Journal of Personality and Social Psychology
2007, Vol. 93, No. 5, 711–727

0022-3514/07/$12.00 DOI: 10.1037/0022-3514.93.5.711

Happiness Versus Sadness as a Determinant of Thought Confidence in Persuasion: A Self-Validation Analysis

Pablo Briñol
Universidad Autónoma de Madrid

Richard E. Petty
Ohio State University

Jamie Barden
Howard University

The present research introduces a new mechanism by which emotion can affect evaluation. On the basis of the self-validation hypothesis (R. E. Petty, P. Briñol, & Z. L. Tormala, 2002), the authors predicted and found that emotion can influence evaluative judgments by affecting the confidence people have in their thoughts to a persuasive message. In each study, participants first read a strong or weak persuasive communication. After listing their thoughts about the message, participants were induced to feel happy or sad. Relative to sad participants, those put in a happy state reported more thought confidence. As a consequence, the effect of argument quality on attitudes was greater for happy than for sad participants. These self-validation effects generalized across different emotion inductions, different persuasion topics, and different measures of thought confidence. In one study, happy and sad conditions each differed from a neutral affect control. Most important, these metacognitive effects of emotion only occurred under high elaboration conditions. In contrast, individuals with relatively low motivation to think showed a main effect of emotion on attitudes, regardless of argument quality.

Keywords: persuasion, attitudes, emotion, metacognition, validation

The impact of experienced emotions on information processing and social judgment has been a central concern in psychology (e.g., Forgas, 2001). One topic that has received particular attention over the last 20 years is the impact of emotions on persuasion (see Petty, Fabrigar, & Wegener, 2003). In many of these investigations, as in the current one, emotions have been studied as incidental affect, which derives from a source independent of the persuasive communication. Initial investigations indicated that emotional states had a simple relationship with persuasion whereby the presence of positive states generally led to increased attitude change compared with negative states. However, subsequent findings have suggested that the relationship between emotions and persuasion is more complex, with emotion having multiple effects via multiple processes (e.g., Petty, Schumann, Richman, & Strathman, 1993).

Multiprocess theories of persuasion such as the elaboration likelihood model (ELM; Petty & Cacioppo, 1986) and the heuristic–systematic model (Chaiken, Liberman, & Eagly, 1989) provide a general framework to organize the mechanisms by which incidental emotion impacts persuasion. The ELM, for instance, holds that attitude change occurs through different processes depending on the extent of elaboration the individual engages in regarding the message. After reviewing the roles for emotion that have already been documented in the literature, we propose and test a new role that emotion can serve in persuasion settings.

From past studies, we know that when elaboration is constrained to be low (i.e., low motivation and ability to think), persuasion-relevant variables such as emotion can have an impact on attitudes through relatively low effort peripheral processes (Petty et al., 1993). A number of specific low effort mechanisms have been proposed to explain the effects of emotion under these restricted elaboration conditions, including classical conditioning (Staats & Staats, 1958), use of emotion-based heuristics (e.g., "I feel good, so I must like it"; Chaiken, 1987), and misattribution of one's emotional state (Zillmann, 1978). In each case, however, the effect of emotion is direct such that positive states lead to more persuasion than do negative ones.

When people are not constrained to either high or low elaboration, emotional states have been shown to impact persuasion by influencing the extent of processing that a persuasive message receives. Most studies have compared happiness with sadness. According to Mackie and Worth (1989), happiness interferes with cognitive capacity in comparison to a neutral state, resulting in a decrease in elaborative processing. According to the feelings-as-information viewpoint (e.g., Schwarz, Bless, & Bohner, 1991), sadness indicates that the current environment is problematic, motivating a high level of effortful processing, whereas happiness

Pablo Briñol, Department of Social Psychology and Methodology, Universidad Autónoma de Madrid, Madrid, Spain; Richard E. Petty, Department of Psychology, Ohio State University; Jamie Barden, Department of Psychology, Howard University.

We thank all of the members of the 2000–2007 Groups for Attitudes and Persuasion at Ohio State University for providing feedback on the experiments reported in this article. We also thank Gerald Clore for his feedback on an earlier version of this article and Derek Rucker for his help with data analyses in Study 3.

Correspondence concerning this article should be addressed to Richard E. Petty, Department of Psychology, Ohio State University, 1835 Neil Avenue Mall, Columbus, OH 43210-1222. E-mail: petty.1@osu.edu

indicates that the current environment is safe and therefore a low level of cognitive effort is satisfactory. In a related argument, Tiedens and Linton (2001) suggested that sadness is typically associated with less confidence than happiness, leading to more thinking in an effort to reduce uncertainty. According to the hedonic contingency view (Wegener, Petty, & Smith, 1995), individuals in a happy mood wish to maintain this state and are thus highly sensitive to the hedonic implications of messages that they encounter. Because of this, they may be motivated to avoid processing information that might threaten their happiness (such as counterattitudinal communications). Thus, there are several accounts related to both motivation and ability to explain the typical finding that when thinking is unconstrained, happiness often leads to decreases in the extent of message processing compared with sadness. The end result of this decreased thinking is that the attitudes of people in a happy state tend to be less affected by the quality of the arguments in a message than people in a sad state.[1]

Finally, when elaboration is constrained to be high, the impact of emotion works by different, more cognitively effortful processes. First, one's emotions can be scrutinized as a piece of evidence relevant to the merits of an attitude object (e.g., Martin, 2000). Second, according to associative network theories of memory, emotions can facilitate the retrieval of emotionally congruent information and inhibit the retrieval of emotionally incongruent information (Blaney, 1986; Bower, 1981; Clark & Isen, 1982; but see also Parrot & Sabini, 1990). Because of this, under high thinking conditions emotions have been shown to bias the thoughts that come to mind about a persuasive message (Petty et al., 1993) and have increased the perceived likelihood of emotionally congruent versus emotionally incongruent consequences (DeSteno, Petty, Rucker, Wegener, & Braverman, 2004; Wegener, Petty, and Klein, 1994).[2]

The purpose of the current investigation is to propose and examine a new role for emotional states under high thinking conditions that has not been considered previously in persuasion research. In particular, we examine whether induced emotions can affect attitudes by instilling confidence or doubt in the thoughts people have in response to a message. The notion that variables can affect attitudes by affecting thought confidence is called the *self-validation hypothesis* (Petty, Briñol, & Tormala, 2002).

The Self-Validation Hypothesis

The key idea of the self-validation hypothesis (Petty et al., 2002) is that just as attitude confidence is an important determinant of which attitudes predict behavior (e.g., Fazio & Zanna, 1978), thought confidence is an important determinant of which thoughts predict attitudes. Considerable research has demonstrated that when people are motivated and able to think about an issue, the profile of thoughts they have in response to a message determines the extent of attitude change. Over the past 30 years, numerous studies have documented that both the number and valence of thoughts in response to a message are important contributors to attitude change (Petty & Wegener, 1998). The self-validation hypothesis suggests that in addition to number and valence, it is also important to consider thought confidence. According to the self-validation idea, any variable that increases confidence in thoughts is likely to increase reliance on those thoughts in determining attitudes. Increased confidence in positive thoughts should result in more favorable attitudes, whereas increased confidence in negative thoughts should result in less favorable attitudes. On the other hand, any variable that instills doubt in thoughts is likely to decrease reliance on those thoughts in determining attitudes. Thus, increasing doubt in positive thoughts results in less favorable attitudes, whereas increasing doubt in negative thoughts results in more favorable attitudes.

