Implicit Self-Concept and Evaluative Implicit Gender Stereotypes: Self and Ingroup Share Desirable Traits

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Experiment 1 unexpectedly found sex differences in evaluative gender stereotypes (only men associated male with potency and only women associated female with warmth). Experiment 2 dramatically reduced sex differences in gender-potency judgments when measures were redesigned to avoid implying that potency was positive (the concepts, strong and weak, were represented by evaluatively matched words; e.g., destroy vs. feeble, loud vs. quiet, and mighty vs. gentle). Experiment 3 tested the hypothesis that these sex differences were in the service of self-esteem but found no correlation between own-gender-favorable stereotyping and implicit self-esteem. Rather, participants showed a correlation between linking self to the favorable potency trait and linking own gender to that trait. Experiment 4 confirmed the correlation between implicit self-concept and gender stereotype using the contrast between potency and warmth for the implicit stereotype measure. In concert, results suggest that people possess implicit gender stereotypes in self-favorable form because of the tendency to associate self with desirable traits.

By bringing attention to unjustified occupational and political discrimination, the Women's Movement of the 1960s dramatically changed sex stereotypes and attitudes toward women—or did it? Certainly, success of the Women's Movement is evident in the speed with which "sexism" (a new coinage ca. 1970) came to represent traditional, but widely disapproved, sex-discriminatory beliefs and practices. However, the appearance of reduced sexism is based entirely on results obtained with self-report methods (e.g., Ballard-Reisch & Elton, 1992; Harris & Firestone, 1998; Spence & Hahn, 1997). Even the self-report findings indicate limited success in reduction of sex discrimination. For example, gender-egalitarian beliefs and reduced sex stereotyping are observed more strongly among women than men (e.g., Glick & Fiske, 1996; Spence & Buckner, 2000; Swim, Aiken, Hall, & Hunter, 1995; Williams & Best, 1990). This may not be surprising because women are the political beneficiaries of reduced gender discrimination. These observations raise the question, "To what extent does the rise of gender-egalitarian beliefs and attitudes 'on paper' represent internalized or private change versus changes in publicly expressed beliefs regarding men and women?"

Research examining implicit gender stereotypes casts doubt on the ability of self-report measures to reveal the whole story. These investigations find that men and women possess implicit gender stereotypes that may vary from their conscious beliefs (e.g., Banaji & Greenwald, 1995; Banaji & Hardin, 1996; Blair & Banaji, 1996). Greenwald and Banaji (1995) defined implicit stereotypes as "the introspectively unidentified (or inaccurately identified) traces of past experience that mediate attributions of qualities to members of a social category" (p. 15). Because implicit stereotypes operate without respondents' awareness, they bypass conscious processes that might otherwise serve as a defense against sexism.

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For example, men and women show similarly negative implicit attitudes toward female authorities, despite differences in their explicit attitudes (Rudman & Kilianski, 2000). Moreover, implicit gender stereotypes may lead even nonsexists to discriminate against female job applicants (Rudman & Glick, in press). In sum, implicit gender beliefs and attitudes are less likely to show differences based on participant sex or conscious beliefs, compared to self-report counterparts. These observations of weak correlations between measures of implicit and explicit gender stereotypes argue for conceptualizing implicit and explicit gender stereotypes as distinct constructs (Greenwald & Banaji, 1995).

The present research used the Implicit Association Test (IAT) (Greenwald, McGhee, & Schwartz, 1998) to investigate differences in implicit versus explicit gender stereotypes. Although introduced as a measure of implicit attitudes, research has extended the IAT to measure stereotypes (Rudman, Greenwald, Mellott, & Schwartz, 1999), self-esteem (Farnham, Greenwald, & Banaji, 1999), and self-concept (Greenwald, Banaji, Rudman, Farnham, Nosek, & Rosier, 2000). Furthermore, convergent and predictive validity for the IAT has been shown in investigations of sex-based and ethnicity-based discrimination (e.g., McConnell & Leibold, in press; Rudman & Glick, in press; Rudman & Kilianski, 2000). The present research sought to extend the IAT's usefulness as a measure of implicit stereotypes by focusing on potential differences between implicit and explicit gender stereotypes.

The IAT as a Measure of Implicit Stereotypes

The IAT measures the automatic concept-attribute associations that are hypothesized to underlie implicit stereotypes (Greenwald & Banaji, 1995). The IAT method requires participants to categorize four categories of stimuli using just two responses (e.g., left and right computer keys). When categories are well associated, mapping them onto the same response key is considerably easier than when categories are less associated. For example, college-age participants showed shorter latencies when youthful names (e.g., Tiffany, Kyle) and attributes (e.g., quick, bold, flexible) shared a response key compared to when elderly names (e.g., Agnes, Irwin) and youthful attributes shared a response key (Rudman et al., 1999). This relative difference in response latencies (abbreviated as "the IAT effect") indirectly assesses the strength of the implicit stereotypic association.

The present research focused on gender stereotypes because their content has been well established with self-report measures. In particular, men are more associated with powerful (and women with weak), whereas women are more associated with warm (and men with cold) (e.g., Ashmore, 1981; Ashmore, Del Boca, & Bilder, 1995; Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972; Williams & Best, 1990). It has been argued that the power and warmth dimensions are the primary ones by which the sexes are differentiated (Ashmore, Del Boca, & Wohlers, 1986).

Using the IAT, Experiment 1 compared implicit and explicit measures of gender-potency and gender-warmth stereotypes. If implicit gender stereotypes are widely shared (see Greenwald & Banaji, 1995, for a review), then stereotype-compatible tasks should show shorter latencies than stereotype-noncompatible tasks irrespective of participant sex, the specific stereotype under investigation, or participants' scores on self-report measures. In contrast, we expected sex differences to be apparent on explicit (self-report) measures of gender beliefs. As inheritors of the Women's Movement, it is understandable that young adult women may consciously reject traditional gender beliefs more strongly than do men. However, due to the observed similarity between men's and women's implicit stereotypes, and the independence of implicit and explicit gender beliefs, we did not expect to find either these same sex differences on the implicit measures or strong relationships between self-report and IAT gender stereotyping scores.

EXPERIMENT 1

Experiment 1 employed two IATs, one to assess gender-potency (powerful vs. weak) and one to assess gender-warmth (warm vs. cold) stereotypes. Each task required participants to categorize male versus female names together with either (a) powerful and weak attributes or (b) warm and cold attributes. Each task's four concepts were categorized under stereotype-compatible (e.g., male + potency) or noncompatible (e.g., female + potency) conditions. On the basis of past research in implicit gender stereotypes, the IAT procedure was expected to reveal shorter latencies for stereotype-compatible tasks than for stereotype-noncompatible tasks.

Method

PARTICIPANTS

One hundred and three volunteers (46 men and 57 women) from introductory psychology courses at the University of Washington participated in exchange for course credit.

EXPLICIT MEASURES

Participants completed two self-report stereotype measures, each consisting of four 7-point semantic differential items for men and women as separate objects (object order was counterbalanced). The gender-potency semantic differential consisted of the bipolar

adjectives *strong-weak*, *dominant-submissive*, *harsh-lenient*, and *hard-soft*. The gender-warmth semantic differential consisted of the bipolar adjectives *warm-cold*, *supportive-detached*, *trusting-skeptical*, and *caring-distant*. The measures were scored by averaging the items for each stereotype, scored on a scale ranging from 3 (*potent or warm*) to –3 (*weak or cold*). Difference scores were then computed separately for the gender-potency and gender-warmth indexes such that higher scores reflected more stereotypic judgments (i.e., that men are more powerful than women and women are warmer than men). These difference scores had a potential range of +6 (*maximal gender stereotype*) to –6 (*maximal counterstereotype*).

