Implicit Theories and Evaluative Processes in Person Cognition

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Evaluative processes are often considered to be a cornerstone of social perception. The present study seeks to understand an individual-difference factor that is linked to evaluative processing. Specifically, past studies have shown that individuals who believe that people have fixed traits (''entity theorists'') are more inclined to diagnose traits from person information than are those who believe that people's personality is malleable (''incremental theorists''). Because evaluation is typically an integral part of trait diagnosis, we hypothesized that relative to incremental theorists, entity theorists would process person information in a more evaluative manner. To test this, subjects were presented with the test scores of a fictitious pilot trainee. Later, they were asked to perform on a priming task in which the test scores were used as primes on some trials. As predicted, entity theorists' response times indicated that they attached evaluative meaning to the test scores, but those

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of incremental theorists did not. In addition, subjects' judgments of the trainee's performance and recall of his test scores suggested different processing strategies among entity theorists than among incremental theorists.   © 1997 Academic Press

Evaluative processes are considered by some researchers to be a cornerstone of social perception (e.g., Zajonc, 1980; see also Wyer & Gordon, 1984; Wyer, Lambert, Budesheim, & Gruenfeld, 1992), and have been demonstrated empirically to be an integral part of social perception (e.g., Rosenberg, Nelson, & Vivekananthan, 1968; Osgood, 1971). As Zajonc (1980) put it, ''There is hardly any social phenomenon—person, behavior, group, and the product of some individual's work—which we perceive without at the same time having some form of reaction which can be described best on the good–bad, pleasant–unpleasant, safe–unsafe, likable–dislikable, and other such scales. To judge people as intelligent or stupid is not only to assign them to locations on the dimension of intelligence but also to make value judgments that may have profound consequences for them'' (p. 196). Indeed, research has shown that excessive evaluative processing may contribute to stereotype formation and prejudice (e.g., Esses, Haddock, & Zanna, 1993; Fiske & Ruscher, 1993; Stangor, Sullivan, & Ford, 1991). The present study seeks to understand individual difference factors that are linked to evaluative processing. Specifically, we sought to examine how implicit theories of personality may relate to evaluative processing.

Implicit theories of personality played an important role in early theories of person perception (Kelly, 1955; Heider, 1958). Jones and Thibaut (1958), for example, proposed that how a stimulus person is perceived ''will tend to be imposed on the stimulus person by the perceiver; the missing link in the inference chain will be supplied by the perceiver's own 'theory' of personality'' (p. 166). More recently, with increasing theoretical interest in how individuals' cognitive processes are guided by their latent or implicit world views (Epstein, 1989; Janoff-Bulman, Timko, & Carli, 1985; Medin, 1989; Murphy & Medin, 1985; Ross, 1989), implicit theories of personality have become increasingly important perceiver variables in person cognition (see Trope & Higgins, 1993).

Research by Dweck and her associates (Chiu, Hong, & Dweck, in press; Dweck, Chiu, & Hong, 1995a; Dweck, Hong, & Chiu, 1993; Dweck & Leggett, 1988; Erdley & Dweck, 1993) has identified two implicit theories of personality that predict inferential practices in person perception. One theory, termed an ''entity theory,'' assumes that an individual's personal attributes are fixed entities that cannot be changed. The other theory, termed an ''incremental theory,'' holds, on the contrary, that the qualities of a person are not fixed but malleable.

Past research has shown that people who believe in fixed traits (entity theorists) tend to understand people and their behavior in terms of traits. That is, they make more dispositional inferences and attributions than do people who hold an incremental theory (incremental theorists) (Chiu et al., in press; Erdley & Dweck, 1993; Gervey, Chiu, Hong, & Dweck, 1993; Hong, 1994; see Dweck et al., 1995a for a review). For example, in one study, Hong (1994) asked college students to

explain positive and negative behaviors, such as "Alexis stole some bread from the bakery shop." Specifically, the subjects were asked to make causal attributions for the behaviors by completing the sentence stem, "This probably occurred because. . . ." Entity theorists spontaneously generated significantly more global personality traits (e.g., "Alexis was a thief," "Alexis was dishonest") than did incremental theorists. Incremental theorists, in contrast, tended to generate more process-oriented, psychological-state explanations (e.g., "Alexis was hungry," "Alexis was desperate") than did entity theorists. In other studies (Chiu et al., in press; Erdley & Dweck, 1993; Gervey et al., 1993), subjects were presented with scenarios and asked to judge the protagonists. Results consistently showed that entity theorists were more likely than incremental theorists to make global trait inferences.

Thus it appears that people who hold an entity view of personality may take a different approach to understanding behaviors and forming impressions of others than do those who hold an incremental view. A belief in fixed traits seems to orient individuals to focus on evaluating and diagnosing others' personality traits. Since many studies have demonstrated that evaluation is an important aspect of trait inferences (Felipe, 1970; Osgood & Ware, reported in Osgood, 1962; Rosenberg & Olshan, 1970; Rosenberg et al., 1968; see Tesser & Martin, 1996 for review; cf. Peabody, 1967, 1970), we asked whether entity theorists would also be more likely than incremental theorists to engage in evaluative processing. That is, do they attach evaluative tags to incoming information as part of the process of forming a trait judgment? If entity theorists are seeking to make trait judgments (Is this person good or bad? competent or incompetent?), would they code incoming information in highly evaluative ways so that they could readily weigh that information and arrive at a trait judgment? In contrast, if incremental theorists are not primarily seeking to make trait judgments, would they code the same information in a less evaluative way, even when they are seeking to form an impression?

This research question deserves close examination because it speaks to an individual difference factor that might moderate evaluative processing, which, as noted, is considered to be a highly important process in stereotype formation and prejudice (e.g., Esses et al., 1993; Fiske & Ruscher, 1993; Stangor et al., 1991). Recently, Jarvis and Petty (1996) have discovered considerable individual differences in the need to form opinions and evaluative judgments and to engage in spontaneous evaluative processing. The present research extended this literature by seeking to identify the beliefs that may underlie such individual differences in the domain of interpersonal perception.

In addition, this research may shed light on another important issue. Bargh, Chaiken, Govender, and Pratto (1992) have demonstrated a very general "automatic attitude activation effect." That is, they have found that people, in general, tend to react evaluatively to virtually all objects, even those toward which they hold weak attitudes. Fazio (1986, 1989, 1990), in contrast, has argued that people react evaluatively only to objects toward which they hold strong attitudes, but not

to those toward which they hold weak attitudes. By examining how implicit theories of personality may moderate the tendency to engage in evaluative processing of person information, the present research could shed light on *who* is more likely to display the automatic attitude activation effect vis-à-vis person information.

Finally, this research may provide an interesting supplement to the literature on individuals' processing goals. Studies on individuals' processing goals, reviewed below, have addressed the question of when evaluative processing is most likely to take place. Yet they have not addressed individual differences in the tendency to engage in evaluative processing. To supplement this literature, we propose individuals' implicit theories of personality as an individual difference factor that may predict the extent of evaluative processing.

Processing Goal and Evaluative Processing

According to the social information-processing model proposed by Wyer and Srull (1986; 1989), the processing goal of the perceiver may be a factor that determines how extensively evaluative information-processing is performed. Evaluation may be particularly extensive when perceivers are instructed to form an impression of the target person (e.g., Hartwick, 1979; Wyer & Gordon, 1982). In one study, Hartwick (1979) presented to subjects adjective descriptions of a target person and asked them either to remember the adjectives (memory set) or to form an impression of the target person (impression set). Later, subjects in both conditions were given a recognition test on the adjectives they had seen. Some of the recognition items had not been presented before but were evaluatively consistent with the original adjectives. Subjects in the impression-set condition were significantly more likely than those in the memory-set condition to mistake the new adjectives for ones presented before when these adjectives were evaluatively consistent with the presented ones. This suggests that subjects with impression-formation instructions may have engaged in evaluative processing when they first encoded the adjective descriptions, and later relied on the evaluative encoding to recognize the new adjectives. Thus, impression-formation instructions, in comparison to the memory instructions, may orient individuals toward more extensive evaluative processing.

In the same vein, Wyer and his colleagues (Wyer, Bodenhausen, & Srull, 1984; Wyer & Gordon, 1982) have also found that subjects with impression-formation instructions seem to focus more heavily on the evaluative aspects of the social information presented than do the subjects with memory instructions. Specifically, subjects in these studies were presented with some trait adjectives together with some behaviors that were systematically varied in terms of their evaluative and descriptive consistency with respect to the trait adjectives. For example, ''Returned a wallet containing money to the lost-and-found'' was both evaluatively and descriptively consistent with ''honest,'' whereas ''Turned in a classmate for giving someone an answer in an exam'' was considered to be descrip-

tively consistent but evaluatively inconsistent with "honest." Under impression-set conditions, subjects' recall of the behaviors was more affected by the evaluative consistency of the behaviors than by the descriptive consistency of the behaviors. In short, similar to Hartwick's (1979) findings, subjects under impression-set conditions seem to engage more extensively in evaluative processing than do subjects under memory-set conditions.