Several studies have provided support for the role of thought confidence in persuasion, thereby providing evidence for the self-validation hypothesis (e.g., Briñol & Petty, 2003; Briñol, Petty, & Tormala, 2004; Tormala, Briñol, & Petty, 2006). In one experiment, for instance, participants were exposed to a message containing strong or weak arguments before completing a typical thought listing task (see Cacioppo & Petty, 1981). Then, in a purportedly separate task Petty et al. (2002) asked participants to think about situations in which they had felt confidence or doubt in their thinking. Those who generated instances of confidence became more certain of the validity of their thoughts to the persuasive message than those who generated instances of doubt. Furthermore, this confidence led to greater persuasion when the message arguments were strong and to less persuasion when the arguments were weak. This is because confidence led people to rely on the favorable thoughts generated in response to strong arguments and the unfavorable thoughts generated in response to weak arguments. Individuals who were induced to doubt the validity of their thoughts were less reliant on them in forming attitudes even though the number and valence of thoughts was the same as for those induced to feel confidence.

It is important that prior research has suggested that self-validation effects are most pronounced under high thinking conditions. For example, in prior research head nodding affected confidence in thoughts when individuals were high but not low in need for cognition (Cacioppo & Petty, 1982) and when the issue was high but not low in personal relevance (Petty & Cacioppo, 1979). Relatively high elaboration is presumably a requirement for self-validation effects for at least two reasons. First, if people have few thoughts, then thought confidence has little effect. Second, the same variables that would increase thinking (e.g., personal relevance) would also likely increase caring about one's thoughts. If people do not care enough to generate thoughts in the first place, they are hardly likely to care enough to think about the validity of their thoughts (Petty, Briñol, Tormala, & Wegener, 2007).

---

[1] Emotional states other than happiness and sadness have produced more mixed results. For example, anger, a negative state, has been associated with decreased information processing. This could be due to the enhanced confidence associated with it (Tiedens & Linton, 2001) or because it might be adaptive to respond relatively quickly in situations involving potential harm (Bodenhausen, Sheppard, & Kramer, 1994).

[2] Emotions can also influence dimensions of thinking other than amount and direction. For example, in an extensive program of research, Isen and colleagues (e.g., Isen, 1999b) have shown that positive emotions produced patterns of thoughts that were more unusual, flexible, and creative. Consistent with this view, subsequent research has shown that the attentional and cognitive processes of people experiencing positive emotions are characterized by a global rather than a local focus (Fredrickson & Branigan, 2004; Gasper & Clore, 2002). This idea has guided some persuasion work as well (e.g., Bless, Mackie, & Schwarz, 1992).

The self-validation hypothesis provides a new mechanism by which classic persuasion variables can have an impact on attitudes. That is, in addition to serving as cues or arguments, or affecting the number and valence of thoughts that come to mind (see Petty & Cacioppo, 1986), variables can also influence the confidence people have in their thoughts and thus whether they rely on their thoughts in forming attitudes. In line with this logic, the present research argues and provides the first evidence for the idea that emotions can influence attitude change by affecting the extent to which people rely on their thoughts. As explained further below, we hypothesized that happiness increases confidence relative to sadness, and thus people in a happy state should be more reliant on their thoughts than people in a sad state. As a consequence, the self-validation notion predicts that happy versus sad states can increase or decrease persuasion depending on the direction of the thoughts generated in response to the message.

Emotion and Confidence

Our key self-validation hypothesis is based on the notion that emotions can be associated with confidence or doubt. This argument is in line with appraisal theories of emotion, which hold that emotions can be differentiated beyond their positive and negative valence and that cognitive concomitants of emotion can have important consequences for subsequent judgments (Smith & Ellsworth, 1985). Across many studies, researchers have shown that there are critical dimensions in which emotional experiences vary (e.g., Dunn & Schweitzer, 2005; Keltner, Ellsworth, & Edwards, 1993; Lerner & Keltner, 2000).

Particularly relevant to the present research, studies on appraisal theory have shown that the experience of some emotions is accompanied by feeling certain, having a sense of understanding what is happening in the current situation, and feeling able to predict what will happen next. In contrast, other emotions are characterized by feeling uncertain, not understanding what is happening, and feeling unsure about what will happen next (Ellsworth & Smith, 1988; Roseman, 1984; Scherer, 1984; Smith & Ellsworth, 1985; Tiedens & Linton, 2001). Emotions such as happiness, anger, disgust, and contentment are associated with a sense of certainty, whereas the emotions of sadness, hope, surprise, fear, and worry are associated with a sense of uncertainty.

The current work relies on the notion that happiness is associated with increased confidence, whereas sadness or depression is associated with decreased confidence (e.g., Gleicher & Weary, 1991; see Clore, Gasper, & Garvin, 2001, for a review). Furthermore, happiness relative to sadness has been shown to increase the confidence with which people use a wide variety of information that happens to be accessible at the time, including behavioral scripts (Bless et al., 1996), expectations (Bodenhausen et al., 1994), general categories (Isen & Daubman, 1984), and stereotypes (Wyer, Clore, & Isbell, 1999). Taken together, these studies suggest that happy versus sad states can influence the confidence with which people hold their available thoughts, regardless of the type or nature of those thoughts.

Applied to persuasion, we begin with the assumption that when a persuasive message is processed under high elaboration conditions (e.g., high personal relevance; Petty & Cacioppo, 1979), people typically generate issue-relevant thoughts to the message. Second, according to the self-validation framework, confidence stemming from irrelevant sources, such as one's emotional state, can become associated with these thoughts to the message, validating or invalidating the thoughts (Petty et al., 2002). This leads to the prediction that if thoughts are favorable to the advocated position, then happiness (as opposed to sadness) will facilitate confidence in those thoughts, leading to more persuasion. On the other hand, if thoughts are unfavorable, then happiness (as opposed to sadness) will facilitate confidence in those negative thoughts, leading to less persuasion. Or stated differently, if happiness is more likely to validate one's thoughts than sadness, then the valence of one's thoughts in response to a message should be a more important determinant of attitudes under conditions of happiness than sadness.

Critically, prior research on self-validation indicates that variables are especially likely to affect thought confidence when they are introduced after information processing has already taken place rather than before it has occurred. That is, for a variable to affect thought confidence (instead of the number or direction of the thoughts), it is best to induce it after information processing when people are most likely to reflect on the thoughts they have generated.

Emotional State, Thought Confidence, and Persuasion

As just explained, the self-validation hypothesis applied to emotion and persuasion predicts that people in a happy state should show attitudes that are more influenced by the valence of their thoughts than do people in a sad state. In persuasion research, one way to manipulate the valence of thoughts is to vary the quality of the arguments in a message (Petty, Wells, & Brock, 1976). Because strong arguments elicit predominantly favorable thoughts and weak arguments elicit primarily unfavorable thoughts, if happiness increases reliance on thoughts more than sadness, this means that happy people should be more influenced by argument quality than sad individuals. It is interesting that in prior research in which happiness versus sadness has been manipulated along with argument quality, the dominant finding in the literature is just the opposite. However, in virtually all of the prior studies manipulating emotional state and argument quality, the manipulation of emotional state has preceded presentation of the persuasive message. As explained earlier, in this order emotions can affect the amount of information processing that takes place. Because happiness tends to decrease processing relative to sadness (especially of counterattitudinal messages), the dominant finding has been that argument quality effects were reduced under happiness.

The self-validation hypothesis, however, applies when emotional states are induced after information processing has taken place. We were only able to locate one published article in which emotional state was manipulated after people had processed a message containing strong or weak arguments. It is interesting that this research by Bless, Mackie, and Schwarz (1992) produced a pattern that was consistent with the self-validation hypothesis, and it stands in stark contrast to the results obtained in the many studies in which emotion has been induced prior to a message.

