or female) between-subjects design.

Subjects

Eighty-five subjects (44 women and 41 men) participated in the experiment. Fourteen subjects were introductory psychology students who received course credit for their participation, and 71 subjects were recruited from the university undergraduate community and received \$5 for their participation. Subjects participated either individually or in small groups.

Materials and Procedure

All materials, including prime stimuli, target paragraphs, and trait scales, were identical to those of Experiment 1A. The procedure was a replication of Experiment 1A as well, except that a recall task was added to assess subjects' memory for the sentences they had previously unscrambled. After subjects evaluated the target, they attempted to recall the sentences they had unscrambled during the "first study." They were instructed to disregard the letters that preceded each sentence and to not be concerned about spelling or grammar. Subjects were encouraged to write down any sentence or any part of a sentence that they could recall from the unscrambling task, including single words. Subjects required no more than 5 min to complete the task. All subjects were screened for awareness of the hypothesis and were debriefed. No subject expressed suspicion of the connection between the sentence unscrambling and judgment tasks, nor did any subject anticipate the incidental recall task.

Results and Discussion

Judgment of Targets

The results of Experiment 2 replicated the finding that a target's social category moderates the influence of primed information on judgment. As expected, an ANOVA revealed no reliable main effects of subject sex, target gender, or prime type on any of the dependent variables. As predicted, on ratings of *dependent* a reliable Prime Type $\times$ Target Gender interaction was obtained, $F(1, 81) = 4.04, p < .05$. As shown in Table 3, the gender of the target determined the influence of previous expo-

sure to dependence primes. Subjects exposed to neutral primes rated female and male targets equivalently on *dependent*, $t(40) = <1$, but mean ratings of *dependent* were reliably greater for female than male targets after exposure to dependence primes, $t(41) = 2.74, p < .01$. Ratings of the female target on *dependent* were higher for subjects exposed to dependence primes ($M = 7.68$) than for those exposed to neutral primes ($M = 6.3$), $t(40) = 2.59, p < .02$. In contrast, ratings of the male target on *dependent* for subjects exposed to dependence primes ($M = 6.19$) were statistically equivalent to ratings for subjects exposed to neutral primes ($M = 6.63$), $t(41) = <1$. There was no Prime Type $\times$ Target Gender interaction effect on any other set of traits.

In Experiment 2, the predicted change in judgment of a stereotype-consistent target was obtained after exposure to the stereotype. In addition, the predicted absence of an effect of a primed stereotype on judgment of a stereotype-inconsistent target was obtained. This particular finding replicates the results of Experiment 1B but not those of 1A. Because the contrast effect found in Experiment 1A was neither predicted nor replicated in Experiments 1B or 2, it must be evaluated with caution. Pending replication of this unique contrast effect (i.e., lower ratings of the target after stereotype primes compared with neutral primes), these experiments suggest that prior exposure to stereotype-related information will not influence judgment of a stereotype-inconsistent target.

The implicit stereotyping effect found in Experiment 2 did not extend to traits that were semantically and evaluatively congruent. This finding is consistent with the results of Experiment 1B, but not those of Experiment 1A. This inconsistency is also observed across several existing studies on this topic. Not all experimental procedures allow comparisons between the target trait and related trait dimensions (e.g., Higgins, Bargh, & Lombardi, 1985; Lombardi et al., 1987). However, of the studies that do allow such a comparison, findings are mixed. Some studies demonstrate generalization to only semantically related trait dimensions (e.g., Devine, 1989; Erdley & D'Agostino, 1988). Others report that the effect extends to traits that are evaluatively related but semantically unrelated to the primed construct (e.g., Bargh & Pietromonaco, 1982; Sinclair, Mark, & Shotland, 1987; Skowronski, Carlston, & Isham, 1993; Srull & Wyer, 1980).

Memory for Primes

Two coders, blind to experimental conditions, independently rated each subject's recall of the priming sentences. Because the recall protocols could be scored in a strict or lenient fashion, the following 5-point scoring system was used to ascertain the faithfulness of recall to the original: 1 (*perfect recall*), 2 (*conceptually identical recall*), 3 (*at least one key word recalled*), 4 (*at least one key word recalled, but with altered meaning*), or 5 (*incorrect recall*). Each item was also coded as belonging to either the dependence or neutral category of primes. Ninety-two percent of independent codings were in agreement, and the remainder were resolved by discussion.

