

Discrepancies Between Explicit and Implicit Self-Concepts: Consequences for Information Processing

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Individuals with discrepancies among their explicit beliefs often engage in greater elaboration of discrepancy-related information in a presumed attempt to reduce the discrepancy. The authors predicted that individuals with discrepancies between explicit and implicit self-conceptions might similarly be motivated to engage in processing of discrepancy-related information, even though they might not be aware of the discrepancy. Four studies were conducted in which various self-dimensions were assessed with explicit and implicit measures. Across several different self-dimensions (e.g., need to evaluate, self-esteem), the authors found that as the discrepancy between the explicit and implicit measure increased (regardless of direction), people engaged in more thinking about information framed as related to the self-dimension on which the discrepancy existed. This research suggests that individuals might be motivated to examine relevant information as a strategy to minimize the implicit doubt that accompanies an inconsistency between explicit and implicit self-conceptions.

Keywords: discrepancy, explicit–implicit, self, persuasion, attitude change

The psychological literature has clearly documented that people can simultaneously hold incompatible explicit beliefs, attitudes, feelings, and behavioral tendencies regarding oneself and others (e.g., Abelson & Rosenberg, 1958; Bem & Allen, 1974; Brehm & Cohen, 1962; Cacioppo, Gardner, & Berntson, 1997; Heider, 1958; Higgins, 1987; Kaplan, 1972; Newcomb, 1968; Norton, 1975; Osgood & Tannenbaum, 1955; Priester & Petty, 1996). Virtually every relevant theory holds that such internal discrepancies tend to be unpleasant and can result in psychologically undesirable outcomes (e.g., Campbell, 1990; Carver & Scheier, 1990; Greenier, Kernis, & Waschull, 1995; Higgins, 1987; Kernis & Waschull, 1995). Because of this, people often attempt to resolve these internal discrepancies. Perhaps the most common approach to addressing discrepancy is enhanced thinking or information processing (e.g., Abelson et al., 1968; Aronson, 1969; Festinger, 1957; Heider, 1958; Hass, Katz, Rizzo, Bailey, & Moore, 1992). By considering additional information, individuals may hope to gain enough information for one or the other side of the discrepancy to resolve or minimize the inconsistency, or at least the

subjective discomfort that results from the discrepancy (e.g., Hänze, 2001; Hodson, Maio, & Esses, 2001; Jonas, Diehl, & Bromer, 1997; Katz, Wackenhut, & Hass, 1986).

For example, Maio, Bell, and Esses (1996) measured participants' ambivalence regarding the issue of immigration to Canada (i.e., the extent to which they had both positive and negative reactions to the issue) and then exposed them to a discrepancy-related message favoring immigration from Hong Kong to Canada that contained either strong or weak arguments. The extent to which participants processed the message information was assessed by examining the extent to which the quality of the arguments affected postmessage immigration attitudes (Petty, Wells, & Brock, 1976). When people are thinking carefully about information, they should be affected by the quality of the arguments a message contains (see Petty & Cacioppo, 1986). As expected, Maio et al. (1996) found that individuals who had ambivalent attitudes toward immigration were more influenced by argument quality than were unambivalent individuals, suggesting that they engaged in enhanced scrutiny of the information.

Although research has focused extensively on explicit discrepancies, relatively little work has examined the potential existence of and consequences of discrepancies in which one cognitive element may not be easily reported. Theory suggests that just as people can hold conscious, explicit self-beliefs, they may also hold less conscious (or explicitly denied) automatic self-associations that can conflict with the more consciously endorsed ones (e.g., Greenwald et al., 2002). The present research examines the information-processing consequences of discrepancies between self-conceptions as assessed with explicit and implicit measures of individual differences.

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The Relationship Between the Implicit and the Explicit Self-Concept

Compared with an explicit or conscious self-conception, an implicit self-view is generally defined as one that is held outside of conscious awareness, or at least is an association that is not endorsed consciously (Fazio & Olson, 2003; Petty, Wheeler, & Tormala, 2003). Such self-conceptions can influence judgment and action automatically without the need for reflection and may only be apparent on disguised or implicit measures. Considerable research has examined the predictive utility of such measures in the domains of motivation (e.g., McClelland, 1985), memory (e.g., Lindsay & Johnson, 1989), personality (e.g., Bornstein, 1995), self-esteem (e.g., Greenwald & Banaji, 1995; Hetts, Sakuma, & Pelham, 1999), attitudes (e.g., Greenwald, McGhee, & Schwartz, 1998; Fazio, Jackson, Dunton, & Williams, 1995), and stereotypes (e.g., Blair & Banaji, 1996; Dovidio, Kawakami, & Beach, 2001). Currently the most popular implicit measures of self-conception are based on reaction times, for example, the Implicit Association Test (IAT; Greenwald et al., 1998) and the Automatic Evaluation Task (Fazio et al., 1995). These measures capitalize on automatic associations between the self and other constructs—reactions that may occur too quickly to come under deliberative control (see Petty, Fazio, & Briñol, in press, for reviews).¹

Sometimes, what is assessed with implicit and explicit measures is the same, suggesting that there is just *one* underlying motive, attitude, personality, or self-conception that is open to conscious awareness. However, explicit and implicit assessments are not always congruent. Although there are various explanations for this incongruency, some researchers have developed theoretical frameworks that account for the divergence by proposing that explicit and implicit constructs sometimes stem from two independent systems that operate in different contexts and influence different types of behavior. For example, Dovidio et al. (2001) have argued that self-report (explicit) and response latency (implicit) measures of attitudes can tap into different evaluations that predict behaviors in different situations (spontaneous vs. deliberative; see also Carlston & Skowronski, 1986; Gawronski & Bodenhausen, in press; Wilson, Lindsey, & Schooler, 2000). A similar distinction has been made in the domain of motivation (see, e.g., McClelland, 1985; Patten & White, 1977).

Indeed, Carver (2005) documented that psychologists have promulgated a wide array of dual system approaches (e.g., Lieberman, 2000; Metcalfe & Mischel, 1999; Shastri & Ajjanagadde, 1993; Sloman, 1996; Smith & DeCoster, 2000; Smolensky, 1988). Although the various frameworks differ in some details, each has tended to emphasize the fact that some behavior is guided in a relatively automatic and unconscious way, whereas other behavior is guided in a more deliberative and conscious way. For example, cognitive-experiential self-theory (Epstein, 1973, 2003) argues that humans are characterized by two independent, interactive systems of thinking that jointly determine behavior: a preconscious experiential system and a conscious rational system. Similarly, the reflective-impulsive model (Strack & Deutsch, 2004) postulates two systems—one thoughtful and one more automatic—that operate in parallel and interact with one another.

Simultaneous Activity of Explicit-Implicit Self-Discrepant Dimensions

If discrepant explicit and implicit constructs always operated in different situations (e.g., spontaneous vs. deliberative), then they should lead to little conflict in any given situation. But if the two self-conceptions were ever jointly activated or operative, there would be the possibility of some consequences that mirror incongruency between discrepant *explicit* constructs (Petty et al., 2006). In fact, there is some evidence suggesting that possessing discrepant implicit and explicit self-concepts can be consequential. For example, Shedler, Mayman, and Manis (1993) studied individuals who reported minimal emotional disturbance on Eysenck's Neuroticism scale (explicit measure) but who were simultaneously judged on the basis of their early memories (implicit measure) to be relatively disturbed. In comparison with participants in the genuine self-esteem group (who scored as healthy on both measures), those with explicit-implicit discrepancies were significantly more reactive on a combined index of heart rate and blood pressure and scored higher on behavioral indices of anxiety (see also Weinberger & Haradaway, 1990).

In conceptually similar research, Zelenski and Larsen (2003) found that having incongruent explicit (e.g., self-ratings) and implicit (measured by the Thematic Apperception Test; Proshansky, 1943) motive profiles was associated with reduced emotional well-being. Other recent research has demonstrated that people who scored relatively high on an explicit measure of self-esteem, but relatively low on an implicit measure (the IAT), exhibited the most self-aggrandizement across different indices (Bosson, Brown, Zeigler-Hill, & Swann, 2003), which is the main characteristic of a narcissistic personality (e.g., Wing & Gough, 1990). Additionally, individuals with the combination of relatively high scores on explicit measures of self-esteem and relatively low scores on implicit measures have been shown to be particularly defensive (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003).

Finally, we have found that discrepancy between explicit and implicit self-esteem scores is associated with implicit but not explicit self-doubt (Briñol, Petty, & Wheeler, 2003). Specifically, as explicit-implicit self-esteem discrepancy (as assessed using the absolute value of the difference between participants' standardized explicit and implicit self-esteem scores) increased, the strength with which participants automatically associated doubt words with self-words on an IAT also increased. However, increased discrepancy was not associated with explicit reports of self-uncertainty. Similarly, recent research has shown that when people's attitudes change on explicit measures, they show more doubt on an implicit but not explicit measure of confidence regarding the attitude object compared with people whose attitudes have not changed (Petty et al., 2006). Because recent research also shows that when attitudes

¹ When not compatible with the endorsed (explicit) self-conception, the self-associations measured with contemporary implicit measures can represent many things (e.g., repressed evaluations of oneself, prior evaluations of oneself, others' evaluations of oneself, hopes for oneself, strong societal prescriptions for self-conduct, and so forth). We postulate that regardless of the particular source of the association, inconsistency with one's consciously endorsed self-view can lead to psychological conflict (see Petty, in press; Petty, Tormala, Briñol, & Jarvis, 2006; Priester & Petty, 2001).

change, a residue of the prior attitude may still be available on an implicit (automatic) measure (e.g., Gregg, Seibt, & Banaji, 2006), the enhanced implicit doubt that accompanies attitude change is plausibly due to a discrepancy between old (implicit/automatic) and new (explicit/deliberative) evaluations.

