

## Stereotype Formation and Endorsement: The Role of Implicit Theories

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Five experiments supported the hypothesis that peoples' implicit theories about the fixedness versus malleability of human attributes (entity versus incremental theories) predict differences in degree of social stereotyping. Relative to those holding an incremental theory, people holding an entity theory made more stereotypical trait judgments of ethnic and occupational groups (Experiments 1, 2, and 5) and formed more extreme trait judgments of novel groups (Experiment 3). Implicit theories also predicted the degree to which people attributed stereotyped traits to inborn group qualities versus environmental forces (Experiment 2). Manipulating implicit theories affected level of stereotyping (Experiment 4), suggesting that implicit theories can play a causal role. Finally, implicit theories predicted unique and substantial variance in stereotype endorsement after controlling for the contributions of other stereotype-relevant individual difference variables (Experiment 5). These results highlight the importance of people's basic assumptions about personality in stereotyping.

Over the last two decades, research on social cognition has identified fundamental cognitive processes involved in the formation, use, and maintenance of stereotypes (e.g., Fiske, 1998; Hamilton & Sherman, 1994; Hamilton, Stroessner, & Driscoll, 1994; Macrae, Stangor, & Hewstone, 1996). When forming stereotypes, for example, people often make extreme trait and evaluative judgments of a group, even on the basis of sparse information about group members (e.g., Ford & Stangor, 1992; Judd & Park, 1988), and perceive limited within-group variability (e.g., Linville, Fischer, & Salovey, 1989; Park & Hastie, 1987). Once formed, stereotypes often serve as the primary basis for judging groups and their members (e.g., Kunda & Sherman-Williams, 1993; Sagar & Schofield, 1980); consequently, judgments based on stereotypes tend to be made quickly (e.g., Dovidio, Evans, & Tyler, 1986; Macrae, Bodenhausen, & Milne, 1995).

Research on people's implicit theories has examined some

similar social judgment processes in the areas of self- and person perception (e.g., Chiu, Hong, & Dweck, 1997; Erdley & Dweck, 1993; also see Dweck, Chiu, & Hong, 1995; Levy & Dweck, in press; Levy, Plaks, & Dweck, in press).<sup>1</sup> This research suggests that people may vary in the degree to which they engage in processes that are implicated in stereotyping. Specifically, *entity* theorists, individuals who believe that people's traits are fixed, have been shown to process information about the self and other individuals differently from *incremental* theorists, who believe that people's traits are malleable. Entity theorists appear particularly prone to engage in processes similar to those involved in stereotyping.

Whereas this work to date has focused on perceptions of the self and other single individuals, we sought in the present research to assess whether differences in implicit theories would predict differences in perceptions of groups. Before describing the experiments that addressed this issue, we briefly review the existing research on implicit theories and social information processing.

#### Implicit Theories of the Self and Others

The notion that perceivers' belief systems provide information about their social world has a long history in psychology.

<sup>1</sup> Our work on implicit person theories should be contrasted with a line of research on implicit personality theories (IPT). Broadly speaking, both conceptualizations are concerned with naive theories about people's attributes and have their roots in Kelly's (1955) approach to personality. However, whereas our research has examined people's beliefs about the nature of traits (e.g., their malleability or fixedness), work on IPT (e.g., Ashmore & Del Boca, 1981b; Schneider, 1973) has been concerned with perceptions of the relations among traits.

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Early social psychologists (Heider, 1958; Jones & Thibaut, 1958; Kelly, 1955) recognized that people's lay theories, even if unconscious or not clearly articulated, can play a pivotal role in social understanding. Over the last decade, several different kinds of lay or implicit theories that guide people's information processing have been investigated. These include implicit theories about intelligence (e.g., Dweck & Leggett, 1988; Hong, Chiu, & Dweck, 1995; Rhodewalt, 1994; Sternberg, 1985), creativity (e.g., Runco, Johnson, & Bear, 1993), expertise (e.g., Wright & Murphy, 1984), morality (e.g., Chiu, Dweck, Tong, & Fu, 1997), free will or determinism (e.g., Stroessner & Green, 1990), people (e.g., Chiu, Hong, et al., 1997; Ross, 1989), and relationships (e.g., Fletcher & Thomas, 1996).

Research by Dweck and her associates, as noted, has focused on implicit theories about the nature of human attributes. This research originally focused on implicit theories about intelligence (Dweck & Leggett, 1988; Hong et al., 1995) and showed that entity theorists, who view intelligence as fixed, used information about their own performance on a single task as the basis for judging their global intellectual ability. Incremental theorists, who view intelligence as malleable, used the same performance information to make inferences about their own effort or task strategies. Therefore, whereas entity theorists showed a greater tendency to make sweeping ability judgments, incremental theorists showed a greater tendency to focus on specific, dynamic processes that may have shaped their performance.

Research on self-theories led to the question of whether individuals with different implicit theories would also differ in their judgments of other individuals. Specifically, would entity theorists make more extreme judgments about others' traits from a small sample of behavior in the same way that they made global inferences about themselves? Why should this be? Entity theorists, believing that traits are fixed, may expect a high degree of consistency in behavior. This expectation has two important implications. First, traits will be perceived as very useful, that is, as having high predictive value. Second, if trait-related behaviors are seen as highly regular, then one will believe that traits can be reliably inferred from small samples of behavior. Thus, entity theorists may readily infer strong traits from sparse information, and once they have inferred traits they may make confident predictions on the basis of those traits. In contrast, if people believe traits are more dynamic and malleable, they may view people's behaviors as varying, either over time or across situations; consequently, a trait reading cannot afford as much predictive value and may not be sought as vigorously.<sup>2</sup> In this way, a fixed versus malleable view of traits may set up a framework for understanding social information and rendering social judgments.

A number of studies on implicit theories and person perception have been conducted with preadolescents and college students. For example, Erdley and Dweck (1993) showed preadolescents a narrated slide show depicting some negative behaviors of a (nervous) new boy at school (e.g., he glorified his background and tried to copy a classmate's paper). Entity theorists made significantly stronger inferences than incremental theorists about the boy's global moral traits (e.g., bad, mean, nasty). Recently, Chiu, Hong, et al. (1997; Study 3) asked college students to evaluate a set of positive and negative behaviors, one

at a time. When asked to simply rate the desirability of the behaviors, entity and incremental theorists gave virtually identical ratings. However, as predicted, when asked how indicative each behavior was of a person's character, entity theorists judged even mildly valenced positive and negative behaviors (e.g., "making one's bed in the morning"; "interrupting someone who is speaking") as significantly more indicative of the target's moral traits than did incremental theorists.

In summary, then, entity theorists appear more likely than incremental theorists to engage in a key process implicated in stereotyping: They tend to make more extreme trait judgments (both positive and negative) of a target person from limited social information. In addition, entity theorists, relative to their incremental counterparts, have been found to draw strong trait judgments even when situational information (e.g., external pressures acting on a person) and psychological process information (e.g., a target's thoughts, intentions, goals, emotion states) are made salient (Erdley & Dweck, 1993). They have also been shown to exhibit other processes that may be related to stereotyping, namely, a lesser tendency to adjust their trait judgments when exposed to expectancy-inconsistent information (Erdley & Dweck, 1993) as well as a lesser tendency to expect variability in an individual's behavior over time and across different contexts (Chiu, Hong, et al., 1997).

Although entity theorists tend to make more extreme trait judgments than incremental theorists, incremental theorists, of course, do use traits to describe others. The traits entity and incremental theorists apply are not only viewed, by definition, to have a different nature but also appear to serve a different function (for discussions of different meanings of traits, see Trope, 1989; Uleman, Newman, & Moskowitz, 1996). For entity theorists, fixed traits seem to be easily detectable from sparse information and can be used to make confident predictions in the future; traits appear to serve as enduring dispositional labels. When incremental theorists endorse traits, they seem to invest them with less predictive value; for them, traits appear to serve as more tentative or provisional descriptors (Chiu, Hong, et al., 1997; Erdley & Dweck, 1993).

### Implicit Theories and Perception of Groups

Given these differences in person judgments, would entity and incremental theorists differ in their judgments of groups of people? In forming stereotypes, for example, would entity theorists more readily and more strongly affix trait labels to groups? Would entity theorists, relative to incremental theorists, more strongly agree with positive and negative stereotypical traits of familiar targets, such as occupational or ethnic groups? In the same way that they expected less variability in an individ-

<sup>2</sup> Incremental theorists appear to take other things (besides underlying traits) into account when explaining and predicting behavior. For example, Hong (1994) asked college students to explain isolated positive and negative behaviors (e.g., "Arthur brought his colleagues some souvenirs from a trip") and found that whereas entity theorists proposed significantly more trait attributions (e.g., "Arthur is good-hearted"), incremental theorists proposed significantly more psychological process attributions (e.g., goals, needs, or values such as "Arthur wanted to please his colleagues"; see also Levy & Dweck, 1998, in press).

ual's behavior, would entity theorists expect or perceive less variability in a group's behavior? Five experiments sought to answer these questions. In Experiment 1, as a first step in relating implicit theories to perception of groups, participants generated stereotypes of several ethnic groups and indicated how true they believed these stereotypes were. It was predicted that entity and incremental theorists would have the same knowledge of societal stereotypes but that entity theorists would express greater belief in the stereotypes than would incremental theorists. In Experiment 2 we focused in greater detail on perceptions of African Americans. We compared entity and incremental theorists' endorsements of a set list of stereotypes of African Americans as well as their explanations for the existence of the stereotypes.