In addition, participants completed the Attitudes Toward Women Scale (AWS) (Spence & Helmreich, 1972) and the Ambivalent Sexism Inventory (ASI) (Glick & Fiske, 1996). The AWS consists of 25 items that assess traditional gender-role beliefs on 4-point scales ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The ASI consists of two subscales—benevolent sexism ("Women should be cherished and protected by men") and hostile sexism (e.g., "Women seek to gain power by getting control over men"). Participants indicated agreement with ASI items on a scale ranging from 0 (*strongly disagree*) to 5 (*strongly agree*). For all three measures (AWS, benevolent sexism, and hostile sexism), high scores reflected more traditional or sexist attitudes. Although these measures assess attitudes, their correlation with gender stereotypes has been shown (e.g., Glick & Fiske, 1996).

IMPLICIT MEASURES

The gender-potency IAT used 60 stimulus items: 15 male names (e.g., Brian, Kevin, Paul), 15 female names (e.g., Meg, Karen, Ann), 15 potent-meaning words (e.g., power, strong, bold) and 15 weak-meaning words (e.g., weak, vulnerable, timid). The gender-warmth IAT used the same male and female names in addition to 15 warm-meaning words (e.g., warm, support, nurture) and 15 cold-meaning words (e.g., cold, distant, detached). Stimuli were inspired by standard measures of gender identity (e.g., Bem, 1974; Spence, Helmreich, & Stapp, 1974). The appendix presents the full set of stimuli.

DESIGN OF THE IAT

The IAT was administered in seven blocks, described here with materials used in Experiment 1's gender-potency IAT. Male versus female names were the target concepts, and powerful versus weak was the attribute contrast. Participants responded to target concepts and attributes by pressing the right and left keys on a computer keyboard. Participants' tasks were as follows: (a) distinguish male versus female names (20 trials); (b) distinguish powerful versus weak attributes (20 trials); (c) for practice, respond to male names and strong attributes with the left key and female names and weak attributes with the right key (20 trials, abbreviated as male + power);[1] (d) repeat Block 3 as a test block (40 trials); (e) again distinguish powerful versus weak attributes, with response key assignments reversed (20 trials); (f) for practice, respond to female names and potent attributes with the right key and male names and weak attributes with the left key (20 trials, abbreviated as female + power); and (g) repeat Block 6 as a test block (40 trials). The IAT effect is computed by subtracting the mean response latency for performing the stereotype-compatible task (Block 4) from the stereotype-noncompatible task (Block 7). Thus, positive difference scores reflect a stronger implicit stereotype (i.e., greater tendency to associate gender with stereotypic attributes). The order in which participants perform the stereotype-compatible and noncompatible tasks was counterbalanced across participants.

APPARATUS AND IAT PROGRAM DETAILS

The experiment was administered on PC-type desktop computers.[2] Responses were assigned to the left and right forefingers (using the "A" key and "5" key on the numeric keypad, respectively). IAT stimuli appeared within a white window, vertically and horizontally centered against a light-gray screen background. Participants viewed this display from a distance of approximately 65 cm. To facilitate discrimination of target concepts (male and female names) from the attribute stimuli (powerful vs. weak or warm vs. cold), the former were presented in upper-case black letters and the latter in lower-case blue letters. The program randomly presented stimuli within each block of trials.

DESIGN

All participants completed both the gender-potency and the gender-warmth IATs. Each IAT included stereotype-compatible (male + power or female + warm) and stereotype-noncompatible (female + power or male + warm) blocks. Order of IAT tasks and block order within IATs was counterbalanced. The design was a 2 (stereotype: gender-potency, gender-warmth) × 2 (stereotype order) × 2 (block order: stereotype compatible vs. stereotype noncompatible first) × 2 (participant sex) mixed factorial, with repeated measures on the first factor. The two procedural order factors did not produce any effects that qualified interpretations.

PROCEDURE

Participants performed the experiment in individual cubicles. They first completed the explicit measures. After receiving computerized instructions and a practice task, participants began their first IAT. Each IAT was administered in seven blocks of trials, as described

above. Each trial block began with instructions describing the category discrimination(s) for the upcoming block and the assignment of response keys (left or right) to categories. Reminder labels, in the form of category names appropriately positioned to the left or right, remained on screen during each block. Participants received summary feedback that gave their mean response latency in seconds and percentage correct following each block. All blocks were participant-initiated. Response accuracy feedback was displayed directly below the stimulus in the form of a green "O" for correct responses and a red "X" for incorrect responses. The red "X" remained on screen until participants provided the correct response. Both latency to the correct response and accuracy of the initial response were recorded. Intertrial intervals were 150 ms between pressing the correct response key and presentation of the next stimulus.

Results

DATA REDUCTION

The data for each trial block included mean response latency to correct response (in ms) and error rates. Consistent with Greenwald et al. (1998), response latencies greater than 3,000 ms and less than 300 ms were recoded as 3,000 and 300 ms, respectively; the first two trials of each block were dropped because of their typically lengthened latencies, and latencies were log-transformed to normalize the distribution. As in previous research, error rates were low (an average of 5%), and were positively correlated with latencies, but showed less variability as a function of the stereotype compatibility of the task than did latencies (Greenwald et al., 1998).

THE IAT EFFECT

The top half of Figure 1 displays mean latencies for the gender-potency IAT tasks, separately by participant sex. In the present research, the expected IAT effect should take the form of shorter latencies on stereotype-compatible than on noncompatible combined tasks (i.e., higher black bars than white in Figure 1). The top half of Figure 1 shows this effect, but only for male participants. On average, men showed an IAT effect of +155 ms (d = 1.19),[3] whereas women showed an IAT effect of +5 ms (d = .04). Thus, men showed strong evidence of implicit stereotyping on the gender-potency IAT but, unexpectedly, women did not. The male-female difference in gender-potency stereotype was statistically significant, $t(101) = 5.60$, $p = 10^{-7}$. The bottom half of Figure 1 similarly displays mean latencies for the gender-warmth IAT tasks. Again, compatible tasks (female + warm) are shown as white bars and noncompatible tasks (male + warm) as black bars. Only women showed the expected gender-warmth IAT effect. On average, women showed an IAT effect of +169 ms (d = 1.01), whereas men showed

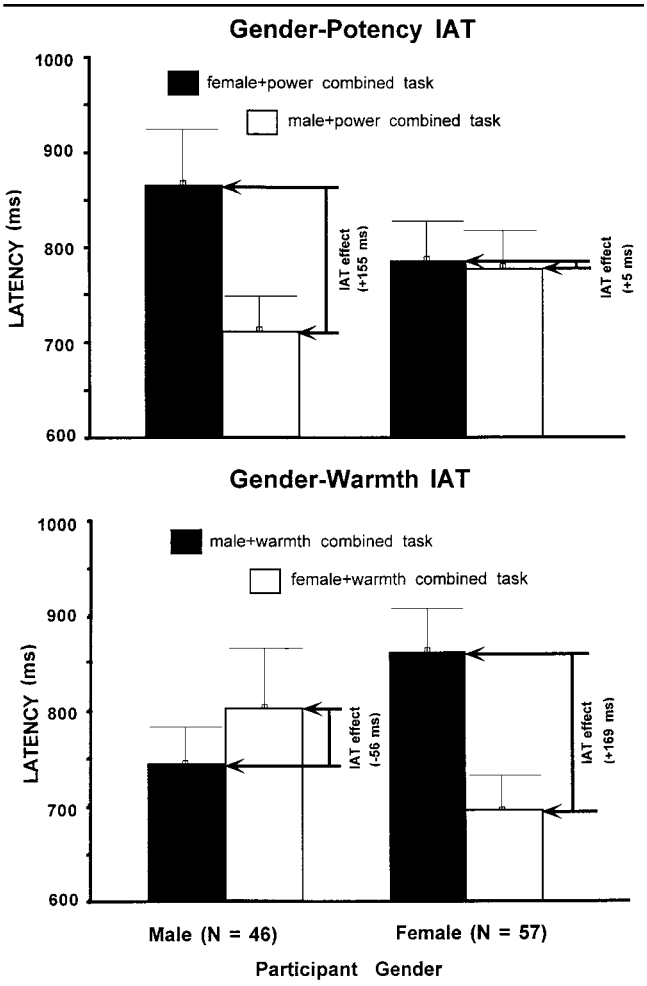

Figure 1 Mean latency results of Experiment 1 as a function of participant sex and IAT (gender-potency and gender-warmth).