Together, these studies suggest that having discrepant explicit and implicit self-dimensions is associated with numerous consequences that often appear to be negative, unpleasant, or dysfunctional. Because of this, people with such discrepancies should be motivated to engage in some discrepancy resolution. Specifically, we postulate that like possession of an explicit discrepancy (e.g., attitudinal ambivalence), possession of a discrepancy between implicit and explicit self-conceptions will be associated with attempts at discrepancy reduction, and that this would occur regardless of the direction of the discrepancy. As described earlier, by thinking about information presumed relevant to the issue on which there is a discrepancy, individuals with explicit–implicit discrepancies can possibly restore internal consistency. Thus, the purpose of the present research was to examine the influence of explicit–implicit discrepancies on information processing. We examined conditions under which the discrepancy results both from one’s explicit self-conception being relatively higher (more positive) than one’s implicit self-conception within the sample distribution as well as from one’s explicit self-conception being relatively lower (less positive) than one’s implicit self-conception.

Overview of the Present Research

We hypothesized that to reduce a discrepancy between explicit and implicit self-conceptions, individuals with such discrepancies would engage in more effortful elaboration of information presumed relevant to the self-dimension on which the discrepancy exists. To test this hypothesis, we conducted four studies in which explicit and implicit assessments of the self along four different dimensions were collected. In each study we used a standard self-report as the explicit measure and an IAT as the implicit measure. The IAT was selected because (a) it taps into automatic associations that are less subject to conscious control and (b) previously validated procedures were available for some of the dimensions of interest. We then examined the impact of explicit–implicit divergence on the extent of processing of information framed as discrepancy related.

The logic was similar across the four studies. In each study, an index of the relative explicit–implicit discrepancy was formed for each participant following procedures used in prior research (see Kehr, 2004, for a discussion). Then, all participants were exposed to a persuasive message. The extent to which participants processed the information in the message was assessed by using an information quality manipulation. As noted earlier, the impact that the quality of information in a message has on resulting attitudes is a widely used indicator of the extent to which individuals carefully attend to and think about the information to which they are exposed (Petty & Cacioppo, 1986).

Finally, across studies we varied whether the information contained in the message was actually relevant (Study 1) or simply framed as relevant (Studies 2, 3, and 4) to the self-dimension on which discrepancy existed. In two studies (Studies 3 and 4), we manipulated the extent to which participants *expected* the message to be relevant to the issue on which discrepancy existed, even

though the message actually contained discrepancy-unrelated information. This manipulation was expected to moderate the impact of discrepancy on information processing. If thinking is aimed at reducing the discrepancy, then explicit–implicit incongruence should be associated with enhanced thinking only when participants expect the message to be related to the self-dimension on which there is a discrepancy (i.e., when it presumably could help reduce the discrepancy). When the same information is framed as unrelated, it should be useless in resolving the discrepancy.

Thus, in studies in which the information was presumed relevant to the discrepancy (Studies 1 and 2), we predicted a two-way interaction on attitudes between size of the explicit–implicit discrepancy and information quality. Information quality should have a greater impact on attitudes as discrepancy increases. In studies in which we manipulated the presumed relevance of the information to the discrepancy, a three-way interaction on attitudes was expected. Specifically, discrepancy should affect information processing primarily when the information is framed as relevant. We did not expect these results to depend on the direction of the discrepancy (i.e., whether implicit scores were relatively higher or lower than explicit scores). To the extent these hypotheses are supported, it would suggest that the presence of discrepant explicit and implicit self-dimensions, regardless of direction, is associated with enhanced thinking. The enhanced thinking presumably reflects an attempt at discrepancy reduction.

Experiment 1

Experiment 1 was conducted to provide an initial test of the notion that divergence between explicit and implicit self-views can influence the extent of processing of information relevant to those self-views. In our first experiment, we used the trait of shyness as a specific dimension of personality. There were several reasons for this selection. First, shyness is a personality trait that is well represented in common language and lay psychology, is easily judged by oneself, and is readily observable by others (Asendorpf, 1987, 1989). Second, because of its observability and ubiquity in lay psychology, the self-concept dimension of shyness is relatively accessible (Asendorpf, 1990). Third, it is easy to select shyness-descriptive adjectives for both explicit self-ratings and an IAT for shyness, because previous research has pretested instruments for its assessment (Asendorpf, 1987, 1989). Last, research conducted by Asendorpf, Banse, and Mücke (2002) has demonstrated that the implicit measure of shyness uniquely predicted spontaneous (but not controlled) shy behavior, whereas the explicit ratings uniquely predicted controlled (but not spontaneous) shy behavior. That is, Asendorpf et al. validated the implicit and explicit shyness measures used in Study 1 as useful independent indicators of behavior.

The explicit shyness measure consisted of a series of self-reported responses to shyness-related adjectives, whereas the implicit measure was a shyness IAT (see Asendorpf et al., 2002). In this study, all of the participants were exposed to a persuasive message containing either strong or weak arguments directly related to shyness. After reading the message, participants were asked to report their attitudes toward the proposal in the message. We expected participants with a large explicit–implicit discrepancy to be more attentive to the persuasive message than those with a small discrepancy. This enhanced thinking would be evi-

denced in greater attitudinal responsiveness to the argument quality manipulation.

Method

Participants and Design

Eighty-one undergraduate psychology students at the Universidad Autónoma de Madrid in Madrid, Spain, participated in partial fulfillment of a course requirement. The students were randomly assigned to the argument quality conditions (strong or weak). Additionally, explicit and implicit shyness were assessed for all the participants to form an index of explicit-implicit discrepancy. The independent variables thereby constituted an Argument Quality (strong vs. weak) \times Explicit-Implicit Discrepancy (continuously scored) \times Direction of Discrepancy (higher on explicit or implicit measure) design.

Procedure

Upon arrival, participants were seated at individual computer stations and completed the IAT for shyness. After the IAT task, all of the participants reported their explicit shyness and completed several other ancillary questions. Participants were then told that because of extra time remaining in the session, they would also be participating in another experiment designed to examine personality characteristics that were good for being a psychologist. Participants received a message arguing that being shy was a positive trait for a psychologist. The message contained either strong or weak arguments. All of the participants were told in advance that the message they were about to read had to do with shyness. After reading the message, participants were told that it was important to know what their personal views were on the benefits of shyness. Thus, they completed a measure of their attitudes toward shyness as a trait. Finally, the participants were thanked, asked for permission for their responses to be analyzed (all gave permission), and given an appointment for a meeting to provide them with feedback about their results.

Independent Variables

Argument quality. Participants were exposed to a message containing information directly relevant to shyness and thus to any explicit-implicit discrepancy on this trait. The shyness-related message participants received contained either strong or weak arguments. This manipulation was designed to assess the extent to which people were attentive to the content of the message (Petty & Cacioppo, 1986). The arguments selected were pretested and were shown to produce the appropriate pattern of cognitive responding. That is, the strong arguments elicited mostly favorable thoughts and the weak arguments elicited mostly unfavorable thoughts when people were instructed to think carefully about them. In brief, 58 students were asked to list their thoughts for each version of the message. Analysis of the thoughts listed revealed that, on average, the strong message elicited more favorable ($M = 1.86$, $SD = 1.80$) than unfavorable ($M = 0.65$, $SD = 1.07$) thoughts, $t(28) = 5.54$, $p < .001$. For the weak version of the message, participants generated more unfavorable ($M = 2.58$, $SD = 1.93$) than favorable ($M = 0.86$, $SD = 1.57$) thoughts, $t(29) = 7.19$, $p < .001$. The gist of one strong argument in favor of shyness was that shy people have more introspective ability, a quality that was highly valuable in the workplace. The gist of another strong argument was that shy people have been rated as better friends and partners, because they tend to have interpersonal relationships that are more sincere, committed, stable, and satisfactory. In contrast, the gist of one weak argument in favor of shyness was that shy people tend to talk less than extraverted interviewees, making other shy people feel more comfortable. The gist of another weak argument was that some students' parents prefer that their sons and

daughters choose shy people as friends and roommates in college because they tend to be more self-controlled.

It is important to note that both the strong and weak arguments argued *in favor of shyness*, but the strong arguments provided more compelling reasons than did the weak arguments. This manipulation can be distinguished from other forms of message variations, such as arguing either in favor of or against the proposal. Because the argument manipulation is used to assess how much thinking people are doing about the message, all arguments need to argue for the same position—but only with high or low convincingness. Because both sets of arguments are ostensibly in favor of the issue, they may be equally persuasive if people do not think about their implications. Individuals not thinking about the message carefully may respond simply to the number of arguments presented or their initial gut reaction to the proposal (e.g., Petty & Cacioppo, 1984; see also Petty & Wegener, 1998). The more attention paid to the information provided, however, the greater the difference in subsequent attitudes to strong versus weak arguments.

Explicit measure of shyness. Shyness was assessed by asking participants to rate the extent to which 10 adjectives described them on 4-point scales anchored by *extremely uncharacteristic of me* (1) and *extremely characteristic of me* (4). The adjectives were presented in random order and included words such as *inhibited*, *insecure*, *timid*, *reticent*, *reserved*, *daring*, *candid*, *open*, *secure*, and *assertive*. These words were taken from Asendorpf et al. (2002) and were also the items used for the implicit measure in the present research. Ratings on the scale items were highly consistent with each other ($\alpha = .86$) and were averaged (reverse scoring where appropriate) to form a single index of explicit shyness for each participant.