In Experiment 3 we addressed differences in the formation of stereotypes. We predicted that entity theorists would more readily form stereotypes of novel groups than would incremental theorists and that they would display other signs of stereotyping, such as perceiving greater group homogeneity. Experiment 4 was designed to assess whether implicit theories play a causal role in level of stereotyping. In this experiment, either an entity or incremental theory was highlighted by having participants read compelling "scientific" articles. The impact of this manipulation on agreement with stereotypes of ethnic and occupational groups was assessed. Finally, given that several individual difference variables have recently been discussed in relation to stereotyping, in Experiment 5 we assessed the extent to which implicit theories predict unique variance in level of stereotyping. In short, this research sought to establish preliminary evidence for the importance of people's implicit theories in the belief in and formation of group stereotypes.

### Experiment 1: Stereotype Knowledge and Truth Ratings

Experiment 1 was designed to determine which stereotypes entity and incremental theorists attach to ethnic groups and whether their beliefs about the truth of the stereotypes differed. Consistent with the finding that high- and low-prejudice participants are equally knowledgeable about societal stereotypes because they share a similar cultural background (e.g., Devine, 1989; Lepore & Brown, 1997), we hypothesized that participants would have the same knowledge or availability of societal stereotypes regardless of their implicit person theory. However, since people holding entity theories are more likely to believe that traits, due to their stability, are useful and valid ways of characterizing others, we predicted that they would express greater belief in stereotypes.

### Method

#### Participants

A total of 78 introductory psychology students (34 males and 44 females) between the ages of 17 and 37 years ( $M = 20.5$ ) participated in the experiment to partially fulfill a course requirement. Data from one student who was confused about the task were removed from the analysis.

#### Measures

**Implicit person theory measure.** Because stereotypes tend to contain beliefs about a variety of attributes, we used the domain-general measure

of implicit theories (i.e., an implicit person theory measure) rather than the domain-specific measure of implicit theory (i.e., theory of intelligence or theory of moral character; see Dweck et al., 1995). Consistent with Kelly's (1955) direct approach to examining people's underlying theories of their social world, people's implicit theories are directly measured. The theories are termed *implicit* because we believe that they are most often poorly articulated. We presume, however, that people will know whether they tend to agree or disagree with the simple, straightforward items in our measure. The three items of the implicit person theory measure are: "The kind of person someone is, is something basic about them, and it can't be changed very much"; "People can do things differently, but the important parts of who they are can't really be changed"; "Everyone is a certain kind of person, and there is not much that they can do to really change that." Each item is accompanied by a scale ranging from 1 to 6 (1 = *strongly agree*, 2 = *agree*, 3 = *mostly agree*, 4 = *mostly disagree*, 5 = *disagree*, 6 = *strongly disagree*). Responses to the items are used to identify entity and incremental theorists (typically 40–45% per theory group), as well as a small set of individuals (typically 10–15%) who do not have a well-defined or consistent implicit theory.

Two potential concerns arising from the format of the measure should be discussed. Because items depicting only an entity theory are included in the measure, one potential concern might be whether disagreement with these items (i.e., disagreement that these traits are fixed) can be taken as agreement with an incremental theory (i.e., the belief that traits are malleable). A second potential concern is that agreement with the entity items on the original measure may represent an acquiescence set. Incremental-worded items have not been included because participants in previous studies tended to universally endorse them (see Dweck et al., 1995, for a discussion of validation studies of the measure).

These concerns are addressed by recent data documenting that participants who disagree with entity theory statements do indeed agree with incremental theory statements. Specifically, to avoid the compelling or socially desirable nature of past incremental items, Levy and Dweck (1997) developed a new scale with strongly stated incremental items that emphasized a belief in substantial potential change for anyone. Across five validation studies, the new 8-item scale containing both entity and incremental items was administered in a separate session from the original 3-item measure. The correlation between responses to the original entity items and the new incremental items was found to be between  $-.69$  and  $-.86$ , showing that disagreement with the entity items does in fact represent agreement with the incremental items. Moreover, responses to the 3-item and 8-item measures in two validation studies were correlated between  $.83$  and  $.92$ . (The new 8-item scale is used in Experiment 5.) The classification of participants as entity, incremental, and unclassified on both measures was also very similar in these studies.

**Stereotype measure.** There were two parts to the stereotype measure: one designed to assess stereotype knowledge and one to assess stereotype beliefs. The instructions to Part 1 of the measure asked participants about their knowledge of the societal stereotypes of African Americans, Asians, Caucasians, Hispanics–Latinos, and Jews. Participants were asked to list stereotypes under three categories: Positive, Negative, and Other (not necessarily positive or negative). This was done to ensure that any differences in endorsement of the stereotypes were not due to differences in the way that entity and incremental theorists evaluated stereotyped characteristics (with, e.g., one group viewing *assertiveness* as a positive trait and the other group viewing it as a negative trait). A *stereotype* was defined for them "as beliefs about the personal attributes of a group" (Ashmore & Del Boca, 1981a). Part 2 assessed endorsement of the stereotypes participants generated in Part 1. Participants were provided with an example of a "true" stereotype to reduce the demand to report that all stereotypes are false. Specifically, participants were told that "Some stereotypes are true. For example, men are stereotyped as physically stronger than women. Studies have supported the view of

men as physically stronger than women in general." Participants were instructed to review the descriptions they listed in Part 1 and to rate every item on a 5-point Likert scale (0 = *not at all true*, 1 = *a grain of truth*, 2 = *moderately true*, 3 = *mostly true*, 4 = *extremely true*).

### Procedure

Participants were tested individually and were seated in private cubicles. On arrival, they completed a consent form and the implicit person theory measure. To reduce the likelihood that participants would perceive a connection between the theory measure and the stereotype measure, there was a short delay before the stereotype measure was distributed, during which, participants were told, the experimenter would take a few minutes to organize materials for the study. The study was then introduced as one consisting of a short questionnaire packet (i.e., the stereotype measure). After completing the packet, participants were fully debriefed and thanked. No participant reported thinking that the theory measure was relevant to the stereotyping measure; when probed, some suggested that it was a measure for other research.

### Results and Discussion

#### Responses to the Implicit Person Theory Measure

Participants' responses to the implicit person theory items were highly reliable (Cronbach's  $\alpha = .93$ ). Accordingly, responses to the three theory items were averaged to create an implicit person theory index for each participant. As in previous research (see Dweck et al., 1995), participants with a mean theory score of 3.0 or below (indicating overall agreement) were classified as entity theorists ( $n = 29$ ), and participants with mean scores of 4.0 and above (indicating overall disagreement) were classified as incremental theorists ( $n = 41$ ). Because our predictions were made only for participants with clear implicit theories, participants with mean theory scores that fell between 3.0 and 4.0 were unclassified and were excluded from the data analyses ( $n = 8$ ).

#### Responses to the Stereotype Measures

**Coding and content of stereotype lists.** Two judges who were blind to participants' implicit person theory coded the stereotype lists into categories. One category, participants' trait listings, was of primary interest in this experiment, and traits constituted most of the stereotypes listed. The reliability of coding the traits was 95% (calculated as the number of agreements divided by the total number of agreements and disagreements). Discrepancies were resolved by a third judge (the first author), who was also blind to participants' implicit person theory. Table 1 contains the percentage of entity and incremental theorists who listed the most frequently reported stereotypes of each group—traits listed by one third of the participants (for a similar set of generated stereotypes, see Devine, 1989; Stangor, Sullivan, & Ford, 1991).

Our hypothesis that entity and incremental theorists would not differ in their knowledge of the stereotypes attributed to the five groups was confirmed. Chi-square analyses revealed no differences between entity and incremental theorists' beliefs about the contents of the stereotypes. Additionally, there were no significant differences in the number of stereotypes entity or incremental theorists listed for each group. The mean number

**Table 1**  
*Frequently Listed Stereotypes and Mean Truth Ratings for Each Stereotype as a Function of Implicit Person Theory, Experiment 1*

Group and traits	Listed (%)		Truth ratings		<i>p</i>
	ET	IT	ET	IT	
African Americans					
Athletic	74.1	77.5	2.4	2.0	
Criminal or violent	81.5	85.0	1.3	0.8	
Lazy	37.0	55.0	1.6	0.5	<.01
Musical or rhythmic	77.8	62.5	2.2	2.0	
Undisciplined	66.7	60.0	1.4	1.0	
Unintelligent	48.1	67.5	0.7	0.2	<.05
Asians					
Ethnocentric	48.3	29.3	2.4	1.3	<.05
Hardworking	72.4	63.4	2.7	1.9	<.01
Intelligent	82.8	78.0	2.5	1.8	
Introverted	44.8	29.3	1.5	1.2	
Caucasians					
Racist	79.3	78.0	2.1	1.4	<.05
Unathletic	24.1	39.0	1.8	1.0	
Hispanics-Latinos					
Criminal or violent	55.2	48.8	1.5	0.6	<.01
Drug user	27.6	41.5	1.5	0.7	<.05
Lazy	34.5	46.3	1.1	0.7	
Musical	27.6	34.1	2.5	1.7	
Unintelligent	58.6	61.0	1.1	0.7	
Jews					
Cheap	82.8	85.4	1.8	1.2	
Ethnocentric	37.9	29.3	2.2	1.4	
Intelligent	48.3	46.3	2.5	1.5	<.05
Racist	37.9	31.7	1.5	1.4	

Note. ET = entity theorists; IT = incremental theorists.

of stereotypes generated by entity and incremental theorists, respectively, for African Americans ( $M = 5.1$ ,  $M = 5.3$ ), Asian Americans ( $M = 4.3$ ,  $M = 3.9$ ), Caucasians ( $M = 3.0$ ,  $M = 3.5$ ), Jews ( $M = 4.5$ ,  $M = 4.2$ ), and Hispanics-Latinos ( $M = 3.8$ ,  $M = 4.2$ ), were statistically equivalent (all  $ps > .18$ ). Taken together, these findings support the assumption that entity and incremental theorists do not differ in their knowledge of societal stereotypes of these groups.