In addition to evaluative processing, impression-formation instructions seem also to promote trait-based representations of social information. Several studies (e.g., Gordon, 1982 reported in Wyer & Gordon, 1984; Wyer & Gordon, 1982; Wyer et al., 1984) have shown that trait adjectives facilitate recall of related behaviors under the impression-set conditions but less so under the memory-set conditions, suggesting that the behavioral information is originally encoded and organized around traits in the impression-set condition (cf. Winter & Uleman, 1984).

Other research findings have also suggested that trait inferences are closely related to evaluative processing. First, research (Rosenberg & Olshan, 1970; Felipe, 1970; cf. Peabody, 1967, 1970) has shown that apart from their descriptive content, trait attributes typically have a clear evaluative content (desirable or undesirable), which could constitute the basis for evaluative processing. For example, Osgood and Ware (reported in Osgood, 1962) asked subjects to rate personality traits (and their opposites) on semantic differential scales. Analysis of subjects' ratings yielded an evaluative dimension, which accounted for more than half of the perceived covariance in the connotative meanings of the trait terms.[1] This finding suggests that trait inferences may often have strong evaluative components. As another example, Rosenberg et al. (1968) asked subjects to sort 60 traits into groups, with each group describing a different person they knew. Rosenberg et al. then performed multidimensional scaling on subjects' sortings. Results revealed two evaluative dimensions (intellectually good vs bad, socially good vs bad), which accounted for almost all the perceived covariance in personality traits. Again, this pattern of findings suggests that trait judgments may involve evaluation.

In summary, past research has found that impression-set instructions elicit more evaluative processing and personality-trait encoding than do memory-set instructions and that trait inferences and evaluative processing often go hand in hand. The present research extended these findings by proposing that forming an impression may mean different things for people who hold the two types of implicit theories of personality. Even under an instruction to form an impression, individual differences in the extent of evaluative processing should be systematically related to the individuals' implicit theories.

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[1] Potency and activity are the other two major dimensions of connotative meanings of trait terms. However, while the evaluative dimension accounted for about 50 to 75% of the total covariation in the connotative meanings of trait terms, potency and activity together accounted for a much lower percentage and hence appear to be less central to the connotations of traits (see Tesser & Martin, 1996).

Impression Formation and the Role of Implicit Theories of Personality

Why should the extent of evaluative processing systematically relate to individuals' implicit theories even under the instruction to form an impression? As described above, findings from a number of studies (Chiu et al., in press; Erdley & Dweck, 1993; Gervey et al., 1993; Hong, 1994; see Dweck et al., 1995a for a review) suggest that entity theorists are more likely than incremental theorists to make trait inferences. Indeed, Chiu et al. (1996) found that entity theorists rated positive and negative behaviors, even relatively trivial behaviors (e.g., making the bed in the morning), as more indicative of people's personality than did incremental theorists (although both groups evaluated the behaviors themselves as equally positive or negative). Taken together with previous findings, this suggests that entity theorists in the process of arriving at trait judgments may be actively evaluating each piece of information, even seemingly trivial ones, with regard to its implications for trait judgments.

To the extent that trait inferences are closely related to evaluative processing, entity theorists, who are found to make trait inferences more readily than incremental theorists, may also be more likely than incremental theorists to engage in evaluative processing. The present study was designed to test this prediction.

Overview of the Study

To address this question, participants' implicit theories were first assessed by means of a questionnaire. In a second phase about two weeks later, the participants were shown (one at a time on a computer screen) scores that a fictitious pilot trainee had earned on twenty pilot-relevant aptitude tests and were asked to "form an impression of the trainee's performance on the tests." In order to determine whether the scores had acquired evaluative meaning, they were then asked to perform a priming task on which selected scores (as well as positively and negatively evaluated attitude objects, such as ice cream or rats) were used as primes. The task was modeled on one used by Bargh et al. (1992; see also Fazio, Sanbonmatsu, Powell, & Kardes, 1986) in which positive-attitude objects preceding positive adjectives (e.g., outstanding and attractive) and negative-attitude objects preceding negative adjectives (e.g., gruesome and terrible) tended to facilitate responding to the adjectives.

Theoretically, as perceivers engage in evaluative information processing, evaluative tags are attached to the information (Wyer & Gordon, 1984). For example, a good performance outcome would receive a positive evaluative tag, whereas a poor performance outcome would receive a negative tag. Thus, if entity theorists processed the scores in a more evaluative way, we should see evidence of their having attached stronger evaluative tags to the scores than the incremental theorists. Specifically, the evaluative tags attached to this information should affect entity theorists' responses to subsequent stimuli in the ways that positively or negatively valenced attitude objects do (cf. Fazio et al., 1986). In contrast, for

incremental theorists, who were expected to process the scores in a less evaluative way, the scores should have a significantly weaker priming effect.

As a secondary prediction, it was proposed that, if entity theorists are seeking to make trait judgments and encode person information with evaluative tags, it would be convenient for them to group together information with similar evaluative tags. That is, if they are seeking to decide whether a person is good or bad, or competent or incompetent, then these judgments might be facilitated if evidence for the positive trait is grouped together and evidence for the negative trait is grouped together. This would mean that entity theorists may code and store positively and negatively evaluated information separately, without integrating the two kinds of information. This way of storing information may make entity theorists more susceptible to biased information retrieval later. In contrast, because incremental theorists may not be seeking as much to make evaluative judgments (but rather to understand the dynamics behind behavior and outcomes), they may store positive and negative information together so that they can resolve the inconsistencies and/or integrate the information to form an impression. Consequently, they may be less likely to fall prey to biased information retrieval.

Our proposal concerning information storage is consistent with existing models of social memory and social judgment. Although research indicates that perceivers under an impression-formation set may try to integrate evaluatively inconsistent information into a consolidated representation of the target (e.g., Hamilton, Driscoll, & Worth, 1990; Hastie & Kumar, 1979), both information segregation and inconsistency resolution can lead to formation of a unitary impression. As Asch and Zukier (1984) put it, "segregation made sense only because it preserved and supported the unity of the person. . . . Segregation did not contradict the property of unity; rather it provided an intelligible rationale for unity" (p. 1234). Moreover, Asch and Zukier found that segregation is a principal cognitive strategy perceivers may *spontaneously* adopt to resolve evaluatively incongruent person information. In their study, Asch and Zukier presented to subjects person information that was apparently evaluatively discordant and had them describe the target person briefly. In this study, segregation was one of the most popular strategies the subjects spontaneously generated.

Similarly, Wyer and Carlston (1994) also proposed that clustering person information together by its evaluative implication is an alternative cognitive tactic for integrating evaluatively incongruent person information. Moreover, because segregation can help avoid interactions of positive and negative information, the resulting impression may tend to be more global and strongly valenced. Finally, research has shown that perceivers who resolved information inconsistency by considering all the information are likely to recall and base their subsequent judgments on both positive and negative information, whereas those who segregated inconsistent person information by its valence are likely to recall and base their later judgments on either positive or negative information, depending on which information store is activated (see Wyer & Carlston, 1994).

In summary, the present study seeks to understand how an entity theory versus incremental theory of personality may be linked to a more evaluative versus a less evaluative approach to social knowing.

PILOT STUDY

Method

Past research (e.g., Fazio et al., 1986; see also Bargh et al., 1992) has shown that exposure to an attitude object (e.g., ''ice cream,'' ''rat'') shortens subjects' response latency to a subsequently presented adjective (e.g., ''terrific,'' ''repulsive'') if the valence of the attitude object matches that of the adjective. If the valences of the two do not match, exposure to the attitude object instead lengthens the response latency to the adjective. Accordingly, to test whether participants had attached evaluative meaning to the trainee's test scores, in the main study, we presented the scores as primes to examine their effects on responses to subsequently presented adjectives. We predicted that entity theorists would be more likely to show response-time facilitation when high (low) scores were used as primes for positive (negative) adjectives, or response-time retardation when high (low) scores were used as primes for negative (positive) adjectives. However, to ensure that both entity and incremental theorists would exhibit the priming effect when the primes were clearly valenced attitude objects, an independent sample was pretested in a pilot study in which only clearly valenced attitude objects were used as primes.