Implicit measure of shyness. In the IAT measure of shyness, participants classified target concepts (represented by *me* or *other*) and attributes (represented by *shy* or *nonshy* categories of words) using two designated keys on a computer. The *me* category was represented by the words *I*, *self*, *my*, *me*, and *own*, whereas the *other* category was represented by the words *they*, *them*, *your*, *you*, and *other*. Attributes related to *shyness* were selected from the items on the explicit measure and included the words *inhibited*, *insecure*, *timid*, *reticent*, and *reserved*. In contrast, *nonshy* attributes included the words *daring*, *candid*, *open*, *secure*, and *assertive*. The test was similar to the original IATs used by Greenwald et al. (1998) and paralleled the one used by Asendorpf et al. (2002). There were seven blocks of trials. Blocks 1, 2, and 5 were practice blocks for which participants made single categorizations (*me* vs. *other*, and *shy* vs. *nonshy*). In the remaining blocks, participants discriminated *shy* versus *nonshy* words and *me* versus *other* words on separate trials within the same block. In Block 4, participants used one response key to indicate if a word belonged to the *nonshy* or *other* categories and the other key if the word belonged to the *shy* or *me* categories. In Block 7, participants used one response key to indicate if a word belonged to the *nonshy* or *me* categories and the other key if the word belonged to the *shy* or *other* categories. Blocks 3 and 6 were combined blocks that served as practice for Blocks 4 and 7. Only data from Blocks 4 and 7 were used to compute IAT scores. The main dependent variable (IAT score) was computed by subtracting participants' average response latencies during Block 4 from their average response latencies during Block 7. Positive differences in this index indicated faster automatic associations between *me* and *shy* than between *others* and *shy*.

It is evident from the above description that the IAT is a relative measure. For example, in the present studies, the category *me* is contrasted with the category *others*. Indeed, opposing *me* with *others* might make the IAT scores difficult to interpret in certain cases because they can reflect associations with the self, with the others, or a combination of the two (e.g., Karpinski, 2004). Particularly relevant to the present research, however, the explicit self-report scale also likely involved a similar relative judgment compared with others. Most subjective judgments about the self or others require reference to some standard—typically provided by others. For example, as Mussweiler (2003) noted, “To characterize oneself as athletic

... implies that one is more athletic than others and is thus, in essence, a comparative statement" (p. 472). In fact, it would be hard for people to develop their self-conceptions without comparing with others (Festinger, 1954). Thus, it is plausible to argue that both the implicit and the explicit measures of shyness might include a comparative component.

Following typical procedures, stimuli in the IAT task appeared within a centered white window. Reminder labels were positioned on top of the stimuli on the left and right side. These reminders read *me* and *other* for single target-classification blocks, *shy* and *nonshy* for single attribute-classification blocks. Mixed target + attribute blocks were also accompanied by appropriate labels (e.g., *shy* or *other*; *nonshy* or *me*). Incorrect classifications were followed by error feedback (i.e., the word *ERROR*). Summary feedback was provided at the end of each practice block informing participants about their average response latency and percentage of errors for that block. All practice trials in the IAT were administered in five blocks. Data-collection trials, consisting of combined target + attribute classifications, were collected in four blocks. Within each block, stimuli were randomly selected without replacement, and no more than two consecutively presented stimuli belonged to the same category. To correct for anticipatory responses and momentary inattention, we recorded latencies shorter than 300 ms and longer than 3,000 ms as 300 and 3,000 ms, respectively. Response latencies were then log transformed to normalize the distribution. Further details about the IAT procedure are provided by Greenwald et al. (1998).

Explicit-implicit discrepancy. The explicit and implicit measures of shyness were significantly correlated ($r = .40, p < .001$). This correlation is similar to those obtained by Asendorpf et al. (2002) using similar explicit and implicit measures in a different sample.² An index of explicit-implicit discrepancy was formed as the absolute value of the difference between the standardized explicit and implicit measures of shyness. The discrepancy index considers where people fall within the distribution of participants in the study on the implicit versus explicit measures. A zero on the index indicates that the person's place in the distribution is exactly the same on the implicit and explicit measures (e.g., high in the distribution on both, low in the distribution on both, middling on both, and so forth). Discrepancies can be in either direction. That is, people can be higher in the sample distribution on the explicit measure than the implicit measure (a positive discrepancy) or they can be lower in the distribution on the explicit measure than the implicit measure (a negative discrepancy). In this study, 38 participants had positive discrepancies and 39 participants had negative discrepancies. In addition to including size of the discrepancy, analyses also included a factor for whether the discrepancy was positive or negative.

Dependent Measure: Attitudes

After reading the message relevant to shyness, participants' attitudes toward shyness were assessed using a single-item 9-point semantic differential scale ranging from *bad* (1) to *good* (9) on which they rated how favorably they viewed shyness.

Results

Attitudes toward shyness were submitted to a hierarchical regression analysis, with extent of discrepancy (continuous variable), manipulated argument quality (strong-weak; dummy coded), and direction of discrepancy (explicit > implicit vs. explicit < implicit; dummy coded) as the independent variables. Scores on the discrepancy index were centered by subtracting the mean from each person's score (Aiken & West, 1991). Main effects were interpreted in the first step of the regression, the two-way interactions in the second step, and the three-way interaction in the final step (Cohen & Cohen, 1983). Responses to the attitude scales were scored so that higher values represented more favorable opinions toward shyness.

Results of this analysis revealed a significant main effect for extent of discrepancy, $\beta = -.25, t(73) = -2.19, p = .03$, showing that participants' attitudes were less favorable toward shyness as explicit-implicit discrepancy increased (all β s reported are standardized coefficients). In addition, a significant interaction between argument quality and direction of the discrepancy emerged, $\beta = .43, t(70) = 2.42, p = .02$, revealing that argument quality had a larger effect on attitudes for the explicit > implicit direction than the implicit > explicit direction. This effect was not obtained in any of the other studies and is not discussed further.

More critical to our hypothesis, a significant interaction between argument quality and extent of discrepancy was evident, $\beta = .46, t(70) = 3.17, p = .002$, revealing that as discrepancy increased, argument quality had a larger effect on attitudes. Specifically, decomposition of this interaction by recentering discrepancy at one standard deviation (*SD*) above and below the mean (Aiken & West, 1991) indicated that there was a significant effect of argument quality among participants with high discrepancy, $\beta = .36, t(69) = 2.37, p = .02$, but not among those with relatively low discrepancy, $\beta = -.25, t(69) = -1.69, p = .10$. The three-way interaction between argument quality, extent of discrepancy, and direction of the discrepancy was not significant, $\beta = .26, t(69) = 1.14, p = .26$, indicating that the effects of explicit-implicit discrepancy on elaboration were not restricted to any particular direction of the discrepancy.

Discussion

Experiment 1 demonstrated that as the discrepancy between implicit and explicit measures of shyness increases, people are more likely to think carefully about a shyness-related persuasive message. This conclusion was supported by the finding that the attitudes of relatively discrepant individuals were more reflective of the quality of the persuasive message that they received about shyness than were the attitudes of individuals who were low in discrepancy. These findings suggest that participants with a high explicit-implicit discrepancy paid more careful attention to the message than those with a low discrepancy, presumably in an attempt to resolve the discrepancy.

Experiment 1 demonstrated that explicit-implicit discrepancies in shyness can lead to greater thinking about information directly relevant to the dimension on which the discrepancy exists. As noted earlier, shyness is a general and somewhat broad personality self-dimension. To extend the utility and generality of our findings, we sought to test whether the same effects would emerge when the explicit-implicit discrepancy concerned a more specific dimension of the self: a person's need to evaluate (Jarvis & Petty, 1996).

Experiment 2

Our second study was designed to provide a conceptual replication and extension of the first. In Study 2, we used the same paradigm to assess the extent to which participants engaged in

² Asendorpf et al. (2002) reported correlations between explicit and implicit shyness that ranged from .20 to .44 depending on the format of the explicit measure. For example, the correlation between the IAT and the explicit measure based on the shyness adjectives scale was .40.

effortful elaboration (i.e., an argument quality manipulation). However, several changes were introduced. First, instead of assessing explicit and implicit shyness as in Study 1, we focused on a motivational self-concept dimension, *need to evaluate* (NE; Jarvis & Petty, 1996; Petty & Jarvis, 1996), which refers to individual differences in people's tendencies to engage in evaluative thought. People who are high in NE tend to spontaneously assess whether things are good or bad (e.g., Tormala & Petty, 2001; see also the "need to assess"; Kruglanski et al., 2000). Knowing whether things in the world are good or bad helps people to understand the environment. Probably because of this and other functions (e.g., Maio & Olson, 2000), people tend to form attitudes about nearly everything (e.g., Bargh, Chaiken, Gendler, & Pratto, 1992; Roskos-Ewoldsen & Fazio, 1992). Nevertheless, some people are more chronic and spontaneous than others in their tendency to evaluate, and the NE scale assesses this. In contrast to the explicit self-report measure typically used to assess NE, we developed an implicit NE measure using an IAT. Similar to the previous study, an index of self-discrepancy was formed as the absolute value of the difference between the standardized values of the explicit and implicit measures.

Second, to generalize our results across topics, we used a different persuasive issue. Instead of presenting information directly related to the discrepancy dimension as in Study 1, we used a message containing substantive information that actually was not relevant to the issue of the discrepancy. However, for all participants, the message was framed to appear relevant to NE. That is, participants were told before reading the message that the research concerned their evaluations, and so all participants had an expectation that the message would contain information directly relevant to the domain of the discrepancy.

The topic of the message the participants were to evaluate was increasing the amount of vegetables in the diet. Comparing the persuasive effect of strong and weak arguments tested the effects of explicit-implicit self-discrepancy on information processing. We expected participants with a relatively high discrepancy between their explicit and implicit NE to think about information expected to be discrepancy related to a greater extent than individuals with a relatively low discrepancy. That is, we expected argument quality to have a larger impact on attitudes for participants with a high discrepancy between explicit and implicit NE compared with participants with a low discrepancy. Thus, as in Study 1, we expected to find a Discrepancy \times Argument Quality interaction on the measure of attitudes that was unmoderated by the direction of the discrepancy.