**Category placement.** By having participants list stereotypes according to three categories (Positive, Negative, and Other), we could assess whether the evaluative connotations of stereotypes differed for entity and incremental theorists. Entity and incremental theorists were nearly unanimous in agreement with all of the categorizations; for example: negative stereotypes (*lazy*, *cheap*, and *ethnocentric*), positive stereotypes (*athletic*, *musical*, and *hardworking*), and neutral stereotypes (food preferences and family characteristics). In addition, both theory groups placed the following kinds of stereotypes in more than one category: physical characteristics, religious activities, and political affiliation.

**Ratings of stereotype truth.** Our second hypothesis, that belief in the truth of stereotypes would vary according to implicit person theories, was also generally confirmed. We conducted one-way analyses of variance (ANOVAs) on the most frequently listed stereotypes for each group. The mean endorsement by

entity and incremental theorists of each stereotype is displayed in the far right columns of Table 1. To control for the Type I error rate across the entire set of comparisons, we also conducted a sign test. Because all of the differences in entity and incremental theorists' mean stereotype ratings are in the predicted direction, this test yielded a highly significant effect ( $p < .001$ ). Thus, although the entity-incremental difference was not significant for all of the individual stereotypes (in large part because none of the stereotypes were listed by all participants and all univariate tests were conducted on a subset of the whole sample), there was a highly consistent and significant pattern across the ethnic groups.

To conclude, although entity theorists and incremental theorists generated the same number of stereotypes and agreed on the connotations of those stereotypes, they expressed different levels of belief that the stereotypes reflect real group differences. Entity theorists more strongly endorsed both positive and negative ethnic stereotypes than did incremental theorists.

### Experiment 2: Agreement With and Explanations for Stereotypes

In Experiment 2 we attempted to extend the findings of Experiment 1 by focusing on perceptions of African Americans. One purpose of the experiment was to replicate our findings of Experiment 1 on a measure of stereotype endorsement that would allow greater power for comparing incremental and entity theorists' ratings.

A second aim of Experiment 2 was to explore another dimension of beliefs about stereotypes—how people account for the existence or perpetuation of stereotypes of African Americans. Explanations for the existence or persistence of stereotypes can clarify the meaning of the stereotype for different people. For example, believing that particular stereotypes persist because they reflect innate characteristics of group members implies that those stereotypes would persist even if the group's social environment were changed. In contrast, explaining stereotypes through social and environmental causes implies that particular stereotypes need not characterize the group in the future and that group members who develop under different conditions might display different traits. The significance of beliefs about the basis of stereotypes has been highlighted by research showing that stereotypes for categories that are seen as inherent or biologically based are especially likely to be used in making social judgments (e.g., Hoffmann & Hurst, 1990; Rothbart & Taylor, 1992) and that people's failure to understand the impact of social environments can contribute to the preservation of pre-existing stereotypes and the formation of new ones (see Schaller, Boyd, Yohannes, & O'Brien, 1995).

A greater belief in an innate versus environmental explanation of stereotypes may follow directly from a fixed versus malleable view of traits. However, because explanations for stereotypes have important implications, we investigated whether, relative to one another, entity theorists indeed believe that traits are fixed from birth, not stamped in at some later point in development, and that incremental theorists indeed view one's environment or life situation as a molder of personal attributes.

## Method

### Participants

A total of 114 introductory psychology students (42 males and 72 females) between the ages of 17 and 34 years ( $M = 19.7$ ) participated in the experiment to partially fulfill a course requirement. The data from 4 participants who were confused about the task were not used. Because the experiment focused exclusively on stereotypes of African Americans, no African Americans who volunteered to participate ( $n = 10$ ) were asked to complete the measures. Instead, they were fully debriefed about the experiment's purpose.

### Procedure and Measures

Participants were told the experiment included two separate, unrelated studies. To provide privacy and anonymity, they were seated in individual cubicles and were given envelopes in which to seal their responses to each study. "Study 1" was described as a short pilot study of newly developed questionnaires and included the same implicit person theory measure used in Experiment 1, as well as Paulhus's (1984) Social Desirability Scale.

Next, participants were told that "Study 2" was being conducted to better understand how African Americans as a group are perceived compared to other groups. They were given a three-part questionnaire. The first part was intended as a warm-up, and participants were asked to "list five stereotypes, to your knowledge, of African-Americans." The second part assessed their endorsement of a set list of positive and negative stereotypes of African Americans—the six stereotypes that were most frequently generated by participants in Experiment 1. On an 11-point Likert scale (0 = *not at all* to 10 = *very much*), participants rated their agreement with each stereotyped view (e.g., "How much do you agree with the view of African-Americans as more athletic [criminal or violent, undisciplined, musical or rhythmic, unintelligent, lazy]?"). In the third part of the questionnaire, participants were asked to consider six possible explanations for why certain views of groups tend to persist. These explanations included two items that reflected innate or inherent factors within the group (e.g., "The view of African-Americans as more \_\_\_\_\_ has persisted because of innate factors [inherent traits]") and one item that reflected social or environmental factors ("The view of African-Americans as more \_\_\_\_\_ has persisted because of past or present environmental or social causes within American society"). The three filler explanations were drawn from a pilot study. Participants rated their agreement with all six explanations for each stereotype on an 11-point Likert scale (0 = *not at all* to 10 = *very much*). The stereotype order was held constant in Parts 2 and 3 of the questionnaire. The final page of the questionnaire asked participants to report how comfortable they felt with the study. After inserting their envelopes into appropriate drop boxes, they were fully debriefed and thanked. No one reported being suspicious of a connection between the studies.

## Results and Discussion

### Responses to the Implicit Person Theory Measure

Responses to the measure again exhibited high internal reliability (Cronbach's  $\alpha = .88$ ). Following the procedure described in Experiment 1, entity theorists ( $n = 57$ ), incremental theorists ( $n = 34$ ), and unclassified participants ( $n = 23$ ) were identified. Data from the unclassified participants were not used in subsequent analyses.

To test whether implicit theories might be linked to differences in concerns over self-presentation, responses to Paulhus's (1984) Social Desirability Scale were analyzed. This analysis

indicated that entity theorists' scores ( $M = 3.7$ ) and incremental theorists' scores ( $M = 3.6$ ) did not differ,  $t(89) = 0.36$ ,  $p = .72$ . (Moreover, the independence of the implicit theory measure with both the Marlowe–Crowne Social Desirability Scale [Crowne & Marlowe, 1960] and the Motivation to Control Prejudice Reactions Scale [Dunton & Fazio, 1997] was confirmed in Experiment 5. These data [along with evidence reported in Dweck et al., 1995, and Levy & Dweck, 1997] indicate that implicit theories and concerns about responding in a socially desirable manner are not related.)

### Responses to the Stereotype Measures

**Agreement ratings.** Participants' ratings of African Americans on the six stereotypes were submitted to a 2 (implicit theory)  $\times$  6 (stereotype) ANOVA with repeated measures on the second factor. The analysis yielded a significant main effect of implicit theory,  $F(1, 89) = 6.38$ ,  $p < .05$ . Entity theorists agreed more with the stereotypes ( $M = 3.5$ ) than did incremental theorists ( $M = 2.4$ ). As can be seen in Figure 1, entity theorists' ratings of the individual stereotypes were consistently higher than incremental theorists' ratings. The Implicit Theory  $\times$  Stereotype interaction was not significant ( $F < 1$ ), indicating no qualification of the theory main effect. These results provide clear evidence that entity theorists endorse stereotypes of ethnic groups such as African Americans to a greater degree than do incremental theorists.

**Ratings for explanations.** Participants' ratings of the reasons for the persistence of stereotypes were analyzed in a 2 (implicit theory)  $\times$  2 (explanation: innate–inherent vs. environmental)  $\times$  6 (stereotype) ANOVA with repeated measures on the last two factors. Of greatest relevance to the hypotheses was a significant predicted Implicit Theory  $\times$  Explanation interac-

tion,  $F(1, 89) = 10.13$ ,  $p < .01$ . To better understand the nature of the interaction, we conducted separate one-way analyses for each explanation. On ratings of the innate–inherent factors explanation, there was a significant main effect for theory,  $F(1, 89) = 8.75$ ,  $p < .01$ , indicating that, as predicted, entity theorists' ratings ( $M = 2.8$ ) were significantly higher than incremental theorists' ratings ( $M = 1.5$ ). In contrast, on ratings of the environmental factors explanation for stereotypes, there was a marginally significant effect for theory,  $F(1, 89) = 3.78$ ,  $p = .055$ , indicating that incremental theorists' ratings were higher than entity theorists' ratings ( $M = 7.0$  vs.  $M = 6.0$ , respectively).