NOTE: IAT = Implicit Association Test. Only latencies for the stereotype-compatible and noncompatible tasks are shown. Practice blocks and single categorization blocks are not included in the figure. Data are collapsed across counterbalanced procedural variables, which did not have significant influences on IAT effects. Error bars are 95% confidence intervals for the participants contributing to each mean (46 men, 57 women).

an unexpected reverse effect of –56 ms (d = –.33). Thus, women showed strong evidence of implicit stereotyping on the gender-warmth IAT but, unexpectedly, men showed a pattern indicating that they associated male gender with warm and female gender with cold. This sex difference was statistically significant, $t(101) = 6.75$, $p = 10^{-10}$.

On the explicit measures, both men (M = +1.98, d = 1.96) and women (M = 1.33, d = 1.32) showed a male-potency association on the gender-potency semantic differential, but men showed this effect more strongly, $t(101) = 3.09$, $p = .01$. On the gender-warmth semantic differential, both men (M = 1.51) and women (M = 1.32) reported women to be warmer than men, and the differ-

TABLE 1: Correlations Among Implicit and Explicit Measures (Experiment 1)

	IAT Measure		*Explicit Stereotype*		*Explicit Sexism*	
	1	*2*	*3*	*4*	*5*	*6*
IAT measure						
1. Gender-potency[a]						
2. Gender-warmth[b]	–.46***					
Explicit measure						
3. Gender-potency[a]	**.29*** **	**–.23****				
4. Gender-warmth[b]	**.11**	**–.04**	.32***			
5. AWS[c]	**.31*** **	**–.24****	.31***	.02		
6. BS[d]	**.21****	**–.09**	.29***	.21**	.26**	
7. HS[e]	**.33*** **	**–.36*****	.21**	–.04	.41***	.42***

NOTE: IAT = Implicit Association Test, AWS = Attitudes Toward Women Scale, BS = benevolent sexism, HS = hostile sexism. Correlations were computed using IAT log-latency difference scores. Correlations with untransformed latencies were similar. Correlations are based on $N = 103$. Correlations with Ambivalent Sexism Inventory (ASI) subscales are partial, in each case holding the other subscale constant (Glick & Fiske, 1996). Correlations between implicit and explicit measures are in bold.

a. High scores indicate men are more potent than women.

b. High scores indicate women are warmer than men.

c. High scores reflect more traditional attitudes toward women.

d. High scores reflect more benevolent sexism.

e. High scores reflect more hostile sexism.

**$p < .05$. ***$p < .01$.

ence between them was not statistically significant, $t(101) = .81$, $p = .42$. In addition, men scored higher than women on the AWS and on both ASI subscales, all ts > 3.07, ps < .01. Thus, compared with women, men were more likely to judge men as more powerful than women, to endorse traditional attitudes toward women, and to indicate both benevolent and hostile sexism.

RELATIONSHIPS AMONG IAT AND EXPLICIT MEASURES

Table 1 shows the correlations among Experiment 1's implicit and explicit measures. High scores on the IAT and semantic differential measures reflect relatively more implicit and explicit gender stereotyping, respectively. High scores on the AWS and ASI subscales reflect relatively more traditional attitudes toward women, benevolent sexism (e.g., putting women on a pedestal), and hostile sexism (e.g., antifeminism). Although these correlations could have been examined with participant sex partialed, that seemed inappropriate because sex-associated variance might constitute a large portion of the meaningful individual difference variance of the measures.

As can be seen in Table 1, the two IATs were negatively related, $r(101) = –.46$, $p < .01$. This negative relationship suggests that viewing own gender as potent corresponded to also viewing own gender as warm. By contrast, the explicit gender-potency and gender-warmth stereotype measures were positively related, $r(101) = .32$, $p < .01$. Women who judged their gender as weak also judged their gender as warm, and men who judged their gender as strong also judged their gender as cold. Table 1 also shows that the relationships among the implicit and explicit measures were predictably modest. The gender-potency IAT was positively related to the gender-potency semantic differential, the AWS, and both ASI subscales, all ps < .05. That is, participants who explicitly endorsed the gender-potency stereotype, traditional attitudes toward women, and both hostile and benevolent sexism showed evidence of an automatic association between men and potency. In contrast, the gender-warmth IAT was negatively related to the gender-potency semantic differential, the AWS, and the ASI Hostile subscale, all ps < .05. That is, participants who explicitly endorsed the gender-potency stereotype, traditional attitudes toward women, and who were hostile sexists showed *less* evidence of an automatic association between women and warmth.

Discussion

As expected, men scored significantly higher than women on Experiment 1's explicit measures of sexism and stereotypes. Unexpectedly, gender differences also emerged on the implicit stereotype measures. Rather than men showing generally stronger gender stereotypes, they showed greater implicit stereotypes only on the gender-potency IAT measure. Women showed greater implicit stereotyping on the gender-warmth IAT measure. Why might Experiment 1 have revealed sex differences in implicit stereotyping when previous research (Banaji & Greenwald, 1995; Banaji & Hardin, 1996; Blair & Banaji, 1996) has not? Our speculation is that the critical feature of Experiment 1 was that the stereotypical attributes used were also implicitly evaluative, such that *powerful* and *warm* were favorable, whereas *weak* and *cold* were unfavorable. As a consequence, the implicit stereotypical association of male with powerful and female with weak was favorable to men, whereas the association of female with warm and male with cold was favorable to women.[4] Experiments 2 through 4 were conducted to follow up on this line of reasoning, with the goal of explicating Experiment 1's unexpected finding of sex differences in evaluative gender stereotypes.

Both men and women showed robust implicit stereotyping effects, but only on tasks that had favorable implications for their own gender (and, by extension, themselves). These results suggest that implicit gender stereotypes may be influenced by an automatic link between the self and positive evaluation, or *implicit self-esteem* (Greenwald & Banaji, 1995). Because potency is more positive than weakness, and warmth more positive

than coldness, men may possess an implicit gender-potency stereotype in which men are powerful, dynamic, and bold but not an implicit gender-warmth stereotype in which men are cold, detached, and selfish. Correspondingly, women may possess an implicit gender-warmth stereotype in which women are warm, nurturing, and caring but not an implicit gender-potency stereotype in which women are weak, vulnerable, and timid.

If Experiment 1's sex differences in implicit gender stereotypes were indeed manifestations of implicit self-esteem, then it should be possible to reduce sex differences in implicit stereotyping by manipulating the attributes' evaluative connotations. For example, women might show evidence of the implicit gender-potency stereotype if they were allowed to associate women with *weak* without it placing women (and implicitly self) in an unfavorable light. Experiment 2 was conducted to test this hypothesis.