In Study 1 of Bless et al.'s (1992) research, the order of the emotion induction was directly manipulated along with argument quality. In the order that has dominated the literature (i.e., emotion before message), argument quality impacted attitudes under sadness but not happiness. This was consistent with the idea that

happiness reduces message processing. However, when emotional state was induced after the message, the opposite interaction pattern emerged. To explain this pattern, Bless et al. argued that happiness leads to retrieval of just a single evaluation of the arguments, which produces large argument quality effects, because simple structures tend to be more extreme (Judd & Lusk, 1984). On the other hand, sadness leads to retrieval and careful postmessage processing of the details of the message.

Although Bless et al. (1992) provided a plausible account of their findings, the self-validation hypothesis provides an alternative explanation for the same results. That is, argument quality could have had a larger impact on attitudes when happiness followed message processing because people in a happy state relied more on the thoughts that they generated than did people in a sad state. Although the self-validation hypothesis offers a plausible alternative explanation for the key results of Bless et al., it is also completely speculative. The first study of the present research was designed to provide an explicit test of the self-validation hypothesis for the impact of happiness versus sadness on persuasion.

Overview of the Present Research

The goal of the present research was to further examine the impact of emotion on attitude change when the emotional state follows a persuasion message. In particular, we aimed to distinguish between the self-validation hypothesis and other previously postulated mechanisms of emotion effects on persuasion by testing the following: (a) whether emotion can influence the amount of confidence people have in their own thoughts about a message, (b) whether thought confidence can mediate the persuasive effects of emotion on attitude change, and (c) whether this effect is moderated by elaboration. If emotion does influence the confidence with which people hold their cognitive responses to a persuasive message, we would expect happiness to increase argument quality effects relative to sadness, especially under high thinking conditions. This finding would be important not only because it would extend the self-validation effect to a new and important variable—emotion—but also because it would suggest a relatively unexplored role for emotion in the persuasion process and account for anomalous prior research.

We conducted a series of studies to assess the role of self-validation processes as an account for emotion effects on persuasion. The logic was similar across the studies. In each study, college students read a persuasive message composed of strong or weak arguments. This manipulation was designed to produce mostly positive or negative thoughts toward the proposal of the message (Petty & Cacioppo, 1986). After receiving the message, participants were induced into either a happy or a sad state (or neutral affect). Again, we expected emotion to affect thought confidence such that it would be higher with happiness than sadness. Furthermore, across the studies we aimed to show that thought confidence mediates the impact of emotion on attitude change, but only for people who are highly motivated to think about the information in the message. After demonstrating the basic self-validation pattern on attitudes in Experiment 1, we turn to questions of mediation, moderation, and ecological validity in the remaining studies.

Experiment 1

Experiment 1 was designed to provide an initial examination of the role of emotion in persuasion through self-validation processes. All participants received a persuasive message composed of strong or weak arguments and then listed their thoughts about the message. Then, participants' emotional state was manipulated by asking them to remember and write down personal experiences in which they felt happy or sad. Following the emotion induction, participants reported their attitudes toward the proposal of the message. On the basis of the self-validation hypothesis, we predicted that emotion would interact with argument quality to influence persuasion. More specifically, this interaction would indicate that the effect of argument quality on attitudes is greater with happiness than with sadness.

It is important that the present study was also designed to test the specific conditions under which emotion can influence persuasion through self-validation processes. Thus, message focus was also manipulated in this study to parallel the manipulation used by Bless et al. (1992, Study 2). More concretely, after the thought listing and just before the attitude measures, half of the participants were asked to rate the quality of the arguments contained in the message. The other half of the participants did not receive this question and reported their attitudes immediately after listing their thoughts about the message. The inclusion of this question was designed to assess whether the predicted self-validation pattern required individuals to be artificially focused on the strength of message arguments before reporting attitudes.

Method

Participants and Design

Ninety-two undergraduate 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), emotion conditions (happy or sad), and the message focus conditions (argument focus or control), which were manipulated orthogonally.

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 participants were told that they were going to participate in two different research projects. Specifically, participants were told that the first project they would help out with was research designed to assess possible changes in Ohio State University's academic policies. All participants were told that Ohio State University was considering the possibility of instituting senior comprehensive exams in students' major areas for next year and that the University's Board of Trustees wanted to gauge students' reactions. We used a topic of high personal relevance for the participants to motivate them to thoughtfully process the information (Petty & Cacioppo, 1979; Petty et al., 2002). All participants received a message in favor of the comprehensive exams containing strong arguments or weak arguments.

After reading the message, participants were told that because of extra time remaining in the session, they would also be participat-

ing in another study about prototypical reactions to certain types of situations. As a part of this second research project, the manipulation of emotion was introduced. Participants received instructions to think and write about either happy or sad personal experiences. Following the emotion induction, participants were asked to think back to the message and write down the thoughts they already had regarding the proposal. Following the thought-listing procedure, we manipulated the message focus by asking (or not asking) participants to rate the strength of the arguments they read (Bless et al., 1992). Following this manipulation, participants were told that because their personal views on the comprehensive exam topic might have influenced their responses to the earlier questions, 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 emotion manipulation checks and several ancillary questions.

Independent Variables

Argument quality. The comprehensive exam message participants received contained either strong or weak arguments. This manipulation was designed to influence the direction (favorable or unfavorable) of the thoughts generated by participants. The arguments selected were adopted from previous research and have been shown many times to produce the appropriate pattern of thoughts (see Petty & Cacioppo, 1986). 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.

Emotion. Participants were asked to provide a vivid and detailed written report of either two happy or two sad events, ostensibly as part of a research project on prototypical reactions to certain types of situations. Reporting happy events was intended to induce a relatively happy state, whereas focusing on experienced sad events was intended to induce a relatively sad one. Asking people to remember happy and sad episodes has been found to be a highly effective procedure to induce differential emotions in past research (e.g., see Schwarz & Clore, 1983).

Message focus. After listing their thoughts and before reporting their attitudes, participants were asked (or not) to answer a question originally designed to influence global message representation in work by Bless et al. (1992). Following that research, half of the participants were asked to think about "the strength of the arguments you saw" and to rate the strength or weakness of the arguments using a 9-point rating scale, in which 9 indicated very strong and 1 very weak. According to Bless et al. (1992), this question should lead participants to form a global evaluation related only to the strength of the arguments contained in the message. The other half of participants did not receive the induction and served as a default control group.

Dependent Measures

Thoughts. Participants were instructed to list the thoughts that went through their minds as they read the message. Ten boxes were provided to list up to 10 individual thoughts. They were told to write 1 thought per box and not to worry about grammar or spelling (see Cacioppo & Petty, 1981, for additional details on the thought listing procedure).

Two judges unaware of participants' experimental condition coded the listed thoughts. Message-related thoughts were classified as favorable, unfavorable, or neutral toward the proposal. Thoughts that were irrelevant to the proposal (e.g., "it's hot in here") were excluded. Judges agreed on 93% of the thoughts coded, and disagreements were resolved by discussion. Following much prior research, as an index of the valence of message-related thoughts we subtracted the number of unfavorable thoughts from the number of favorable thoughts and divided the difference by the total number of message-related thoughts (e.g., Cacioppo & Petty, 1981).

Attitudes. Participants' attitudes toward senior comprehensive exams were assessed using a series of four 9-point (1–9) semantic differential scales (i.e., *bad–good, in favor–against, foolish–wise, harmful–beneficial*) on which they rated the comprehensive exam policy. Ratings on these items were highly intercorrelated (α = .94), so they were averaged to form one overall attitude index.

Emotion. At the end of the experiment, participants completed a manipulation check for the emotion induction. Specifically, participants were asked to report how they felt. Responses to various adjectives including happy, good, sad, down, and annoyed were given on 1–6 point scales, anchored by *not at all* and *very much*. Ratings on these items were highly intercorrelated (α = .95), so after reverse scoring negative items, they were averaged to form one overall emotion index.