Another noteworthy finding is that entity and incremental theorists did not differ in their reports of feeling comfortable with the topic of the study, ( $M = 6.4$  vs.  $M = 7.5$ , respectively, on a 13-point Likert scale on which 1 = *very uncomfortable* and 13 = *very comfortable*),  $t(84) = -1.35$ ,  $p < .12$ . If anything, it was the entity theorists, those who reported greater agreement with stereotypes, who reported less comfort. Furthermore, entering the reported comfort levels and social desirability data as covariates in the analysis of stereotype explanations did not alter the results. Thus, differences in comfort or susceptibility to social demand cannot easily account for the theoretically crucial Theory  $\times$  Explanation interaction.

In summary, the findings from Experiment 2 provided further evidence that people holding entity theories tend to make significantly stronger judgments of both positive and negative group attributes than do individuals holding incremental theories. Additionally, evidence from ratings of explanations for African American stereotypes suggest another way in which beliefs about stereotypes may differ depending on one's implicit person theory. Not only do entity theorists endorse stereotypes to a greater degree than do incremental theorists, but they also seem

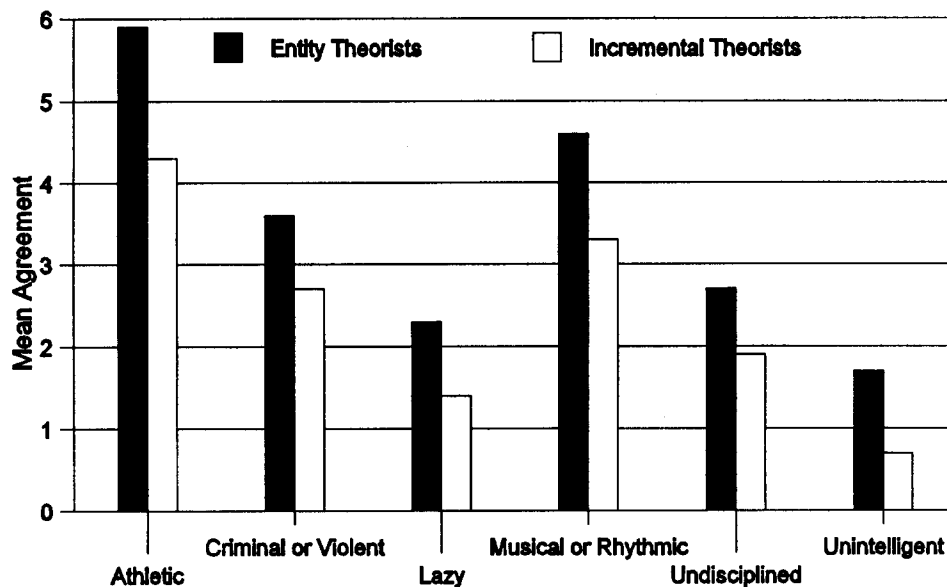


Figure 1. Mean agreement with stereotypes of African Americans as a function of implicit theories, Experiment 2.



to believe to a greater degree that these stereotypical traits are fixed from birth. In contrast, incremental theorists not only view these stereotypes as less true but, consistent with their dynamic view of others, they also tend to agree more with a social forces explanation, an explanation suggestive of greater group variability and of how things can change over time.

### Experiment 3: Formation of Stereotypes

Experiments 1 and 2 showed that entity theorists more strongly endorse positive and negative stereotypes of existing groups than do incremental theorists, but do they also form stronger stereotypes of groups that they have never before encountered? As noted earlier, prior research on implicit theories and person perception suggests that they might (Chiu, Hong, et al., 1997; Erdley & Dweck, 1993).

In Experiment 3 we provided entity and incremental theorists with behavioral information about novel groups of people (groups with members exhibiting either predominately positive or negative behaviors). Specifically, we examined whether entity theorists, compared with incremental theorists, would make more extreme and rapid judgments of a group's attributes from sparse behavioral information (Ford & Stangor, 1992; Judd & Park, 1988), would find the information more sufficient for rendering these judgments, would regard group members as more similar with respect to those attributes (Park & Hastie, 1987; Sedikides & Ostrom, 1993), and would make more extreme evaluative judgments of the groups (Haddock, Zanna, & Esses, 1993; Stangor et al., 1991).

## Method

### Participants

Participants were 121 undergraduates who participated in exchange for \$8. Five participants who were confused about the task and 3 participants who were skeptical of the cover story were excluded from the analyses, leaving 113 participants (49 males and 64 females) between the ages of 17 and 33 years ( $M = 20.0$ ). Participants were randomly assigned to one of the two group valence conditions.

### Stimulus Materials

In Experiment 3, participants read about members of a hypothetical group who generally behaved in either a desirable or undesirable manner. A pilot test ( $N = 148$ ) was conducted to identify behaviors that varied in their perceived desirability. Participants in the pilot study were presented with 98 one-sentence behavioral descriptions intended to reflect varying degrees of desirability. The valence of each behavior was rated on a 9-point Likert scale (1 = *very negative*, 5 = *neutral*, 9 = *very positive*). Participants also rated the intelligence implied by each behavior on a similarly labeled 9-point scale.

On the basis of the pilot study, we selected 30 behavioral sentences—12 positive ( $M = 7.59$ ), 12 negative ( $M = 2.76$ ), and 6 neutral ( $M = 5.21$ )—for use in the experiment. A positive group set was created that contained the 12 positive sentences and the 6 neutral sentences. A negative group set contained the 12 negative sentences and the 6 neutral sentences. The selection and grouping of the behavioral sentences were based on two criteria. First, so that the groups did not vary with respect to another trait dimension, only behaviors that were rated close to the neutral range of the intelligence scale were selected for each group. Second, behaviors were selected so that the groups would have similar

within-group variability ( $SD = 1.25$  for the negative group and 1.20 for the positive group) and means that were roughly equidistant from the scale midpoint (midpoint = 5;  $M = 3.57$  for the negative group and 6.79 for the positive group). Examples of negative, positive, and neutral behaviors are "pushed to the front of the line at a movie theater," "offered to share an umbrella with a stranger," and "played a video game at an arcade," respectively.

In addition, to ensure that any differences in entity and incremental theorists' trait inferences could not be attributed to differences in their evaluation of the behaviors themselves, participants' implicit person theories were assessed in the pilot study. As expected, there were no significant differences between entity ( $n = 62$ ) and incremental theorists' ( $n = 59$ ) ratings of the behaviors on either trait dimension ( $F_s < 1$ ; for a similar finding, see Chiu, Hong, et al., 1997, Study 3; Levy & Dweck, 1998).

### Procedure and Measures

As in our previous experiments, participants were told that they would be involved in two unrelated studies and thus completed two consent forms. They were told that they would first complete "Study 1," which involved a questionnaire packet, and then they would complete "Study 2" on a computer. The questionnaire packet was described as a collection of newly developed questionnaires by different researchers in the Psychology Department. The first measure in the battery, which was the implicit person theory measure, was followed by several other unrelated questionnaires. After participants completed the packet of questionnaires, they performed a 6-min visual task as a further distractor. They then were seated in individual cubicles facing a computer screen.

The instructions for the computer portion of the experiment were self-paced, and participants advanced the instructions by pressing the space bar or a response key. To familiarize participants with the method of responding on the experimental trials, and to reduce the variability of the response latency data, a set of practice trials was administered. Participants responded to all questions using a 9-point scale, ranging from  $-4$  to  $+4$ , and were instructed to respond both as quickly and honestly as possible. Labels for the response scale were placed on keys between the "2" and "0" keys on a standard keyboard. Response times (i.e., time required to make a trait judgment) were measured as the interval between the presentation of a particular attribute with its rating scale and a participant's response.

After five practice trials, instructions on the computer screen informed participants that they would be evaluating a student group at another university, based on observations of that group. They were told that some investigators were conducting an extensive study of student groups across the country and felt that the most valid impression of the student groups would be impressions formed by their same-age peers at other universities. Behaviors by different members of the group were then displayed one at a time (in random order) at the center of the computer screen for 7 s, followed by a blank screen for 3 s. After all 18 behaviors were presented, the dependent measures were administered.

First, participants were given 2 min to provide an open-ended description of the group. Second, at the computer, they rated the group as a whole on relevant and irrelevant attributes using bipolar scales (e.g., for the attribute *bad-good*,  $-4 = \textit{very bad}$ ,  $4 = \textit{very good}$ ). Relevant traits were those traits specifically implicated in the sets of behavioral stimulus sentences and included, in order, *uncooperative-cooperative*, *dishonest-honest*, *bad-good*, *inconsiderate-considerate*, *immoral-moral*, *mean-kind*, *unsociable-sociable*, *evil-virtuous*, *selfish-generous*, *rude-polite*, and *unlikable-likable*. Irrelevant traits, which were traits that were not directly implied by the stimulus sentences, were included to assess whether entity theorists would make uniformly more extreme trait judgments than incremental theorists. Irrelevant traits included *serious-humorous*, *disorganized-organized*, *careless-meticu-*

lous, and *unintelligent-intelligent*. Included in the trait ratings was a question—"How similar are the group members to one another?"—that was designed to assess perceived intragroup variability.