Experiments 1A and 2 demonstrated that exposure to dependence primes led subjects to rate a male target as less dependent than a female target. Other research has shown that memory for the priming event predicts relative contrast effects (Lom-

Table 3
Mean Ratings of Dependent As a Function of Prime Type and Target Gender (Experiment 2)

Target gender	Prime type	
	Neutral	Dependence
Female		
<i>M</i>	6.30 _a	7.68 _b
<i>SD</i>	2.22	1.08
<i>n</i>	20	22
Male		
<i>M</i>	6.63 _a	6.19 _a
<i>SD</i>	2.49	2.29
<i>n</i>	22	21

Note. Means should be compared horizontally and vertically. Means that differ reliably ($p < .05$) have different subscripts. All means were calculated from 10-point Likert scales, with higher numbers indicating greater dependence.

bardi, et al., 1987; Newman & Uleman, 1990). Such findings suggest that the relatively lower ratings of the male target compared with the female target may be due to superior explicit memory for the primes in the male target condition.

The relationship between memory for the dependence primes and judgment of the target was examined in two ways. Both methods involved only the dependence prime conditions for the obvious reason that the neutral prime conditions, by definition, contain no dependence primes. The first method compared memory for the primes between male and female target conditions (a between-subjects comparison). That is, did subjects who rated a male target recall more primes than subjects who rated a female target? A subject was considered to have recalled a dependence prime if the item was coded as belonging to any one of the first three categories in the coding scheme. Only 3 subjects in the female target condition and 2 subjects in the male target condition failed to recall at least one of the 30 dependent behaviors. Inconsistent with the prediction that memory for the primes is inversely related to extremity in judgment, subjects who judged a male target recalled fewer dependence primes ($M = 2.04$) than did subjects who judged a female target ($M = 3.18$), $t(41) = 2.13$, $p < .03$. A similar pattern was revealed when overall memory (i.e., memory for both dependence and neutral primes) was analyzed. Again, subjects who judged a male target recalled fewer primes ($M = 2.52$) than did subjects who judged a female target ($M = 3.63$), $t(41) = 1.98$, $p < .05$.

In a second analysis, we examined the correlation between memory for the dependence primes and ratings of dependence within each target condition. If memory for the primes influences ratings of the target, recall of primes and ratings of the target dependence will be correlated. However, there was no relationship between recall and ratings of the female target, $r(22) = .16$, $p = .46$, nor the male target, $r(21) = -.16$, $p = .48$, on *dependent*. This lack of a relationship was also observed when memory for both neutral and dependent primes was included (female target: $r[22] = .08$, $p = .72$; male target: $r[22] = -.06$, $p = .78$). The absence of a within-condition relationship between memory for primes and judgments of dependence suggests that evaluations of the target on dependence were independent of explicit memory for the primes.

This result sheds some light on the relationship between judgment and the influencing agent, the primes. Previous research on category accessibility has found that differential memory for the primes or the priming event can moderate the influence of the priming stimuli on judgment (Lombardi, et al., 1987). The results of this experiment suggest that differential memory for the primes does not account for the effects on judgment obtained in the present experiments. That is, the interaction of prime type and target type produce changes in judgment without the systematic involvement of explicit memory for the primes. The finding of no within-condition correlation between the number of explicit primes recalled and the judgment score suggests an independence of memory and judgment that is consistent with other person perception studies reporting a lack of relationship (Anderson & Hubert, 1963; Dreben, Fiske, & Hastie, 1979; see Hastie, Park, & Weber, 1984). Even so, target social category did influence subjects' recall of the primes. Subjects recalled more primes after evaluat-

ing a target whose social category was stereotypically associated with the primes.

The finding of greater explicit memory in the female target condition stands in contrast to the previous finding that greater explicit memory for the primes is associated with lower ratings of a target. Because subjects' memory for the primes was assessed after the evaluation of either a female or male target, the social category manipulation presumably influenced the memory measure. Our results suggest that the social category of the target served as a more effective retrieval cue for the primes, leading to greater memory in the female target condition. This finding is consistent with research demonstrating that gender-consistent information is remembered better than gender-inconsistent information (reviewed in Ruble & Stangor, 1986).

