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CHAPTER 18

Attitude Structure and Change

Implications for Implicit Measures

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Attitudes refer to one's likes and dislikes, what one favors or disfavors, supports or opposes, views positively or negatively. That is, attitudes refer to people's evaluations of a wide variety of objects, issues, and people, including the self. In the contemporary literature, both explicit and implicit measures of attitudes are commonly used. Explicit measures are those that directly ask people to report what their evaluations are, such as: "Is Diet Coke good or bad?" In a recent review, Petty, Fazio, and Briñol (2009b) articulated three different meanings that have been applied to defining implicit attitude measures: indirect, automatic, and unconscious. In the first meaning, implicit measures are indirect in that they do not ask the individual to report his or her attitude like a direct measure does (Petty, Wheeler, & Tormala, 2003). In the second meaning, implicit measures are said to tap into an automatic evaluative reaction, one that comes to mind spontaneously on the mere presentation of the attitude object, rather than a more deliberative assessment that comes to mind only on some reflection (Fazio, Jackson, Dunton, & Williams, 1995). In the third meaning, implicit measures are said to tap into an attitude of which the person is unaware, an unconscious evaluation rather than a conscious one (Kihlstrom, 2004). Although these aspects are conceptually and empirically separable (De Houwer, 2009), we refer to implicit measures in this review as measures that are both indirect and designed to tap into automatic evaluative reactions, whereas explicit measures are characterized by requiring at least some deliberative self-report. We do not assume that implicit measures tap into unconscious reactions.

Assessing a person's automatic evaluative reactions is important because such measures can often bypass social desirability concerns and have been shown to have a pervasive influence on spontaneous information processing, judgment, and behavior (e.g., Fazio, 1995; see Petty, Fazio, & Briñol, 2009a, for a review). In contrast, deliberative attitudes are especially important in predicting behaviors that also are undertaken with some degree of thought (e.g., Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997). Although implicit and explicit measures often yield the same outcome (e.g., both reveal that a person likes Diet Coke), sometimes these measures are discrepant. Because implicit and explicit measures of attitudes are useful in predicting behavior separately (e.g., Greenwald, Poehlman, Uhlmann, & Banaji, 2009) and in combination (e.g., Briñol, Petty, & Wheeler, 2006), it is helpful to understand how each is modified by various persuasion techniques. We use the term *persuasion* to refer to any situation in which the attitudes of a person are modified in a desired direction. After a long tradition of assessing the impact of persuasion treatments on attitudes solely with deliberative self-reports (Eagly & Chaiken,

1993; Petty & Wegener, 1998), more recent work has assessed attitude change with implicit measures that are designed to tap the more automatic evaluations associated with objects, issues, and people. After a brief discussion of attitude structure, we turn to our primary focus: understanding attitude change on implicit and explicit measures.

ATTITUDE STRUCTURE: THE METACOGNITIVE MODEL

We assume that, in addition to associating attitude objects with general evaluative summaries (e.g., good/bad), people sometimes develop an attitude structure in which attitude objects are linked to both positivity and negativity separately (see also Cacioppo, Gardner, & Berntson, 1997). Furthermore, we assume that people can tag these evaluations as valid or invalid or hold them with varying degrees of confidence. Our framework for understanding attitude structure is called the metacognitive model (MCM; Petty & Briñol, 2006a; Petty, Briñol, & DeMarree, 2007). For many attitude objects, one evaluation is dominant and seen as valid. This evaluation would come to mind spontaneously upon encountering the attitude object (e.g., see Bargh, Chaiken, Raymond, & Hymes, 1996; Fazio et al., 1995). However, sometimes both the positive and negative evaluations are deemed to be valid, and people's attitudes are best described as being *explicitly ambivalent* because both positive and negative associations come to mind and are endorsed (e.g., de Liver, van der Pligt, & Wigboldus, 2007; see left panel of Figure 18.1). At other times, however, people might have two opposite accessible evaluations but one is seen as valid and the other is rejected (see right panel of Figure 18.1). A denied evaluation can be a past attitude (e.g., "I used to like smoking, but now it is disgusting") or an association that was never endorsed but nonetheless salient because of one's culture (e.g., from continuous depictions in the media). In such cases, the MCM refers to the attitude structure as one of *implicit ambivalence* (Petty, Tormala, Briñol, & Jarvis, 2006). This kind of ambivalence is not explicit because people do not endorse opposite evaluations of the same attitude object. Nevertheless, people can feel uncomfortable about such attitude objects even though they might not know the specific source of the conflict (see Petty & Briñol, 2009).

The MCM relates to explicit and implicit attitude measures in the following ways. First, implicit measures are sensitive to the strength of the evaluative associations without respect to validity tags. Second, explicit measures also consider the extent to which people endorse their evaluative associations. That is, just as overall attitudes held with high confidence are more likely to affect behavior than those held with doubt (e.g., Fazio & Zanna, 1978), automatic reactions that are trusted are more likely to affect deliberative measures of attitudes than those held with doubt or explicitly denied (see also Gawronski & Bodenhausen, 2006). Later in this chapter we show that online assessments of confidence or doubt can influence which specific beliefs or thoughts people incorporate into their general evaluations (e.g., Petty, Briñol, & Tormala, 2002).

FUNDAMENTAL PROCESSES OF ATTITUDE CHANGE

Over the past 50 years, researchers have developed numerous theories of attitude change. One of the earliest assumptions was that effective influence required a sequence of steps leading to absorption of the content of a message (e.g., exposure, attention, comprehension, learning, retention; see McGuire, 1985). However, subsequent research evidence showed that message learning could occur in the absence of attitude change and that attitudes could change without learning the specific information in the communication (Petty

FIGURE 18.1. Illustration of the metacognitive model representation of explicit (left panel) and implicit (right panel) ambivalence toward smoking.

& Cacioppo, 1981). Cognitive response theory (Greenwald, 1968; Petty, Ostrom, & Brock, 1981) was developed explicitly to account for the low correlation between message learning and persuasion observed in many studies. In contrast to the traditional learning view, the cognitive response approach contended that the external information was merely a stimulus for a person's own thoughts, which, in turn, determined the extent of influence. According to this framework, an appeal that elicited issue-relevant thoughts that were primarily favorable toward a particular recommendation would produce agreement, whereas an appeal that elicited issue-relevant thoughts that were predominantly unfavorable would be ineffective in achieving attitude change.