Third, several questionnaires were administered to assess other aspects of group impressions. Participants were asked to make an evaluative judgment of the overall positivity or negativity of the group and to report how sufficient the information provided was to form an impression of the group. To assess their memory for and attention to presented behaviors, we asked participants to recall as many of the behaviors performed by the group members as possible. Last, participants were asked to provide written feedback on the experiment. No participant reported being suspicious of any aspect of the experiment.

## Results and Discussion

### Responses to the Implicit Person Theory Measure

The measure again had high internal reliability (Cronbach's  $\alpha = .90$ ). Using the same classification criteria as in Experiments 1 and 2, we identified entity theorists ( $n = 43$ ), incremental theorists ( $n = 45$ ), and unclassified participants ( $n = 25$ , excluded from all subsequent analyses).

### Group Perceptions

*Coding and content of open-ended group descriptions.* Three judges who were blind to participants' implicit person theories coded the open-ended descriptions of the group. Traits made up much of participants' open-ended descriptions (45%). Their descriptions also contained behaviors they read about the group (17%), attributions for group members' behaviors (15%), comparisons to other groups (7%; e.g., other student groups), demographic attributions (4%; e.g., lives in a city), and unclassifiable statements (12%). Participants' trait descriptions were also coded according to their extremity, that is, whether they were accompanied by extreme or absolute modifiers, such as *very*, *extremely*, and *always*. The judges agreed on 90% of their trait codings and 88% of their trait qualifier codings. Discrepancies were resolved by a fourth judge (the first author) who was also blind to participants' implicit person theory.

The number of traits participants listed were analyzed in a 2 (implicit theory)  $\times$  2 (group valence) ANOVA. This analysis yielded a significant main effect for implicit theory,  $F(1, 87) = 8.13, p < .01$ , indicating that entity theorists listed significantly more traits ( $M = 3.0$ ) than did incremental theorists ( $M = 1.9$ ) across both valence conditions.<sup>3</sup>

The number of extreme trait qualifiers participants used were also submitted to a 2 (implicit theory)  $\times$  2 (group valence) ANOVA with the total number of listed traits entered as a covariate. This analysis yielded the predicted main effect for implicit theory,  $F(1, 87) = 9.43, p < .01$ , showing that entity theorists used significantly more extreme trait qualifiers ( $M = 1.2$ ) than did incremental theorists ( $M = 0.3$ ). The Theory  $\times$  Group Valence interaction, however, was not significant, indicating that entity theorists used more extreme qualifiers for both the positive and negative groups.

*Trait ratings.* To examine ratings of relevant and irrelevant traits as a function of implicit theories, we performed a 2 (implicit theory)  $\times$  2 (group valence)  $\times$  2 (trait relevance: relevant or irrelevant) ANOVA with repeated measures on the last factor.

This analysis yielded a significant interaction involving all three variables,  $F(1, 84) = 5.69, p < .05$ .

To understand this interaction better, we conducted separate two-way ANOVAs for the relevant and irrelevant traits (see Figure 2). For the relevant traits, a significant Implicit Theory  $\times$  Group Valence effect emerged,  $F(1, 84) = 12.51, p < .001$ . Further analyses indicated that whereas entity theorists made significantly less favorable ratings of the negative group than did incremental theorists ( $M = -1.8$  vs.  $-1.2$ , respectively),  $F(1, 84) = 4.43, p < .05$ , they made significantly more favorable ratings of the positive group than did incremental theorists ( $M = 3.1$  vs.  $2.2$ , respectively),  $F(1, 84) = 8.30, p < .01$ . The analysis for the irrelevant traits did not yield any effects involving participants' implicit theories (all  $ps > .23$ ).

Thus, participants' group descriptions and their ratings of the group on relevant traits are consistent with findings from previous studies on person perception showing that entity theorists draw more extreme trait judgments from limited social information (Chiu, Hong, et al., 1997; Erdley & Dweck, 1993). Entity theorists, however, do not appear to make more extreme judgments of unfamiliar groups on all traits; their judgments tend to be more extreme on the traits for which some behavioral evidence exists.

*Trait rating latencies.* Mean reaction times for the relevant and irrelevant trait judgments were submitted to a 2 (implicit theory)  $\times$  2 (group valence)  $\times$  2 (trait relevance) ANOVA with repeated measures on the last factor. A marginally significant Implicit Theory  $\times$  Trait Relevance interaction emerged,  $F(1, 84) = 3.64, p = .06$ . Entity and incremental theorists' responses differed on the relevant traits ( $M = 2,102$  ms vs.  $2,408$  ms),  $F(1, 84) = 5.04, p < .05$ , but not on the irrelevant traits ( $M = 3,011$  ms vs.  $2,994$  ms;  $F < 1$ ). Therefore, not only did entity theorists make more extreme judgments of groups on relevant traits, but they also formed or accessed those judgments more quickly.

*Perceived similarity.* A 2 (theory)  $\times$  2 (group valence) ANOVA on responses to the question "How similar are the group members to one another?" ( $-4 = \textit{very dissimilar}$ ,  $4 = \textit{very similar}$ ) yielded a predicted main effect of implicit theory,  $F(1, 84) = 4.04, p < .05$ , indicating that entity theorists ( $M = 1.6$ ) perceived the groups to be more homogenous than did incremental theorists ( $M = 0.9$ ). This difference in perceived similarity reflects another prominent characteristic of stereotyping (Park & Judd, 1990; Sedikides & Ostrom, 1993).

*Group evaluations.* Participants' evaluations of the group as a whole ( $-100 = \textit{very negative}$ ,  $100 = \textit{very positive}$ ) were entered into a 2 (implicit theory)  $\times$  2 (group valence) ANOVA. (Four participants did not respond to this question.) The predicted Implicit Theory  $\times$  Group Valence interaction was significant,  $F(1, 80) = 6.33, p < .05$ . An analysis of the negative group valence condition showed that entity theorists ( $M = -35.4$ ) exhibited some tendency to make less favorable assessments of the negative group than did incremental theorists ( $M$

<sup>3</sup> No theory differences were revealed for the non-trait categories (all  $ps > .19$ ), which is not surprising given the small number of responses in these categories. By constraining the time that participants had to write open-ended descriptions, we may have limited our ability to detect differences on non-trait descriptions that might exist.



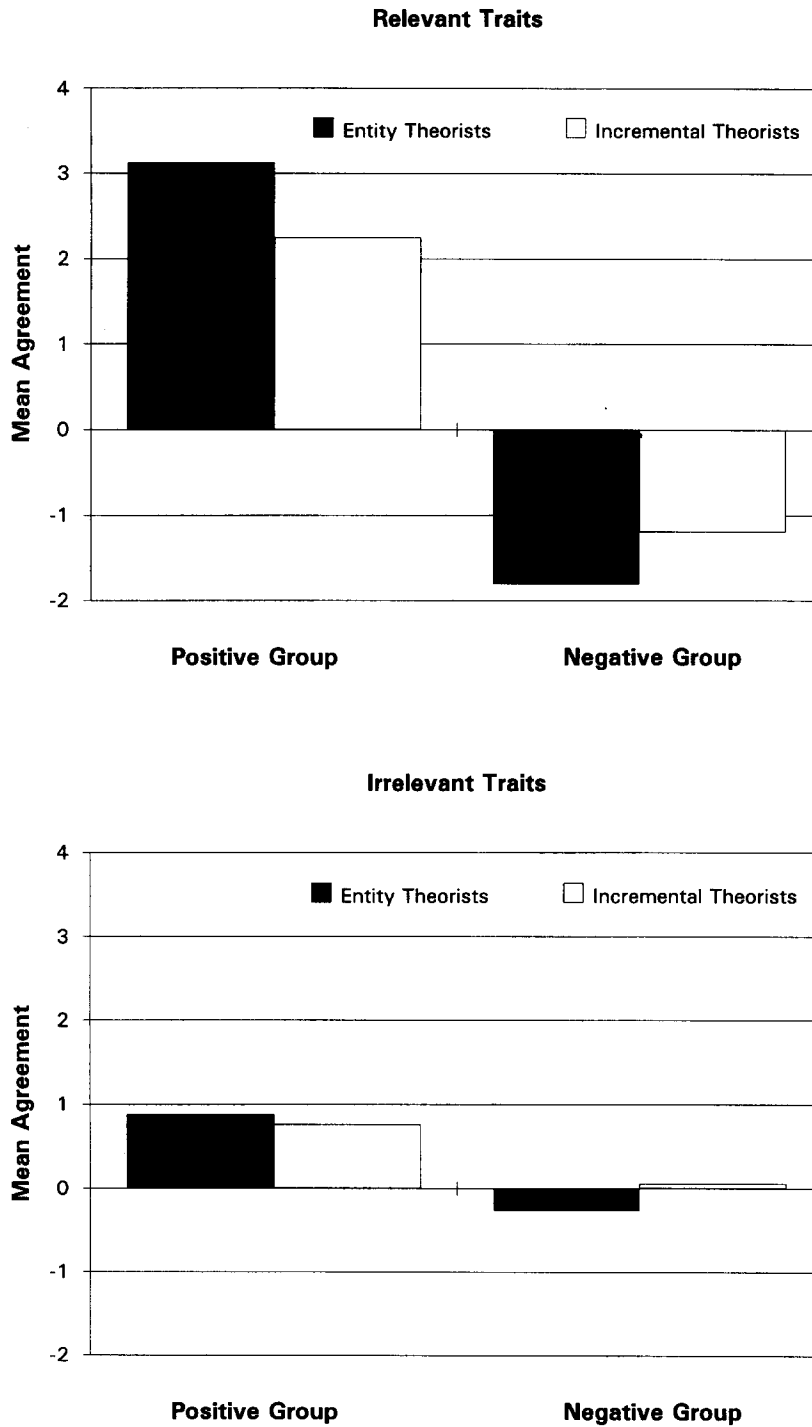


Figure 2. Mean ratings on relevant and irrelevant traits as a function of implicit theories and group valence, Experiment 3.