General Discussion

Three experiments were designed to examine one primary question: What is the influence of the social category of a target on the implicit use of previously exposed stereotyped knowledge? We found that incidental exposure to stereotyped information differentially influenced evaluations of targets that varied in no way except for their social category. These experiments show a previously undocumented effect of implicit stereotyping which, following Higgins (1989), we have labeled *social category applicability*. Social category markers such as race, gender, age, social class, and disability may function like magnetic fields to attract and repel previously encountered stereotyped information on judgment (a) when such information is extraneous to the judgment, and (b) without awareness that the stereotyped information is a source of influence on judgment.

Summary of Empirical Results

All three experiments supported the main prediction that a target's social category determines the influence of previously exposed stereotyped information. In particular, all three experiments demonstrated that judgments of a target whose social category was stereotypically associated with the primed information was judged more extremely after exposure to the primes compared with a control condition of neutral primes.

In all three experiments, male and female subjects showed the implicit stereotyping effect equally, suggesting that the stereotypes used in this research may be impervious to group-protective biases. Although we collected no self-report measure of belief in female dependence and male aggression from the participants in our experiment, we suspect that subjects would not freely admit to using such stereotypes in their judgment of the target. Yet, following exposure to stereotyped information, they showed evidence of implicit stereotyping, irrespective of their own gender. Culturally pervasive stereotypes about social groups, whether consciously accepted or rejected by the individual perceiver, may produce stereotyped judgments, even by members of the stereotyped group (e.g., Banaji & Greenwald, in press; Goldberg, 1968; Linville, Fischer, & Salovey, 1989). The relationship between consciously and unconsciously held stereotypes, and in particular the conditions that produce dissociations between them, will be critical for advancing theory and

the predictive validity of new measures of stereotyping that may emerge from research on implicit stereotyping.

Finally, in all three experiments, no difference in judgment of female and male targets was found in the neutral prime conditions. These findings are consistent with other studies indicating that target social category does not always influence evaluation (see, Crosby, Bromley, & Saxe, 1980; Gaertner & Dovidio, 1986). For example, Darley and Gross (1983) found that although knowledge of socioeconomic class alone did not strongly influence subjects' expectations of a student's future academic performance, expectations differed more dramatically if this knowledge was followed by observation of the student in a test-taking situation. In the latter condition, identical test performance led to predictions of better future performance if subjects believed the student to be from a high rather than low socioeconomic class. Thus, the finding that social category membership alone does not produce discrimination is not sufficient cause for relief. Implicit stereotyping effects may not always take the form of main effects (i.e., men are not always rated as more aggressive than women, and women are not always rated as more dependent than men). Instead, our data show a more complex interaction effect, suggesting that stereotyping is more responsive to recent experiences than is commonly assumed (see Smith & Branscombe, 1988).

Social Category Applicability

From the earliest research, priming effects in impression formation were predicted to not occur indiscriminately. Accessible information was believed to influence judgment only if it was applicable (i.e., an overlap of features between exposed information and some input semantically relevant to the judgment at hand [cf. Higgins et al., 1977; Srull & Wyer, 1979]). The specificity of accessibility effects suggests that they may well be understood as effects of memory or learning. Tulving and Thomson's (1973) influential observation that memory is enhanced when retrieval conditions match encoding conditions has been widely used in providing explanations of various effects of prior experience on memory and judgment. For example, both explicit and implicit memory are known to benefit from a match in operations at encoding and retrieval (Roediger et al., 1989). As Smith and Branscombe (1988) pointed out, the "category accessibility effect is a form of implicit memory: memory because it constitutes an effect of an earlier experience, and implicit because the task is presented as a judgment rather than a memory task, and in fact the effect can occur without the perceiver's awareness of the prior (priming) episode" (p. 490).

Accessible information influences judgment only if it is applicable. Dimensions of applicability or match identified in the construct accessibility literature include (a) the match in denotative meaning between primed information and target behaviors (Higgins et al., 1977; Srull & Wyer, 1979), (b) the procedural match between priming and judgment tasks (Smith, 1989, 1990; Smith & Branscombe, 1987, 1988), and (c) the match between prime valence and target valence (Bargh et al., 1992; Greenwald et al., 1989). Thus, whether the dependent variable is memory or judgment, a match in theoretically specified fea-

tures of the learning and memory/judgment conditions is crucial.