Although the cognitive response approach provided important insights into the persuasion process, it focused only on those situations in which people were active processors of the information provided to them. The theory did not account very well for persuasion that was obtained in situations where people were not actively thinking about the message content. In fact, persuasion was thought to be unlikely in such situations. Yet numerous studies have shown that attitudes can be changed when the likelihood of extensive thinking is low. The elaboration likelihood model of persuasion (ELM; Petty & Cacioppo, 1981) was proposed to correct this deficit by arguing that persuasion can occur when thinking is high or low, but the processes and consequences of persuasion are different in each situation (see Petty & Cacioppo, 1986). The ELM is an early example of what became an explosion of dual-process and dual-system theories that distinguished thoughtful from nonthoughtful (or automatic) determinants of judgment (see Chaiken & Trope, 1999; Petty & Briñol, 2006b, 2008).

According to the ELM, any persuasion variable (i.e., whether source, message, recipient, or context) can influence attitudes by affecting the key processes of persuasion. That is, variables can affect attitudes by (1) serving as simple cues or heuristics; (2) biasing the thoughts that are generated; (3) affecting one's confidence in those thoughts (or other structural features of thoughts); (4) serving as persuasive arguments or evidence; and/or (5) affecting the amount of information processing that occurs. This is depicted schematically in Figure 18.2. As we discuss shortly, the likelihood that variables will serve in these different roles depends on a person's overall motivation and ability to think in a given situation as well as factors such as the relevance of the variable to the topic of persuasion and the timing of the variable (e.g., does it occur before or after the persuasive message?). By identifying a finite set of persuasion processes and specifying when they operate, the ELM provides a useful guide to organize key findings in the growing literature on change in implicit attitude measures just as these processes have organized the literature on explicit change. We describe the implications of these processes for attitude strength, the extent to which any observed attitude change is consequential (Petty & Krosnick, 1995). Illustrative research on each of these processes is described next.

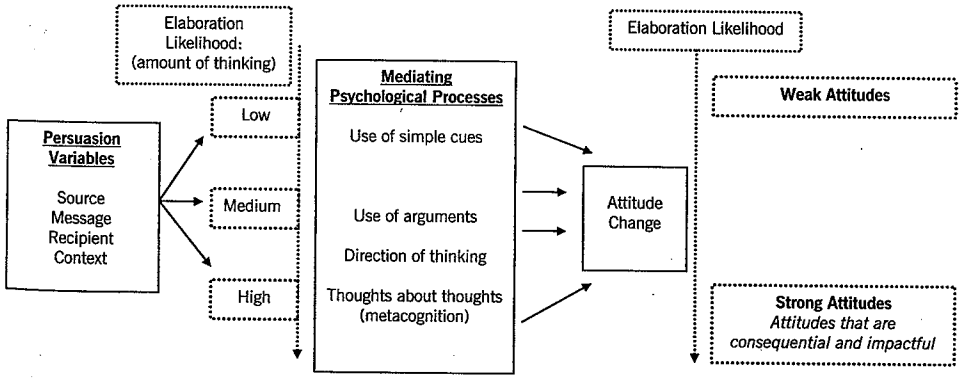

FIGURE 18.2. Fundamental processes by which persuasion variables influence explicit and implicit measures of attitude change.

Serving as Cues

As noted earlier, people do not think about all the information they receive. When conditions do not foster thinking, variables influence attitudes by serving as simple cues. Cues operate by a variety of low-effort processes such as mere association (Cacioppo, Marshall-Goodell, Tassinary, & Petty, 1992) or reliance on simple heuristics (Chaiken, 1987). The existence of cue processes is important because it suggests that attitude change does not always require effortful evaluation of information. Instead, when a person's motivation or ability to process issue-relevant information is low, numerous studies have shown that persuasion on explicit measures can occur by a peripheral route in which processes invoked by simple cues in the persuasion context influence attitudes (see Petty & Wegener, 1998). Although peripheral ways to change attitudes can be very powerful in the short term, research has shown that explicit attitude changes based on peripheral cues tend to be less accessible, enduring, and resistant to subsequent attacking messages than attitude changes based on careful processing of message arguments (see Petty, Haugtvedt, & Smith, 1995, for a review). Petty (1994) suggested that one reason why cue processes have little impact on explicit measures is that people explicitly reject this impact (e.g., an attractive source is not relevant to one's judgment), or the weight of the argument processing can overwhelm the cue impact. However, because implicit measures typically require less thinking during attitude expression than explicit measures, the impact of simple cue processes might be more apparent on them just as these processes have greater impact on explicit measures when thinking during attitude formation is low rather than high.

Indeed, the growing research on the malleability of implicit measures of attitudes has demonstrated that simple associative processes requiring little thinking can sometimes affect automatic evaluations even if there is no impact on an explicit measure. Some researchers have even suggested that implicit measures are influenced only by simple associative processes (e.g., Banaji, 2004; Rudman, Ashmore, & Gary, 2001; Rydell & McConnell, 2006; Rydell, McConnell, Strain, Claypool, & Hugenberg, 2007). For example, classical conditioning and mere exposure are two relatively low thought or automatic processes that rely on multiple exposures. Consistent with the idea that automatic attitudes can be changed with these mechanisms, Olson and Fazio (2001) showed that automatic evaluations were sensitive to classical conditioning procedures that used 20 pairings of the target attitude objects and the conditioned stimulus. Using a similar paradigm, Dijksterhuis (2004) found that automatic evaluations of the self were affected by subliminal evaluative conditioning trials (15 pairings) in which the pronoun *I* was repeatedly associated with positive- or negative-trait terms (see also Petty et al., 2006; Walther, 2002).

Also consistent with this approach, research on automatic prejudice has shown that implicit measures can be changed using paradigms that involve exposing individuals repeatedly to either positive or negative examples of outgroup members. For example, automatic evaluations of blacks have been shown to be affected by exposure to admired black individuals (Dasgupta & Greenwald, 2001; Dasgupta & Rivera, 2008), to a black professor (Rudman et al., 2001), to a black experimenter (Lowery, Hardin, & Sinclair, 2001), to a black partner who occupied a superior task role (Richeson & Ambady, 2003), or to other counterstereotypical group members (Dasgupta & Asgari, 2004; for reviews, see Blair, 2002; Fazio & Olson, 2003; Gawronski & Bodenhausen, 2006). Although some of these studies likely involve invoking a different attitude object (e.g., the subtype of a black professional rather than the general category of blacks; e.g., see Barden, Maddux, Petty, & Brewer, 2004) rather than attitude change, there are a sufficient number of studies that clearly demonstrate that automatic evaluations of the same attitude object are being modified to conclude that automatic attitudes can be changed by simple associative processes requiring little elaborative thinking.