Method

Participants and Design

Ninety-nine undergraduates in psychology courses at the Universidad Autónoma de Madrid participated in partial fulfillment of a course requirement. We randomly assigned the students to the argument quality conditions (strong or weak) and assessed their explicit and implicit (IAT) NE to form an index of explicit-implicit self-discrepancy. Direction of discrepancy (higher on explicit or implicit measure) was also coded.

Procedure

The procedure was similar to Study 1. Participants were seated at individual computer stations and were told that they were going to partic-

ipate in two different research projects. First, participants completed the IAT for the NE measure, ostensibly as part of a research project in the cognitive psychology program. After the IAT task, participants were told that because of extra time remaining in the session, they would also be participating in another experiment designed to assess their attitudes toward a particular issue. To create a context of evaluation, all of the participants were explicitly told that the goal of the second research project was to measure their opinions and evaluations of a current commercial campaign. Participants received a persuasive message in favor of the consumption of vegetables containing either strong or weak arguments. Then, participants were told that it was important to know more specifically what their opinions about the consumption of vegetables were. After reporting their attitudes toward the proposal, participants completed the explicit NE scale and several ancillary measures.

Independent Variables

Argument quality. The message about vegetable consumption contained either strong or weak arguments in favor of this topic. This manipulation was designed to influence the favorability of participants' cognitive responses if participants were thinking about the message (Petty & Cacioppo, 1986). The gist of one of the strong arguments in favor of vegetable consumption was that vegetables have more vitamins than the majority of vitamin supplements on the market, making them especially appropriate during exams and workout periods. The gist of one of the weak arguments was that vegetables are becoming more popular for wedding celebrations because they are colorful and look beautiful on plates. The argument quality of the two messages was pretested to ensure that the strong version of the message produced mostly favorable thoughts, whereas the weak one produced mostly negative thoughts when people were instructed to think carefully about them (e.g., Briñol, Horcajo, Becerra, Falces, & Sierra, 2002).

Explicit measure of need to evaluate. Participants completed the 16-item NE scale (Jarvis & Petty, 1996). This scale assesses the chronic tendency to engage in evaluative responding. Jarvis and Petty (1996) demonstrated that, compared with people low in NE, those high in the NE are more likely to form attitudes toward a variety of social and political issues (see also Bizer et al., 2004), and the attitudes of high NE individuals tend to be more accessible (Hermans, DeHouwer, & Eelen, 2001; for a review, see Briñol & Petty, 2005). The NE scale contains statements such as "I enjoy strongly liking and disliking new things" and "I am pretty much indifferent to many important issues" (reverse scored). Participants responded to each statement on a 5-point scale anchored by *extremely uncharacteristic of me* (1) and *extremely characteristic of me* (5). The items on this self-concept dimension were intercorrelated ($\alpha = .79$), so responses to each item were summed to form a composite score of NE. Participants' NE scores were not affected by the argument quality manipulation, $F(1, 98) = 0.44, p = .5$.

Implicit measure of need to evaluate. As in Study 1, we used an IAT procedure as the implicit assessment of this self-conception (Greenwald et al., 1998). The NE IAT was administered at the beginning of the experimental session and was presented as part of a research project designed to study how taxonomies are represented in people's minds. In this IAT, participants classified target concepts (represented by *me* or *other*) and attributes (represented by *neutral* or *extreme*) using two designated keys. The words *extreme* and *neutral* were pretested as representative of high and low evaluation categories, respectively. Although the NE scale was designed to measure the tendency to engage in evaluation per se rather than the tendency to engage in extreme evaluation, a number of items on the NE scale clearly refer to extremity. According to Jarvis and Petty (1996, p. 190), the reason those items were included was to maximize the variance in participants' scores on the NE scale. Also for that reason, we selected the words that were related to extremity to increase the variability in the IAT. The *me* category was represented by the words *I, me, mine, my, and self*, whereas the *other* category was represented by the words *they, others,*

them, theirs, and their. The *extreme* category included words such as *extremity*, *limit*, *radical*, *total*, and *extreme*. In contrast, the *neutral* category included words as *moderate*, *caution*, *prudent*, *temperate*, and *neutral*. These words were equally familiar to participants and were selected based on some of the items of the NE scale (e.g., "It bothers me to remain neutral," "I prefer to avoid taking extreme positions" [reversed], and "I often prefer to remain neutral about complex issues" [reversed]). The difference in response latencies for (*me + extreme* and *other + neutral*) versus (*other + extreme* and *me + neutral*) provided our implicit measure of NE. Regarding the combination of blocks, random assignment of stimuli, incorrect classifications, practice trials, anticipatory responses, momentary inattention, and data transformation, we followed the standard IAT procedures described in our first study (see also Greenwald et al., 1998).

Explicit-implicit discrepancy. Explicit and implicit NE were not correlated ($r = -.13, p = .17$). An index of discrepancy was formed as the absolute value of the difference between the standardized explicit and standardized implicit measures. Higher scores on that variable reflected greater differences between the explicit and the implicit measures, and thus higher explicit-implicit discrepancy in NE. As in the previous study, direction of discrepancy was symmetrical, with 50 participants showing a positive discrepancy (i.e., higher in the sample distribution on the explicit measure than the implicit measure) and 48 participants showing a negative discrepancy (i.e., lower in the distribution on the explicit than the implicit measure).

Dependent Measure: Attitudes

Similar to Study 1, participants' postmessage attitudes toward vegetable consumption were assessed using a single item 9-point semantic differential scale anchored at *bad* (1) and *good* (9).

Results

Attitudes toward vegetables were submitted to the same hierarchical regression analysis used in Study 1. Thus, the independent variables included extent of discrepancy (continuous variable), manipulated argument quality (strong-weak; dummy coded), and direction of discrepancy (explicit > implicit vs. explicit < implicit; dummy coded). Scores on the discrepancy index were centered by subtracting the mean from each person's score (Aiken & West, 1991). Main effects were interpreted in the first step of the regression, the two-way interactions in the second step, and the three-way interaction in the final step (Cohen & Cohen, 1983). Responses to the attitude scales were scored so that higher values represented more favorable opinions toward the proposal.

Participants' attitudes were more favorable toward consuming vegetables after receiving the strong ($M = 8.29, SD = 0.71$) than the weak ($M = 7.98, SD = 0.79$) message, $\beta = .20, t(95) = 1.96, p = .05$. No main effect for extent of discrepancy emerged ($p = .66$). More important and consistent with expectations, the main effect of argument quality was qualified by a marginally significant interaction between argument quality and extent of discrepancy, $\beta = .28, t(92) = 1.83, p = .07$. This interaction revealed that as discrepancy increased, argument quality had a larger effect on attitudes. That is, there was a significant effect of argument quality among participants with relatively high discrepancy (recentered at $+1 SD$), $\beta = .38, t(91) = 2.64, p = .01$, but not among those with relatively low discrepancy (recentered at $-1 SD$), $\beta = .005, t(91) = 0.03, p = .97$. It is important to note that the three-way interaction between argument quality, extent of discrepancy, and direction of the discrepancy was not significant, $\beta = -.28, t(91) = -1.42, p = .16$, revealing that the effects of explicit-implicit

discrepancy on elaboration were not restricted to any particular direction of the discrepancy.³

Discussion

Experiment 2 conceptually replicated the first experiment by showing that participants with relatively high explicit-implicit discrepancy in their NE processed the message more carefully than participants with relatively low discrepancy. That is, compared with those with a small discrepancy between their explicit and implicit NE, individuals with a high discrepancy were more influenced by the quality of the arguments in the message than were those with a low discrepancy.

Although the message in the present study did not actually contain information directly related to the issue on which the explicit-implicit discrepancies existed (i.e., a person's own NE), the whole context of the study was framed as dealing with the participants' opinions. We argue that emphasizing that the task was related to evaluation was sufficient for participants with high explicit-implicit discrepancies in NE to engage in more extensive thinking. From our first two studies, it appears that information can be directly related to the issue of discrepancy (Study 1) or simply framed as related to the dimension in which the discrepancy exists (Study 2).

We argue that the mere existence of a discrepancy does not result in the indiscriminate processing of any information present in the situation. Enhanced thinking is expected only if the dimension on which the discrepancy exists is activated by leading people to believe that the message is going to pertain or be relevant to that dimension. Without that, there should be no differential processing. To address this issue, our third study included a manipulation of the message frame designed to induce participants to expect the message to be related or unrelated to the issue on which there was an explicit-implicit discrepancy. If having an explicit-implicit discrepancy enhances information processing in general, then high discrepancy individuals should be equally likely to process messages framed as relevant or irrelevant to the issue on which the discrepancy exists. If the information processing is in service of discrepancy reduction, however, individuals with high discrepan-

³ Because of possible concerns about the use of difference scores in our analyses (i.e., the discrepancy index), we also conducted an alternative analysis treating implicit and explicit measures separately. For maximum power, data from both Studies 1 and 2 were combined and submitted to another hierarchical regression analysis, with the implicit and explicit measures (continuous variables) and manipulated argument quality (dummy coded) as independent variables. Study was also included as a factor in this analysis so that we could examine whether the results generalized across the study differences. As expected, this analysis revealed a significant main effect for argument quality, $\beta = .14, t(175) = 1.97, p = .05$, which was qualified by a three-way interaction between argument quality, explicit self-concept, and implicit self-concept, $\beta = -.16, t(175) = -2.08, p = .03$. Also importantly, this significant three-way interaction was not moderated by the study independent variable, as is evident in the absence of a four-way interaction ($p = .64$). To facilitate ease of presentation (i.e., interpreting two-way rather than three-way interactions) and matching more closely our conceptual variable (i.e., psychological discrepancy), we present the discrepancy analysis in the text and figures.

cies should be more likely to process the messages framed as relevant than irrelevant.