Results

Emotion

We began by submitting the emotion manipulation check index to a 2 × 2 × 2 analysis of variance (ANOVA), with argument quality, emotion, and message focus as the independent variables. This analysis revealed a successful manipulation of emotion. Participants reported feeling significantly better after writing about happy (M = 5.03, SD = 1.20) rather than sad (M = 1.95, SD = 0.78) personal episodes, $F(1, 91) = 202.75$, $p < .0001$. There were no other significant effects (Fs < 1).

Thoughts

Consistent with our expectations, the 2 × 2 × 2 ANOVA revealed that participants' thoughts were more favorable toward the proposal after receiving the strong version of the message (M = 0.13, SD = 0.77) rather than the weak version of the message (M = −0.47, SD = 0.77), $F(1, 86) = 12.56$, $p < .001$. There were no other significant effects (all Fs < 1).

Attitudes

Responses to the attitude scales were scored so that higher values represented more favorable opinions toward the proposal. Consistent with our expectations, the 2 × 2 × 2 ANOVA revealed a main effect for argument quality such that participants' attitudes were more favorable toward the proposal after receiving the strong (M = 6.01, SD = 1.81) rather than the weak (M = 4.46, SD =

1.68) message, $F(1, 91) = 17.14$, $p < .0001$. More critical to our primary concerns, the predicted two-way interaction between argument quality and emotion was significant, $F(1, 91) = 4.10$, $p = .04$. As illustrated in Figure 1 (top panel), this interaction revealed that the effect of argument quality on attitudes was greater for happy than for sad participants. That is, for happy participants, those who received the strong message reported significantly more favorable attitudes toward the proposal ($M = 6.41$, $SD = 1.66$) than did those who received the weak message ($M = 4.16$, $SD = 1.72$), $t(46) = 4.59$, $p < .0001$. Attitudes of sad participants, however, did not differ for the strong ($M = 5.55$, $SD = 1.90$) and the weak ($M = 4.77$, $SD = 1.62$) message, $t(42) = -1.48$, $p = .15$. It is important that the three-way interaction between argument quality, emotion, and message focus was not significant, $F(1, 91) = 0.18$, $p = .66$, revealing that the effects of emotion were not restricted to the condition in which argument quality was made salient prior to reporting attitudes.

Discussion

Although many studies manipulating emotion prior to a message have found larger argument quality effects on attitudes for sad than for happy emotions (see reviews by Petty et al., 2003; Schwarz et al., 1991), the results of our Study 1 replicated the one published study that manipulated emotion following the presentation of a message. That is, we found a larger argument quality effect for participants in a happy than in a sad emotion. Notably, emotion did not affect the valence of the thoughts that participants reported.[3]

In addition, the observed emotion effects on attitudes were not moderated by our manipulation from Bless et al. (1992) of the presumed global mental representation of the message. As predicted, happiness enhanced the effect of thoughts on attitudes regardless of whether or not participants were asked to think about the strength of the arguments. According to our interpretation, this finding suggests that previous research by Bless et al. might not be due to their postulated mechanism but might instead be due to the effect of emotion on confidence. That is, when people felt happy after processing a message they were more likely to rely on the favorable (or unfavorable) thoughts that they generated than when they felt sad following message processing.[4]

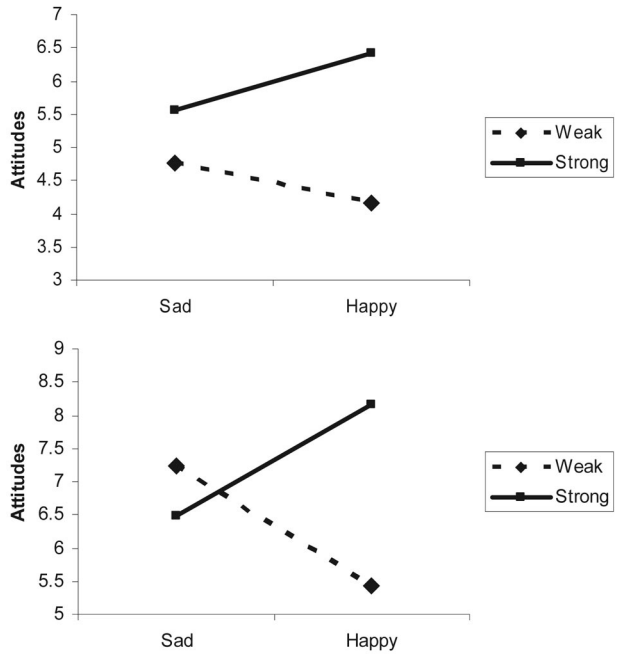

Figure 1. Attitudes toward the message as a function of argument quality and emotion in Experiment 1 (top panel); attitudes toward the message as a function of argument quality and emotion in Experiment 2 (bottom panel).

Experiment 2

Although the data from Experiment 1 replicated prior research in which emotional state was manipulated after message exposure and provided a data pattern that was consistent with the self-validation predictions, it did not show any link between emotion and confidence in one's thoughts. This mediational question was the focus of Experiment 2.

All participants received a persuasive message composed of strong or weak arguments about a proposal (a new identification card) and were asked to list their thoughts about it. Participants' emotion was then manipulated by asking them to remember and write down personal experiences in which they felt happy or sad. Of importance, following this participants reported the confidence that they had in their thoughts. Our hypothesis was that once again, people put in a happy state would be more influenced by argument quality than would those assigned to the sad condition. Furthermore, we expected that this effect would be mediated by changes in thought confidence.

Method

Participants and Design

Eighty-nine undergraduates at the Universidad Autónoma de Madrid participated in partial fulfillment of a course requirement. The students were randomly assigned to a 2 (argument quality: strong, weak) × 2 (emotion: happy, sad) between-subjects factorial design.

[3] One other study that manipulated emotion prior to a message also found greater argument quality effects for happy than for sad participants. In particular, Wegener et al. (1995) found this interaction pattern when the message was framed as uplifting. When the message was not framed as uplifting, the dominant interaction pattern was obtained (greater argument quality under sad than under happy emotion). According to their hedonic contingency explanation, the argument quality manipulation showed greater impact under happiness, because those in a happy state were more motivated to process the uplifting message to maintain their happiness. The hedonic contingency framework does not offer an explanation for the findings of Bless et al. (1992) or the current study because the messages used were pretested to be counterattitudinal.

[4] It is worth noting that a difference between this particular study and previous research is that we asked all participants to list their thoughts prior to the attitude judgment, which might have made the thoughts particularly salient. In subsequent studies, we address this possibly limiting condition by examining the moderating role of elaboration (Study 3) and whether the self-validation pattern holds when thoughts are not made salient (Study 4).

Procedure

As in the first study, participants were told that they were going to be involved in two different research projects. The first one was described as a part of an investigation into possible changes in their university's policies. They were told that it was important to pay attention to the message because they would be required to give their opinions about those policy changes at the end of the study. As in Study 1, we used a context of high personal relevance for all participants to motivate them to thoughtfully process the information (Petty & Cacioppo, 1979). All participants were told that their university was considering the possibility of requiring all students to carry personal identification cards. Participants received a strong or weak version of the message in favor of the identification cards and were asked to list their thoughts in response to the message

After the thought-listing task, participants were told that because there was extra time remaining in the session, they would be required to participate in another line of research about prototypical reactions to certain types of situations.[5] As a part of this second research project, participants were asked to think and write about personal experiences in which they felt happy or sad. Then, participants were asked to think back to the thoughts they listed about the message and, as a control and memory measure, respond to several questions regarding the confidence they had in those thoughts. Finally, participants were told that because their personal views on the proposal might have influenced their responses to the earlier questions, we wanted to know what their opinions were about the proposal.