Participants. The participants were 42 entity theorists (subjects whose scores on the implicit person theory measure were 3.0 or below) and 48 incremental theorists (whose scores on the implicit person theory measure were 4.0 or above). The subjects were students of introductory psychology class who received course requirement credit for participating in the experiment. All subjects were either native speakers of English or had spoken English for more than 10 years.

The implicit theories measure. Although implicit theories can be domain-specific (e.g., a person can have an entity theory about moral character and an incremental theory of intelligence) (see Dweck et al., 1995a), and although domain-specific assessments and predictions are likely to be the most powerful, the test scores used in the main study were described as measuring diverse set of skills (see below), which could be interpreted by the subjects as cutting across various domains. Therefore, we used a more domain-general measure of implicit theories. This implicit person theory measure consists of three items: ''The kind of person someone is something very 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'' and ''Everyone is a certain kind of person and there is not much that can be done to really change that.'' Participants were asked to show their degree of agreement with each item on a 6-point Likert scale, from 1 (strongly agree), to 2 (agree), 3 (mostly agree), 4 (mostly disagree), 5 (disagree), and 6 (strongly disagree). Only three items are included because the items are intended to depict a unitary theme, and continued repetition of the same theme using more than three items becomes somewhat bizarre and tedious to the respondents. Respondents' implicit person theory was indexed by their mean scores on the three items.

Items depicting an incremental theory are not included in this measure because several studies (Boyum, 1988; Leggett, 1985) and our own pilot studies on the implicit theory measures in another domain (intelligence) have shown that, even for respondents who endorse items depicting entity theories, there is a strong tendency to endorse items depicting the opposite, incremental theory, as well as a tendency to drift toward incremental choices over items. This suggests that incremental items are highly compelling and socially desirable. Accordingly, we included only items depicting entity theory in the measure. How did we ensure that people who disagreed with the entity theory statements were indeed agreeing with the incremental theory? In one study (Dweck et al., 1995a), we asked a group of college students to fill out the implicit theory measure and also to explain their answers. We found that respondents who disagreed with the entity theory statements gave clear incremental theory justifications for their responses.

In addition, Levy and Dweck (1996) just completed a study in which they had participants respond to the present theory measure and some time later to an expanded measure. The expanded measure

contains the entity items in the present measure as well as incremental items. To avoid the problem of social desirability, a strong form of incremental theory was depicted in the incremental items (e.g., "Everyone, no matter who they are, can significantly change their basic characteristics," and "All people can change even their most basic qualities"). On the expanded measure, there was a strong negative correlation between agreement with entity items and agreement with incremental items, $r = -.73$, $N = 652$. Moreover, a sample of 101 respondents took the present measure and the expanded measure with a delay of a week or less. The correlation between the present measure and the expanded measure was .83. There was also a substantial overlap between the present measure and the expanded measure in the classification of incremental theorists. Of those who were classified as incremental theorists on the present measure, 87.9% were classified as incremental theorists on the expanded measure (meaning that they consistently agreed with the incremental items), and only 9.1% were classified as entity theorists. Of those who were classified as entity theorists on the present measure, 89.5% were classified as entity theorists and none were classified as incremental theorists on the new measure. These findings provide direct evidence that disagreement with the entity theory statements can be taken to represent agreement with the incremental theory.

Because, in the current format, endorsement of an entity theory entails agreement with the items, it is important to demonstrate that agreement with these statements does not just represent an acquiescence set. First, MacGyvers (1992) found that there was no relation between respondents' endorsement of an entity theory and the tendency to agree with arbitrary items presented in a forceful and compelling way. Second, Dweck et al. (1995a) found that even though the implicit person theory measure has the same format as measures of implicit theories about nonhuman attributes (i.e., whether attributes of the world are fixed or malleable), they form statistically independent factors.

Moreover, previous validation studies (Dweck et al., 1995a) have consistently shown the measure to have high internal reliability, with $\alpha = .90$, .92, and .94 for three independent samples of $N = 184$, 93, and 69, respectively. In addition, the test–retest reliability has also been found to be high, with $r = .80$ ($N = 69$) over a 2-week test–retest interval. As far as the construct validity of the measure is concerned, studies show that the measure predicts theoretically meaningful inferential patterns and reactions to social events (see Dweck et al., 1993; Dweck et al., 1995a, 1995b). As found in a series of validation studies reported in Dweck et al. (1995a), the measure does not correlate with respondents' scores on academic aptitude tests (Verbal and Quantitative SAT scores), or with standard measures of socially desirable responding (the Paulhus, 1984, Social Desirability Scale) and self-presentation (the Snyder, 1974, Self-Monitoring Scale). This indicates that the measure is not confounded with intellectual ability or self-presentation concerns. Also, it does not correlate with our measure of optimism about human nature or with the Coopersmith's (1967) self-esteem measure, and is therefore not a measure of positivity and negativity about the self and others. Finally, the measure does not correlate with measures of ideological rigidity, such as the Altemeyer (1981) Right-Wing Authoritarianism Scale and the Kerlinger (1984) Measures of Conservatism and Liberalism (see Dweck et al., 1995a), and is thus not confounded with the respondents' political stance.

The priming task. On each trial of the priming task, a clearly valenced attitude object (e.g., "sunshine," "cockroach") was presented briefly (250 ms) in the center of a computer screen, which was followed by a blank screen (50 ms) and then a positive or negative adjective (e.g., "lovely," "painful"). The positive- and negative-attitude objects were chosen from the stimuli used in Bargh et al. (1992). The intertrial intervals were 4 s.

Because Fazio et al. (1986) demonstrated that an automatic activation effect occurred when SOA was 300 ms, we kept the stimulus onset asynchrony (SOA) for each trial at 300 ms. Note, however, that in Fazio et al. (1986) and Bargh et al. (1992), the prime was presented for 200 ms and followed by a 100 ms blank-screen interval. In the present research, some of the primes used in the main study (see below) contained a short phrase and a score (e.g., "Donn B.'s Score: 4.6"). When we pretested our experimental materials, some subjects could not register these primes when the primes were presented for 200 ms. Thus, we adjusted the presentation time of the primes to 250 ms and shortened the interstimulus interval (ISI) to 50 ms to keep the SOA at 300 ms. A secondary purpose of the pilot test was to determine whether this change in procedure would affect the automatic activation effect.

The following instructions were presented to the subject on the computer screen:

> In this experiment, we are interested in finding out what kinds of signals facilitate attention. Specifically, how different signals facilitate the responses that follow them. In the following, you will be asked to judge whether some adjectives imply something good or something bad. We will present to you 32 adjectives. One adjective will be presented on each trial. Before each adjective appears, a word will be shown briefly. You need not do anything at that point except attend to the word shown. After the word is shown briefly, an adjective will be presented on the screen. At this time, you are to judge whether the adjective implies something good or something bad. If you think the adjective implies something good, press "1." If you think the adjective implies something bad, press key "2." You should respond as quickly and as accurately as possible.

The response latency to identify the evaluative connotation of the target adjective was measured from the onset of the adjective presentation until the key-pressing. The task consisted of 32 trials, with four positive prime–positive adjective trials, four positive prime–negative adjective trials, four negative prime–positive adjective trials, and four negative prime–negative adjective trials. The other 16 trials were filler trials formed by pairing neutral attitude objects ("dictionary," "window") with positive or negative adjectives. The neutral objects were found in a pilot study to be rated neutral. The trial types were presented in a randomized order, with the same order for each subject.

Finally, to avoid practice effects due to repeated exposure of the same prime or target, none of the primes or adjectives was used more than once for any one subject. Furthermore, to ensure that any effects were not due to associations between a particular prime–target unit, the primes were randomly paired with targets to yield four versions of random prime–target units. A version of the pairings was chosen randomly for a participant.

Results

Average reaction times were computed for the positive prime–positive adjective trials, the positive prime–negative adjective trials, the negative prime–positive adjective trials and the negative prime–negative adjective trials. The distribution of the average reaction times was positively skewed, skewness = 4.29 and the standard error of skewness estimated from 500 bootstrapped samples = 0.25. Thus, a natural log transformation was performed on the average reaction times. This effectively reduced the skewness of the data, skewness for the log reaction times = 0.62 and the standard error of skewness estimated from 500 bootstrapped samples = 0.43.