Experiment 3

Studies 1 and 2 provided initial evidence supporting the notion that divergence between explicit and implicit self-views can influence the extent of information processing of ostensibly discrepancy-related information. Experiment 3 was conducted to replicate and extend the findings from these studies. Thus, several changes were introduced. First, instead of examining a general dimension of personality (shyness) or motivation (NE), we focused on a more specific dimension of the self-concept: one's beliefs concerning one's own resistance to persuasion.

Beliefs regarding one's resistance to change play a central role in people's values and identities. For example, Schwartz's (1992) theory about universal human values is organized by two motivational dimensions: the self-transcendence/self-enhancement dimension and the openness to change/conservation dimension. This work implies that almost everyone might have beliefs about their own resistance to change and that such beliefs might be an integral part of the self-concept. In fact, resistance to change constitutes one of the most basic dimensions of personality according to the Big Five framework (e.g., McCrae & Costa, 1985; Wiggins & Trapnell, 1997). Although the construct of resistance to change can be conceptualized quite differently in terms of personality, cognitive ability, psychic structure, openness to experience, or openness as culture (McCrae & Costa, 1997), we focus specifically on personal perceptions of resistance to persuasion. In this experiment, the explicit self-dimension of resistance to persuasion was assessed using the Resistance to Persuasion Scale (Briñol, Rucker, Tormala, & Petty, 2004), and implicit resistance was assessed using an IAT developed for this study. As in our previous studies, an index of explicit-implicit discrepancy was created as the absolute value of the difference between the standardized explicit and implicit scores.

Second, to further generalize our results across topics, we used a different persuasive issue. Instead of presenting information about a relatively proattitudinal topic (i.e., increasing the amount of vegetables in the diet; Study 2) or a rather neutral one (i.e., the benefits of shyness; Study 1), we moved to a relatively counterattitudinal topic (i.e., institution of required exams for college students).

Finally, and most importantly, we manipulated the presumed discrepancy-relevance of the message information. Because the explicit-implicit discrepancy was related to individual differences in susceptibility to change in attitudes and opinions, half of the participants were told that the study had to do with their attitudes and opinions (similar to the frame in Study 2). This condition was compared with a discrepancy-unrelated frame in which participants were told that the experiment was part of a text comprehension study. Thus, all of the participants were exposed to a persuasive message containing either strong or weak arguments that were framed as either related or unrelated to the dimension on which the discrepancy existed. After reading the message, participants were asked to report their attitudes toward the proposal. We expected participants with a large explicit-implicit discrepancy to think more about the persuasive message than those with a small discrepancy, but only when the message was framed to appear dis-

crepancy related. As in previous studies, this enhanced thinking would be evidenced by greater attitudinal responsiveness to the manipulation of argument quality.

Method

Participants and Design

One hundred seventy-three introductory psychology students at Ohio State University participated in partial fulfillment of a course requirement. The students were randomly assigned to the argument quality conditions (strong or weak) and the message context conditions (discrepancy related or unrelated), which were manipulated orthogonally. Additionally, we measured participants' explicit and implicit resistance to persuasion to form an index of explicit-implicit discrepancy. The independent variables thereby constituted an Argument Quality (strong vs. weak) \times Message Frame (discrepancy-related vs. discrepancy-unrelated) \times Extent of Explicit-Implicit Discrepancy (continuously scored) \times Direction of Discrepancy (higher on implicit or explicit measure) design.

Procedure

Upon arrival, participants were seated at individual computer stations and were presented with all of the materials on the computer using MediaLab software (Jarvis, 2000). All of the participants were told that they were going to participate in two different research projects. First, participants completed the IAT for resistance to persuasion, ostensibly as part of a research project on semantic recognition and categorization conducted by the cognitive psychology program. After the IAT task, participants were told that because of extra time remaining in the session, they would also be participating in another experiment designed to assess possible changes in university policies. They read about a new school policy and were told that students' opinions about this policy were of importance to the university. Participants received a message in favor of instituting senior comprehensive exams that contained either strong or weak arguments. After reading the message, participants were told that it was important for the Board of Trustees to know what their opinions on the topic were. Thus, they completed measures of their attitudes toward the comprehensive exam policy. Finally, participants completed the Resistance to Persuasion Scale (Briñol et al., 2004) and several ancillary questions.

Independent Variables

Argument quality. The comprehensive exam message participants received contained either strong or weak arguments. The arguments selected were adopted from previous research and have been shown many times to produce the appropriate pattern of cognitive responding (see Petty & Cacioppo, 1986). That is, the strong arguments elicited mostly favorable thoughts and the weak arguments elicited mostly unfavorable thoughts when people were instructed to think carefully about them. The gist of some strong arguments in favor of the exam policy were that students' grades would improve if the exams were adopted and that the average starting salary of graduates would increase. The gist of some weak arguments in favor of the exam policy were that implementing the exams would allow the university to take part in a national trend and that the exams would give students the opportunity to compare their scores with those of students at other universities.

Message frame. The frame of the message was manipulated to appear related or unrelated to participants' opinions. That is, because the explicit-implicit discrepancy was related to persuasion (openness vs. resistance to changing one's opinions), we framed the study as related (or not) to opinions and attitudes. Thus, the message was introduced as part of an opinion-related study (discrepancy-related frame) or as part of a text

comprehension study (unrelated frame). Participants in the discrepancy-related frame condition read the following:

OPINION SURVEY

This part of the study consists of a survey designed to obtain your opinions and thoughts about a campus issue. The message we are going to ask you to read is based on the transcript of an editorial from a college radio station. The editorial was introduced on the radio in order to familiarize students with this important issue. Please pay attention because your opinions will be measured.

In the comprehension frame, participants were told that the message was designed to measure their appreciation of new information. Comprehending a text would presumably not trigger the idea that the study involved any explicit or blatant persuasive attempt. In this condition, participants read the following:

TEXT COMPREHENSION

This part of the study has been designed to measure your appreciation of new information. The information we are going to ask you to read and to examine is based on a transcript of a class project broadcast on a college radio station. We want you to examine the content of the information presented carefully because the extent to which you understand the text will be measured.

It is important to note that although attitude change was not salient for the text comprehension frame, opinions toward the proposal were still measured following the message. At the time opinions were measured, the idea of persuasibility may have become apparent to these participants, but by this time the extent of processing of the message was already determined. That is, in the *discrepancy-relevant* case, participants already expected to give their opinion while they were reading the message because the study was about opinions. In the *discrepancy-irrelevant* case, they thought that the study was on text comprehension while reading and processing the message, so forming opinions was not salient. We pretested the effectiveness of the induction by randomly assigning 50 students to one of the two frames and asking them what kind of information they expected to receive after the frame. Specifically, we asked participants to respond on a 5-point scale to the question: "To what extent do you expect to receive any information that might be related to your resistance to persuasion?" As expected, participants who received the discrepancy-related frame reported significantly higher expectations to receive persuasion-related information ($M = 3.14$, $SD = 1.00$) than those who received the discrepancy-unrelated frame ($M = 2.68$, $SD = 1.21$), $t(48) = 10.39$, $p < .0001$. It is also important to note that although the message was framed to be related or not to the basis of the self-discrepancy, the actual message participants received was identical.

Explicit measure of resistance. The Resistance to Persuasion Scale was used to assess participants' explicit perceptions of their resistance to persuasion. This scale measures individuals' perceptions and beliefs about their own vulnerability to persuasion, willingness to change, and motivation and ability to resist persuasion. In prior research validating the scale, it has predicted the number of counterarguments people generate to a message and how resistant they were to influence (Briñol et al., 2004). The scale contains 11 statements such as "My attitudes are open to change" and "It is hard for me to change my ideas." Participants responded to each statement on a 5-point scale anchored by *extremely uncharacteristic of me* (1) and *extremely characteristic of me* (5). Ratings on the scale items were highly consistent with each other ($\alpha = .86$) and were averaged to form a single index of resistance to persuasion for each participant. Resistance to persuasion scores were not affected by the argument quality manipulation, $F(1, 173) = 0.26$, $p = .61$; the frame manipulation, $F(1, 173) = 0.68$, $p = .41$; or the interaction of the two, $F(1, 173) = 0.02$, $p = .87$.

Implicit measure of resistance. In the IAT measure of resistance, participants classified target concepts (represented by *me* or *other*) and

attributes (represented by *easy* to be persuaded or *hard* to be persuaded categories of words) using two designated keys. The *me* and *other* categories included the same words used in Study 2. Attributes related to persuasibility were selected from the items on the explicit scale and included the words *easy*, *flexible*, *open*, *variable*, and *changeable*. In contrast, resistant attributes included the words *resistant*, *stable*, *hard*, *consistent*, and *committed*. The difference in response latencies for *me-easy* (*me* + *easy* and *other* + *hard*) versus *me-hard* (*other* + *easy* and *me* + *hard*) responses provided a measure of relative self-association with resistance (i.e., the IAT effect). Regarding the combination of blocks, random assignment of stimuli, incorrect classifications, practice trials, anticipatory responses, momentary inattention, and data transformation, we followed the standard IAT procedures described in our previous studies (see also Greenwald et al., 1998).

Explicit-implicit discrepancy. The explicit and implicit measures of personal resistance were uncorrelated ($r = -.10$, $p = .16$). An index of explicit-implicit discrepancy was formed as the absolute value of the difference between the standardized explicit and the implicit measures of resistance. Higher scores on that variable reflected greater differences between the explicit and the implicit measures (i.e., higher discrepancy). The distributions of scores using this index revealed roughly equal numbers of people on each side of the discrepancy, with 87 participants showing positive discrepancy (i.e., higher in the sample distribution on the explicit measure than the implicit measure) and 86 showing negative discrepancy (i.e., lower in the distribution on the explicit than the implicit measure). Perhaps more relevant for the present research, the number of participants in each direction was also equivalent in the conditions for which the information was presented as discrepancy related, with 42 participants revealing positive discrepancies and also 42 participants showing negative discrepancies.