EXPERIMENT 2

In Experiment 2, participants responded to IATs that employed strong and weak items that were matched on valence so as to reduce the evaluative differences between the two concepts. This experiment was limited to the gender-potency stereotype because of the difficulty of finding high-frequency, evaluatively negative words to indicate warmth (e.g., solicitous, lugubrious, and unctuous connote warmth but are rare). In the design of the experiment, both men and women provided data for three separate gender-potency IATs that were constructed with items that were homogeneous in evaluation—either evaluatively positive (mighty vs. gentle), neutral (loud vs. quiet), or negative (violent vs. feeble). The expectation was that, unlike Experiment 1, in which strong items were evaluatively more positive than weak items, and in which only men showed the gender-potency implicit stereotype, all three IATs in Experiment 2 should reveal the male-potency association for both male and female participants. This is because equating the valence of the stimulus words affords a test of sex differences in the implicit gender-potency stereotype (which might be the same for men and women) that is not contaminated by differences in implicit self-evaluation (which can occur when the words for the two sexes are differently evaluated).

Method

PARTICIPANTS

Fifty-one volunteers (24 men and 27 women) from introductory psychology courses at the University of Washington participated in exchange for course credit.

IMPLICIT MEASURES

Each IAT used Experiment 1's male and female names, categorized with negative, neutral, or positive strong and weak attributes. The stimulus items for the negative (e.g., destroy, violent, rage; feeble, frail, lame), neutral (e.g., loud, iron, durable; quiet, feather, fragile), and positive (e.g., mighty, robust, stamina; gentle, delicate, fine) IAT tasks are shown in the appendix. In addition, each IAT used four core words related to potency (strong, large, solid, steel) and four core words related to weakness (weak, small, thin, twig). These neutral core words were intended to preserve definitions of the contrasting categories, but without undermining the valenced nuances of the remaining items. Responses to all stimuli, including the core words, were included in each IAT measure.

EXPLICIT MEASURES

Participants also completed semantic differential and thermometer (explicit) measures of the gender-potency stereotype, in counterbalanced order. The semantic differential measure was composed of four items used to rate men and women as separate objects (object order was counterbalanced). These 7-point scales were anchored at either end by polar-opposite adjective pairs: *strong-weak*, *large-small*, *durable-fragile*, and *loud-quiet*. Each item was scored on a scale ranging from –3 (*low potency*) to +3 (*high potency*). A difference score was then computed from the 4-item averages for the two objects, such that high scores reflected judgment of men as stronger than women. These difference scores had a potential range of +6 (*maximal gender stereotype*) to –6 (*maximal counterstereotype*). For the thermometer measure, participants rated the strength of men and the strength of women on separate vertical scales labeled at 10-degree intervals from 0 (*weak*) to 99 (*strong*). A difference score was computed from the two thermometer items such that higher scores reflected more stereotypic judgments (i.e., greater male than female potency).

PROCEDURE

Participants completed the explicit measures either before or after introduction to the IAT (a variable that did not influence results). Administration of the IAT was identical to that of Experiment 1, with the exception that participants completed three IAT measures instead of two. Order of the three IAT measures and order of stereotype-compatible versus noncompatible tasks within IATs was counterbalanced. The design was a 3 (IAT item valence: negative, neutral, positive) × 6 (IAT order: six possible valence sequences) × 2 (compatibility order: male + power vs. female + power first) × 2 (participant sex) mixed factorial, with repeated measures on the first

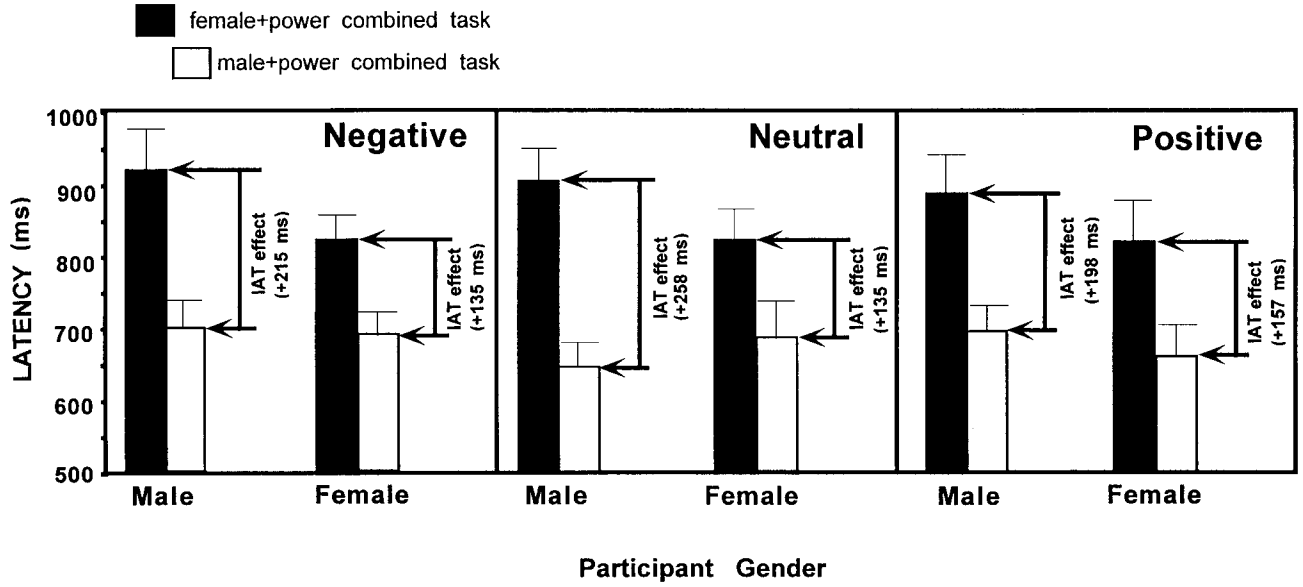

Figure 2 Mean latency results of Experiment 2 as a function of participant sex and IAT valence.
NOTE: IAT = Implicit Association Test. Only latencies for the stereotype-compatible and noncompatible tasks are shown. Practice blocks and single categorization blocks are not included in the figure. Data are collapsed across counterbalanced procedural variables, which did not have significant influences on IAT effects. Error bars are 95% confidence intervals for the participants contributing to each mean (24 men, 27 women).

factor. The IAT procedural variables did not qualify any effects or their interpretation.

Results and Discussion

THE IAT EFFECT

Experiment 2 sought to determine whether Experiment 1's sex differences in the gender-potency IAT would be reduced when valences for powerful and weak attributes were matched. As can be seen in Figure 2, evidence for the gender-potency stereotype appeared for both men and women in all three IATs (i.e., higher black bars than white). Averaged effect sizes (Cohen's *d*) across the three conditions revealed large effects for men and women (*d*s = 1.33 and .85, respectively). These results show the predicted reduction in sex differences for the gender-potency stereotype. Specifically, the effect for participant sex on the gender-potency IAT was reduced from $d = 1.16$ (Experiment 1) to $d = .48$ (Experiment 2).