= -17.5),  $F(1, 42) = 2.55, p = .12$ . In the positive group condition, entity theorists ( $M = 74.3$ ) rated the group as marginally more favorable than incremental theorists ( $M = 50.4$ ),  $F(1, 38) = 3.76, p = .06$ . This pattern closely parallels the trait rating results, suggesting that the entity theorists were extreme both in how they perceived and in how they evaluated the groups.

*Information sufficiency.* A 2 (implicit theory)  $\times$  2 (group valence) ANOVA on responses to the question "Did you feel that you were provided with sufficient information to form an impression of the group?" (0 = not at all to 10 = very much) yielded the predicted main effect of implicit theory,  $F(1, 82) = 16.27, p < .001$ . Entity theorists ( $M = 4.7$ ) felt that the

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information was significantly more sufficient for rendering judgments than did incremental theorists ( $M = 2.4$ ). Entity theorists, then, seem to view even limited behavioral information as sufficient for making stronger trait inferences of groups than incremental theorists.

*Recall of behaviors.* Two judges who were blind to participants' implicit theories coded the recall of the positive, neutral, and negative behaviors using a gist criterion. Analyses of the recall yielded no significant implicit theory differences ( $F_s < 1$ ). This suggests that entity and incremental theorists retained the same basic information but interpreted this information quite differently.

Taken together, the results from this experiment indicate that, when forming an impression of a basically positive or negative group on the basis of relatively sparse information, people holding an entity theory make more extreme group judgments on both global and specific relevant attributes than people holding an incremental theory. Additionally, entity theorists make judgments more quickly and have greater confidence in the sufficiency of the information provided as a basis for such judgments. Entity and incremental theorists' differing group perceptions were also evident when they were asked to convey their impression of the group in a more open-ended manner; entity theorists generated more traits to describe the group and tagged the traits with more extreme qualifiers than did incremental theorists. We also found that implicit theories predicted differences on one measure of perceived variability, a key component of stereotyping. Compared to their incremental counterparts, entity theorists perceived group members to be more similar overall.

#### Experiment 4: Causal Relation Between Implicit Person Theories and Level of Stereotyping

Experiments 1, 2, and 3 provided evidence for a consistent relation between an entity theory and a stronger belief in positive and negative stereotypes of both existing and novel groups. Because these experiments were correlational in nature, however, we cannot argue that differences in implicit theories caused differences in the formation and endorsement of stereotypes. Experiment 4 was therefore designed to determine whether manipulating people's implicit theories would affect their level of stereotyping.

There is evidence from past research (Bergen, 1991; Chiu, Hong, et al., 1997, Study 5; Dweck, Tenney, & Dinces, 1982, reported in Dweck & Leggett, 1988) that implicit theories can be manipulated with predicted effects on goals, inferences, and reactions to events. For example, Chiu, Hong, et al. (1997, Study 5) designed and used fictitious scientific articles to manipulate participants' implicit person theories. Those given an entity theory, as opposed to an incremental theory, showed a significantly greater tendency to infer global traits from behavior and to view traits as more predictive of future behavior. Therefore, when people were led to think of traits in fixed terms, they were more likely to characterize others and to understand their behavior in terms of traits. Would this also apply to groups? Would participants given an entity versus an incremental theory be more likely to agree with traits that represent group stereotypes?

## Method

### Participants

The experiment involved 155 introductory psychology students (77 males and 78 females) between the ages of 16 and 42 years ( $M = 19.8$ ) who participated to partially fulfill a course requirement. Participants were randomly assigned to receive either an entity or an incremental theory induction.

### Stimulus Materials

*Entity and incremental theory induction articles.* Participants were given compelling "scientific" articles written by Chiu, Hong, et al. (1997, Study 5; modeled on Bergen, 1991) that vividly described fictitious scientific research attesting to either an entity or an incremental view of personality. One article, titled "Personality is Changeable and Can Be Developed," argued that personality could be changed, and the other article, titled "Personality, Like Plaster, Is Pretty Stable Over Time," argued that it could not. The same sources of evidence—case studies of individuals (including famous people), longitudinal studies conducted over several decades, and large-scale intervention programs—were cited in both articles, but the findings were altered to consistently support only one view of personality. Although these induction articles quite thoroughly addressed entity and incremental views, they were in no way related to the specific dependent measures used. Neither ethnic and occupational groups nor stereotypes were ever mentioned in the articles. The article took approximately 10–15 min to read.

*Selection of stereotypical and nonstereotypical traits for the stereotyping measure.* Participants in the experiment were asked to indicate the degree to which they believed that a set of 15 traits described members of three ethnic groups (African Americans, Asians, and Latinos) and four occupational groups (teachers, doctors, lawyers, and politicians). All groups were rated on all traits, but different traits were stereotypical and nonstereotypical for different groups. Stereotypical traits for African Americans, Asians, and Latinos were derived from Experiment 1. Stereotypical traits for the occupational groups were selected by participants in a pretest ( $N = 15$ ) who indicated how stereotypical a variety of traits were for each occupational group. Traits selected by at least two thirds of the participants as stereotypical of teachers (*hardworking, intelligent*), politicians (*competitive, dishonest, greedy, hardworking, intelligent, pushy, trustworthy* [reverse scored]), lawyers (*competitive, dishonest, greedy, intelligent, pushy, trustworthy* [reverse scored]), *submissive* [reverse scored]), and doctors (*hardworking, intelligent*) were used in the experiment. Traits not considered stereotypical for a particular group later were used to compose a nonstereotypical trait measure against which the mean ratings on stereotypical traits could be compared.

### Procedure and Measures

Participants were seated in individual cubicles to give them a sense of privacy. They were told the experiment included two separate, unrelated studies but that the experimental design required them to alternate between the two studies. As the first part of "Study 1" they worked on a filler task (which was actually an unrelated computer experiment on decision making concerning fictitious groups) for 20 min. Next, for the first part of "Study 2," participants were asked to read carefully one of the induction articles (ostensibly from a psychological journal) and to be prepared to answer some questions about it later.

After reading an induction article, participants were told that their ratings of several different groups were needed to assist the Study 1 researchers in selecting an existing group to test in a future study on decision making. They were then asked to rate honestly the extent to which each of 15 traits described each of the seven groups (0 = *not at all* to 10 = *very much*). To reduce potential reactivity, two occupational

groups were rated first, followed by the three ethnic groups, and finally the two remaining occupational groups. The traits appeared in a fixed order. After completing the stereotype measure, participants sealed their completed questionnaires in envelopes and inserted them in a drop box.

Finally, participants rated how understandable, how credible, and how persuasive they found the article to be (0 = *not at all* to 10 = *very much*). To assess the strength of the article manipulation, they were asked, using a forced-choice format, "Do you think that people's traits can change or cannot change?" They were then fully debriefed. To dilute the persuasive message conveyed by the articles (see Lord, Lepper, & Preston, 1984), the experimenter discussed how actually both views of personality (fixed and malleable) were widely represented in the psychological literature. During the extensive debriefing, no participant reported being suspicious of any aspect of the experiment.

## Results and Discussion

### Manipulation Check

Analyses of participants' evaluations of the articles they read revealed that the induction articles had successfully manipulated person theories, at least temporarily. A one-way ANOVA on responses to the manipulation check, "Do you think that people's traits cannot change or can change?" (1 = *cannot change*, 2 = *can change*) yielded a significant main effect of inducement,  $F(1, 152) = 15.90, p < .001$ . Participants who received the entity induction were less likely to believe that traits can change ( $M = 1.5$ ) than were participants who received the incremental induction ( $M = 1.8$ ). There were no differences in response to questions concerning the comprehensibility, credibility, or persuasiveness of the entity- and incremental-oriented articles, indicating that both articles were seen to be equally understandable, credible, and persuasive.

### Responses to the Stereotype Measure

To examine beliefs about stereotypical and nonstereotypical traits as a function of induced implicit theories, we performed a 2 (induced implicit theory)  $\times$  2 (stereotypicality)  $\times$  7 (target group) ANOVA with repeated measures on the last two factors. This analysis yielded a marginally significant interaction between induced theory and stereotypicality,  $F(1, 153) = 3.67, p = .06$ . A separate one-way analysis conducted on the stereotypical traits revealed the predicted inducement main effect,  $F(1, 153) = 5.74, p < .05$ , indicating that entity-induced participants ( $M = 7.0$ ) rated these traits as more descriptive than did incremental-induced participants ( $M = 6.7$ ). In contrast, there was no difference on the nonstereotypical traits (both  $M = 4.4$ ), suggesting that entity-induced participants were not uniformly more extreme in their trait ratings than incremental-induced participants.