Thus, the accumulated research is generally consistent with the idea that implicit measures of attitudes can be affected by relatively low thought processes just as explicit attitudes can be changed by these processes especially when thinking is low. Another illustration of this possibility comes from research on *embodiment*. That is, simple bodily responses of the recipient can affect not only explicit but also implicit measures of attitudes. For example, embodiment research conducted with explicit measures has shown that stimuli presented while performing an approach behavior (e.g., using one's hands to pull up from underneath a table) is evaluated more positively than stimuli presented during an avoidance behavior (e.g., pushing down on a tabletop surface) (Cacioppo, Priester, & Berntson, 1993), especially when thinking is low (Priester, Cacioppo, & Petty, 1996). Similar findings have been found for a large number of behaviors, postures, and body movements (for a review, see Briñol & Petty, 2008) and hold for implicit measures as well. For example, Kawakami, Phills, Steele, and Dovidio (2007) found significant reductions in an implicit measure of prejudice toward blacks when participants had to respond repeatedly with an approach action to black faces and with an avoidance action to white faces (see also Ito, Chiao, Devine, Lorig, & Cacioppo, 2006; Kawakami, Steele, Cifa, Phills, & Dovidio, 2008).

Type or Direction of Thinking

When motivation and ability to think are high, people will be engaged in careful thought about a message, but that thinking can be biased by other variables in the persuasion setting. Most importantly, variables can motivate or enable people to either support or derogate the content of the information provided. This is important, of course, because when elaboration is high, attitude change is a function of the number and valence of thoughts that come to mind (see reviews by Eagly & Chaiken, 1993; Petty & Cacioppo, 1986). When thinking is high, some factors such as being in a positive mood increase the likelihood of favorable thoughts being elicited (e.g., Petty, Schumann, Richman, & Strathman, 1993), but other factors such as providing a forewarning of persuasive intent increase the likelihood that unfavorable thoughts come to mind (Petty & Cacioppo, 1979b). One of the most powerful factors that produce a bias is the position the message takes. In general, any time a message takes a position opposed to one's attitudes, values, or identity, people will be biased against it (Petty & Cacioppo, 1990). When a message takes a position supporting one's views, people will be biased in favor of it. Nevertheless, if the likelihood of thinking is high, some variables are capable of producing thinking that is biased against one's favored position or biased in favor of a disliked position (e.g., instilling reactance; see Petty & Cacioppo, 1979a).

Perhaps the most direct way to bias the direction of the thoughts that come to mind is to ask people to think in a given direction (e.g., ask them to generate and write down only proarguments in favor of a specific issue or only counterarguments against it). Previous research on persuasion has shown that participants are able to comply with this kind of direct instruction, and that this is an effective way to create different profiles of thoughts and attitudes regarding an issue (see Killeya & Johnson, 1998). In line with the findings for explicit persuasion, other research has found that implicit measures are sensitive to similar forms of directed thinking. For example, Blair, Ma, and Lenton (2001) found that, compared with controls, participants who were asked to think about and visualize a counterstereotypical woman showed reduced levels of implicit gender stereotyping. Along with previous research on explicit persuasion, these findings suggest that the direction of the thoughts that come to mind in response to a treatment can influence both explicit and implicit measures of attitudes.

Not only can self-generated thoughts influence attitudes, but so too can thoughts generated in response to persuasive messages. There are, of course, numerous studies showing that explicit attitudes can change following exposure to persuasive messages. In one study examining implicit attitude change, Horcajo, Briñol, and Petty (2009) asked participants to read a communication composed of compelling arguments in favor of consuming vegetables. In a control condition, participants read a neutral message. An example argument in favor of vegetable consumption was that vegetables have more vitamins than most supplements on the market, making them particularly beneficial during exam and workout periods. The neutral topic was an editorial related to interior design in which the word *vegetable* was also mentioned explicitly to control for the accessibility of the attitude object itself. All participants were asked to think carefully about the message. After thinking about the message, participants had to complete an apparently unrelated task (Implicit Association Test [IAT]) that was designed to assess automatic evaluations relevant to the proposal of the message. In the IAT, participants classified target concepts (*vegetable* and *animal*) and attributes (good–bad). Consistent with the idea that persuasive messages processed under thoughtful conditions can influence implicit measures, we found that automatic evaluations of vegetables were more favorable in the message than in the control condition.

Although this research demonstrates that automatic evaluations can be influenced by traditional persuasive messages, it is unclear what the psychological processes were underlying the obtained effects. In our initial study, because we asked participants to read the content of the arguments, we suspect that the observed changes on automatic evaluations were due to the careful consideration of their merits. However, it is also possible that participants just counted and relied on the number of arguments presented in favor of the proposal (e.g., Petty & Cacioppo, 1984), or they might have followed some other low-effort process. For example, just by looking at the message superficially (i.e.,

simply attending to the advocated position of the message without reading the content of the arguments), a person might have reasoned that the culture favors vegetables (e.g., Olson & Fazio, 2004). Because the findings of this study, like other research in this domain, do not allow us to examine whether (and how much) participants elaborated the information received, we conducted several additional studies in which the extent of thinking and argument quality were manipulated.

In one study, Horcajo, Briñol, and Petty (2009) exposed participants to a persuasive message composed of strong or weak arguments in favor of including more vegetables in their diet (adapted from Briñol et al., 2006). Thinking about the strong message leads people to generate favorable thoughts associated with the proposal, whereas thinking about the weak message leads to unfavorable thoughts.[1] In addition to varying the strength of the arguments, the extent of thinking was manipulated by making the message personally relevant or irrelevant (see Petty & Cacioppo, 1979b). Thus, the message was introduced as part of an article about personal habits with potential consequences for academic performance (personally relevant frame) or as part of an article about plant properties (personally irrelevant frame). After reading the message, participants were asked to list their thoughts about the proposal. After the thought listing, and as part of an ostensibly unrelated study, participants were then asked to complete an IAT to assess automatic evaluations of vegetables.