The log-latency IAT-effect difference scores were substantially different from zero, $F(1, 50) = 132.13$, $p = 10^{-15}$, indicating the expected implicit stereotyping effect. These scores were submitted to a mixed factor ANOVA for Experiment 2's four-factor design. The effects for participant sex and IAT valence were nonsignificant in this analysis, both Fs$(1, 50) < 2.52$, ps $> .13$, as was the IAT Valence × Participant Sex interaction effect, $F(2, 50) = 1.64$, $p = 20$.[5]

Although sex differences in the gender-potency stereotype were dramatically reduced in Experiment 2, they were not completely eliminated. The difference between effect sizes of the gender-potency implicit stereotype for men and women approached a moderate effect ($d = .48$). A test for sex differences on a combined IAT index (Cronbach's $\alpha = .70$) showed that men's average IAT effect was significantly stronger than women's, $t(49) = 2.15$, $p = .04$.

On the explicit measures, there were no sex differences on the semantic differential, $t(49) = .28$, $p = .78$ (*M*s = 1.06 vs. 1.16; *d*s = .88 vs. .97, for men and women, respectively). Thus, men were judged to be larger, stronger, louder, and more durable than women. However, there was a small sex difference on the thermometer measure. Men ($M = 12.5$, $d = .80$) showed stronger gender potency stereotypes than women ($M = 4.3$, $d = .27$), $t(49) = 1.89$, $p = .06$.

RELATIONSHIPS AMONG IMPLICIT AND EXPLICIT MEASURES

The three IATs were positively intercorrelated, with *r*s ranging from .26 to .59, all *p*s < .08. The positive correlation between the explicit semantic differential and thermometer measures was also statistically significant, $r(48) = .51$, $p = .0001$. Correlations between each IAT and the explicit measures were positive but weak, average $r(49) = .13$, consistent with other evidence that implicit and

explicit measures tap different constructs (Greenwald & Banaji, 1995).

Experiment 2's focal finding was the increase in implicit gender-potency stereotyping by women when the IAT items did not imply female inferiority. Under these circumstances, both men and women showed strong implicit stereotypes that associated male (more than female) with strength. Moreover, this occurred whether the strong and weak items presented in the IAT were evaluatively negative, neutral, or positive.

EXPERIMENT 3

The findings of Experiments 1 and 2 indirectly suggested that self-evaluation is involved in expressions of implicit gender stereotypes. Experiment 1 did so by showing sex differences in evaluative gender stereotypes (with only men associating their gender with power and only women associating their gender with warmth). Experiment 2 presented complementary evidence, showing that Experiment 1's sex difference in the gender-potency stereotype was greatly diminished when attribute valences (for powerful vs. weak) were matched such that the measure no longer implied male superiority.

Experiment 3's objective was to directly test whether implicit self-evaluation influences gender-potency judgments. Participants performed three IATs. These assessed (a) gender-potency stereotype (associating male vs. female with powerful vs. weak), (b) self-esteem (associating self vs. others with pleasant vs. unpleasant), and (c) self-potency (associating self vs. others with powerful vs. weak). High scores on each IAT reflect more positive evaluation of men compared to women or more positive evaluation of self compared to others (with respect to esteem and potency, which was represented in this experiment as evaluatively positive; see the appendix).

The general hypothesis is that self and gender are connected such that evaluative gender judgments serve as indirect judgments of the self. This link might be described as "If I am good, then my gender is potent." Consistent with our interpretation of the findings from Experiments 1 and 2, we expected people with high self-esteem to view their own gender as powerful (vs. weak). Support for this self-esteem hypothesis would be observed if men showed a positive relationship between implicit self-esteem and gender-potency IAT scores and women showed a negative relationship between these two measures.

Alternatively, past research has shown a link between self-concept and ingroup judgments at the implicit level (Smith & Henry, 1996). It was therefore possible that evaluative gender judgments might be biased by a tendency to associate the self with desirable traits. This link might be described as follows: "If I am potent, then my gender is potent." Support for the self-concept hypothesis would be observed if men showed a positive relationship between implicit self-potency and gender-potency IAT scores, whereas women showed a negative relationship between these two measures.

Method

PARTICIPANTS

Sixty-two volunteers (28 men and 34 women) from introductory psychology courses at Rutgers University participated in exchange for course credit.

IMPLICIT MEASURES

Experiment 3 used Experiment 1's gender-potency IAT. The two remaining IATs used the target concepts *self* (me, my, mine, and participants' first name) versus *other* (it, they, them, and their). For the self-potency IAT, these target concepts were paired with the gender-potency IAT's attributes (e.g., power, bold, strong; weak, timid, shy). For the self-esteem IAT, these target concepts were paired with evaluative words either pleasant or unpleasant in meaning (e.g., gold, smile; filth, poison) (Farnham et al., 1999). The appendix contains Experiment 3's stimulus words.

EXPLICIT MEASURES

Participants also completed three explicit measures. These were two potency semantic differentials to assess stereotypes and self-concept and the Self-Esteem Scale (SES) (Rosenberg, 1965). Each semantic differential measure consisted of a set of five 7-point potency scales for men and women (or self and others) as separate objects (object order was counterbalanced). The potency scales were anchored at either end by the following polar-opposite concepts: *power-weak*, *assert-withdraw*, *success-failure*, *bold-shy*, and *dynamic-timid*. Each measure was scored by averaging the items, scored on a scale ranging from 3 (*high potency*) to –3 (*low potency*). Difference scores were then computed separately for each semantic differential such that high scores reflected more stereotypic judgments or more endorsement of self-potency (possible range: +6 to –6). The SES was scored in the traditional manner, with high scores reflecting more self-esteem (possible range: 1 to 4).

PROCEDURE

Participants completed three IAT measures in counterbalanced order. The order of compatibility conditions within IATs also was counterbalanced. Half of the participants completed the stereotype-compatible (male + power) and self-favorable (self + power, self + pleasant) conditions first. The remaining half completed the stereotype-noncompatible (female + power) and self-unfavorable (self + weak, self + unpleasant) conditions first. The design was a 3 (IAT) × 6 (IAT order) × 2 (com-

TABLE 2: Summary Statistics for Implicit and Explicit Measures (Experiment 3)

	Men (n = *28*)	*Women* (n = *34*)	*Pooled* SD	*Sex Difference*	
				t	p
IAT measure					
Gender-potency	+186 (*d* = **1.28**)	+28 (*d* = **.19**)	144.76	4.26	10^{-5}
Self-potency	+150 (*d* = **.99**)	+34 (*d* = **.22**)	151.17	2.23	.03
Self-esteem	+164 (*d* = **1.23**)	+118 (*d* = **.89**)	132.83	.54	.59
Explicit measure					
Gender-potency	1.39 (*d* = **1.27**)	.78 (*d* = **.71**)	1.09	2.16	.04
Self-potency	.00 (*d* = **0**)	–.26 (*d* = **–.22**)	1.17	.96	.34
Self-esteem	3.26	3.06	.57	1.38	.17

NOTE: IAT = Implicit Association Test. All measures other than the direct self-esteem scale are mean difference scores computed so that positive scores represent more stereotypical or self + positive judgments. IAT measures are based on an ms index. Gender differences were examined via *t* tests (*df* = 60). Effect sizes (in bold) are Cohen's *d*. Effect sizes were computed by dividing men's and women's IAT effect means by the pooled *SD*. Conventional small, medium, and large effect sizes for *d* are .2, .5, and .8, respectively (Cohen, 1988).

patibility order) × 2 (participant sex) mixed factorial, with repeated measures on the first factor.