The log reaction times were then subjected to a $2 \times 2 \times 2$ (Implicit Theory $\times$ Prime Valence $\times$ Target Valence) ANOVA, with the last two factors as within-subject factors. The focus of this analysis was whether the Prime Valence $\times$ Target Valence interaction, which according to Bargh et al. (1992) is an index of evaluation-based responding, was significant for both entity and incremental theorists. In this analysis, the Prime Valence $\times$ Target Valence interaction was significant, $F(1, 88) = 32.07$, $p < .0001$, whereas three-way interaction was not, $F(1, 88) = 1.53$, *ns*. In addition, the Prime Valence $\times$ Target Valence interaction was significant for both entity theorists, $F(1, 41) = 15.29$, $p < .001$, and incremental theorists, $F(1, 47) = 18.92, p < .001$. As shown in Fig. 1, the response-time patterns of
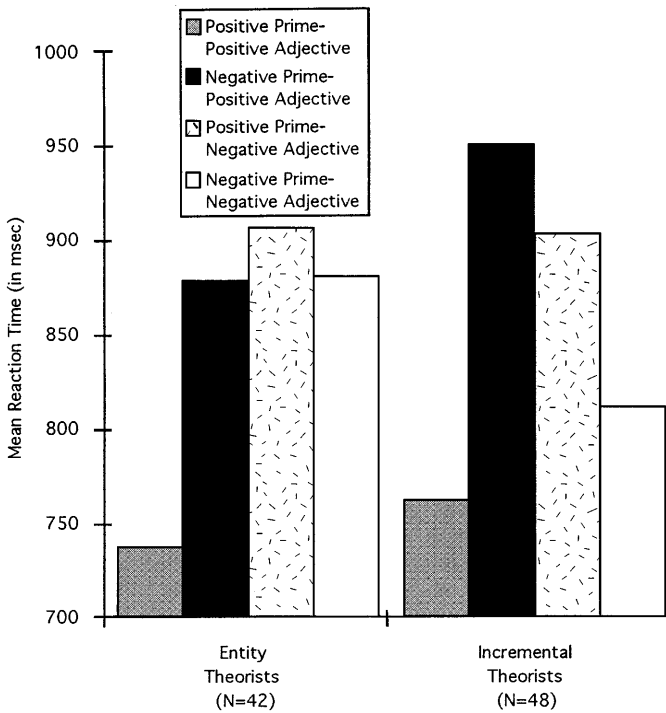
FIG. 1. The priming effects of valenced attitude objects on valenced adjectives (Pilot Study data).

the two theory groups were similar, with responding facilitated when the prime and target valences matched relative to when they did not match.[2]

Apart from the Prime Valence × Target Valence interaction, the prime valence main effect and the target valence main effect were also significant. Consistent with previous findings of the automatic stimulus evaluation effect (Hampson, Goldberg, & John, 1987; Osgood & Hoosain, 1983), responses after a positive prime were faster than responses after a negative prime ($M = 815.58$ vs 883.80 ms), $F(1, 88) = 18.08$, $p < .001$, and responses to positive adjectives were faster than responses to negative adjectives ($M = 833.60$ vs 910.09 ms), $F(1, 88) = 4.57$, $p < .05$. An Implicit Theory × Target Valence ANOVA was also performed on the log mean reaction times from the 16 trials that used neutral-attitude objects as primes. The only significant effect was the target valence main effect, $F(1, 91) =$

[2] Differences in the reaction time from the positive prime–positive adjective trials and the reaction time from the positive prime–negative adjective trials are difficult to interpret because these two types of trials required the subjects to give different responses (press different keys). The same is true for comparisons between the reaction time from the negative prime–positive adjective trials and the reaction time from the negative prime–negative adjective trials. Thus, as in Bargh et al. (1992), these comparisons were not used in assessing evaluative responding to the primes.

7.36, $p < .01$, with responses to positive adjectives being faster than responses to negative adjectives ($M = 816.90$ vs 850.11 ms).

In summary, in this pilot study, entity and incremental theorists both displayed evaluative response patterns to clearly valenced attitude objects. Moreover, the change in prime presentation time and ISI in this experiment did not affect the automatic activation effect. However, in processing person information, would entity theorists be more likely than incremental theorists to display evaluative response patterns? This question was addressed in the main study.

MAIN STUDY

Method

Participants. One hundred and twenty-five college undergraduate students from an introductory psychology class were recruited. They were given course-requirement credit in return for their participation. None of them had participated in the pilot study. The subjects were either native speakers of English or had spoken English for at least 10 years.

Set-up story and test score presentation. To provide a context for the test-score presentation, a story portraying a pilot trainee entering a pilot-training program was presented on a computer screen. Briefly, the story described how, according to government requirements, candidates for international pilot licenses must attend an international pilot-training school to receive intensive training. Before the start of the training program, each trainee has to take the Pilot Trainee Screening Test so that the school can make an early assessment of the trainee's proficiency. The Screening Test was described as consisting of 20 component tests measuring a diverse set of skills relevant to pilot performance. The participants were then shown the test scores of a pilot trainee, Donn B., presented one at a time, each for 1700 ms, in the center of the computer screen. To prevent subjects from forming impressions based on the trainee's performance on a few component tests which measure certain skills that the subjects deem important for flying, the test scores were presented with nonspecific labels (e.g., "Donn B.'s score on component test A is:"). The scores ranged from 1.2 to 8.8 and were normally distributed around a mean of 5.0. To prevent subjects from adopting different performance standards, the mean score was used to induce a standard. That is, participants were told that scores above 5.0 indicated high performance, and below 5.0 indicated low performance. Based on the scores presented, participants were asked to form an impression of the trainee's performance on the 20 tests.

The priming task in the main study. The same priming task was used in the main study. To test whether entity theorists would display stronger evaluative responses to the stimulus person's (Donn B.'s) test scores than would incremental theorists, an additional group of primes was used. Specifically, four of the high scores were used as primes (e.g., "Donn B.'s score: 8.8") for positive adjectives (e.g., "outstanding"), and four of the high scores were used as primes (e.g., "Donn B.'s score: 7.6") for negative adjectives (e.g., "unacceptable"). Similarly, four of the low scores were used as primes (e.g., "Donn B.'s score: 2.7") for positive adjectives (e.g., "likable"), and four of the low scores (e.g., "Donn B.'s score: 2.3") were used as primes for negative adjectives (e.g., "painful"). Together with the 32 attitude object–adjective trials which were also used in the pilot study (see above), there were 48 trials in the priming task in the main study. The instruction used in the priming task was the same as the one used in the pilot test, except that slight modifications were made to inform the subjects that the primes could be either a word or one of Donn B.'s scores. The 48 trials were presented to the subjects in random order.

The framing manipulation, judgment, and recall. If entity theorists were more likely than incremental theorists to segregate the test scores by their valence, they may be more likely to fall prey to biased information retrieval. To test this hypothesis, the present study used a positive question frame (e.g., How likely is it that the pilot trainee will succeed in getting a license?) or a negative question frame (e.g., How likely is it that the pilot trainee will fail to get a license?) to orient participants to attend to the positive or negative information (the pilot trainee's high or low test scores). We predicted that entity theorists' subsequent judgment would be affected by the valence of the question frames; for

example, that the positive question frame would orient entity theorists to search for evidence in the positive store, and thus would elicit more positive judgments. We predicted that incremental theorists' judgments, in contrast, would remain relatively unbiased despite the valenced frames. To further explore the effect of evaluative processing on subjective representation of person information, we also asked subjects to recall or reconstruct from memory the twenty scores of the pilot. We predicted that a positive frame would prime entity theorists to access or reconstruct positive data about the pilot whereas a negative frame would prime them to access or reconstruct negative data. In contrast, incremental theorists, being less evaluative in processing person information, would not display this pattern of responses.

To elaborate, participants were randomly assigned to one of the three framing conditions: the negative, the neutral, or the positive framing condition. Participants in all three framing conditions were presented with the following passage on the computer screen.

> We have finished presenting Donn B.'s scores on the 20 tests. You should now have an impression of Donn B.'s performance. Now, suppose you are the coordinator of the pilot trainee program at the pilot training school. You are required to make a series of judgments about Donn B., based on his performance on the Pilot Trainee Screening Test before he receives formal training. First, you have to submit a report to Donn B.'s sponsoring company.

Then, participants in the positive (negative) framing condition were given this additional information: "In this report, you have to estimate how likely it is that he would do *well* (*poorly*) in the pilot training course and *pass* (*fail*) the licensing examination when he leaves the training school. This information is important to the airline company. If a trainee flies *well* (*poorly*) during the course and then *passes* (*fails*) the licensing examination, this could make a financial difference for the company."

Participants in the neutral framing condition were told, "In the report, you have to estimate how he would perform in the pilot training course and on the licensing examination when he leaves the training school. This information is important to the airline company because this could make a financial difference for the company."

After this, participants in all framing conditions were asked, "How do you think Donn B. would do in the course?" They indicated their responses on a 10-point scale, from 0 ("extremely poorly") to 9 ("extremely well"). They were also asked "How likely is it that Donn B. would qualify for an international pilot license?" and indicated their opinions on a 10-point scale, from 0 ("not at all likely") to 9 ("extremely likely").