The results of this study were consistent with the idea that automatic evaluations (as assessed by the IAT) can change as a result of processing persuasive messages. We first found that elaboration increased the impact of argument quality on automatic evaluations just as past research has shown this pattern for deliberative evaluations. That is, under high elaboration conditions, automatic evaluations of vegetables were more impacted by argument quality than they were under low elaboration conditions. More importantly, under high elaboration conditions, the obtained changes on automatic evaluations from argument quality were mediated by the valence of the thoughts (i.e., positive or negative) that participants generated in response to the message. Thus, this study provides preliminary evidence for thoughtful mediation of changes on implicit measures.

According to Briñol, Petty, and McCaslin (2009), deliberation about message arguments can produce change in implicit measures because thoughts (like emotions and any other variable) can serve in different roles depending on the circumstances. The most simplistic treatment of one's thoughts would only consider their number and valence, two qualities that are relatively easy to extract (e.g., see Betsch, Plessner, & Schallies, 2004). When processing a persuasive message, a person generating mostly positive thoughts would rehearse mostly positive evaluative associations to the attitude object and a person generating mostly negative thoughts would rehearse mostly negative evaluative associations. This would lead strong arguments to show more positive evaluations on an implicit measure than weak arguments. Thus, when the *measurement conditions* involve low thinking, as is the case with measures of automatic evaluation, thoughts likely have an impact on attitudes because of the relatively low-effort extraction of their evaluative information.

Importantly, a person's own thoughts can operate through different processes under different circumstances. Thus, when conditions foster more thinking, as is the case with deliberative measures, it is possible to extract additional information (besides number and valence) from one's thoughts. For example, in addition to the desirability (valence) involved in a thought about a persuasive proposal, a person can consider other aspects of that thought, such as the likelihood of the consequence it implies (e.g., Fishbein & Ajzen, 1975) and the overall confidence one has in the thought (see Briñol, Petty, & Tormala, 2004; Petty et al., 2002). These additional features of thoughts should be less likely to emerge on an automatic measure of attitudes until these dimensions also become highly accessible or well integrated into the overall attitude structure. Thus, as described in the next section, when the measurement conditions involve high thinking, not only the number and valence of one's thoughts but also other information associated with the thoughts is more likely to have an impact.

Structural Features of Thoughts

The structural features of thoughts refer to dimensions of thoughts other than direction (favorable or unfavorable) and amount (high or low). Although there are several important structural features of thoughts, such as how quickly the thoughts come to mind, in this section we highlight metacognitive aspects of thinking, or thoughts about one's thoughts (for a review, see Petty, Briñol, Tormala, & Wegener, 2007). When the amount of thinking is high, variables can affect metacognitive features of the thoughts that are generated, such as how much confidence people have in their thoughts or how biasing they are perceived to be. According to what we have called the *self-validation hypothesis*, confidence in thoughts is important because when people have greater confidence in the validity of their thoughts, these thoughts are more likely to be used in forming judgments (Petty et al., 2002). On the other hand, if people doubt the validity of their thoughts, the thoughts will be less likely to have an impact on judgments. This may be one reason why some persuasion campaigns are unsuccessful. That is, the campaign might produce the appropriate amount of favorable thoughts, but these thoughts might not be held with sufficient confidence to affect judgments.

Recent research on self-validation has identified a large number of variables that have an impact on attitude change by affecting thought confidence (for a review, see Briñol & Petty, 2009). For example, in one of the initial studies on self-validation, Petty and colleagues (2002) gave participants false feedback about the extent to which other people shared similar thoughts to the ones the participants just listed regarding a persuasive proposal. This social consensus affected thought confidence, increasing persuasion when the message recipients' thoughts were mostly favorable and decreasing it when the thoughts were unfavorable. Importantly, social consensus can also validate automatic associations. In an illustration of this possibility, Stangor, Sechrist, and Jost (2001) found that preexisting implicit stereotypes were enhanced when participants learned that other individuals shared that stereotype than when the stereotype was said not to be shared by other individuals. As described later in this review, variables other than social validation can influence explicit and implicit measures by affecting thought confidence.

In the domain of explicit attitudes, these metacognitive features of thoughts have been found to be most impactful when the amount of thinking at the time of attitude formation or change is high because it is only in such situations that people have a substantial number of issue-relevant thoughts with the potential to shape attitudes and also have the motivation and the ability to think about their own thoughts. Just as it is important to consider the extent of thinking during the time of exposure to a persuasion treatment, it is also useful to consider the extent of thinking permitted during response to the attitude measure. In general, if attitudes are not well formed or practiced at the time of attitude measurement, we anticipate that an implicit measure is unlikely to reflect aspects other than evaluation. However, if the attitude is well formed and practiced at the time of attitude measurement (i.e., people have already considered the confidence in their thoughts in developing their attitudes), we predict that implicit measures would be likely to reflect the same factors as explicit measures. Future research should explore this possibility.

Serving as Arguments

When thinking is high, people assess the relevance of *all* of the information in the context and that comes to mind in order to determine the merits of the attitude object under consideration. That is, when thinking is high, people examine source, message, recipient, contextual, and internally generated information as possible arguments or reasons for favoring or disfavoring the attitude object. Individuals (and situations) can vary in what type of information serves as persuasive evidence for any given attitude object. Although there is less research looking at the influence of this process on implicit measures, we suspect that, similar to any other mechanism, a variable that serves as an argument can potentially influence both explicit and implicit measures.

Amount of Thinking

We have already specified several roles that variables can play in producing persuasion depending on whether the amount of thinking is relatively low or high. Variables can also affect the amount of thinking itself. For expository purposes, we have described persuasion processes as if they can be neatly categorized into high versus low thought mechanisms. However, it is important to note that the various persuasion processes fall along a thinking continuum (Petty & Cacioppo, 1986). The more motivated and able people are to think, the more their attitudes are determined by their valenced thoughts and thought confidence. Also, explicit attitudes based on high amounts of thinking are postulated to be stronger than attitudes based on little thought. That is, such attitudes are more accessible, stable, resistant to countermessages, and predictive of behavior (see Petty et al., 1995). Thus, considering the amount of thinking underlying attitude change is important because the overall goal of most persuasion attempts is to induce attitude change that has these features. A large number of variables have been examined that can influence explicit measures of attitudes by affecting people's general *motivation* or *ability*

to think about a message (see Petty & Wegener, 1998, for a review).