To summarize, participants who were led to think of traits in fixed terms more strongly endorsed stereotypes than participants who were led to think of traits in malleable terms. Although the differences were small, entity-induced participants, compared with incremental-induced participants, more strongly endorsed positive and negative traits relevant to the societal stereotypes of ethnic and occupational groups but did not differentially endorse traits irrelevant to societal stereotypes of these groups. It should be borne in mind that the induction was a relatively brief article and that it is likely that its message ran counter to

many participants' pre-existing theories. Nonetheless, the findings paralleled those from the earlier experiments in which pre-existing implicit theories were studied, and they support the idea that implicit theories can have a causal effect on endorsement of stereotypes. These data also support the belief that people's implicit theories are not rigidly fixed entities but are themselves malleable.

Through what mechanism might the implicit theory manipulation have worked to affect stereotype endorsement? As suggested earlier, believing in fixed (vs. malleable) traits may make traits seem like a more accurate and more useful way to characterize others. That is, highlighting the fixedness of traits may temporarily increase the perceived validity and predictive utility of traits. In contrast, highlighting the malleability of traits may call into question the validity and utility of traits for characterizing groups of people.

### Experiment 5: Unique Contribution of Implicit Person Theories in Predicting Level of Stereotyping

Thus far, we have provided evidence that implicit theories are related to differences in the level of stereotyping of existing and novel groups and that implicit theories can have a causal effect on stereotyping. In Experiment 5 we examined the extent to which implicit theories would predict the degree of stereotype endorsement even when controlling for other individual difference variables that have recently been discussed in relation to stereotyping. Accordingly, we selected for comparison right-wing authoritarianism (Altemeyer, 1988; cf. Fascism Scale: Adorno, Frenkel-Brunswick, Levinson, & Sanford, 1950), personal need for structure (Thompson, Naccarato, & Parker, 1989, reported in Neuberg & Newsom, 1993), attributional complexity (Fletcher, Danilovics, Fernandez, Peterson, & Reeder, 1986), the need to evaluate (Jarvis & Petty, 1996), need for cognition (Cacioppo & Petty, 1982), and need for closure (Webster & Kruglanski, 1994).

## Method

### Participants

The sample consisted of 110 introductory psychology students (45 males and 65 females) between the ages of 17 and 29 years ( $M = 19.0$ ) who participated to partially fulfill a course requirement.

### Measures

In this experiment, we assessed implicit theories using the new 8-item measure described earlier (Levy & Dweck, 1997). The measure includes an equal number of items depicting each theory (the three entity items from the old measure, one new entity item, and four new incremental items). The new items are as follows: "As much as I hate to admit it, you can't teach an old dog new tricks. People can't really change their deepest attributes"; "Everyone, no matter who they are, can significantly change their basic characteristics"; "People can substantially change the kind of person they are"; "No matter what kind of a person someone is, they can always change very much"; "People can change even their most basic qualities." Levy and Dweck reported that the measure shows high internal reliability ( $\alpha$ s ranging from .93 to .95). The test-retest reliabilities were .82 over a 1-week interval and .71 over a 4-week interval.

### Procedure

After completing the ethnic and occupational group stereotype measure described in Experiment 4, participants completed a battery of individual difference measures. All participants completed the expanded implicit person theory measure and scales assessing the need to evaluate (Jarvis & Petty, 1996), right-wing authoritarianism (Altemeyer, 1988), attributional complexity (Fletcher et al., 1986), and personal need for structure (Neuberg & Newsom, 1993). In addition, because of time constraints, participants completed either the Need for Cognition Scale (Cacioppo & Petty, 1982;  $n = 60$ ) or the Need for Closure Scale (Webster & Kruglanski, 1994;  $n = 50$ ). There were four versions of the battery with the order of the questionnaires varying from battery to battery.

### Results and Discussion

#### Responses to the Individual Difference Measures

An index for each individual difference measure was calculated as the average of participants' responses to the entire scale with some items reverse scored. In the case of the implicit theory measure, the index was computed as the average of participants' responses to the incremental-worded items and a reverse scoring of their responses to the entity-worded items; reliability across the items was high (Cronbach's  $\alpha = .93$ ).

All the predictor variables except implicit theories are continuous variables, and thus these variables were treated as such in the subsequent analyses. Because between-theory variance, not within-theory variance, was expected to account for differences in level of stereotyping, the implicit theory measure was treated as a dichotomous variable in the analyses of Experiment 5. Moreover, to retain the entire sample, the "unclassifieds" were included, and respondents were split at the median ( $Mdn = 3.13$ ), resulting in 56 respondents above the median (identified as incremental theorists) and 54 respondents below the median (identified as entity theorists).

#### Responses to the Stereotyping Measure

To replicate the findings of Experiment 4 with unmanipulated implicit theories, we analyzed responses to the stereotyping measure. Accordingly, ratings were submitted to a 2 (implicit theory)  $\times$  2 (stereotypicality)  $\times$  7 (target group) ANOVA with repeated measures on the last two factors.<sup>4</sup> This analysis yielded a significant interaction between implicit theory and stereotypicality,  $F(1, 139) = 13.34, p < .001$ . Subsequent analyses showed that on the stereotypical traits, a significant implicit theory main effect emerged,  $F(1, 139) = 16.56, p < .001$ , indicating that entity theorists ( $M = 7.1$ ) agreed significantly more with stereotypical traits than did incremental theorists ( $M = 6.6$ ). In contrast, there was no difference on the nonstereotypical traits, (respective  $M$ s = 4.4 and 4.3).

#### Intercorrelations Among Predictor Variables

Before examining the extent to which each individual difference variable predicted level of stereotyping, we computed Pearson product-moment correlations (and, in the case of the implicit theory measure, point-biserial correlations) among the predictor variables. The correlations between the variables are

Table 2

*Intercorrelations of Variables Entered in Hierarchical Regressions, Experiment 5*

Variable	1	2	3	4	5
1. IPTheory	—				
2. RWA	.10	—			
3. AC	-.18*	-.17*	—		
4. NEVAL	-.19**	-.02	.08	—	
5. PNS	.11	.35***	-.07	-.20**	—
6. NFC	-.19	-.45***	.34***	.19	-.36***
7. NFCS	-.31**	.30**	-.19	-.14	.74***

*Note.* IPTheory = implicit person theory measure; RWA = right-wing authoritarianism; AC = attributional complexity; NEVAL = need to evaluate; PNS = personal need for structure; NFC = need for cognition ( $N = 60$ ); NFCS = need for closure ( $N = 50$ ). Higher values on the IPTheory measure indicate an incremental theory. Significance values for identical coefficients may vary because of sample size differences. \*  $p < .10$ . \*\*  $p < .05$ . \*\*\*  $p < .01$ .

presented in Table 2. Most relevant for the purpose of the present experiment is the general independence between the implicit theory measure and other existing individual difference measures that are associated with a tendency to stereotype. Responses to the implicit theory measure were weakly correlated with responses to the scale measuring attributional complexity (Fletcher et al., 1986) and the need to evaluate (Jarvis & Petty, 1996). For the subsample of participants who responded to the Need for Closure Scale (Webster & Kruglanski, 1994), the correlation between responses to that scale and the implicit theory measure were moderate in magnitude. Thus, responses to the implicit theory measure were not strongly related to the other individual difference measures.

#### Uniqueness of Implicit Theories in Predicting Stereotyping

Hierarchical regression analyses were used to examine the unique contribution of implicit theories in accounting for stereotyping. Participants' ratings of stereotypical traits for each of the seven target groups were aggregated to create a single stereotyping variable, which served as the dependent variable in the following analyses. A series of regression analyses was performed in which each predictor variable was entered into the analysis last, allowing assessment of a given predictor variable's ability to account for unique variance in the stereotyping variable—variance beyond that associated with variables entered earlier in the analysis (see Cohen & Cohen, 1983). Table 3 summarizes the results of these analyses, indicating the total  $R^2$  (the percentage of variance in stereotyping accounted for when all the variables were included in the analysis), the correlation between responses to each scale and the stereotyping variable, the final standardized beta ( $\beta$ ) coefficients for each variable in

<sup>4</sup> To maintain consistency between this and subsequent analyses, the implicit theory classification was based on a median split that, by including the unclassifieds, may introduce a bias against detecting strong implicit theory effects. Nonetheless, analyses in which unclassified theorists were excluded as in the previous studies yielded similar results.

Table 3  
Results of Hierarchical Regression Analyses, Experiment 5

Variable	Correlation <sup>a</sup>	Final beta coefficient	R <sup>2</sup> change (%)
Implicit person theory	-.35***	-.35***	11.3***
Right-wing authoritarianism	.20**	.18*	2.6*
Attributional complexity	.06	.16*	2.5*
Need to evaluate	-.11	-.04	.2
Personal need for structure	.15	.05	.2

Note. N = 110, R<sup>2</sup> total = 18.1%.

<sup>a</sup> Between variable and stereotype measure.

\* p < .10. \*\* p < .05. \*\*\* p < .01.

the regression equation when all variables are entered, and the increment of change in R<sup>2</sup> (the extent to which each variable accounts for variance when the effects of the other variables are already removed).