As a further measure of the subjects' impression of Donn B.'s performance, participants were asked to recall or reconstruct from memory five scores of Donn B.'s 20 scores that they thought best reflect Donn's performance. To allow the memory of the test scores to decay, a delay before the recall task was created. Participants were asked to work on a filler task after they had indicated their responses on the judgment task. The filler task was a sentence–picture matching task adapted from Clark and Chase (1972), which lasted for about 15 min. The instructions for the "recall" task were as below:

> Although we told you not to try special effort to remember Donn B.'s scores, we are interested in what you happened to remember or what you can guess. As we said, you can recall the scores that you remember, or guess or make up scores based on your impression of Donn B.'s performance. There is no time limit on your response. Remember you only need to generate 5 scores that you think best reflect Donn B.'s performance.

The recall task was intended to be another measure of the participants' momentary representation of Donn B.'s performance subsequent to the framing manipulation. Thus, our analysis of this measure would focus on the mean of the recalled or reconstructed scores, rather than on the accuracy of the scores the participants generated.

Including the judgment, recall/reconstruction, and priming tasks in the same experiment allowed us

to test whether the same group of entity and incremental theorists would display different extents of evaluative processing on all three tasks. We predicted that entity theorists' relatively extensive evaluative processing would reflect in (a) a significant framing effect on judgment and on recall/reconstruction and (b) a significant automatic evaluation activation effect of Donn B.'s scores independent of the framing manipulation. The present design might have two disadvantages. First, the judgment task might heighten evaluative concerns among both entity and incremental theorists, and hence reduce the power of the experiment in detecting implicit theory group differences in the priming task. Note that this potential problem, however, worked against our predictions. Second, the framing manipulation might contaminate participants' responses to the subsequent priming task. This potential problem was dealt with by including the framing manipulation as a design variable in the analysis of variance of the priming data. If subjects' responses to the priming task were affected by the framing manipulation, this should lead to significant framing interaction effects.

Procedures. About 2 weeks before participating in the experimental session, all participants filled out the Implicit Person Theory Measure in a group session. At the beginning of each experimental session, an experimenter, who was blind to the participants' implicit theory and experimental condition, explained to the subjects that the purpose of the experiment was to examine decision-making in personnel selection. Then each participant was seated in front of a computer. All the stimuli were presented and participants' responses were recorded by the computer.

First, participants read the story about the pilot-training program on the computer screen, and then were presented with the pilot trainee's 20 scores on the Screening Test. After this, the framing manipulation was introduced and the participants were given the judgment task, which was followed by the filler task, then the recall/reconstruction task, and finally the priming task. Because some of Donn B.'s scores were used as primes in the priming task, giving out the priming task first would inevitably expose the subjects to some of Donn B.'s scores, which could affect their responses on the judgment and the recall/reconstruction tasks. To avoid this, we presented the judgment and recall tasks before the priming task to all the subjects. In addition, we did not counterbalance the order of the judgment and the recall/reconstruction tasks because the relation between judgment and recall/reconstruction was not the target of our interest. These procedures should not cause problems because we predicted individual differences between entity and incremental theorists who, using these procedures, received the same order of tasks (judgment → recall/reconstruction → priming).

Results

Overview. In general, the results supported our hypotheses. When high versus low test scores were used as primes, entity theorists' response times to adjectives with the same valence were facilitated, just as when positive and negative attitude objects were used as primes. In contrast, incremental theorists' responses to the valenced adjectives were not systematically affected when the test scores were used as primes. It thus appears that entity theorists engaged in more extensive evaluative processing of the test scores than did incremental theorists. In addition, only entity theorists' judgment and recall/reconstruction were affected by the framing manipulation, such that presenting the judgment task in a positive (negative) frame elicited relatively more (less) favorable judgments and led to recall/reconstruction of more high (low) test scores. In contrast, the framing manipulation did not affect incremental theorists' judgment and recall/reconstruction. These results suggest that relative to incremental theorists, entity theorists may process person information in a more evaluative manner and be more likely to segregate person information by its valence.

The implicit theories measure. The mean implicit theory score (with a range from 1 to 6) and its standard deviation were 3.49 and 1.24, respectively. Those

participants who believe that the kind of person an individual is is fixed (entity theorists) should consistently endorse responses at the lower (agree) end of the scale (yielding a mean score of three or lower), whereas participants who believe that the qualities of a person are malleable (incremental theorists) should consistently endorse responses at the upper (disagree) end of the scale (yielding a mean score of four or above). Those whose average score falls between three and four have given mixed answers across items and are indeterminate (or mixed) in their beliefs about the nature of persons. In order to select participants with clear beliefs, participants who scored in the middle (i.e., with an average score higher than 3.0 and lower than 4.0) were eliminated from the analyses ($N = 24$, 19%). Participants with average scores lower than or equal to 3.0 were classified as entity theorists ($N = 55$), whereas those with average scores higher or equal to 4.0 were classified as incremental theorists ($N = 46$).

Reaction times to the priming task. To prepare the data for later analyses, the reaction times of incorrect responses to the adjectives (6.6% of the data points) were discarded. The mean reaction times for each type of prime–target trial were then computed. As in the pilot study, the distribution of the average reaction times was positively skewed, skewness $= 3.71$, and the standard error of skewness estimated from 500 bootstrapped samples $= 0.71$. A natural log transformation of the average reaction times reduced the skewness of the data to 1.02, with a bootstrapped standard error of 0.15.

A $2 \times 3 \times 2 \times 2 \times 2$ (Implicit Theory $\times$ Framing $\times$ Prime Type $\times$ Prime Valence $\times$ Target Valence) ANOVA was performed on the log reaction times. The predicted Implicit Theory $\times$ Prime Type $\times$ Prime Valence $\times$ Target Valence interaction was not significant, $F(1, 89) = .03$, *ns.* A significant Prime Valence $\times$ Target Valence interaction was found, $F(1, 89) = 11.47$, $p = .001$. However, this interaction was qualified by the Implicit Theory $\times$ Prime Valence $\times$ Target Valence interaction, $F(1, 89) = 4.10$, $p < .05$, indicating that the Prime Valence $\times$ Target Valence effect, which was characteristic of evaluative responding to the primes, might be differentially significant for entity theorists and incremental theorists.

Following the analysis strategy of Fazio et al. (1986) and Bargh et al. (1992), since the three-way interaction was significant, we tested whether the Prime Valence $\times$ Target Valence interaction was significant among entity theorists and incremental theorists. In support of our predictions, for entity theorists, the Prime Valence $\times$ Target Valence interaction was significant, $F(1, 49) = 12,21$, $p = .001$. Planned analyses revealed that for entity theorists, the Prime Valence $\times$ Target Valence interaction was significant both when attitude objects were used as primes, $F(1, 48) = 17.49$, $p < .001$, and when high or low test scores were used as primes, $F(1, 48) = 6.75$, $p = .01$. As shown in Fig. 2, entity theorists responded more quickly to positive target adjectives when the primes were high test scores than when they were low test scores ($M = 851.50$ vs 905.06 ms), $t(53) = 2.29$, $p < .05$. They also showed a trend toward responding more quickly to negative target adjectives when the primes were low test scores than when they were high
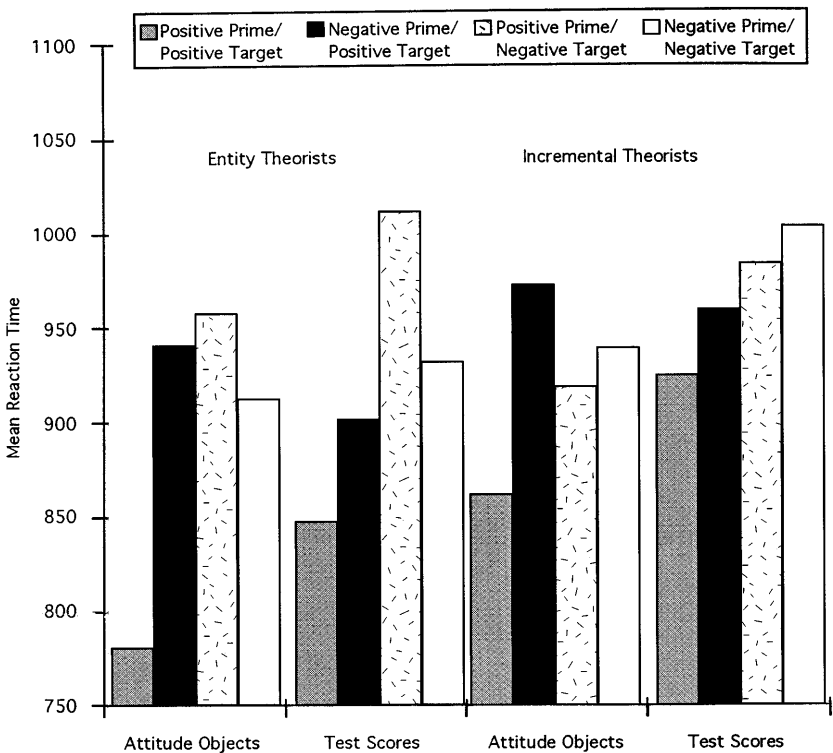
FIG. 2. The priming effects of test scores on valenced adjectives (Main Study data).

test scores ($M = 934.49$ vs 1014.35 ms), $t(53) = 1.80$, $p = .08$. The same pattern of responses was found when attitude objects were used as primes ($M = 782.11$ vs 942.94 ms for positive adjectives, $t(53) = 4.16$, $p = .0001$; $M = 914.15$ vs 958.15 ms for negative adjectives, $t(53) = 1.04$, $p = .30$). This pattern of results indicated that entity theorists display patterns of evaluative responding on trials with test scores as primes and on trials with attitude objects as primes.