For example, distraction in the situation reduces one's ability to process a message so that distraction reduces persuasion if the arguments in a persuasive message are strong (because favorable thoughts are disrupted) but increases persuasion if the arguments are weak (because unfavorable thoughts are disrupted (Petty, Wells, & Brock, 1976). In contrast, repeating a message increases the ability to process it by providing greater opportunities to do so (Cacioppo & Petty, 1989). With respect to motivation, perhaps the most studied variable is the personal relevance of the communication. By increasing the personal relevance of a message, people become more motivated to scrutinize the evidence more carefully such that if the evidence is found to be strong, more persuasion results, but if the evidence is found to be weak, less persuasion occurs (Petty & Cacioppo, 1979b). In fact, linking the message to almost any aspect of the self such as one's values, outcomes, self-conception, identity, and so forth can enhance self-relevance and thereby increase the extent of information processing (Fleming & Petty, 2000; Petty & Cacioppo, 1990).

Most of the research on matching some aspect of a communication to the self has dealt with explicit characteristics of the recipient, dimensions of which people are aware (e.g., gender) and that can be assessed with deliberative, explicit self-reports (e.g., need for cognition, self-monitoring, and so forth; for reviews, see Briñol & Petty, 2006; Petty, Wheeler, & Bizer, 2000). However, of most relevance to this chapter, individual differences can also be assessed with implicit measures. The importance of the distinction between explicit and implicit measures of individual differences is especially apparent when there is a discrepancy between them. We have suggested that such discrepancies can produce *implicit ambivalence* and have important consequences for information processing and attitude change (Petty & Briñol, 2009). Specifically, because internal inconsistencies that are explicit (e.g., endorsing both positive and negative evaluations of the self) are often associated with aversive feelings (e.g., Abelson et al., 1968) and enhanced information processing (e.g., Maio, Bell, & Esses, 1996), we argue that individuals with discrepancies between their automatic and deliberative self-conceptions are similarly (implicitly) motivated to process discrepancy-relevant information. We use the term *implicit* to refer to this ambivalence in the sense that when deliberative and automatic self-conceptions conflict, people are endorsing their deliberative self-conception but not their automatic one (see right panel of Figure 18.1). Because the conflicting reactions are not endorsed, people do not claim to be ambivalent about themselves.

To test the idea that implicit ambivalence exists and is consequential, in a series of studies Briñol and colleagues (2006) assessed various individual differences (e.g., self-esteem, shyness) with both explicit and implicit measures and then examined the information-processing consequences of the extent of discrepancy between the two. Across three studies, as the discrepancy between the implicit and explicit measures increased, so too did processing of a message relevant to that discrepancy. Consistent with our MCM of attitudes described earlier, this line of research reveals that when people reject their stored automatic associations (and, therefore, do not use them when deliberatively responding), those associations can still be impactful. Thus, although people might not be aware of any ambivalence associated with the trait or attitude object in question, they might still experience some discomfort associated with the trait or attitude object that motivates processing of discrepancy-relevant information (see Petty & Briñol, 2009, for a review).

In another series of studies, we examined the notion that discrepancies between automatic versus deliberative attitudes could lead to enhanced information processing in the domain of racial prejudice. In one experiment (Petty, Briñol, See, & Fleming, 2009), we assessed Ohio State University students' attitudes toward African Americans using both automatic (a race IAT; Greenwald, McGhee, & Schwartz, 1998) and deliberative (agreement with pro- and anti-black statements; Katz & Hass, 1988) measures. After completing the implicit and explicit measures of racial attitudes, all of the students were exposed to a message advocating a new program to hire African American faculty at their university that was supported with either strong or weak arguments. Consistent with the idea that people with automatic–deliberative discrepancies would act as if they were ambivalent, discrepancy interacted with argument quality to predict attitudes toward the program. That is, as the discrepancy between attitudes assessed with implicit and explicit measures increased, attitudes were more affected by argument quality.[2]

Finally, in another relevant line of research, we examined whether explicit attitude change (changing one's endorsed attitude from one valence to another) can also produce explicit–implicit discrepancy and enhanced information processing. If a new evaluative association is formed and an old one is rejected (e.g., tagged as false), the MCM predicts that the previous association is still present creating some implicit ambivalence (see right panel of Figure 18.1). In one study testing this idea (Petty et al., 2006, Study 2), participants first formed an initial positive or negative attitude toward another person via evaluative conditioning. This manipulation was pretested and shown to be effective in modifying both automatic (evaluative priming) and deliberative (semantic differential) measures of attitudes. Then the participants received information about the target individual's attitudes on several important topics. The attitudinal information was designed to either get the person to like or dislike the target by having the target agree or disagree with the participant on several important issues. In some conditions, this information was in the same direction as the conditioning manipulation so that no attitude change would occur, but in other conditions the information was opposite in valence to the conditioning. In the latter situation, individuals rejected their earlier evaluations based on conditioning and adopted new evaluations based on the similarity information. Following these inductions, participants were told that the target person was a candidate for a job at their university. To evaluate the candidate, they were provided with either a strong or a weak resume to examine. The key result was that attitudes toward the target as a job candidate were more influenced by the quality of the candidate's resume in the condition where attitudes were changed than in conditions where attitudes were not changed. That is, when attitudes were changed, people engaged in greater information processing as if they were attempting to resolve some ambivalence.

In a conceptual replication of our procedure, Rydell, McConnell, and Mackie (2008) examined whether automatic–deliberative discrepancies were associated with measures of reported discomfort and whether this was responsible for the enhanced information processing observed. In this research, participants were first exposed to either positive or negative associative information (subliminal word prime) about a target person. Then participants received positive or negative information about the behaviors of the target individual. As in the Petty and colleagues (2006) design, in some conditions, this information was in the same direction as the initial manipulation so that no attitude change would occur, and in other conditions the information was opposite in valence to the priming manipulation. After these inductions, participants were exposed to information relevant to the target person that was composed of either strong or weak arguments.