Results and Discussion

THE IAT EFFECT

Table 2 presents Experiment 3's results separately by participant sex. As can be seen, men showed an average IAT effect on the gender-potency measure of +186 ms, whereas women averaged an IAT effect of +28 ms. Replicating Experiment 1, men showed a significantly larger IAT effect than women when strong and weak attributes were opposite in valence (*d*s = 1.28 vs. .19, respectively). Table 2 also shows a significant sex difference on the self-potency measure. Men averaged an IAT effect of +150 ms, whereas women averaged an IAT effect of +34 ms (*d*s = .99 vs. .22, respectively). By contrast, there were no significant sex differences on the self-esteem IAT (see also Farnham et al., 1999). Men and women averaged IAT effects of +164 ms and +118 ms, respectively. These results correspond to large effect sizes for both men and women (*d*s = 1.23 and .89, respectively). Finally, Table 2 shows the results for the explicit measures. As in Experiment 1, men were more likely than women to endorse the gender-potency stereotype on the semantic differential, $t(61) = 2.16$, $p = .04$. No other sex differences emerged on the explicit measures.

CORRELATIONAL ANALYSES

Table 3 shows the relations among gender-potency, self-esteem, and self-potency for men (above the diagonal) and women (below the diagonal). On the diagonal are the relations between the implicit and explicit measures (in italics). Variables were scored so that positive relations were expected between gender-potency and self-assessment IATs for men, whereas negative relations were expected for women (i.e., opposing patterns of relations should be shown for men and women).

The top half of Table 3 shows results for the IAT measures. If self-esteem implicitly biases evaluative gender stereotypes, then men high in implicit self-esteem should be more likely to associate male gender with potency (and female gender with weakness), whereas women high in implicit self-esteem should be less likely to show these associations. However, Table 3 shows no relationship between implicit self-esteem and gender potency judgments for either men, $r(26) = .001$, or women, $r(32) = –.02$. Thus, unexpectedly, no support was shown for the self-esteem hypothesis. By contrast, Table 3 does show support for the self-concept hypothesis. Men and women both showed a link between self-potency and gender-potency judgments. For men, this relationship was significantly positive, $r(26) = .41$, $p = .03$. For women, it was marginally significantly negative, $r(32) = –.31$, $p = .07$. Thus, people who associated self with potency also associated their ingroup with potency, suggesting that the self and ingroup share desirable traits. Table 3 also shows that for women, self-esteem was positively related to self-potency judgments, $r(32) = .38$, $p = .03$. For men, this relationship was positive but nonsignificant, $r(26) = .22$, $p = .26$. Thus, there was some tendency on the part of participants high in implicit self-esteem to also associate themselves more strongly with potency than weakness. However, implicit self-esteem showed no direct link to ingroup judgments.

The bottom half of Table 3 shows results for the explicit measures. In contrast to the IAT results, nonsignificant relations were shown between self-potency and gender-potency judgments for men, $r(26) = .08$, $p = .69$, and women, $r(32) = –.13$, $p = .45$. Similar to the IAT results, men showed no relationship between self-esteem and gender-potency judgments, $r(26) = .10$, $p = .62$. However, women showed a significant negative relationship between self-esteem and gender potency judgments, $r(32) = –.44$, $p = .01$ (i.e., women high in self-esteem were less likely to judge men as powerful and

TABLE 3: Correlations Among Implicit and Explicit Measures (Experiment 3)

	Gender-Potency	*Self-Esteem*	*Self-Potency*
IAT measure			
Gender-potency[a]	*.25**	.001	.41**
Self-esteem[b]	–.02	*.04*	.22
Self-potency[c]	–.31*	.38**	*.36***
Explicit measure			
Gender-potency[a]	*.25**	.08	.09
Self-esteem[b]	–.44**	*.04*	.54**
Self-potency[c]	–.13	.47**	*.36***

NOTE: IAT = Implicit Association Test. Correlations for men (n =28) are shown above the diagonal; correlations for women (n = 34) are shown below the diagonal. On the diagonal (in italics) are correlations between the implicit and explicit measures (N= 62). Correlations were computed using IAT log-latency difference scores. Correlations with untransformed latencies were similar.

a. High scores indicate men are more potent than women.

b. High scores indicate greater self-esteem.

c. High scores indicate self is more potent than others.

*p < .10. **p < .05.

women as weak). Thus, more support was found for the self-esteem hypothesis at the explicit, compared to implicit, level, but only for female participants. Finally, Table 3 shows that for both men and women, self-esteem was positively related to self-potency judgments, both rs > .46, ps < .01.

With respect to the relations among implicit and explicit measures, Table 3 shows a marginally significant relationship between the gender-potency measures, $r(60) = .25$, $p = .05$, and a significant relationship between the self-potency measures, $r(60) = .36$, $p = .004$. However, no relationship emerged between the self-esteem measures, $r(60) = .04$, *ns*. These results echo past IAT research showing more convergence for implicit and explicit measures of self-concept (Nosek, Banaji, & Greenwald, 1998; Swanson, Rudman, & Greenwald, 2001) than for self-esteem (Farnham et al., 1999).

In sum, Experiment 3 showed no support for the hypothesis that implicit self-esteem influences evaluative gender stereotypes. Instead, implicit self-potency was linked to own-gender potency. Finally, this link between self-concept and gender stereotypes was evident only with implicit (not explicit) measures.

EXPERIMENT 4

Experiment 4 provided a conceptual replication of Experiment 3's unexpected result. Participants performed two IAT measures that assessed (a) gender-stereotype (potency vs. warmth) and (b) self-concept (potency vs. warmth). These measures differed from those previously used because they used attributes that reflect favorably on both men and women; that is, potency is a positive male-stereotypical attribute and warmth is a positive female-stereotypical attribute. As a result, both men and women were expected to show greater facilitation when associating men with potency and women with warmth, compared to when these associations were reversed.

Experiment 4 was originally designed to test a balance-theory-derived prediction (reported in Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellott, 2000; see Note 5) and was conducted prior to our interest in comparing self-esteem and self-concept as predictors of ingroup stereotypes. Consequently, it did not include self-esteem measures. Nevertheless, because the experiment included both self-concept and gender stereotype measures, it afforded a replication of Experiment 3's finding that self-concept is linked to implicit gender stereotypes.

Method

PARTICIPANTS

Ninety-eight volunteers (48 men and 52 women) from introductory psychology courses at the University of Washington participated in exchange for course credit. From these, 5 male participants were eliminated due to IAT error rates greater than 25%, indicating lack of attention to the task. The resulting sample consisted of 95 participants (43 men, 52 women).

MATERIALS, DESIGN, AND PROCEDURE

The gender-stereotype IAT used powerful and warm attributes that were matched for positivity on the basis of ratings obtained in a separate pretest. These words included *power*, *strong*, *confident*, *warm*, *nurture*, and *nice* (see the appendix). The target concepts were male and female meaning words (e.g., male, man, boy, sir; female, woman, girl, lady; see the appendix). High scores on the gender-stereotype measure reflect implicit stereotyping (i.e., associating male more with power and female more with warmth). The self-concept IAT used the same power and warmth attributes, but target concepts were self (I, me, my, mine, and participants' first name) versus other (it, they, them, their, theirs). High scores on this measure indicated association of self with power more than warmth.

To measure explicit stereotypes, participants rated the IAT's power and warmth words vis-à-vis their own beliefs about men and, separately, about women (1 = *not at all true of men* [*women*]; 7 = *very true of men [women]*). Difference scores were computed for power and warmth gender judgments and subsequently averaged, such that high scores reflected more stereotypic judgments (greater association of male with power and female with warmth). These difference scores had a potential range

of +6 (*maximal gender stereotype*) to –6 (*maximal counterstereotype*). To measure self-concept, participants indicated the extent to which each power and warmth word characterized themselves and, separately, others (1 = *not at all true of me* [*others*]; 7 = *very much true of me* [*others*]). Difference scores were computed for power and warmth self-concepts and subsequently combined such that high scores reflected a judgment of self as more potent than warm. These difference scores had a potential range of +6 (*maximal self-potency*) to –6 (*maximal self-warmth*).