Dependent Measure: Attitudes

Participants' attitudes toward the proposal were assessed using a series of five 9-point semantic differential scales ranging from 1 to 9 (i.e., bad-good, unfavorable-favorable, pro-against, foolish-wise, harmful-beneficial) on which they rated the comprehensive exam policy. Ratings on these items were highly intercorrelated ($\alpha = .84$), so they were averaged to form one overall attitude index.

Results

Attitudes were submitted to a hierarchical regression analysis, with extent of discrepancy (continuous variable), manipulated argument quality (strong-weak; dummy coded), message frame (relevant-irrelevant; dummy coded), and direction of discrepancy (explicit > implicit vs. explicit < implicit; dummy coded) as the independent variables. Scores on the discrepancy index were centered by subtracting the mean from each person's score (Aiken & West, 1991). Main effects were interpreted in the first step of the regression, two-way interactions in the second step, three-way interactions in the third step, and the four-way interaction in the final step (Cohen & Cohen, 1983). Responses to the attitude scales were scored so that higher values represented more favorable opinions toward the proposal.

Participants' attitudes were more favorable toward the proposal after receiving the strong ($M = 4.46$, $SD = 2.34$) than the weak ($M = 3.68$, $SD = 2.09$) message, $\beta = .18$, $t(168) = 2.35$, $p = .02$. A significant interaction between argument quality and extent of discrepancy also emerged, $\beta = .33$, $t(162) = 3.31$, $p = .001$, revealing that as discrepancy increased, argument quality had a larger effect on attitudes. An interaction between frame and extent

of discrepancy also emerged, $\beta = .23$, $t(162) = 1.97$, $p = .05$. This interaction suggested that attitudes tended to become more positive as discrepancy increased for the relevant frame but more negative as discrepancy increased for the irrelevant frame. This interaction was only obtained in this study and is not discussed further.

More critical to our primary concerns, the predicted three-way interaction between argument quality, extent of discrepancy, and message frame was significant, $\beta = .42$, $t(158) = 2.84$, $p = .005$. As depicted in Figure 1, this three-way interaction indicated that the two-way interaction between discrepancy and argument quality was only significant for the discrepancy-related frame, $\beta = .56$, $t(157) = 4.26$, $p < .0001$, but not for the discrepancy-unrelated frame, $\beta = -.02$, $t(157) = -.14$, $p = .89$. For the discrepancy-related frame, there was a significant effect of argument quality among participants with relatively high discrepancy (analyzed at $+1 SD$), $\beta = .72$, $t(157) = 4.86$, $p < .0001$, but not among those with relatively low discrepancy (analyzed at $-1 SD$), $\beta = -.13$, $t(157) = -.93$, $p = .36$. The four-way interaction was not significant, $\beta = -.12$, $t(157) = -.51$, $p = .61$, revealing that the effects of explicit-implicit discrepancy on elaboration were symmetrical and not restricted to any particular direction of the discrepancy.

Discussion

Experiment 3 conceptually replicated our previous findings by showing that people who have a large discrepancy between their

implicit and explicit views of their resistance to persuasion are more likely to think carefully about a discrepancy-related persuasive message than are people who have a small discrepancy between their implicit and explicit self-conceptions. As in Studies 1 and 2, this conclusion was supported by the finding that the attitudes of relatively discrepant individuals were more reflective of the quality of the discrepancy-related persuasive message than were the attitudes of less discrepant individuals. The fact that the enhanced information processing only occurred for individuals with large discrepancies when the message was framed so as to seem related to the basis of the discrepancy (i.e., an opinion context) rather than unrelated to the discrepancy (i.e., a comprehension context) is consistent with the idea that the purpose of the processing was to resolve the discrepancy.

Experiment 3 demonstrated that explicit-implicit discrepancies in resistance to persuasion can lead to greater thinking about information framed as related to the discrepancy. However, resistance to change is a very specific and descriptive self-dimension. Thus, Studies 1, 2, and 3 all focused on descriptive (shyness, NE, and persuasibility, respectively) rather than evaluative self-dimensions. To extend the utility and generality of our findings, in a final study we sought to test whether the same effects can emerge when the explicit-implicit discrepancy concerns a broad, global evaluation of the self. Thus, in our fourth study we used a similar paradigm to test whether the information-processing effects can be found for explicit-implicit divergences on a general evaluative self-dimension: a person's self-esteem.

Experiment 4

Our fourth study was designed to extend the previous findings to the domain of self-evaluation. That is, in this study we focused on an evaluative dimension of the self-concept, self-esteem, and assessed it with both explicit and implicit measures. Implicit self-esteem typically has been defined as an evaluation of the self that occurs automatically and unintentionally and can differ from one's more controlled and deliberative self-assessments (e.g., Farnham, Greenwald, & Banaji, 1999; Greenwald & Banaji, 1995; Greenwald & Farnham, 2000; Hetts & Pelham, 2001; Koole, Dijksterhuis, & van Knippenberg, 2001).

In Study 4, we used the same paradigm to assess the extent to which participants engaged in effortful thinking (i.e., an argument quality manipulation). Similar to Study 3, we also manipulated the ostensible discrepancy relatedness of the message information by framing it as related or unrelated to the basis of the discrepancy. Finally, in this study we used the relatively proattitudinal topic used in Study 2 (i.e., increasing the amount of vegetables in the diet). We expected participants with a relatively large discrepancy between their explicit and implicit self-esteem to elaborate the information more than individuals with a relatively small discrepancy, but only when the information was framed to seem discrepancy related. That is, we expected argument quality to have a larger impact on attitudes for participants with a large discrepancy between explicit and implicit self-esteem compared with participants with a small discrepancy, but only when the message was framed to seem related to the discrepancy (i.e., when the message was framed to seem related to their self-concept). More specifically, as in Study 3 we expected to find a Discrepancy \times Argument Quality \times Message Frame interaction on attitudes toward the message proposal.

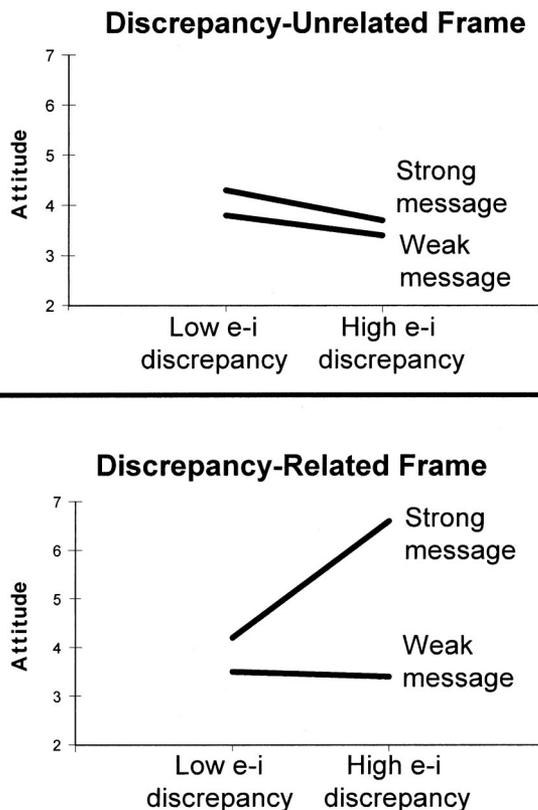


Figure 1. Attitudes as a function of argument quality, message frame, and extent of explicit-implicit (e-i) discrepancy graphed at -1 standard deviation (low discrepancy) and $+1$ standard deviation (high discrepancy) in Experiment 3.

Method

Participants and Design

One hundred seventeen undergraduate psychology students at the Universidad Autónoma de Madrid were randomly assigned to the argument quality (strong or weak) and the message frame (discrepancy-related or discrepancy-unrelated) conditions, which were manipulated orthogonally. Additionally, we measured participants' explicit and implicit self-esteem to form an index of explicit-implicit discrepancy and coded for the direction of discrepancy. The independent variables thereby constituted an Argument Quality (strong vs. weak) \times Message Frame (discrepancy-related vs. discrepancy-unrelated) \times Extent of Explicit-Implicit Discrepancy in Self-Esteem (continuously scored) \times Direction of Discrepancy (relatively higher in explicit or implicit self-esteem) design.

Procedure

Upon arrival, participants were seated at individual computer stations and were told that they were going to participate in two different research projects. As in previous studies, participants first completed an IAT, ostensibly as part of a research project on categorization conducted by the cognitive psychology program. After the IAT task, participants were told that because of extra time remaining in the session, they would also be participating in another experiment designed to assess their attitudes toward an opinion topic. Half of the participants were told that the message they were about to read had to do with plants and vegetables and their qualities and properties (discrepancy-unrelated frame). The rest of the participants were told that the message concerned their personal habits and the way they interact with the world (discrepancy-related frame). Then, participants received a message containing strong or weak arguments in favor of the consumption of vegetables. After reading the message, all of the participants were told that it was important to know more specifically what their opinions about the consumption of vegetables were. Finally, after reporting their attitudes toward the proposal, participants completed the Rosenberg Self-Esteem Scale (Rosenberg, 1965).

Independent Variables

Argument quality. The message about vegetable consumption contained either strong or weak arguments in favor of this topic. This manipulation was identical to that used in Study 2.

Message frame. The introduction to the message was framed to seem as though the message would contain information unrelated or related to the discrepancy domain. In the discrepancy-unrelated frame condition, participants were told, "You are about to read an article about the characteristics and properties of different plants and vegetables." In the discrepancy-related frame condition, they were told, "You are about to read an article about your self-concept, your personal diet habits, and the way you see your world." To further enhance the discrepancy relevance, in the discrepancy-unrelated frame, the title of the message was "Research About Vegetables" and in the discrepancy-related frame, the title of the message was "Research About the Self-Concept."