There were several notable findings from this study. First, it was found that a discrepancy in automatic versus deliberative evaluations was associated with increased information processing, replicating our previous findings. Furthermore, the automatic–deliberative discrepancy was associated with reports of general discomfort regarding the attitude object. Perhaps of most interest, Rydell and colleagues (2008) showed that the measure of general discomfort mediated the information processing effect observed. Because previous investigators used the measure of discomfort to assess a state of cognitive dissonance (e.g., Elliot & Devine, 1994), Rydell and colleagues interpreted their results to suggest that implicit–explicit discrepancies enhance information processing because of cognitive dissonance rather than implicit ambivalence. However, finding that discomfort is affected by an implicit–explicit discrepancy and that it mediates information processing does not necessarily indicate that dissonance is involved because many psychological states other than dissonance can produce discomfort. In fact, we hypothesized that implicit ambivalence would do just that (see Petty et al., 2006; Petty & Briñol, 2009). That is, we argued that people with automatic–deliberative discrepancies would be in a state of implicit ambivalence, which would produce discomfort that motivated information processing. As noted earlier, the ambivalence is *implicit* because individuals do not explicitly acknowledge endorsing contrary views about the object, although they might acknowledge some discomfort with respect to the object. However, the discomfort does not stem from freely choosing to bring about an aversive consequence (Cooper & Fazio, 1984) or some acknowledged self-inconsistency (Aronson, 1969), conditions necessary for dissonance. Rather, the discomfort stems from the conflict between an endorsed and an unendorsed evaluation associated with the attitude object (see right panel of Figure 18.1).

THE INFLUENCE OF COMMUNICATION VARIABLES ON EXPLICIT AND IMPLICIT PERSUASION

As we just reviewed, the ELM (Petty & Cacioppo, 1981, 1986) identifies the key processes by which variables can affect attitudes and highlights their role in producing attitude changes that are consequential or not. Thus, analyzing processes informs us of both the immediate and long-term consequences for persuasion. Whether variables are part

of the message source, the recipient, the communication itself, or the persuasion context, they can affect attitudes by affecting the same key processes. A few examples should help to clarify the multiple roles that any variable can have in different situations for both explicit and implicit measures.

Source Factors

Consider first the multiple processes by which source factors, such as expertise, attractiveness, race, or gender, can have an impact on persuasion. In research using explicit measures to assess attitude change, all of the postulated roles for source factors have been observed. Thus, when the likelihood of thinking was low, source factors have influenced persuasion by serving as a peripheral cue, affecting attitudes in the same direction as their valence (e.g., Petty, Cacioppo, & Goldman, 1981; see Chaiken, 1987). On the other hand, in several studies in which the elaboration likelihood was moderate, the source factors of expertise and attractiveness affected how much thinking people did about the message (e.g., Priester & Petty, 1995; Puckett, Petty, Cacioppo, & Fisher, 1983).

When the likelihood of thinking is already set to be very high (e.g., high personal relevance of the message topic), source factors have taken on other roles. For example, if a source factor is relevant to the merits of a message, it can serve as a persuasive argument. Thus, an attractive endorser might provide persuasive visual evidence for the effectiveness of a beauty product (see Petty & Cacioppo, 1986). Under low thinking conditions, where attractiveness serves as a simple cue, the relevance of attractiveness to the topic of the message is of little importance: All that matters is valence. Thus, under low thinking conditions, source attractiveness would be just as effective in selling cars as beauty products, whereas under high thinking conditions attractiveness would be more impactful in the latter than the former case.

Another role that sources can play under high thinking conditions is biasing information processing. For example, Chaiken and Maheswaran (1994) found that when recipients under high-elaboration conditions received an ambiguous message (i.e., not clearly strong or weak), the expertise of the source biased message processing in a positive direction and produced more favorable attitudes. Finally, under high-elaboration conditions, source factors have been found to influence persuasion by affecting people's confidence in the validity of their thoughts in response to the message (Briñol et al., 2004). The effect of source credibility on thought confidence under high thinking conditions is most likely to occur when the source information follows, rather than precedes, the persuasive message (Tormala, Briñol, & Petty, 2007). When source credibility validates thoughts, it leads to more persuasion when the thoughts are favorable (such as if the arguments are strong) but to less persuasion when the thoughts are unfavorable (such as when the arguments are weak).

In sum, the ELM shows how any one outcome for a source factor can be produced by different processes in different situations. For example, if a credible source led to more persuasion than a source that lacked credibility, it could be because credibility served as a simple cue under low thinking conditions or enhanced thinking about strong arguments under moderate thinking conditions. If thinking was high, then credibility could have enhanced persuasion because it served as a strong argument, biased thinking in a positive direction, or validated people's positive thoughts. As noted earlier, the role that was operative under high thinking conditions would depend on factors such as the relevance of the source variable to the topic under consideration and the timing of the source factor (i.e., whether it was available before or after message presentation).

Can the same source factors influence implicit measures by multiple processes as well? We think so. Perhaps the most obvious role for source factors is as a simple cue. For example, Forehand and Perkins (2005) exposed participants to an advertisement for a product that featured a liked celebrity. Some participants recognized the identity of the celebrity, whereas others did not. When the liked celebrity was not explicitly recognized, both implicit and explicit attitudes were affected positively. However, when the celebrity was explicitly identified, only the implicit measure was affected positively. In fact, under these conditions, a reversal effect emerged on the explicit measure, revealing more negative attitudes toward the liked source. When the celebrity was explicitly recognized, recipients presumably attempted to debias their judgments, not wanting them to be influenced by this presumably irrelevant factor. If people overcorrect their judgments, a reverse effect will be obtained (e.g., see Petty, Wegener, & White, 1998, for a reverse effect of source attractiveness resulting from correction). The Forehand and Perkins findings suggest that implicit measures are particularly sensitive to the valence of the source of the persuasive treatment but less so to correction processes.[3]

In another relevant line of research, McConnell, Rydell, Strain, and Mackie (2008) presented participants with positive or negative behavioral information about a target who also varied in some observable physical characteristic (i.e., overweight vs. normal, attractive vs. average vs. unattractive, black vs. white). They found that explicit evaluations of the target were affected by the explicit behavioral information but not by the physical characteristics. These results are analogous to classic persuasion studies in which substantive arguments impacted explicit attitudes, but simple issue-irrelevant valence cues did not when people were thinking carefully (see Petty & Wegener, 1998, for a review). In contrast, implicit attitudes toward the target generally reflected only the observable physical characteristics of the person rather than the explicitly provided behavioral information (see also Rydell & McConnell, 2006). For example, when the source was unattractive, overweight, or black, implicit attitudes were negative regardless of whether the behavioral information was positive or negative. These results are also analogous to classic persuasion studies in which simple source cues impacted explicit attitudes, but substantive arguments did not when thinking was impaired (e.g., Chaiken, 1980; Petty et al., 1981). Interestingly, when physical appearance provided no particularly positive or negative valence cue (e.g., a white, normal-weight target of average attractiveness), then the valence of the explicit behavioral information did affect implicit attitudes. This finding is similar to the research noted earlier where argument quality affected implicit measures in the absence of any simple peripheral cues (Horcajo, Briñol, & Petty, 2009; see Briñol, Petty, & McCaslin, 2009, for a review).