Participants first completed the IAT, with block order counterbalanced (stereotype compatible first vs. stereotype compatible second), and then completed the explicit measures. The design was a 2 (block order) × 2 (participant sex) factorial.[6]

Results and Discussion

THE IAT EFFECT

Because the gender-stereotype IAT contrasted the positive poles of gender stereotypes, we expected (and found) no sex differences on this measure. Men and women averaged gender-stereotype IAT effects of +147 ms and +164 ms, respectively (ds = 1.02 and 1.13). These IAT effects were not significantly different, $t(93) = 1.11$, $p = .27$. Thus, both men and women showed strong evidence of implicit gender stereotypes in a measure contrasting traits that reflected favorably on both groups. On the self-concept IAT, both men and women were more likely to associate self with warmth than with power. Men and women had average self-concept IAT effects of –43 ms ($d = -.35$) and –51 ms ($d = -.41$), respectively. There were no sex differences in implicit self-concept, $t(93) = .58$, $p = .56$.

In contrast to the gender-stereotype IAT, men endorsed the power-warmth stereotype more than did women on the explicit measure (Ms = 1.40 vs. .86; ds = 1.69 vs. 1.04). This sex difference was significant, $t(93) = 3.14$, $p = .01$. Similar to the self-concept IAT, both men and women judged warmth to be more applicable to the self than potency (Ms = –.76 vs. –1.05; ds = –.80 vs. 1.11). There were no sex differences on this measure, $t(93) = 1.49$, $p = .13$.

CORRELATIONAL ANALYSES

The primary aim of these analyses was to replicate the link between self-concept and ingroup judgments found in Experiment 3. Table 4 shows the relationships among Experiment 4's dependent measures, separately for men (above the diagonal) and women (below the diagonal). On the diagonal are the relations between the implicit and explicit measures (in italics). Variables were scored so that positive relations were expected between self-concept and gender-stereotype IATs for men, whereas negative relations were expected for women.

TABLE 4: Correlations Among Implicit and Explicit Measures (Experiment 4)

Power-Warmth Measure	*Gender-Stereotype*	*Self-Concept*
IAT measure		
Gender-stereotype[a]	*.11*	.34**
Self-concept[b]	–.27**	*.05*
Explicit measure		
Gender-stereotype[a]	*.11*	–.12
Self-concept[b]	–.10	*.05*

NOTE: IAT = Implicit Association Test. Correlations for men (N=43) are shown above the diagonal; correlations for women (N = 52) are shown below the diagonal. On the diagonal (in italics) are correlations between the implicit and explicit measures (N= 95). Correlations were computed using IAT log-latency difference scores. Correlations with untransformed latencies were similar.

a. High scores indicate men are more potent than women and women are warmer than men.

b. High scores indicate self is more potent than others and others are warmer than self.

**$p < .05$.

The top half of Table 4 shows results for the implicit measures. As can be seen, people who associated self with potency also associated their gender with potency, resulting in opposing patterns of relations for men and women; that is, men showed the expected positive relationship between the gender-stereotype and self-concept IATs, $r(41) = .34$, $p = .02$, whereas women showed the expected negative relationship between these measures, $r(50) = -.27$, $p = .05$. These results replicate Experiment 3's finding that self- and own-gender judgments are implicitly linked. The bottom half of Table 4 shows results for the explicit measures. As can be seen, no significant relations were found between self- and own-gender judgments for either men, $r(41) = -.12$, $p = .42$, or women $r(50) = -.10$, $p = .47$. As in Experiment 3, the link between self-concept and gender stereotypes was evident only with implicit measures.

With respect to the relations among implicit and explicit measures, Table 4 shows a nonsignificant relationship between the gender-stereotype measures, $r(93) = .11$, $p = .27$. In contrast to Experiment 3's results, there was also no reliable covariation between the IAT and explicit self-concept measures, $r(93) = .05$, $p = .61$ (cf. Nosek et al., 1998; Swanson et al., 2001).

Experiment 4's focal finding was the replication of Experiment 3's observed link between implicit self-concept and own-gender stereotypes. Although the gender-stereotype measure was evaluatively imbalanced in Experiment 3 (power vs. weakness) and evaluatively matched in Experiment 4 (power vs. warmth), results were similar. Each experiment showed an association

between implicit self-concept and gender stereotypes for both men and women.

GENERAL DISCUSSION

Measuring Implicit Gender Stereotypes

The results of Experiments 1 through 4 support the effectiveness of the IAT as a method for investigating implicit gender stereotypes. The average implicit stereotype (IAT) effect size across four experiments was $d = .87$, which is considered a large effect by conventional standards (Cohen, 1988). The IAT therefore appears to be sensitive to automatic concept-attribute associations underlying implicit stereotypes, much as it was previously shown to be sensitive to automatic evaluative associations underlying implicit attitudes (Greenwald et al., 1998; see also Rudman et al., 1999; Rudman & Kilianski, 2000).

Implicit Self-Esteem Versus Self-Concept as Predictors of Implicit Gender Stereotypes

Effect sizes for implicit gender stereotypes in the present research varied depending on participant sex and the evaluative connotations of stereotypic judgments. Although past research has not found evidence of sex differences in implicit gender stereotypes, prior work has not used evaluative gender stereotypes—stereotypes in which the two poles (powerful vs. weak, warm vs. cold) are contrasted in a way that suggests the superiority or inferiority of men or women. In the present research, men's evaluative gender-potency stereotype was stronger than women's, and women's evaluative gender-warmth stereotype was stronger than men's.

These results suggested that implicit self-esteem might contaminate evaluative implicit gender stereotypes by promoting self-favorable responses. Experiment 2 controlled for this potential influence of self-esteem by removing the evaluative connotations of the gender-potency stereotype. This manipulation dramatically reduced sex differences in gender stereotypes, in support of the self-esteem hypothesis. Experiment 3 returned to an evaluative stereotype (favorable strong vs. unfavorable weak) to directly test for an expected correlation of implicit self-esteem with implicit gender stereotypes. However, the hypothesis was not supported.

Instead, a link was found between implicit self-concept and implicit evaluative gender stereotypes, such that men and women who associated self with potency also associated their gender with potency. Experiment 4 conceptually confirmed this link between implicit self-concept and gender stereotypes, using the power-warmth gender stereotype. In this case, men and women who associated self with potency (or warmth) also associated their gender with potency (or warmth). Taken together, the results indicate that, at the implicit level, self and ingroup share desirable attributes.

These findings conform to cognitive consistency theory, in which self- and ingroup judgments are positively linked (when self and ingroup form a unit relationship) (Heider, 1958). Because IAT research has shown that men and women are strongly implicitly gender identified (Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellott, in press), the positive relationships found in Experiments 3 and 4 between self- and gender judgments support consistency principles (see also Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellott, 2000; Greenwald, Banaji, Rudman, Farnham, Nosek, & Rosier, 2000). The causal direction of this implicit relationship cannot be known from the present findings (i.e., whether self-concept generalizes to the ingroup or vice versa). But it is noteworthy that in Experiments 3 and 4, the link between self-concept and own-gender judgments was not found using self-reports. Instead, it appears that self- and ingroup attributes are shared in an implicit, associative structure (Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellott, 2000; Greenwald, Banaji, Rudman, Farnham, Nosek, & Rosier, 2000).