Independent Variables

Argument quality. The critical editorial message advocated that all students be required to carry personal identification cards as part of a proposed new university security system. The cards would be required for admittance to classes, the library, and so forth. The topic and messages were pretested in previous research (Briñol & Petty, 2003). The argument quality manipulation was designed to influence the favorability of participants' thoughts (Petty & Cacioppo, 1986) and was pretested in previous research so that the strong version of the message produced mostly favorable thoughts whereas the weak one produced mostly negative thoughts. The gist of one of the strong arguments in favor of this proposal was that with their new cards, students could check their grades and exam comments securely through the Internet. In contrast, the gist of one of the weak arguments was that some campus guards felt that with the new system in place, they would be able to have twice as much time for lunch.

Emotion. The emotion induction was identical to Study 1. Participants received instructions to think about either happy or sad personal experiences and to write them on a piece of paper.

Dependent Measures

Attitudes. Participants were informed that it was important to assess their attitudes toward the security card proposal because what they thought might have influenced their earlier responses. Participants responded to a series of 11-point semantic differential scales (i.e., *negative–positive, beneficial–harmful, agree–disagree, desirable–undesirable*) regarding the proposed new security system. Responses to the attitude scales were scored so that higher values represented more favorable opinions of the proposal. Ratings on the different scales were highly intercorrelated (α = .94) and were averaged to create a composite measure of attitude toward the issue.

Thoughts. Following the message, participants completed the same thought listing measure included in Study 1. Also as in Study 1, two judges unaware of participants' experimental conditions coded the thoughts as favorable, unfavorable, or neutral toward the message proposal. Judges agreed on 91% of the thoughts coded, and disagreements were resolved by discussion. Only message-related thoughts were included in subsequent analyses. An index of favorability of message-related thoughts was formed by subtracting the number of unfavorable message-related thoughts from the number of favorable message-related thoughts and dividing by the total number of message-related thoughts.

Thought confidence. After the emotion induction task and before measuring attitudes toward the proposal, participants were asked to think back to the thoughts they listed about the message and to rate their overall confidence in those thoughts. Confidence was rated on a 7-point semantic differential scale anchored at 1 (*not at all confident*) and 7 (*extremely confident*).

Emotion. Following the attitude measures, current feelings were rated on a series of 9-point semantic differential scales anchored with *excited–relaxed, sad–happy, bored–interested, depressed–uplifted,* and *unpleasant–pleasant*. A composite measure of emotion was computed by averaging responses to these items (α = .79).

Results

All dependent measures were submitted to 2 (emotion: happy, sad) × 2 (argument quality: weak, strong) ANOVAs.

Emotion

The 2 × 2 ANOVA on the emotion index revealed only a significant main effect of the emotion manipulation, $F(1, 89) = 10.77$, $p = .001$, such that happy participants reported feeling better ($M = 7.13$, $SD = 1.25$) than did sad participants ($M = 6.20$, $SD = 1.27$).

Attitude

Results of the 2 × 2 ANOVA on attitudes revealed a significant main effect of argument quality, such that participants who received strong arguments held more favorable attitudes toward the proposal ($M = 7.50$, $SD = 1.65$) than did those who received weak arguments ($M = 6.38$, $SD = 1.98$), $F(1, 89) = 7.69$, $p = .007$. It is more interesting that consistent with the self-validation hypothesis, a significant Argument Quality × Emotion interaction emerged, $F(1, 89) = 24.15$, $p < .001$. As illustrated in Figure 1 (bottom panel), these analyses revealed that the effect of argument

[5] In Study 1, the emotion induction followed the message but preceded the thought listing. In this study, the thought listing came before the emotion induction to ensure that the number and/or valence of thoughts listed could not be affected by the emotion manipulation.

quality on attitudes was greater for happy than for sad participants. That is, for happy participants, those who received the strong message reported significantly more favorable attitudes toward the proposal ($M = 8.16$, $SD = 1.49$) than did those who received the weak message ($M = 5.44$, $SD = 1.98$), $t(46) = -5.38$, $p < .001$. Attitudes of sad participants, however, did not differ for the strong ($M = 6.48$, $SD = 1.37$) and the weak ($M = 7.24$, $SD = 1.57$) messages, $t(39) = 1.57$, $p = .12$.

Thoughts

As expected, analysis of the thought index only yielded a significant main effect of argument quality, $F(1, 88) = 15.12$ $p < .001$. That is, participants' thoughts were more favorable toward the advocacy after receiving strong arguments ($M = 0.25$, $SD = 0.47$) than weak arguments ($M = -0.27$, $SD = 0.67$).

Thought Confidence

As expected, a 2 × 2 ANOVA on this index revealed only a significant main effect of the emotion manipulation, $F(1, 89) = 19.49$, $p < .0001$, such that happy participants reported significantly more confidence in their own thoughts ($M = 5.27$, $SD = 1.00$) than did sad participants ($M = 4.27$, $SD = 1.02$). No other significant effects emerged ($ps > .15$)

Mediation of the Emotion Effect

In addition to replicating the attitude results from Study 1 and investigating the effect of emotion on thought confidence, we examined whether thought confidence mediated the effect of emotion on attitudes. To address this issue, we used the technique recommended by Baron and Kenny (1986). Prior to analysis, the attitude data for the weak argument conditions were reversed scored, so that this group would have the same direction of effect as the strong arguments group. Consistent with the self-validation hypothesis, we found evidence of the expected mediation. There was a significant positive effect of emotion on attitudes, $\beta = .46$, $t(88) = 4.94$, $p < .001$, and on confidence in thoughts, $\beta = .44$, $t(88) = 4.65$, $p < .001$. Moreover, there was a significant positive relationship between confidence in thoughts and attitudes, $\beta = .49$, $t(88) = 5.29$, $p < .001$. As illustrated in Figure 2, when both emotion and confidence in thoughts were included as predictors in the regression equation, confidence in thoughts still predicted attitudes, $\beta = .35$, $t(88) = 3.58$, $p = .001$, and so did emotion, $\beta = .31$, $t(88) = 3.11$, $p < .01$. It is important, however, that the decrease in the direct effect of emotion on attitudes was statistically significant ($z = 2.58$, $p < .001$). In other words, the effect of emotion on attitudes was at least partially mediated by confidence in thoughts.

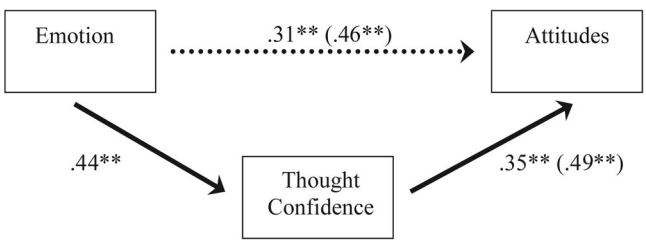

Figure 2. Mediation of the impact of emotion on attitudes in Experiment 2. Values in parentheses indicate the direct effect of the variable on attitudes prior to controlling for the effect of the other variable. $^{**}p < .01$.

Discussion

Consistent with the self-validation hypothesis, Study 2 showed that emotion can influence attitude change by affecting thought confidence. First, as intended, argument quality affected the direction of participants' cognitive responses. Second, emotion influenced the confidence with which participants held their thoughts. Most important, in accord with the self-validation hypothesis, the confidence with which participants held their thoughts mediated the effects of emotion on attitudes. To our knowledge, this is the first time that thought confidence has been found to mediate emotion effects on judgment. Specifically, thought confidence induced via happiness led participants to rely on their thoughts more than when they were in a sad state. The end result was that argument quality had a larger effect on attitudes when people were placed in a happy than in a sad emotion following the message.