In considering the effects of prior knowledge on judgment, the present experiments suggest that social category ought to be considered alongside previously demonstrated dimensions of applicability. In the present experiments, we extend the notion of a match in connotative meaning, specifically a target's social category. Because the stereotyped behaviors presented during the priming stage were chosen to be gender-specific, they included, among other features, a gender code. The subsequent input, in the form of the story subjects read, also included a gender code through the name Donna or Donald. It was the match in a quite specific component of the meaning of the judged material (i.e., the gender of the target) and the priming stimuli (i.e., the stereotypic behaviors) that produced the assimilation effect in judgment.

The Implicit Nature of Stereotyping

The present experiments demonstrate that information necessary to produce stereotyping can be derived even from information temporarily available because of an unrelated task in an unrelated context. As with all priming effects, this effect underscores the important influence of incidental experience on subsequent behavior. In particular, it may not be possible, even under the best of conditions, to accurately know, prevent, or even attribute influences of the past on present behavior (cf. Jacoby & Kelley, 1987). The finding of implicit stereotyping suggests that stereotyped information may be an especially potent source of discrimination when it is not consciously attended to at the time of judgment. Although this possibility is consistent with recent research that demonstrates variability in priming effects on judgment as a function of awareness (Lombardi et al., 1987; Schwarz & Bless, 1992; Smith, Stewart, & Buttram, 1992), the role of awareness in stereotyping must be examined in future experiments that directly manipulate the implicit and explicit use of stereotyped information.

That social category membership can shape the implicit influence of stereotyped information is consistent with other observations that social characteristics moderate the influence of previous experience on judgment (e.g., Smith & Zarate, 1992). If a target's social category is used unconsciously in judgment, the implications for stereotyping and prejudice are serious. Such findings converge with others recently obtained by Gilbert and Hixon (1991) to show that knowledge of a targets' social category will, under certain conditions, influence judgment without awareness of the source of influence. Recently, Banaji and Greenwald (in press) demonstrated another effect of implicit stereotyping. Subjects exposed to names of nonfamous men and women were more likely to mistakenly judge familiar nonfamous male names to be famous than equally familiar nonfamous female names. Under conditions of uncertainty about the source of familiarity of a name, subjects used the target's social category to assign the attribute of fame. This gender bias in judgments of false fame as well as the present findings point to the pervasiveness of implicit stereotyping. To speculate about the cumulative effects of individual stereotyped judgments, we submit that each such judgment, although unconscious, systematically reinforces the association between particular attributes

(e.g., fame, dependence, and aggression) and social categories (e.g., female and male), creating the associative learning that perpetuates the cycle of stereotyping.

The exposure of stereotyped knowledge in these studies represents an experimental analog of the countless ways in everyday life by which stereotyped information is continuously made available. Such information has been assumed to have impact on one's thoughts and actions, but the discovery of priming effects makes clear the extent to which, as well as a mechanism by which, such everyday exposures can influence subsequent thought and action. The implicit stereotyping effects captured in these experiments demonstrate one of many ways in which exposure to information (e.g., through the media) can influence one's judgment of socially marked targets without that person's knowledge of the influence. Implicit stereotyping effects undermine the current belief about the role of consciousness in guaranteeing equality in the treatment of individuals irrespective of sex, class, color, and national origin. The belief in the ability and pervasiveness of conscious control over actions is not only prominent in lay thinking, but is also a fundamental tenet of justice systems that rest on the assumption of the willful control of beliefs, judgments, and actions. Implicit stereotyping critically compromises the efficacy of "good intention" in avoiding stereotyping and points to the importance of efforts to change the material conditions within which (psychological) stereotyping processes emerge and thrive.

Conclusion

Three experiments demonstrated the effects of a match between temporarily available stereotyped knowledge and the social category of the target in producing implicit stereotyping. Primed information selectively influenced judgments of targets that varied solely in their social category membership. Such effects identify new boundary conditions in the operation of unconscious processes in social judgment and reveal how insidious forms of discrimination are perpetrated. If contextually unrelated information is used outside subjects' awareness of the source of influence to produce stereotyped judgments, it is unlikely to be detected by the perceiver, and opportunities to consciously combat such influences will be minimal.

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