In contrast, for incremental theorists, the Prime Valence $\times$ Target Valence interaction was not significant, $F(1, 44) = .59$, $p > .05$, and this was the case when test scores were used as primes, $F(1, 42) = 0.03$, *ns,* and when valenced attitude objects were used as primes, $F(1, 42) = 1.51$, $p > .05$. As predicted, incremental theorists did not show significantly faster responding to the positive adjectives when the primes were high scores than when they were low scores ($M = 927.97$ ms for the high score–positive adjective trials and 961.99 ms for the low score–positive adjective trials), $t(44) = 0.47$, *ns.* They also did not respond more quickly to the negative adjectives when the primes were low scores than when they were high scores ($M = 1006.26$ ms for the low score–negative adjective trials and 986.34 ms for the high score–negative adjective trials), $t(44) = -0.48$, *ns.* Consistent with our prediction, this pattern of results indicated that

incremental theorists, unlike entity theorists, did not display the response patterns that characterize evaluative responding on trials with high or low test scores as primes.

Recall the pilot test which tested how entity and incremental theorists responded to valenced objects. Results from this pilot test revealed that the Prime Valence × Target Valence interaction was significant for entity theorists and also for incremental theorists, indicating that both entity and incremental theorists displayed similar patterns of responses when the primes were clearly valenced. However, in the main study, this interaction effect was not significant for incremental theorists. Similar to entity theorists, incremental theorists responded more quickly to positive adjectives when the primes were positive attitude objects than when the primes were negative attitude objects ($M = 863.51$ ms for positive attitude objects as primes and 963.91 ms for negative attitude objects as primes, respectively), $t(44) = -2.12, p < .05$. However, unlike entity theorists, incremental theorists did not respond more quickly to negative adjectives when the primes were negative attitude objects than when the primes were positive attitude objects ($M = 923.34$ ms for positive attitude objects as primes and 945.77 ms for negative attitude objects as primes, respectively), $t(44) = -0.55$, *ns.* Thus, when attitude objects were used as primes, incremental theorists showed the expected effect for positive adjectives but not the negative adjectives. We will return to the discrepancy between the pilot study and the main study in incremental theorists' responses to the valenced attitude objects in the follow-up study.

In addition to the above findings, the five-way ANOVA also revealed a significant prime valence main effect, $F(1, 89) = 6.38, p = .01$, and a significant target valence main effect, $F(1, 89) = 22.79, p < .001$. Overall, responses were faster when positive attitude objects or high scores were used as primes than when negative attitude objects or low scores were used as primes ($M = 908.69$ vs 952.41 ms). Subjects also responded more quickly to positive adjectives than to negative adjectives ($M = 901.45$ vs 958.15 ms). There was also a significant framing main effect on response latencies, $F(2, 89) = 3.60, p < .05$.[3] Finally, a $2 \times 3 \times 2$ (Implicit Theory × Framing × Target Valence) ANOVA was also performed on the neutral attitude object–adjective trials. Only the framing main effect was significant, $F(2, 95) = 3.38, p < .05$.[4] Although the framing manipulation had systematic effects on response latencies, the lack of any significant framing interactions indicated that framing did not affect the automatic evaluation activation effects.

In short, as we hypothesized, the high and low test scores were effective in facilitating entity theorists' responses to subsequently presented adjectives that were congruent in valance. However, the test scores were not effective in

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[3] In general, except for the condition in which attitude objects were used to prime positive adjectives, response times tended to increase from the negative framing condition, to the neutral framing condition, and the positive framing condition ($M = 845.56$ vs 938.23 vs 1028.65 ms).

[4] Again, response time to the adjectives increased from the negative framing condition to the neutral framing condition and the positive framing condition ($M = 844.72$ vs 941.52 vs 1031.74 ms).

facilitating the incremental theorists' responses. These results support the hypothesis that entity theorists are more likely than incremental theorists to attach evaluative tags to person information (e.g., the test scores) when they are processing this information.

The effect of framing on the judgment and "recall" measures. Thus far, the findings suggest that entity theorists processed the test scores in a more evaluative manner than did incremental theorists. However, did entity theorists also have a greater tendency to separate the test scores by their valence? This question was addressed by assessing the effect of framing on judgments and the recalled/ reconstructed scores. Results supported our predictions in that entity theorists' judgments and person data reconstruction were systematically affected by the frames, whereas incremental theorists' judgments and data reconstruction were much less affected.

Because participants' judgments on the two judgment items (i.e., how well Donn B. would do in the course and how likely he would be to qualify for an international pilot's license) were highly correlated ($r = .75$), the two items were averaged to form an overall judgment index. On the index, which ranged from 0 to 9, a higher score indicated a more favorable judgment of Donn B.'s future success. Similarly, the five recalled or reconstructed scores were averaged to yield an overall recall score.

Our prediction was that entity theorists' impressions of Donn B.'s performance would be systematically affected by the frames, such that a positive frame would lead to a more positive impression and a negative frame would lead to a more negative impression. In contrast, incremental theorists would not be affected as much by the frames. Thus, entity but not incremental theorists would display a linear trend for the effect of frame valence on impression or data reconstruction. To test this prediction, an Implicit Theory $\times$ Frame Valence (2×3) ANOVA was performed on the judgments and the mean recalled/reconstructed scores. In this analysis, the 2 *df* frame valence effect was decomposed into a linear and quadratic contrast, and the 2 *df* interaction term was decomposed into an Implicit Theory $\times$ Linear Frame Valence interaction contrast and an Implicit Theory $\times$ Quadratic Frame Valence interaction contrast. The focus of this analysis was on the Implicit Theory $\times$ Linear Frame Valence interaction.

The analysis of the mean recalled/reconstructed scores revealed a significant frame valence main effect, $F(2, 95) = 5.85$, $p < .05$, and a significant Implicit Theory $\times$ Frame Valence interaction effect, $F(2, 95) = 4.04$, $p < .05$. The significant frame valence main effect was largely due to the significant linear trend contrast, $t(95) = 2.96$, $p < .05$. The linear trend indicated that the mean recalled/reconstructed scores tended to increase linearly with frame valence. The quadratic trend contrast was not statistically reliable, $t(95) = 0.07$, *ns.* More importantly, the Implicit Theory $\times$ Linear Frame Valence interaction contrast was significant, $t(95) = 1.99$, $p < .05$, suggesting that the presence of the linear trend might depend on the participants' implicit theories. Figure 3 shows that for entity theorists, the mean of the scores recalled/reconstructed decreased from the
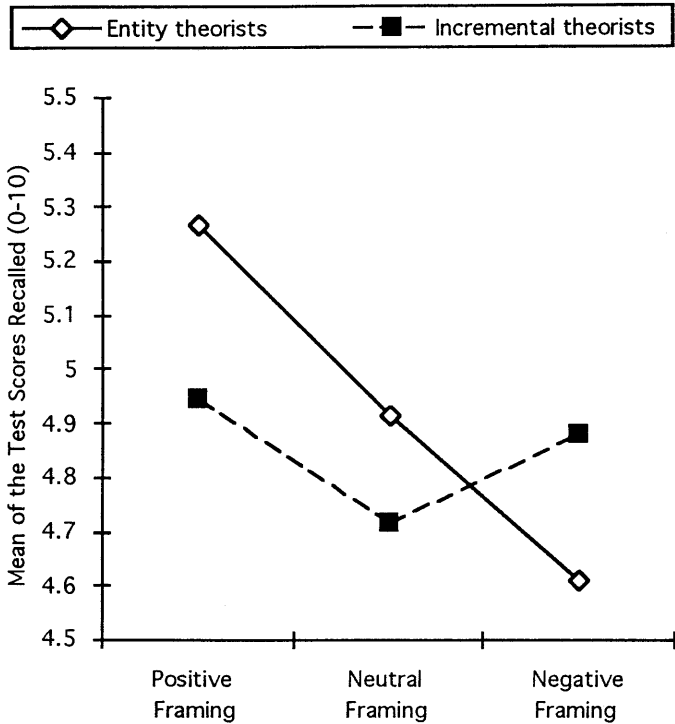
FIG. 3.   Effects of framing on recall/reconstruction.