The self-validation hypothesis predicts that the effects of emotion on persuasion should be most apparent when the likelihood of thinking is high. Because participants in our first two studies were told that their opinions would be assessed after the survey and the issue was relevant to the participants' university (Petty & Cacioppo, 1979), we assume that overall the likelihood of thinking was high. To provide further support for the self-validation effects of emotion, we would need to compare the reactions of individuals who were engaged in much versus little thinking about the message. Thus, the main goal of Study 3 was to examine whether the self-validation effect of emotion would be more likely to occur when people were actively thinking about the message than when they were not.

Experiment 3

Several changes were introduced in our third study. First, to generalize our results across topics, we used yet another persuasive issue. In addition, because the first two studies used topics that were counterattitudinal, Study 3 used a message containing information that was proattitudinal. By varying the direction of participants' prior attitudes toward the proposal, the present research sought to demonstrate that self-validation effects of emotion do not depend on the nature or the direction of the topic. Second, to generalize our results across manipulations, we used a different emotion induction. In the present study, instead of asking participants to think about personal happy or sad episodes as in our first studies, we used the Velten (1968) procedure. Third, the extent to which participants had confidence in their thoughts was assessed using a different measure. In Study 3, thought confidence was measured individually for each thought rather than as a global assessment of the whole group of thoughts. This change was intended to demonstrate that it does not matter how thought confidence is measured. Fourth, because measuring thought confidence before attitudes (as in Study 2) could increase its accessibility, we measured thought confidence after the attitude report in Study 3. This change was intended to show that the self-validation

effects of emotion do not depend on when thought confidence is assessed.

Of most importance, we included a measure of need for cognition (NC; Cacioppo & Petty, 1982) to assess the hypothesis that self-validation effects of emotion are most likely to occur when the extent of thinking is high. NC refers to the tendency to engage in and enjoy effortful thought. Prior research has shown that individuals high in NC tend to form attitudes on the basis of a careful analysis of the quality of the relevant information in a persuasive message, whereas people low in NC tend to be more reliant on simple peripheral cues in the persuasion context (see Cacioppo, Petty, Feinstein, & Jarvis, 1996, for a review). Also of importance is that high NC has been related to metacognitive processes such that individuals high (vs. low) in NC are more likely to evaluate their own thoughts for validity (Briñol & Petty, 2005).

In line with the self-validation hypothesis, we expected emotion to influence thought confidence, also replicating our previous study. We expected confidence in one's own thoughts to increase the effects of the direction of thoughts on attitudes. That is, happy participants were expected to show more argument quality effects than sad participants. It is important that we expected NC to moderate these effects with stronger self-validation effects for high than for low NC individuals. For low NC individuals, we expected emotion to be associated with the proposal in a more direct way, producing a cue effect such that more favorable attitudes should be evident for happy than for sad participants regardless of argument quality. A cue effect of emotion for individuals low in NC would replicate prior work (e.g., Petty et al., 1993), but the self-validation effect for emotion for people high in NC would be a new finding.

Method

Participants and Design

Seventy-nine undergraduates at Ohio State University participated in partial fulfillment of an introductory psychology course requirement. They were randomly assigned to experimental conditions in a 2 (emotion: happy, sad) $\times$ 2 (argument quality: strong, weak) between-participants factorial design. Participants also reported their NC.

Procedure

Participants were seated in a room with 10 computer workstations arranged to prevent visual contact among them. All of the information was presented on the computer using MediaLab software (Jarvis, 2000). The opening screen informed participants that they were going to engage in two different research projects. First, all participants read about a new policy as part of a survey for the state of Ohio. The survey was said to examine students' opinions toward a specific policy change regarding a foster care program. Then, participants received a strong or weak version of a message in favor of the Rhode Island Foster Care Program and were asked to list their thoughts in response to the message. Unlike Studies 1 and 2, the topic selected was low in personal relevance so individual differences in NC would determine the extent of thinking. After the thought-listing task, participants were told that because there was extra time remaining in the session, they would be required to participate in another research project for the School of Arts. Participants were induced to believe that the purpose of this second task was to investigate the skills and abilities required to play the role of someone else as an actor or actress. To assess their dramatic skills, we asked them to imagine themselves delivering statements as if they were acting out a dramatic script. Participants, then, were exposed to a set of happy or sad scripts. After completing the emotion induction, attitudes toward the Rhode Island Program were assessed as a last control and memory measure. Participants were also re-exposed to the thoughts they listed and were asked to rate each one for confidence. Finally, participants answered several ancillary questions and completed the NC scale.

Independent Variables

Argument quality. Participants received a message advocating the implementation of a new foster care program in the state of Ohio. The foster care program was described as a system designed to take care of children who come from broken homes as well as children whose parents are abusive, neglectful, or are unable to provide for them. Participants were randomly assigned to receive a message that contained either strong, cogent arguments or weak, specious ones. The arguments selected were pretested in previous research and were shown to produce the appropriate pattern of cognitive responding (Petty et al., 1993). 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 a strong argument in favor of the foster program was that brothers and sisters are an additional source of love and support for the social development of the child. The gist of other strong arguments were that the program offered a social worker to ensure that family and child made a good adjustment and that the foster children in the program were required to maintain good grades and good behavior to boost their self-confidence. In contrast, the gist of a weak argument in favor of the foster program was that the program recognizes that children need other children to fight with, and brothers and sisters provide an ideal opportunity for this to occur. The gist of other weak arguments were that the program offered a social worker to ensure the right distance between the family and the child and that the foster children in the program are required to maintain good grades and good behavior to look good to school teachers and others.

Emotion. Emotion inductions were accomplished by having participants complete the Velten technique (Velten, 1968). Briefly, in this induction procedure, participants receive instructions to feel what either a happy or a sad person would feel when having different thoughts that they were about to read. Participants are asked to read a series of statements designed to progressively induce happiness or sadness. Examples of the statements in the happy induction are "I do feel pretty good today," and "I am pleased that most people are so friendly to me." Examples of the sad statements are "I feel a little low today," and "I have too many bad things in my life."

This technique has been used successfully in a large number of studies to induce happiness and sadness (e.g., Frost & Green, 1982). The effects produced by this type of induction appear to be due in part to the somatic suggestions that are contained in the items. Although demand characteristics can play a role in the observed effects for this technique, Larsen and Sinnett (1991)

found that using a cover story to disguise the intent of the Velten statements reduces these concerns by lessening participants' knowledge of the expectations of the experimenter. For this reason, in the emotion induction portion of the present experiment, participants were led to believe that they were acting out a script designed to assess their dramatic skills as actors.

NC. Participants completed the 18-item version of the NC scale (Cacioppo, Petty, & Kao, 1984). This scale contains statements such as, "I prefer complex to simple problems," and "Thinking is not my idea of fun" (reversed score). Participants respond to each statement on a 5-point scale anchored at *extremely uncharacteristic of me* and *extremely characteristic of me*. Responses to each item were averaged to form a composite NC score ($\alpha = .91$). Scores were not affected by the emotion or the argument quality manipulations (Fs < 1).

Dependent Measures

Thoughts. Following the message, participants were instructed to list the thoughts that went through their minds as they read the message using the same procedure in our prior studies. Two judges unaware of participants' experimental condition coded thoughts as favorable, unfavorable, or neutral toward the proposal. Thoughts that were irrelevant to the proposal were excluded. Judges agreed on 92% of the thoughts coded, and disagreements were resolved by discussion. As an index of the valence of message-related thoughts, we subtracted the number of unfavorable thoughts from the number of favorable thoughts and divided the difference by the total number of message-related thoughts.

Attitudes. Participants' attitudes toward the foster care program were assessed using a series of 9-point semantic differential scales (i.e., *against–in favor, unfavorable–favorable, bad–good, foolish–wise, negative–positive, beneficial–harmful*) on which they rated the proposal. Ratings on the different scales were highly intercorrelated ($\alpha = .88$) and were averaged to create a composite measure of attitude toward the issue. Responses to the attitude scales were scored so that higher values represented more favorable opinions toward the foster care program.