The results revealed that responses to the implicit theory measure were significantly correlated with the stereotyping variable, as were responses to the Right-Wing Authoritarianism Scale. The beta coefficient and R<sup>2</sup> change measures indicate that implicit theories accounted for a significant and unique percentage of the variance in stereotyping. Of the variables listed in Table 3, implicit theories produced the only significant beta or change in R<sup>2</sup>,  $F_{\text{change}}(1, 104) = 14.31, p < .001$ . Right-wing authoritarianism,  $F(1, 104) = 3.34, p = .07$ , and attributional complexity,  $F(1, 104) = 3.14, p = .08$ , yielded marginally significant effects. To assess the contributions of need for closure and need for cognition, we conducted separate analyses on the subsamples who completed each scale. These analyses revealed significant effects for the Need for Closure Scale ( $r = .50, p < .01$ , significant  $\beta = .42$ , and R<sup>2</sup> change = 6.6%,  $F_{\text{change}}[1, 43] = 4.52, p < .05$ ) but no significant effects for the Need for Cognition Scale (all  $p$ s > .14). Exploratory hierarchical analyses conducted on both subsamples revealed that the unique variance attributable to implicit theories decreased when responses to the Need for Closure Scale were first entered ( $\beta = -.19$ , and R<sup>2</sup> change = 3.0%,  $F_{\text{change}}[1, 43] = 2.02, p = .16$ ). Given that this analysis was conducted on less than half of the total sample of participants and that the percentage of variance accounted for by our variable would be significant if it emerged for the whole sample, it is clear that controlling for need for closure does not eliminate the unique variance in stereotyping attributable to implicit theories.

Even though the contribution of variables other than implicit theories was not of primary interest, the failure of some of these variables to correlate with stereotyping might be surprising. Given that there are a variety of ways to measure and operationalize stereotyping (e.g., see Neuberg & Newsom, 1993; Schaller et al., 1995; also see Haddock et al., 1993; Hamilton et al., 1994), it is possible that different operationalizations of the stereotyping construct might yield different patterns in the degree to which the various variables can account for stereotyping. It will be interesting in future research to examine whether different aspects of stereotyping are differentially explained by the different variables.

In summary, implicit theories were not redundant with other

individual difference variables that have been linked to stereotyping, and implicit theories predicted unique variance in endorsement of stereotypes of ethnic and occupational groups after controlling for the contribution of these other variables. These results, along with results from our other experiments, suggest that implicit theories contribute to an understanding of why some people tend to engage in greater levels of social stereotyping than others.

### General Discussion

We began by noting the parallel between the cognitive processes involved in group stereotyping and the social judgment processes of people holding an entity versus an incremental theory. We then set out to determine whether people's implicit person theories would predict differences in stereotyping.

Across five experiments we found that people who hold entity theories were more likely than those who hold incremental theories to exhibit hallmarks of social stereotyping. Specifically, although both groups were equally knowledgeable about societal stereotypes, entity theorists agreed more strongly with these stereotypes (Experiments 1, 2, and 5), believed more strongly that stereotypes reflected innate or inherent group differences (Experiment 2), generated more traits to describe novel group members (Experiment 3), and used more extreme qualifiers for the traits they generated (Experiment 3). They made more extreme judgments of a novel group's attributes on the basis of limited information, were more likely to believe that the information they received was sufficient to justify their judgments, made their judgments more quickly, and perceived less intragroup variability (Experiment 3).

Furthermore, differences emerged no matter how stereotyping was measured (whether participants generated the stereotypes, rated a specified list of stereotypes, or rated stereotypes embedded in a list of irrelevant traits), whatever the target group (whether existing ethnic and occupational groups or artificially created groups), and regardless of whether person theories were manipulated or simply measured. Entity and incremental theorists' differing group judgments were found both when they were asked to evaluate the group as a whole and when they were asked for their perceptions of the group on particular attributes, whether the attributes were positive or negative, specific or global. These data, then, are strongly supportive of the notion that people's implicit theories about the malleability or fixedness of traits affect the degree to which they engage in the processes that produce and perpetuate group stereotypes.

Despite the breadth of the effects obtained, it is important to note that not all group judgments were affected by implicit theories. Across the different experiments, implicit theories did not predict differences in judgments of attributes generally perceived as irrelevant to the group. In Experiment 3, for example, entity theorists did not make more extreme judgments of the novel groups on traits (humorous, intelligent) that were not directly implied by the sentences describing members' behavior. Similarly, in Experiment 5, entity theorists assigned higher positive and negative group trait ratings only when the traits were relevant to societal stereotypes about each group and not when the traits were irrelevant to societal stereotypes. This does not mean, however, that entity theorists do not go beyond the infor-

mation given to some degree. In Experiment 3, even though entity theorists did not make more extreme judgments on irrelevant traits, they did make more extreme judgments than incremental theorists on global traits (i.e., *evil-virtuous, bad-good*), indicating a greater willingness to generalize from the set of group members' behaviors to superordinate traits.

### *Implications and Extensions*

#### *Intergroup Relations*

One implication of our findings is that differences in entity and incremental theorists' beliefs in and explanations for group stereotypes may relate to differences in behavior toward groups. For example, incremental theorists, placing more stock in the role of social forces for perpetuating stereotypes, may be more likely than their entity counterparts to support policies aimed at remedying disadvantages associated with negatively stereotyped groups. As another example, if a group is perceived as having negative (or positive) character, personality, or intellectual traits, entity theorists, with a more fixed-from-birth view of others' traits, may exhibit biased practices that disfavor (or favor) that group (e.g., in terms of grading practices). Freitas, Levy, and Dweck (1997) recently obtained preliminary evidence indicating entity-incremental differences in intergroup relations.

#### *Mental Representations*

In addition to influencing how group information is used to make judgments, implicit theories might also affect how group information is originally organized and structured in memory. A current debate in the stereotyping literature involves whether group information is stored as abstractions (i.e., summary representations containing group information; see Posner & Keele, 1968) or as sets of exemplars (i.e., specific experiences with group members, see Hintzman, 1986; Smith & Zárate, 1992). Sherman (1996) presented evidence that with low levels of experience, stereotypical knowledge is derived from representations of exemplars, whereas with high levels of experience, stereotypes are abstracted and retrieved independently from specific exemplars.

We are currently testing the hypothesis that entity theorists, given their tendency to readily form trait characterizations, will be quicker to form on-line abstractions when they receive information describing a novel group. Incremental theorists, we suspect, will not abstract on-line trait information as readily but rather will continue to store group information chiefly in the form of exemplars. This difference should be particularly pronounced if low to moderate amounts of information are available. When large amounts of information are available, it is likely that both incremental and entity theorists will form abstractions, although we would expect differences in the meaning or the perceived predictive utility of these abstractions.

#### *Perceiving Individuals Versus Groups*

We have found that the kind of judgments entity and incremental theorists tend to make of groups are, in some important ways, similar to the judgments they tend to make of themselves and individual others (for a review see Levy & Dweck, in press).

Hamilton, S. J. Sherman, and colleagues (Hamilton & Sherman, 1996; Hamilton, Sherman, & Lickel, 1998; McConnell, Sherman & Hamilton, 1997), however, have proposed that forming impressions of individuals may be different from forming impressions of groups. Based on an extensive review of research on groups versus individuals, and also on some of their own recent findings, they suggest that the difference lies in perceivers' expectations about the "entitativity" of individual and group targets. That is, people generally expect more entitativity (unity, consistency, organization, and coherence) in a person than in a group. Whereas Hamilton and Sherman have proposed that expectations of entitativity vary with the nature of the target (individual vs. group), our research has focused on expectations of fixedness (which can be seen as related to unity and consistency) that reside within the perceiver across variations in targets. It would be interesting in future research to investigate how different implicit theories combine with beliefs about the nature of individual versus group targets to determine patterns of inference.

#### *Stereotype Reduction*

Recently, the relation between implicit person theories and level of stereotyping has been replicated and extended with late grade school children (Levy & Dweck, 1998). Taken together, these findings have some interesting implications for research aimed at reducing stereotyping. Much research (e.g., Weber & Crocker, 1983; for a review, see Hewstone, 1994) has attempted to persuade individuals that stereotypes are inaccurate on a trait-by-trait, group-by-group basis. The present research suggests that stereotyping can be potentially reduced by means of an intervention that does not even mention stereotypes but rather alters people's beliefs about the nature and origin of traits. That is, a more potent, long-term version of the manipulation used in Experiment 4 may reduce people's reliance on fixed traits as a way of characterizing people and predicting their behavior. In doing so, it may decrease the probability that they will form new stereotypes or place as much faith in existing ones. By weakening their belief in fixed traits, the intervention may also alter the degree to which they believe that stereotypes have an innate basis. We (Levy and Dweck) have begun constructing such an intervention and testing its effect on stereotypical thinking.

#### *Conclusion*

With widespread acceptance of the functionality of stereotyping for the perceiver, researchers have tended to devote their attention to identifying the fundamental processes involved in stereotyping and the circumstances under which stereotyping will be more or less strongly evoked rather than identifying aspects of perceivers that contribute to more or less stereotyping. The present research provides encouraging support for the notion that people's implicit theories—beliefs about the nature of human attributes—may help illuminate why some people engage in social stereotyping to a greater degree than others.

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