It is important to note that, as in Experiments 2 and 3, we deliberately did not attempt to provide any real information about students' self-conceptions. Rather, the manipulation was oriented to influence what participants perceived was going to be the content of the message (not the actual content itself). Thus, there would be no differences in ability to process the message across conditions or other irrelevant confounds. We pretested the effectiveness of the induction by randomly assigning 58 students to one of the two frames and asked them what kind of information they expected to receive after that. Specifically, we asked participants to respond on a 5-point scale to the question, "To what extent do you expect to receive any information that might be relevant to your self-concept and self-esteem?" As expected, participants who received the discrepancy-

related frame reported significantly higher expectations to receive self-related information ($M = 3.70$, $SD = 0.91$) than those who received the discrepancy-unrelated frame ($M = 1.82$, $SD = 0.94$), $t(56) = 7.68$, $p < .0001$.

Explicit self-esteem. We used the Rosenberg Self-Esteem Scale as our explicit measure (Rosenberg, 1965). Ratings on the items were highly consistent with each other ($\alpha = .76$) and were averaged to form a single index of self-esteem for each participant. Self-esteem scores were not affected by the argument quality manipulation, $F(1, 117) = 0.08$, $p = .77$; the frame manipulation, $F(1, 117) = 1.41$, $p = .24$; or the interaction of the two, $F(1, 117) = 0.11$, $p = .73$.

Implicit self-esteem. As in the prior studies, we used an IAT procedure to assess participants' implicit self-evaluations (Greenwald et al., 1998). The self-esteem IAT was administered at the beginning of the experimental session and was presented as part of a research project designed to study how taxonomies are represented in people's minds. In the IAT, participants classified target concepts (represented by *me* or *other*) and attributes (represented by *good* and *bad*) using two designated keys. The *me* and *other* categories included the same words used in Studies 2 and 3. The *good* category words included *freedom*, *peace*, *love*, *cheer*, and *paradise*, and the *bad* category words included *poison*, *cancer*, *death*, *vomit*, and *disaster* (selected from Greenwald et al., 1998). The difference in response latencies for *me + bad* and *other + good* trials versus *other + bad* and *me + good* trials provided a measure of relative automatic self-esteem (i.e., the IAT effect). Comparable implicit measures have been used in prior research and have been shown to be effective in predicting a variety of thoughts and behaviors relevant to self-evaluations, especially under low thinking (spontaneous) circumstances (e.g., Greenwald & Farnham, 2000; Hetts & Pelham, 2001; Jones, Pelham, Mirenberg, & Hetts, 2002; Koole et al., 2001; see also Bosson, Swann, & Pennebaker, 2000).

Explicit-implicit discrepancy. Explicit and implicit self-esteem showed a small negative correlation ($r = -.19$, $p = .04$). Previous research has also shown negative correlations between explicit and implicit self-esteem (e.g., Bosson et al., 2000; Hetts et al., 1999; Karpinski, 2004; Kitayama & Uchida, 2003). An index of discrepancy was formed as the absolute value of the difference between the standardized explicit and implicit measures. Higher scores on that variable reflected greater differences between the explicit and the implicit measures, and thus higher explicit-implicit self-esteem discrepancy. As in all previous studies, the distributions of scores revealed equivalent numbers of participants on each side of the discrepancy, with 54 participants showing positive discrepancies and 63 showing negative discrepancies. This was also true for the conditions in which the information was presented as discrepancy related, with 26 participants revealing positive discrepancies and 31 showing negative discrepancies.

Dependent Measure: Attitudes

As in the previous studies, participants were instructed to report their attitudes following the message. Participants' attitudes toward the proposal (i.e., the increased consumption of vegetables) were assessed using a series of five 9-point semantic differential scales anchored by 1 and 9 (i.e., bad-good, unfavorable-favorable, pro-against, foolish-wise, harmful-beneficial). Ratings on these items were highly intercorrelated ($\alpha = .84$) and were averaged to form one overall attitude index. Responses to the attitude scales were scored so that higher values represented more favorable opinions toward increasing consumption of vegetables.

Results

Attitudes were submitted to a hierarchical regression analysis, with extent of discrepancy (continuous variable), manipulated argument quality, message frame, and direction of discrepancy as the independent variables. Scores on the discrepancy index were

centered by subtracting the mean from each person's score (Aiken & West, 1991). Main effects were interpreted in the first step of the regression, two-way interactions in the second step, three-way interactions in the third step, and the four-way interaction in the final step (Cohen & Cohen, 1983).

The regression procedure described above revealed a significant main effect for direction of discrepancy, $\beta = .21$, $t(110) = 2.23$, $p = .03$, showing that participants' attitudes were more favorable toward the proposal in one direction of discrepancy (explicit > implicit) than the other (implicit > explicit). This effect was not obtained in any of the other studies and is not discussed further. In addition, a significant interaction between argument quality and extent of discrepancy was obtained, $\beta = .31$, $t(104) = 2.54$, $p = .01$, showing that argument quality had a greater impact on attitudes as discrepancy increased.

Of most interest, the predicted three-way interaction between argument quality, extent of discrepancy, and frame was significant, $\beta = .37$, $t(100) = 2.94$, $p = .004$. To examine the basis of this interaction, we decomposed the interaction by frame conditions. As depicted in Figure 2, the two-way interaction between discrepancy and argument quality was only significant for the discrepancy-related frame, $\beta = .86$, $t(99) = 3.76$, $p = .0002$, but not for the discrepancy-unrelated frame, $\beta = .11$, $t(99) = 0.64$, $p = .52$. More specifically, for the discrepancy-related frame, there

was a significant effect of argument quality among participants with relatively high discrepancy (analyzed at +1 *SD*), $\beta = .82$, $t(99) = 4.37$, $p < .0001$. In contrast, those with relatively low discrepancy (analyzed at -1 *SD*) showed no effect of argument quality, $\beta = -.26$, $t(99) = -1.34$, $p = .18$. The effects of explicit-implicit discrepancy on information processing were not restricted to any particular direction of the discrepancy, as indicated by a nonsignificant four-way interaction, $\beta = .06$, $t(99) = .29$, $p = .77$.⁴

Discussion

Experiment 4 conceptually replicated the earlier experiments by showing that participants with relatively high explicit-implicit discrepancy in their self-esteem processed more carefully the information presumably related to the discrepancy dimension than participants with relatively low discrepancy. That is, individuals with a large discrepancy found strong arguments to be more persuasive than weak ones whereas those with a small discrepancy did not, but only when the messages were potentially relevant to the discrepancy. Those with a high discrepancy presumably devoted more cognitive resources to new information framed as discrepancy related to reduce the uncertainty or subjective discomfort that might result from holding simultaneously favorable and unfavorable implicit and explicit self-evaluations.

General Discussion

Previous research has shown that there are many possible sources of internal discrepancies (e.g., attitudes, motives, self-conceptions), and these discrepancies are often associated with negative affect and undesirable psychological outcomes. Although most of the discrepancy research has relied on explicit and deliberative self-reports, previous studies identifying people who possess specific explicit and implicit self-discrepant dimensions have also found that discrepancy is associated with some notable difficulties in functioning.

The present research extends previous literature by showing that explicit-implicit discrepancy is also associated with enhanced

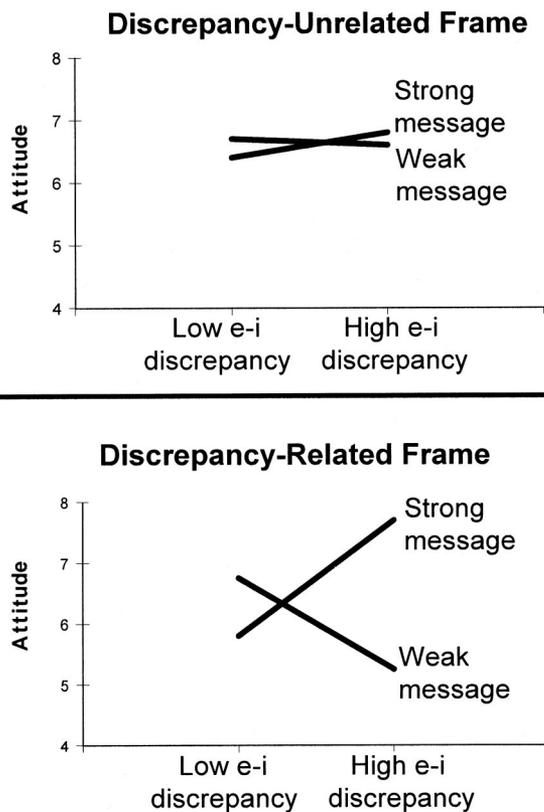


Figure 2. Attitudes as a function of argument quality, message frame, and extent of explicit-implicit (e-i) discrepancy graphed at -1 standard deviation (low discrepancy) and +1 standard deviation (high discrepancy) in Experiment 4.

⁴ Similar to Studies 1 and 2, alternative analyses were conducted in which implicit and explicit measures were treated separately. For maximum power, data from both Studies 3 and 4 were combined and submitted to another hierarchical regression analysis, with the implicit and explicit measures (continuous variables) and manipulated argument quality and message frame (dummy coded) as independent variables. Study was also included as a factor in this analysis so that we could examine whether the results generalized across the study differences. As expected, this analysis revealed a significant main effect for argument quality, $\beta = .18$, $t(250) = 3.61$, $p = .001$, which was qualified by a three-way interaction between argument quality, explicit self-concept, and implicit self-concept, $\beta = -.16$, $t(250) = -2.31$, $p = .02$. Most important for our concerns, a significant four-way interaction also emerged, $\beta = -.26$, $t(250) = 3.27$, $p = .001$. As predicted, this four-way interaction indicates that the three-way interaction between argument quality, explicit, and implicit self-concept was only significant for the discrepancy-related frame, $\beta = -.38$, $t(127) = -4.0$, $p < .0001$, but not for the discrepancy-unrelated frame, $\beta = -.06$, $t(122) = -0.58$, $p = .56$. Also importantly, this significant four-way interaction was not moderated by the study independent variable, as is evident in the absence of a five-way interaction ($p = .44$).

processing of ostensibly discrepancy-related information, presumably in an attempt at inconsistency reduction. The present studies also demonstrate that the tendency to process discrepancy-related information applies to both narrow (Study 3) and relatively broad (Studies 1, 2, and 4), as well as to descriptive (Studies 1, 2, and 3) and evaluative (Study 4), dimensions of the self. Across different types of self-concept elements, we have demonstrated that individuals for whom explicit and implicit self-dimensions are incongruent process information that either is (Study 1) or is framed as (Studies 2, 3, 4) discrepancy related more carefully than individuals with relatively congruent explicit-implicit self-dimensions. By thinking about information that is presumably related to the explicit-implicit dimension of conflict, people may be attempting to reduce the discrepancy between the implicit and explicit dimensions, perhaps unconsciously.