positive framing condition to the neutral framing condition and the negative framing condition ($M = 5.26$, 4.91 and 4.61 for the positive, neutral, and negative framing conditions, respectively). By contrast, incremental theorists' recall of the test scores was not affected significantly by the framing manipulation ($M = 4.95$, 4.72, and 4.88 for the positive, neutral, and negative framing conditions, respectively). Planned analyses showed that the linear trend was significant only among entity theorists, $t(53) = 3.24$, $p < .05$, and not among incremental theorists, $t(44) = .30$, *ns.*

Similar analyses performed on the judgment data revealed a significant frame valence main effect, $F(2, 95) = 7.26$, $p < .05$. This main effect was largely due to the significant linear trend, $t(95) = 2.23$, $p < .05$; the quadratic trend was not statistically reliable, $t(95) = 0.29$, *ns.* However, possibly due to the relatively large measurement error, $MS_e = 1.51$, the Implicit Theory $\times$ Frame Valence interaction was not significant, $F(2, 95) = 1.65$, *ns.* Planned analyses, however, revealed a significant linear trend for the frame valence effect among entity theorists, $t(53) = 2.72$, $p < .05$, but not among incremental theorists, $t(44) = 1.13$, *ns.* As shown in Fig. 4, the favorability of entity theorists' judgments decreased systematically from the positive framing condition to the neutral
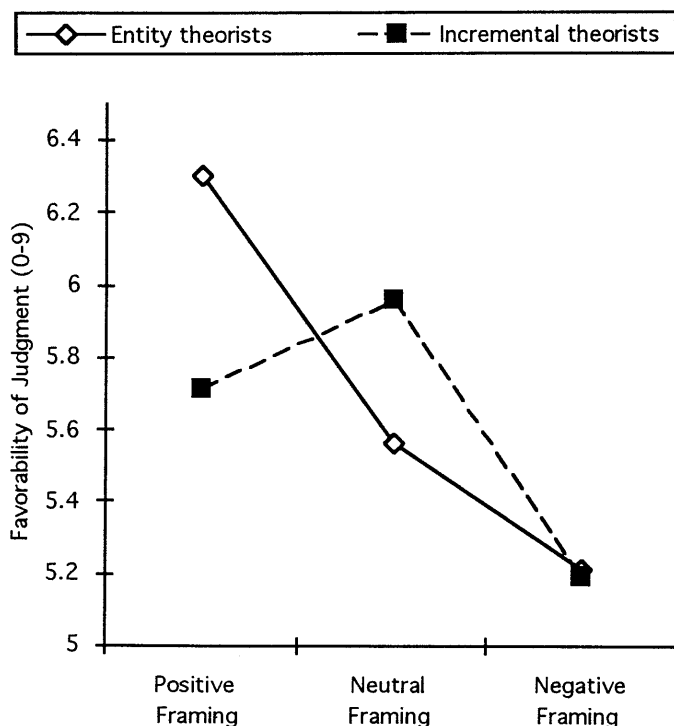
FIG. 4. Effects of framing on judgment.

framing condition and the negative framing condition ($M = 6.30$, 5.56, and 5.21 for the positive, neutral, and negative framing conditions, respectively). Incremental theorists' judgments, by contrast, were not significantly affected by framing ($M = 5.71$, 5.96, and 5.19 for the positive, neutral, and negative framing conditions, respectively). Although incremental theorists' judgments appeared to be more negative in the negative framing condition than in the neutral one, the difference was not statistically reliable, $F(1, 27) = 1.96$, *ns*.

In summary, the framing manipulation appears to have had a greater impact on entity theorists' judgment and recall/reconstruction than on those of incremental theorists, suggesting that entity theorists may be more likely than incremental theorists to separate discordant person information by its valence.

FOLLOW-UP STUDY

The discrepant results in the pilot study and the main study regarding incremental theorists' responses to valenced attitude objects raises a theoretical issue. There are two possible reasons for the nonsignificant Prime Valence × Target Valence interaction for incremental theorists in the main study. First, Bargh et al. (1992) observed that the automatic attitude activation does not occur for attitude objects

that are not consistently evaluated. Thus, it is possible that the incremental theorists in the main study did not have consistent attitudes toward the attitude objects. However, it is also possible that incremental theorists, who tended not to attach evaluative tags to person information (test scores), also tended not to attach fixed evaluative meanings to other attitude objects. Thus, the relation between implicit theories and the tendency to engage in evaluative processing may be domain general rather than domain specific. The generality versus specificity issue is theoretically interesting. If the relation is domain general, it implies that entity theorists have a greater tendency than incremental theorists to form evaluative opinions on everything. However, if the relation is domain specific, entity theorists will be more evaluative than incremental theorists only when they are processing person information.

To address this issue, we conducted a follow-up study, in which we had 336 university students (171 males, 165 females) from a university in Hong Kong fill out the Implicit Theories Measure and one of two versions of the Need to Evaluate Scale (Jarvis & Petty, 1996). One version of the Need to Evaluate Scale was the original scale Jarvis and Petty developed, which assesses individuals' general tendency to form evaluative opinions. This measure has been found to be a reliable predictor of people's tendency to spontaneously engage in evaluative processes. Items from the scale include "I form opinions about everything," "I want to know exactly what is good and bad about everything," and "If something does not affect me, I do not usually determine if it is good or bad" (reverse scoring). We formed a second version, the Need to Evaluate People Scale, by changing the target of evaluation in the original items to people, e.g., "I form opinions about everyone," "I want to know exactly what is good and bad about everyone," and "If someone does not affect me, I do not usually determine if he or she is good or bad" (reverse scoring). The participants were randomly assigned to fill out the original Need to Evaluate Scale or the Need to Evaluate People Scale. A number of filler questionnaires were included between the Implicit Theories Measure and the Need to Evaluate Scales. If the relation of Implicit Theories and the motivation to evaluate is domain general, there should a positive correlation between endorsement of an entity theory and both versions of the Need to Evaluate Scale. However, if the relation is domain specific, endorsement of entity theory should correlate positively with the Need to Evaluate People Scale but not with the original Need to Evaluate Scale.

Results

To ensure that the two versions of the Need to Evaluate Scale had comparable reliability, a factor analysis was performed on each version of the scale. As in Jarvis and Petty (1996), scree tests revealed a dominant one-factor solution for both versions. The factor structure for the original Need to Evaluate Scale and the Need to Evaluate People Scale were almost identical to the factor structure reported by Jarvis and Petty (1996, Sample 1). The coefficient of congruence (Wrigley & Neuhaus, 1955) was .95 for the original Need to Evaluate Scale and

.90 for the Need to Evaluate People Scale. The internal reliability of the original Need to Evaluate Scale and the Need to Evaluate People Scale were .72 and .77, respectively. In short, the two versions of the Need to Evaluate Scales in the present study had acceptable and comparable reliability.

To test our specific prediction, the main effect of implicit theory (treated as a continuous variable), the main effect of version (generalized need to evaluate vs need to evaluate people), and the Implicit Theory $\times$ Version interaction were tested in a regression analysis. A significant version main effect would indicate that the generalized need to evaluate was reliably stronger or weaker than the need to evaluate people. A significant implicit theory main effect would indicate that implicit theories were related to both the generalized and the specific need to evaluate, and a significant interaction would indicate that the association between implicit theories and the need to evaluate depends on the generality of the evaluative need. The only significant effect in this analysis was the Implicit Theory $\times$ Version interaction, $F(1, 322) = 6.28$, $p = .01$. Follow-up analyses revealed a significant positive correlation between subscribing to an entity theory and the need to evaluate people, $r = .17$, $df = 158$. The correlation between endorsement of entity theory and the generalized need to evaluate was not significant, $r = -.13$, $df = 169$.