As noted earlier, Smith and Henry (1996) also showed a link between implicit self-concept and ingroup judgments. Specifically, people were faster to identify self-applicable traits when these traits also described their ingroup (e.g., college major), compared to when these traits did not describe their ingroup. The authors interpreted this result as supportive of social identity theory (SIT) (Tajfel & Turner, 1985) because it demonstrated the "inclusion of a group as part of the self" (Smith & Henry, 1996, p. 641). Nevertheless, the present Experiment 3 did not find a positive correlation between implicit self-esteem and evaluative implicit gender stereotypes. Because SIT argues that ingroup-favorable responses are made in the service of self-esteem, high implicit self-esteem participants should have associated their own gender with potency (a favorable trait) more than with weakness (a negative trait).[7]

Self-Favorability of Implicit Gender Stereotypes

Taken together, the present findings suggest that men and women possess traditional gender stereotypes, but in implicitly self-favorable form (i.e., linking own gender to positive characteristics). Experiments 1 and 3 showed that both men and women possessed stereotypic associations that favored their group—for men, with respect to power; for women, with respect to warmth. Experiment 2 supported this hypothesis by showing an increase in female participants' gender-potency stereotype when

attributes did not reflect unfavorably on women. Finally, Experiment 4 showed no sex differences in IAT effects when the evaluative poles of gender stereotypes were distinctly positive for both men and women (power vs. warmth). In concert, the findings suggest a powerful generalization: Forms of the implicit stereotype possessed by the ingroup differ from those of the outgroup because each is biased in a self-favorable direction. Nevertheless, the findings clearly showed that self-esteem is not responsible for this bias. Instead, at the implicit level, self and ingroup share desirable traits.

CONCLUSION

The IAT's usefulness in assessing implicit stereotypes was shown by its sensitivity to sex differences in the strength and evaluative nuances of gender stereotypes. Results showed that men's gender-potency stereotype is stronger than women's, and women's gender-warmth stereotype is stronger than men's (Experiments 1 and 3). However, when potency judgments were evaluatively symmetric (i.e., did not connote superiority for either group; Experiment 2), or when stereotypes reflected positively on both men and women (Experiment 4), sex differences in implicit stereotypes were reduced or eliminated, respectively. Implicit self-esteem was tested as a positive predictor of evaluative gender stereotypes, but no support emerged. Instead, implicit self-concept was associated with implicit gender stereotypes, such that self and ingroup shared desirable traits (Experiments 3 and 4). The findings collectively demonstrated that men and women possess implicitly self-favorable gender stereotypes and that these are linked to a (trait-specific) positive self-concept, not to global self-esteem.

APPENDIX
Stimuli for Experiments 1 Through 4

Male Names (Experiments 1-3)

Brian	Scott	Kevin	Mark	Alan
Mathew	Eric	Steve	Jason	Robert
Paul	Greg	John	Peter	Daniel

Female Names (Experiments 1-3)

Beth	Marcia	Sara	Laurel	Ann
Lisa	Elaine	Diane	Eva	Susan
Meg	Gwen	Karen	Sandra	Kate

Gender Target Concepts (Experiment 4)

male	man	sir	boy	guy
he	him	female	woman	lady
girl	gal	she	her	

Experiments 1, 3, and 4

Power Words	*Weak Words*	*Warm Words*	*Cold Words*
power[a]	weak	warm[a]	cold
strong[a]	surrender	nurture[a]	abandon
confident[a]	timid	nice[a]	distant
dominant[a]	vulnerable	love[a]	detached
potent[a]	weakness	caring[a]	harsh
command[a]	wispy	gentle[a]	reject
assert[a]	withdraw	kind[a]	rigid
loud	yield	protect	surly
bold	failure	accept	ignore
succeed	shy	support	offend
triumph	follow	welcome	rude
leader	lose	cooperate	selfish
shout	fragile	pleasant	aloof
dynamic	afraid	give	hostile
winner	loser	forgive	cruel

NOTE: Experiment 1 used all of the stimuli shown above. Experiment 3 used the power and weak words.
a. Indicates stimuli used in Experiment 4.

Experiment 2

	Power Words	*Core Words (Power)*	*Core Words (Weak)*	*Weak Words*	
Negative words	Destroy			Feeble	Negative words
	Fight			Frail	
	Fury	Strong	Weak	Scrawny	
	Violent			Lame	
	Rage			Sickly	
Neutral words	Durable			Fragile	Neutral words
	Hardy	Solid	Thin	Slight	
	Loud			Wispy	
	Iron			Quiet	
	Oak	Large	Small	Feather	
Positive words	Bold			Delicate	Positive words
	Mighty			Fine	
	Power			Flower	
	Robust	Steel	Twig	Gentle	
	Stamina			Lamb	

NOTE: Experiment 2 contrasted evaluatively symmetrical power and weak words. Each Implicit Association Test (IAT) (negative, neutral, and positive) included the core words.

Experiment 3

Self Words	*Other Words*	*Pleasant Words*	*Unpleasant Words*
Me	It	Gold	Abuse
My	They	Joy	Corpse
Mine	Them	Smile	Death
[Participants' name]	Their	Peace	Filth
		Paradise	Poison
		Sunshine	Slime
		Warmth	Pain
		Good	Bad

NOTE: Experiment 3's self-concept and self-esteem Implicit Association Tests (IATs) used the self and other words as target concepts. The self-esteem IAT used the pleasant and unpleasant words listed above. The self-concept IAT used the same attributes as those listed for Experiment 1 and 3's gender-stereotype IATs.

NOTES

1. This abbreviation is arbitrary; the task could equally be described as female + weak.

2. The Implicit Association Test (IAT) program was written by Shelly Farnham.

3. The *d* statistics reported in this article are Cohen's (1988) measure of effect size, computed by dividing a numerical effect by the standard deviation of its measure. Effect sizes for male and female participants were computed using a pooled standard deviation for the male and female data. By convention, *d* values of .2, .5, and .8 are interpreted as small, medium, and large effect sizes, respectively.

4. To check on the assumption that power was superior to weak, and warmth was superior to cold, a separate group of participants (28 men, 34 women) completed a measure of stimuli valence for the powerful, weak, warm, and cold meaning words used in Experiment 1. Each word was rated on a scale ranging from 1 (*very bad*) to 7 (*very good*). The ratings were combined to form four separate indexes. The comparisons between powerful versus weak (*M*s = 5.37 vs. 2.85) and warm versus cold (*M*s = 6.15 vs. 2.29) were predictably significant, both ts(61) > 20.00, ps < .001. In no case did gender differences emerge, all ts(60) < 1.34, ps > .17. Thus, the assumption that powerful and warm are preferable to weak and cold was supported by both men and women.

5. Some readers might anticipate an effect for valence because negative-valence words are often responded to more slowly than positive-valence words. However, because the IAT effect is a difference score, any such effect of word valence may affect both components of the difference score equally and, therefore, not be evident in the IAT effect measure.

6. Participants in Experiment 4 also completed a gender identity IAT as part of a balanced-identity design constructed to test a unified theory of implicit self-concept, self-esteem, and stereotype (Greenwald, Banaji, Rudman, Farnham, Nosek, & Rosier, 2000). The present analyses used participant sex as a proxy for gender identity. However, they supported the same conclusion derived from the balanced-identity analysis that used the implicit identity measure and is presented elsewhere (Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellott, 2000).

7. This is not to suggest that self-esteem can never influence implicit stereotypes. For example, under conditions in which self-esteem is overtly threatened, more negative implicit stereotyping of outgroup members has been shown (Spencer, Fein, Wolfe, Fong, & Dunn, 1998).

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