Symmetric Versus Asymmetric Discrepancy

In prior research, most researchers interested in explicit-implicit discrepancies have concentrated their studies in just one of the possible directions of discrepancy: people with more positive explicit than implicit self-views. For example, studies on narcissism (e.g., Bosson et al., 2003) and defensive self-esteem (Jordan et al., 2003; Shedler et al., 1993) have particularly focused on cases in which explicit self-esteem is higher than implicit self-esteem and compared this particular discrepancy with cases in which both implicit and explicit self-esteem are relatively high.

When looking at these asymmetric discrepancies, prior research has usually divided participants on the basis of relative scores within the sample distribution, as we did in the present research (see Weinberger & Hardaway, 1990, for an exception). Several different procedures have been used for dividing people into discrepancy groups, such as by splitting people at the median, tertiles, or quartiles of the sample distribution (Barger, Kircher, & Croyle, 1997; Emmons & Colby, 1995; Mendolia, Moore, & Tesser, 1996; Newman, Duff, & Baumeister, 1997; Weinberger, 1990) and by recentering at one *SD* above and below the mean of the distribution (e.g., Bosson et al., 2003; Jordan et al., 2003; McGregor & Marigold, 2003). Other research (e.g., Kehr, 2004), like ours, used a procedure that created a continuous score by taking the difference between standardized explicit and implicit measures of the self-construct. It is important to note that we had comparable numbers of individuals on each side of the discrepancy (implicit > explicit and explicit > implicit), and we were able to show that direction of discrepancy did not moderate the effects of amount of discrepancy on information processing.

For exploration, we tried an alternative but conceptually similar analysis in which we used the raw discrepancy scores rather than the absolute values and tested for curvilinear argument quality effects across levels of raw discrepancy. In this alternative analysis, both high-positive and high-negative discrepancy individuals should process the relevant frame message more than people who have little discrepancy. That is, because the direction of discrepancy does not matter according to our conceptualization, both high-positive and high-negative discrepancies should look the same. When analyzed in this manner, the results from our experiments look exactly as predicted. Figure 3 shows the significant interaction between discrepancy (quadratic term) and argument quality, $\beta = .70$, $t(315) = 6.87$, $p < .0001$, collapsing across

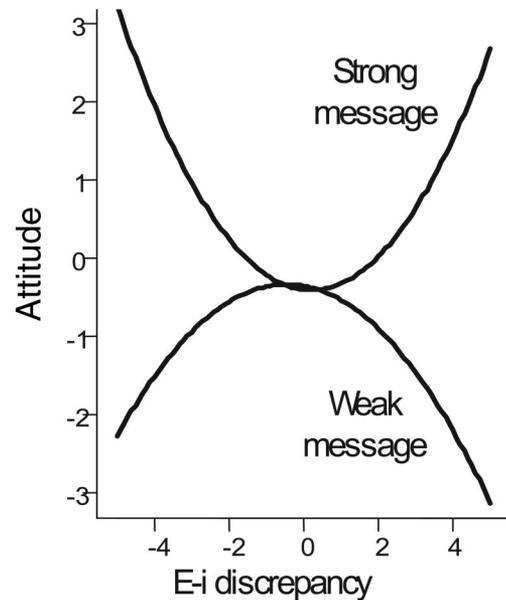


Figure 3. Attitudes (standardized scores) as a function of argument quality and raw discrepancy scores across studies (only relevant-frame conditions are included for Studies 3 and 4). Actual discrepancy scores in the studies range from -5.01 to $+4.52$. E-i = explicit-implicit.

studies and controlling for study as a factor (which did not moderate the critical interaction).

Although our discrepancy index does a good job of capturing people's *relative* standing in the distribution (as in most prior research), our index can only deal with the range of scores observed in the sample. Thus, by an *absolute* criterion, it could be the case that all of the participants are relatively high in both explicit and implicit self-esteem, high in explicit self-esteem and low in implicit self-esteem, and so forth. If this were true, it would still be the case that some people were higher than others on each measure and that the relative discrepancies our index captures is successful in predicting the extent of information processing. Nevertheless, the generality of our conclusions would be limited if all of our studies had the same profile of responses on the explicit and implicit measures (e.g., all absolutely high on both, all high on one and low on the other, etc.).

To explore this issue further, we created an "absolute" discrepancy index in each study by using the middle point of the explicit scale (e.g., 3 in a 5-point scale) and the zero point in the IAT to *approximate* absolute differences between participants high and low in each of the self-concept dimensions. This categorization revealed that only Studies 1 and 3 had reasonable numbers of individuals with discrepancies in both directions by this criterion (e.g., implicit measure suggests shyness but explicit measure suggests not shy; implicit measure suggests not shy but explicit measure suggests shy). Notably, these studies produced the same pattern of results as the studies in which the discrepancies were present mostly on a relative basis.

Our speculation is that the size of the discrepancy matters more than whether the discrepancy is relative or absolute. For example, an individual with trivially positive self-esteem on an explicit measure and trivially negative self-esteem on an implicit measure

would be categorized as discrepant in absolute terms, whereas an individual with trivially positive self-esteem on an explicit measure and extremely positive self-esteem on an implicit measure would not, even though the difference between implicit and explicit scores of the latter individual would be much larger and more consequential in our view. Nevertheless, future research might profitably recruit larger samples and use alternative measures so that the issue of absolute versus relative discrepancies can be examined more systematically.

Motivation to Reduce Self-Inconsistency

As noted earlier, explicit discrepancies are often associated with doubt. Campbell (1990) found that self-concept instability correlated with lower subjective confidence in one's own trait ratings and also with slower "me/not me" responses to trait adjectives (see Wright, 2001, for a review). Previous literature has also related explicit evaluative inconsistency (attitudinal ambivalence) to lack of confidence. For example, Jonas et al. (1997) provided empirical evidence that evaluative inconsistency evokes elaboration of related information to achieve a sufficient level of confidence with respect to the overall evaluation of the object. Bargh et al. (1992) suggested that evaluative inconsistency might be related to doubt, because response latencies (i.e., attitude accessibility) were found to be slower for ambivalent participants (see also Costello, Rice, & Schoenfeld, 1974; Gilmore, 1982). Indeed, one function particular to ambivalent attitudes—and, perhaps, also to explicit-implicit discrepant selves—seems to be reducing action readiness and promoting further and elaborated thinking about related information to amplify confidence and knowledge about the target (e.g., Hänze, 2001; Hodson et al., 2001; Jonas et al., 1997).

On the basis of this research, it seems reasonable that explicit-implicit self-discrepancies might also be associated with uncertainty or doubt (Briñol et al., 2003). If explicit-implicit self-discrepancies are associated with doubt, the enhanced information-processing effects we observed might be due in part to this uncertainty. Individuals who are induced to doubt before receiving a message have been shown to engage in greater thinking (Tiedens & Linton, 2001; Weary & Jacobson, 1997). For example, in one study Tiedens and Linton (2001) had participants write about a sad experience in which they felt uncertain about what was happening or a sad experience in which they felt certain. Following this doubt induction, participants received a message containing strong or weak message arguments. The primary result was that uncertain participants engaged in greater information processing (i.e., greater attitudinal differentiation between strong and weak arguments) than certain participants. We speculate that just as explicit uncertainty can guide information processing, so too might implicit uncertainty (see also Petty et al., 2006).

Future Directions

Future research might examine other consequences of explicit-implicit discrepancies apart from enhanced elaboration. In particular, research might explore other ways in which people could reduce these discrepancies. These could include changing self-discrepant elements (e.g., Festinger, 1957; Harmon-Jones & Mills, 1999), minimizing the salience or perceived (explicit or implicit) importance of the dimension on which the inconsistency exists

(e.g., Steele, Southwick, & Critchlow, 1981), or affirming oneself by expressing important values (e.g., Steele & Liu, 1983). Additionally, ignoring or defensively avoiding discrepancy-related information might constitute another strategy when exposure does not automatically occur, as in the present experiments. Different mechanisms of reducing self-inconsistency might be substitutable for each other (e.g., Tesser, 2001). If such mechanisms were interchangeable, then future research might profitably explore the potential differential impact of each of the discrepancy reduction strategies.

A final avenue for further examination concerns the possibility of actual resolution of the explicit-implicit discrepancy. For example, in our Study 1 participants received information directly relevant to the dimension (shyness) on which the discrepancy existed. Thus, this information might have influenced their explicit or implicit (or both) self-dimensions, thereby affecting the subsequent explicit-implicit discrepancy. Because follow-up measures related to the self-dimension were not included in that study after message processing, such an influence on the resulting discrepancy could not be assessed. In the other studies of the present research, it was less likely that message processing would help participants to resolve their internal conflict toward their implicit or their explicit self-view because the information provided to them was not actually relevant to resolving the discrepancy. The experiments in this article examine whether people are *motivated* to process information when they have an explicit-implicit discrepancy, rather than examining the direction or means of discrepancy resolution. This issue constitutes an intriguing question for future consideration.

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