Thought confidence. At the end of the experiment, the computer presented each of the thoughts entered back to the participants, and they were asked to rate the amount of confidence they had in the validity of each thought. Specifically, they rated each thought on a 9-point scale anchored at 1 (*not at all confident*) and 9 (*extremely confident*). These ratings were highly consistent with each other ($\alpha = .81$) and were averaged to form a single index of overall thought confidence for each participant.

Emotion. Participants rated how happy, content, sad, and down they felt. Responses to these items were given on scales ranging from 1 (*not at all*) to 6 (*extremely*). After reverse scoring the sad and down items, these ratings were averaged to form a single overall index of feelings ($\alpha = .90$).

Results

All dependent measures were submitted to a hierarchical regression analysis, with manipulated argument quality and emotion (dummy coded) and NC (continuous variable) as the independent variables. Scores on NC 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 last step (Cohen & Cohen, 1983).

Emotion

From the regression analyses conducted on this measure, only a significant main effect of the emotion manipulation emerged, $\beta = .85$, $t(78) = 14.05$, $p < .0001$. Validating the efficacy of the induction, this effect was that happy participants reported feeling better ($M = 4.95$, $SD = 0.79$) than did sad participants ($M = 2.29$, $SD = 0.87$).

Thoughts

As intended, participants' thoughts were relatively more favorable toward the proposal after receiving the strong version of the message ($M = 0.61$, $SD = 0.62$) rather than the weak version of the message ($M = 0.26$, $SD = 0.81$), $\beta = .23$, $t(74) = 2.06$, $p = .04$. This main effect was qualified by an interaction between argument quality and NC, $\beta = -.28$, $t(74) = -2.50$, $p = .01$. As in most prior research on NC and argument quality, the form of this interaction was such that the impact of argument quality on thought favorability was magnified as NC increased. This effect validates the utility of using NC in this study as a measure of the extent of thinking. No other effects emerged in the analysis.

Attitude

The regression analyses revealed a significant main effect for argument quality, $\beta = .25$, $t(78) = 2.29$, $p = .02$, indicating that attitudes toward the proposal were more favorable after receiving the strong version of the message ($M = 6.67$, $SD = 1.94$) than the weak one ($M = 5.94$, $SD = 1.44$).[6] A significant main effect for emotion also emerged, $\beta = .25$, $t(78) = 2.36$, $p = .02$, showing that participants reported more favorable attitudes toward the proposal when they were in a happy state ($M = 6.68$, $SD = 1.54$) than in a sad state ($M = 5.91$, $SD = 1.54$). This main effect was qualified by a significant interaction between emotion and NC, $\beta = -.23$, $t(78) = -2.15$, $p = .03$, revealing that as NC increased, emotion had less of a direct effect on attitudes. Of greater interest, the regression analysis revealed a significant interaction between argument quality and emotion, $\beta = .30$, $t(78) = 2.91$, $p = .005$. As predicted by the self-validation hypothesis, this interaction showed that the effect of argument quality on attitudes was only significant for happy participants ($p < .0001$) but not for sad participants ($p = .44$). This replicates the pattern of moderation observed in Studies 1 and 2.

Of greatest interest, the predicted three-way interaction between argument quality, emotion, and NC was also significant, $\beta = .24$, $t(78) = 2.34$, $p = .02$. To examine the basis of this interaction, we decomposed it using the recentering procedure advocated by Aiken and West (1991). This procedure revealed that the two-way interaction between argument quality and emotion was restricted

[6] It is worth noting that the two-way interaction between argument quality and NC obtained for thoughts was not significant for attitudes because sadness presumably undermined the validity of the thoughts for those high in NC.

to those participants with high NC. As depicted in Figure 3, among individuals high in NC (analyzed at +1 *SD*) there was a significant Argument Quality × Emotion interaction, β = .53, $t(78) = 3.79$, $p < .0001$, such that those in the happy emotion condition exhibited a significant argument quality effect, β = .68, $t(78) = 3.58$, $p < .0001$, whereas those in the sad emotion condition did not, β = .18, $t(78) = 0.18$, $p = .19$. In contrast, among participants low in NC (analyzed at −1 *SD*) there was not a significant Argument Quality × Emotion interaction, β = .03, $t(78) = 0.20$, $p = .84$. Participants low in NC only showed a significant main effect of emotion, β = .57, $t(78) = 3.72$, $p < .001$, with more favorable attitudes reported when they were in a happy than in a sad state.

Confidence

The regression procedure described above only revealed a significant main effect for emotion on thought confidence, β = .46, $t(78) = 4.41$, $p < .0001$. As anticipated, the confidence with which participants held their thoughts was higher when they were in a happy emotion ($M = 7.53$, $SD = 1.24$) than in a sad emotion ($M = 6.03$, $SD = 1.58$).

Mediation of the Emotion Effects

Self-validation theory predicts that confidence in thoughts will mediate the emotion effects on attitudes under high, but not low, elaboration conditions. We followed the technique recommended by Baron and Kenny (1986) and examined the mediating role of thought confidence separately for high and low NCs. High and low NCs were divided using a median split ($Mdn = 3.27$; range = 1.33–4.72).

For high NCs, we first reverse coded the attitude data for the weak arguments condition because emotion interacted with argument quality to affect attitudes. There was a significant positive effect of the emotion manipulation on attitudes, β = .54, $t(36) = 3.81$, $p = .001$, and on thought confidence, β = .57, $t(36) = 4.09$, $p < .001$. Moreover, there was a significant positive relationship between confidence in thoughts and attitudes, β = .58, $t(36) = 4.20$, $p < .001$. It is important that when both emotion and thought confidence were included as predictors in the regression equation, confidence in thoughts still predicted attitudes, β = .41, $t(36) = 2.48$, $p = .02$, but the emotion manipulation became marginally significant, β = .31, $t(36) = 1.94$, $p = .06$. Using a version of the Sobel test (Sobel, 1982) recommended by Baron and Kenny (1986), we found that the decrease in the direct effect of emotion on attitudes from the unmediated model to the mediated model was significant ($z = 2.12$, $p < .05$). This finding is consistent with self-validation theory and replicated the mediation pattern observed in Study 2.

For low NCs, we conducted the mediational analysis without reverse coding the attitude data because emotion had a direct effect on attitudes, rather than interacting with argument quality. First, emotion affected both attitudes, β = .43, $t(41) = 3.01$, $p = .004$, and confidence in thoughts, β = .37, $t(41) = 2.55$, $p = .01$. However, no relationship was found between confidence in thoughts and attitudes, β = .25, $t(32) = 1.67$, $p = .10$. Furthermore, when both emotion and confidence in thoughts were entered as predictors in the regression equation, the direct effect of emotion remained significant, β = .36, $t(41) = 2.41$, $p = .02$. This finding suggests that for low NCs, emotion had a direct impact on attitudes that was not mediated by thought confidence.

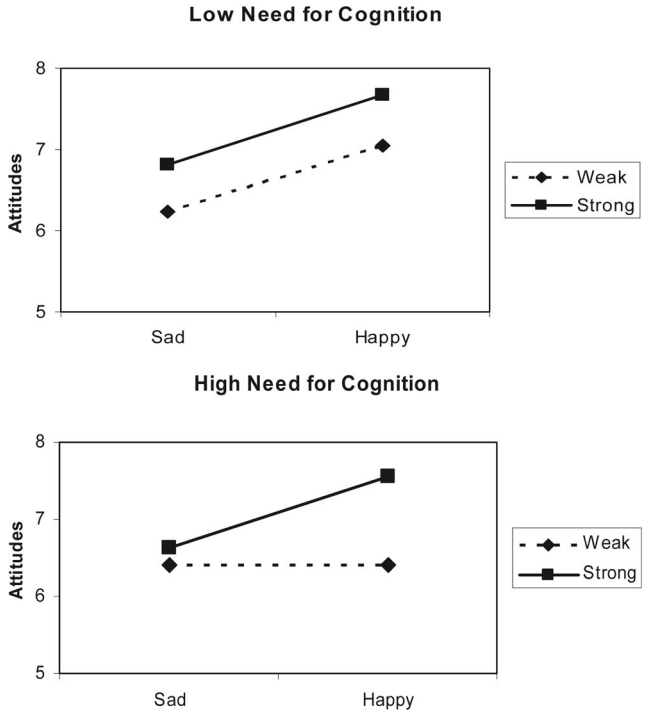

Figure 3. Experiment 3. Attitudes toward the message as a function of argument quality, emotion, and need for cognition (graphed at ±1 *SD*).