Although the McConnell and colleagues (2008) research suggests that easily processed features of people (e.g., race, attractiveness) are especially likely to affect implicit measures by serving as simple valence cues, this does not mean that implicit measures cannot be affected by source variables under high thinking conditions. Under high thinking conditions, source factors could influence automatic measures, but they would do so by other more deliberative processes such as affecting the valence of the thoughts generated. Indeed, this may be what happened when McConnell and colleagues in some conditions presented participants with behavioral information that was ambiguous rather than clear-cut. Under these conditions, the target physical characteristics also affected implicit attitudes but may have done so by a different mechanism. If so, this finding would be similar to past persuasion research showing that simple cues are more likely to affect attitudes under high thinking conditions if the substantive information is ambiguous because the cue biases interpretation of the information (see Chaiken & Maheswaran, 1994; Petty et al., 1993).

Message Factors

Like source variables, message variables can serve in multiple roles. For example, think about the mere number of arguments that a persuasive message contains. This variable serves as a simple peripheral cue when people are either unmotivated or unable to think about the information. That is, people can simply count the arguments in a message or have some sense of a large quantity of arguments and agree more with the advocacy the more information that is presented, regardless of the cogency of that information. When motivation and ability to think are high, however, the informational items in a message are not simply counted as cues, but instead the information is processed for its quality. Thus, under low thinking conditions when the number of arguments in a message serves as a cue, adding weak reasons in support of a position enhances persuasion, but when the items in a message are processed as arguments, adding weak reasons reduces persuasion (e.g., Petty & Cacioppo, 1984). The mere number of arguments is only one of the many message factors that can influence persuasion by serving in different roles in different situations (see Petty & Wegener, 1998).

Like explicit measures, implicit measures are also affected by message factors. For example, Klauer, Musch, and Eder (2004) found that just adding more information to a proposal can influence automatic evaluations. We suggest that this effect can result from a variety of low and high thinking processes. For example, people could have a general positive reaction to the many arguments or could have generated more positive thoughts as the amount of information increased. As described earlier in this chapter, implicit measures have proven to be sensitive to a number of different message variables, such as content, direction, and quality of the message (see Briñol et al., 2009; see also Gawronski & Sritharan, Chapter 12, this volume).

Recipient Factors

Many recipient variables are relevant for persuasion, ranging from motives and abilities to individual differences in personality. For example, as noted earlier, bodily responses of the recipient

can influence persuasion by different processes. Notably, research using both explicit and implicit measures has shown that information presented while performing a positive behavior (e.g., head nodding, arm flexion, smiling) is evaluated more positively than information presented during a negative behavior (e.g., head shaking, arm extension, frowning; e.g., see Wells & Petty, 1980). Although many researchers have speculated that the underlying mechanism for all of these effects was a relatively simple, automatic one (probably because of the nature of the variable and the measure), subsequent research on embodied persuasion has revealed that behaviors such as head movements can influence attitudes not only by relatively simple processes but also by deliberative ones, including metacognitive mechanisms (for a review, see Briñol & Petty, 2008). Thus, bodily responses, like other variables, are capable of affecting both explicit and implicit attitudes through high and low thinking processes.

To illustrate the impact of bodily movements on an implicit measure by a high thinking process, DeMarree, Briñol, and Petty (2009) subliminally primed participants with words related to the black (vs. white) stereotype. Following this induction, participants were instructed to follow a ball moving vertically or horizontally on the screen with their heads. Participants then completed a measure of felt aggression adapted from prior research (i.e., DeMarree, Wheeler, & Petty, 2005), which was framed as a subliminal perception task. As part of this measure, participants were informed that a word would be subliminally presented on the screen and that they would then choose which of four answer choices had been presented. They were instructed that, although they would not be able to consciously process the stimulus, if they relied on the feelings they experienced during stimulus presentation, they would be able to choose the target word successfully. If participants were feeling more or less aggressive as a function of the prime, these feelings should be detected on this measure.[4] Consistent with the self-validation logic, DeMarree and colleagues found that the direction of the prime affected participants' reports of aggressive feelings (as well as their deliberative ratings of closeness to African Americans) in a stereotype-congruent fashion in the head-nodding but not the head-shaking condition. Thus, as was the case with head nodding affecting confidence in thoughts to a persuasive message (Briñol & Petty, 2003), so too did it appear to affect the validity and use of subtly activated mental content via priming.[5]

Another recipient factor that has been studied extensively is the emotions the target of persuasion is experiencing. In accord with the ELM, prior research has shown that a person's emotions can serve in multiple roles (see Petty et al., 2003). First and most simply, when thinking is constrained to be low (e.g., as a result of many distractions), then emotions tend to serve as simple associative cues and produce evaluations consistent with their valence (e.g., Petty et al., 1993). When thinking is high, one's emotions serve in other roles. First, emotions can be evaluated as evidence (e.g., negative emotions such as sadness or fear can lead to positive evaluations of a movie if these are the intended states; e.g., see Martin, 2000). Also, when thinking is high, emotions can bias the ongoing thoughts (e.g., positive consequences seem more likely when people are in a happy vs. a sad state; e.g., DeSteno, Petty, Wegener, & Rucker, 2000). Emotions can also affect the confidence people have in their thoughts but primarily when the emotions are experienced after rather than before thinking (Briñol, Petty, & Barden, 2007). Finally, when the likelihood of thinking is not constrained to be high or low by other variables, then emotions have been shown to affect the extent of thinking. For example, people might think about messages more when in a sad than a happy state because sadness either signals a problem to be solved (Schwarz, Bless, & Bohner, 1991) or conveys a sense of uncertainty (Tiedens & Linton, 2001). If people process a message more when in a sad than happy state, this means that they would be more persuaded by cogent arguments when sad than happy but less persuaded by specious arguments. To affect the extent of thinking, the experience of emotion should precede the presentation of the message.

As was the case with other persuasion variables, recent research has revealed that the emotions experienced by a person can influence not only explicit but also implicit measures. For example, Sassenberg and Moskowitz (2005) found that asking individuals to think about a situation in which they were happy with their ingroup increased the evaluation of that group on an implicit measure relative to thinking about situations in which they were angry with their ingroup. Using different emotions, Gemar, Segal, Sagrati, and Kennedy (2001) studied formerly depressed individuals and found that an implicit measure of self-esteem was affected in a negative way by an induction of sad (vs. control) mood (see also DeHart & Pelham, 2007). In another study conducted in the domain of intergroup attitudes, DeSteno, Dasgupta, Bartlett, and Cajdric (2004) found that anger, but not sadness, increased negativity toward outgroup members on an automatic measure.