The follow-up study was designed to address the issue of whether incremental theorists have inconsistent attitudes towards the attitude objects in the main study or a lower need to evaluate in general. The results argue against the possibility that incremental theorists have a lower generalized need to evaluate and, incidentally, support the domain-specificity of the implicit theories effect. Believing in fixed traits was associated with a stronger need to evaluate the goodness and badness of people, but it was not associated with a stronger need to evaluate in general. Since the attitude objects presented to participants in the main study were generally inanimate or infrahuman (e.g., rats, sunshine, holiday), the difference in responding between entity and incremental theorists could not be attributed to a differential need to evaluate.

The follow-up study itself did not provide direct evidence for the notion that incremental theorists have inconsistent attitudes towards the attitude objects. However, it is interesting to note that the negative attitude objects did not elicit strong evaluative responding from entity theorists either in the pilot study or the main study, and they did not elicit significant evaluative responding from incremental theorists in the main study, possibly because the meanings of some negative attitude objects in the priming task are ambiguous (e.g., ''rats'' can also mean ''darn''). Such ambiguity could have led to weak evaluative responding to the negative attitude objects.

Finally, the present findings suggest that although entity theory predicts the need to evaluate people, it is not redundant with the Need to Evaluate Scale, because entity theory did not correlate with the original scale, and the correlation between entity theory and the need to evaluate people was rather mild.

In short, the main study and the follow-up study together, by showing that

entity theorists attach strong evaluative tags to person information and that entity and incremental theorists differ in their need to evaluate people, provided clear support for the hypothesis that holding an entity theory is associated with more extensive evaluative processing in the domain of person perception.

DISCUSSION

Past research findings suggested that people who hold an entity view of personality may take a different approach to understanding behaviors and forming impressions of others than do those who hold an incremental view. A belief in fixed traits seems to orient individuals to focus on evaluating and diagnosing others' personality traits. Since many studies have demonstrated that evaluation is an important aspect of trait inferences (Rosenberg & Olshan, 1970; Felipe, 1970; Osgood & Ware, reported in Osgood, 1962; Rosenberg et al., 1968; cf. Peabody, 1967, 1970), we asked whether entity theorists would also have a greater tendency than incremental theorists to process person-related information evaluatively.

Specifically, the present study tested two sets of hypotheses, namely the evaluative processing predictions and the segregation of valenced information predictions, and each received support. First, since evaluation is an important aspect of many trait inferences, and since entity theorists have been found in previous studies to be more inclined than incremental theorists to diagnose traits (e.g., Erdley & Dweck, 1993; Hong, 1994; see also Chiu et al., 1996), it was predicted that entity theorists would engage in more extensive evaluation when they process person information than would incremental theorists. In the main study, we indeed found that subjects who believed that personality consists of fixed traits (i.e., entity theorists) displayed responses that were more characteristic of evaluative processing than did those who believed that personality consists of malleable qualities (i.e., incremental theorists). In addition, in the follow-up study, the tendency to subscribe to entity theory was associated with a stronger motivation to evaluate people but was unrelated to a generalized need to evaluate. Taken collectively, these findings indicate that, compared to incremental theorists, entity theorists may indeed have a greater tendency to focus on the evaluative meaning of incoming person information and to attach evaluative tags to this information.

Second, we reasoned that because segregating positive evaluative information from negative evaluative information may increase the efficiency of trait diagnosis, entity theorists might display a greater tendency toward information segregation than incremental theorists. To test this hypothesis, we sought to selectively activate the positive or negative information store by presenting the judgment context with a positive or negative (vs neutral) frame. Although subjects in the different framing conditions received exactly the same person information and were given identical judgment questions, the framing manipulation had a significant and systematic impact on entity theorists' judgments and recall/reconstruction of test scores, but not on those of incremental theorists. This finding is consistent with the idea that entity theorists may have segregated the test scores

by valence, such that, for example, in the presence of a positive frame, the positive information store was activated to a greater extent, resulting in a more favorable person judgment and better recall of high scores.

By contrast, incremental theorists, who were hypothesized to have a lesser tendency to segregate the information by its valence, were less susceptible to the framing effect on judgment and recall. This may be because unlike entity theorists who orient toward diagnosing static qualities of people, incremental theorists are found to focus on understanding the more dynamic processes that underlie a person's behavior (Chiu, 1994; Dweck et al., 1993; Hong, 1994). Doing so may require them to sample and integrate information about an individual from various situations in order to get an accurate profile of a person's behavior and its underlying mediators. Thus, when they confront an array of potentially conflicting information about an individual, they may analyze the information piece by piece in a fine-grained manner (i.e., piecemeal information processing; see Fiske & Neuberg, 1990; Fiske & Pavelchak, 1986) and generate an overall picture of the target person that includes both the positive and negative information. They would thus be less biased by the framing of the question. To test these predictions, a systematic investigation of the processes through which entity and incremental theorists try to reconcile inconsistent social information may be fruitful in future research.

Although we found that incremental theorists did not display an evaluative response pattern in the priming task and that their judgments and recall/reconstruction were not systematically affected by the framing manipulations, these results do not imply that incremental theorists did not distinguish between high and low scores, or that they did not form any evaluation, say, of the pilot trainee's overall performance. Indeed, the procedure called for them to make judgments of how well he was likely to do in the training and how likely he was to succeed in earning a pilot's license. Moreover, these judgments were clearly related to the particular test scores incremental theorists recalled as representative ($r(44) = 0.58, p < .05$), suggesting that they certainly understood the meaning of the various test scores. What the absence of the priming effect for the test scores suggests is that, although incremental theorists are *aware* of the meaning of the test scores, they do not attach strong evaluative meaning to each piece of information.

Taken together, the findings from this study are consistent with our prediction that implicit theories of personality moderate the cognitive processes people engage in to understand the social world: A belief in fixed personality seems to be linked to a tendency to attach evaluative tags to social information and to store valenced information separately, whereas a belief in malleable personality seems to be linked to a weaker tendency to do so.

Such findings extend past research on processing goals by showing that forming an impression may mean different things for people who hold the two types of implicit theories of personality. Even under an instruction to form an

impression, individual differences in the extent of evaluative processing appear to be systematically related to the individuals' implicit theories. Thus, for one person, forming an impression involves making evaluative judgments of the target, whereas for another it may involve gaining an idea about the target's profile of current skills without making strong evaluative judgments. This idea is consistent with Jarvis and Petty's recent findings that people differ considerably in the extent to which they draw spontaneous evaluative judgments.

Implications for Understanding Automatic Evaluative Processing

Fazio (1986, 1989, 1990) proposed that not all attitude objects are capable of activating evaluation automatically. Only attitude objects that possess highly accessible, strong evaluation, probably acquired through prior experience with the attitude objects, should be capable of activating evaluation automatically when presented. The activation of attitudes toward objects that are associated with relatively inaccessible, weak evaluation should, in contrast, require effortful, nonautomatic, reflective processes. Thus, attitude objects should be capable of activating evaluation automatically in individuals who hold relatively strong attitudes about them but not in individuals who hold relatively weak attitudes toward them. According to this analysis, the automatic attitude activation effect should not be general across attitude objects (or across subjects for a given attitude object). However, contrary to this contention, Bargh et al. (1992) obtained findings indicating that people's attitudes were activated quite automatically for attitude objects that varied widely as to (a) extremity, ambivalence, and polarization of attitude, (b) consistency of evaluation across subjects (i.e., consensus), and (c) mean evaluation latencies (presumably indicating the strength of evaluation). Based on these findings, Bargh et al. argued that the automatic attitude activation effect is quite general, holding across both attitude objects for which strong evaluation is held and those for which weak evaluation is held.

In light of the present findings, implicit theory of personality may be an individual difference factor that moderates the generality of the automatic attitude activation effect as far as person information is concerned. Although our study does not allow us to determine whether incremental theorists did not form an ''attitude'' or whether the attitude they formed was too weak to be automatically activated, the finding that entity theorists displayed evaluative processing and evaluative reactions to the trainee's test scores but incremental theorists did not may suggest that perhaps the automatic attitude activation effect holds more strongly for entity theorists. This is a hypothesis that merits further investigation.

Concluding Remarks

In keeping with the emphasis on implicit theories of personality in several prominent early theories of social perception (e.g., Jones & Thibaut, 1958; Kelly, 1955; Heider, 1958), this research demonstrates how implicit theories about the nature of personality may be linked to different approaches of social knowing:

One approach focuses on trait diagnosis (Chiu, 1994; Hong, 1994) and evaluative encoding of social information, and the other approach focuses on understanding the processes mediating behaviors (e.g., emotions, goals, and beliefs) (Hong, 1994) and involves less evaluative encoding. The present study highlights the role of implicit theories of personality in social information-processing, and by doing so, it may suggest new insights into how people understand the social world.

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