Although the impact of emotional manipulations on implicit measures is clear in these studies, there are numerous mechanisms by which these effects could have occurred. As described earlier for explicit measures, we argue that an induction of emotion can affect implicit measures by a number of different processes depending on the circumstances (e.g., acting as a simple valence cue; affecting the direction or amount of processing). Because the process involved is potentially consequential for the strength of the attitude, future work should pay more attention to the mechanism involved when emotions influence implicit attitudes.

Consequences of Deliberative and Automatic Processes for Implicit Measures

The research we have reviewed suggests that deliberative and automatic measures of attitudes can change through the operation of source, message, and recipient factors affecting both low and high thought processes. As noted earlier, traditional research on explicit measures of change has shown that, although both high and low thought attitude change processes are possible, the consequences of those processes are different. In particular, according to the ELM, attitudes formed or changed through low thinking processes are less durable and impactful than attitudes changed via high thinking processes (see Petty et al., 1995, for a review). Although considerable research has demonstrated that extensive thinking enhances the strength of explicit attitudes, there is relatively little research addressing this possibility with respect to automatic attitudes. Attitude strength can be demonstrated in many different ways, ranging from enhanced accessibility of the attitude to influence on related thought processes and behavior.

We conducted several studies to test whether automatic attitudes might show some evidence of greater strength when changed through high- versus low-elaboration processes (Horcajo, Petty, & Briñol, 2009). For example, we noted earlier that attitude change processes that require thinking deeply about the attitude object are likely to result in attitude representations that are well integrated and connected with other relevant material in memory (see, e.g., McGuire, 1981; Tesser, 1978). Because of the strong linkage among constructs associated with high thinking, activating one mental representation induced via high thinking should more readily activate related cognitive elements. Indeed, within the literature on explicitly assessed attitudes, there is some suggestive evidence that it is easier to activate related constructs for high than for low need-for-cognition individuals (Petty, DeMarree, Briñol, Horcajo, & Strathman, 2008; Smith, Haugtvedt, & Petty, 1994). An important issue to examine is the extent to which this argument holds for automatic attitudes induced via high thinking processes.

We have recently used the classic paradigm on minority influence to address this issue. In this paradigm, participants receive persuasive information that is endorsed by either a numerical minority or a majority source. The traditional result for this paradigm is that, although minorities produce little change on explicit measures directly linked to the attitude object, they can sometimes produce change on explicit measures indirectly related to the proposal (e.g., changing on birth control when the message is on abortion; see Mugny & Perez, 1991). This finding has been interpreted in terms of elaboration differences, with minority sources leading to more deliberative processing of the information compared with majority sources (Baker & Petty, 1994; Moscovici, Mucchi-Faina, & Maass, 1994). If participants exposed to minority sources engage in greater message processing, then change on indirect topics becomes more likely as the implications of the information on the direct topic percolate through the cognitive system and impact related beliefs (e.g., see McGuire, 1981).

To examine the implications of these findings for automatic attitudes, Horcajo, Petty, and Briñol (2009) told participants that they were helping out with research designed to assess possible changes in the institutional color representing their university. Following this cover story, participants were exposed to a strong or weak message in favor of the color green endorsed by either a majority or a minority status source. We measured indirect automatic change by using an IAT toward the brand Heineken, a product associated with the color green. That is, the logo of the brand is green and they use the slogan "Think in green" in many of their marketing campaigns. The results showed that only in the minority source condition were attitudes toward Heineken more favorable as a result of the message advocating the color green. If minority sources foster more thinking than majority sources, these findings provide some evidence suggesting that for implicit measures deliberative processes can lead to changes on automatic measures though a process of spreading activation (i.e., from green to Heineken).

SUMMARY AND CONCLUSIONS

By understanding the basic mechanisms of persuasion, we know that numerous variables are capable of affecting both explicit and implicit measures relevant to attitude change by a variety of different processes. Like explicit measures, implicit measures can change as the result of one or more of these mechanisms: (1) affecting the amount of information processing; (2) affecting the direction (valence) of the thoughts that are generated; (3) affecting confidence in one's thoughts (or other structural features); (4) serving as persuasive arguments or evidence, or (5) serving as simple cues. We have reviewed some evidence that both explicit and implicit attitude measures are susceptible to these low and high thinking processes. We also emphasized the idea that just as high thought processes can produce different consequences than low thought processes when explicit measures are involved (e.g., greater spreading activation), the same appears to be true for implicit measures. Finally, we noted that explicit and implicit measures can show similar outcomes (e.g., when people endorse their automatic evaluative associations as valid) but also different outcomes in response to the same treatment (e.g., when people deny or reject one of their automatic evaluations).

NOTES

1. The *argument quality technique* is a procedure designed to assess mechanisms relevant to persuasion, such as the extent of information processing (Petty & Cacioppo, 1986). The arguments are typically pretested to produce the appropriate pattern of cognitive responding. That is, the strong arguments elicit mostly favorable thoughts and the weak arguments mostly unfavorable thoughts when people are instructed to think carefully about them. Notably, both the strong and weak arguments argue in favor of the proposal, but the strong arguments provide more compelling reasons than the weak arguments. 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 in favor of the issue, they would be equally persuasive if people do not think about their implications. Individuals not thinking about the message carefully could respond simply to the number of arguments presented or their initial gut reaction to the proposal (e.g., Petty & Cacioppo, 1984; see Petty & Wegener, 1998). The more attention paid to the information provided, however, the greater the difference in subsequent attitudes to strong versus weak arguments. For a variable (e.g., source credibility) to affect the extent of processing, it should precede presentation of the message.
2. Notably, the direction of the discrepancy did not further qualify the results.
3. With enough repetition and practice, however, correction processes can become automatic and be evident on implicit measures (e.g., Maddux, Barden, Brewer, & Petty, 2005).
4. We portray this as an implicit measure because participants' reports presumably reflect their aggressive feelings rather directly without much reflection.
5. It is important to highlight that even with subliminally induced thoughts and an unrecognized source of validation (head nodding), the validation processes examined in this research still might occur deliberatively; participants might simply be unaware of the *origin* of their conscious thoughts or why they feel valid.

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