Discussion

Using a new attitude topic, a different emotion induction procedure, and a new measure of thought confidence, Study 3 again demonstrated that emotion can impact attitudes through self-validation processes. Emotion affected the confidence with which participants held their thoughts toward the proposal, replicating Study 2. It is important that Study 3 showed that how confidence is measured (i.e., global or individual ratings) did not affect the self-validation effects of emotion. Study 3 also demonstrated that the obtained effects do not depend on when confidence is assessed (i.e., before or after reporting attitudes).

Furthermore, thought confidence induced by emotion influenced persuasion only under high elaboration conditions (i.e., for those high in NC). Under these conditions, thought confidence mediated the effect of emotion on attitude change, replicating Study 2, and provided further evidence for this novel role of emotion in social judgment. Again, under high elaboration conditions, the effect of thought confidence induced by emotion was to produce greater argument quality effects for happy than for sad participants. In contrast, for people low in NC, emotions had a direct effect on attitudes unmediated by confidence in thoughts. That is, for low NC individuals, emotion acted as a simple cue leading to more positive attitudes when happy than when sad, regardless of argument quality. This is consistent with prior research suggesting that low elaboration individuals are more likely

to use their emotions as input to an affect heuristic (e.g., Petty et al., 1993).

Experiment 4

The studies reported so far provided convergent evidence regarding how emotion can influence attitude change by affecting thought confidence. Our final study was designed to address a few remaining questions. First, although Studies 2 and 3 have clearly established a link between emotion and thought confidence across paradigms and procedures, it is less clear from those studies whether the effects on persuasion were due to the impact of happiness, sadness, or both. Because different emotional states can have discrete effects (rather than falling along a continuum), we included a neutral affect condition in Study 3.

Second, it is possible that if emotion had an impact on the attention that people pay to their thoughts, this could provide an alternative mechanism to explain the present findings. There is some evidence that the positive affect induced by happiness can be less attention grabbing than the negative affect induced by sadness (e.g., Pratto & John, 1991). Assuming that in the current studies, positive affect was less likely to distract participants from their thoughts than negative affect, this could lead participants in a positive mood to make greater use of their thoughts in judging the attitude object.

Although this provides a potential alternative account of our findings, the theory and the majority of evidence on emotion suggest the exact opposite prediction. That is, if anything, positive affect has been argued to be more distracting than negative affect. For example, Mackie and colleagues (e.g., Mackie & Worth, 1989; Stroessner and Mackie, 1992) have argued that happiness consumes more cognitive capacity than sadness, giving happy people reduced cognitive resources to process other stimuli. Also, in an extensive program of research, Isen and colleagues (e.g., Kahn & Isen, 1993; see Isen, 1999a) have shown that positive emotions increase people's preference for variety. Finally, research on emotion and attention has shown that positive emotions are characterized by a global rather than a local focus, suggesting that positive emotions help to broaden the scope of attention, which should lead to more rather than less distraction (e.g., Fredrickson & Branigan, 2004; Gasper & Clore, 2002). It should also be noted that this alternative does not easily account for the mediational results obtained in Studies 2 and 3. Nevertheless, to provide an additional opportunity for this alternative to manifest itself, we assessed people's reports of attention and distraction in Study 4.

Third, the studies to this point have established that through self-validation processes, emotion can have an impact on attitudes. It remains an open question whether the impact of emotion on self-validation could extend to other outcomes that are the downstream consequences of attitudes, such as behavioral intentions. If so, this would establish that the current mechanism has greater real-world implications, because previous research has established that behavioral intentions are the best predictors of behavior (e.g., Fishbein & Ajzen, 1975). Thus, in the present study, we aimed to demonstrate that the self-validation effects of emotion can influence proposal-related behavioral intentions.

This study was similar to Study 1. Participants received a persuasive message in favor of comprehensive exams composed of strong or weak arguments. On the basis of the results from Study 1, we knew that this manipulation should influence the direction of thoughts that people generate toward the proposal. Following the message, participants' emotional state was manipulated by asking them to remember past experiences in which they felt happy or sad. Participants in the neutral affect group were asked to remember what they did 1 week ago. Consistent with the self-validation hypothesis, we expected happy participants to show greater argument quality effects on behavioral intentions than sad participants. In the absence of reasons to the contrary, we expected the neutral condition to fall in between the happy and sad conditions.

Method

Participants and Design

Seventy-eight undergraduates at Ohio State University participated in partial fulfillment of an introductory psychology course requirement. They were randomly assigned to experimental conditions in a 2 (argument quality: strong, weak) × 3 (emotion: happy, sad, neutral) between-participants factorial design.

Procedure

The procedure was similar to Study 1. Participants were seated in a room with 10 computer workstations arranged to prevent visual contact between participants. All of the information was presented on computers using MediaLab software. Participants were informed that they were going to engage in two different research projects. First, participants were told that Ohio State University was considering the possibility of instituting senior comprehensive exams in students' major areas for next year. We used a topic of high personal relevance for the participants to motivate them to thoughtfully process the information (Petty & Cacioppo, 1979). All participants received a message in favor of the comprehensive exams containing strong or weak arguments.

After reading the message, participants were told that because of extra time remaining in the session, they would also be participating in another study about prototypical reactions to certain types of situations. As a part of this second research project, the manipulation of emotion was introduced. Participants received instructions either to think and write about happy or sad personal experiences or to describe the details of what they did 7 days ago (neutral group). Following the emotion induction, as a last control measure, behavioral intentions toward the proposal were assessed. Finally, participants answered several ancillary questions.

Independent Variables

Argument quality. The comprehensive exam message participants received contained either strong or weak arguments. This manipulation was identical to the one used in Study 1.

Emotion. Similar to Study 1, participants were asked to provide a vivid and detailed written report of either two happy or two sad events, ostensibly as part of a research project on prototypical reactions to certain types of situations. In contrast, participants in the neutral affect group were asked to provide a description of what they did on the same day of the previous week (e.g., on the previous Monday if their session was on Monday). Similar tasks have been used in prior research to serve as a neutral condition for comparison purposes (e.g., Tiedens & Linton, 2001, Experiment 4).

Dependent Measures

Behavioral intentions. After reading the message, participants were told that it was important to assess their reactions toward the proposal. Specifically, participants were told that we were interested in finding people who would be willing to volunteer to help with the exam policy. Two items were used to measure participants' behavioral intentions toward senior comprehensive exams. Participants were asked about how much time they would be willing to devote to making phone calls to students to tell them about the benefits of the exam policy. They responded on scales ranging from 1 (*0 minutes*) to 9 (*80 minutes*) in blocks of 10 min. Participants also responded to an item asking how many letters they would be willing to write to students to tell them about the benefits of this policy. Responses were made on another 9-point scale, ranging from 1 (*0 letters*) to 9 (*40 letters*). Ratings on these items were intercorrelated ($r = .65$, $p < .0001$), so they were standardized and averaged to form one overall behavioral intention index.

Emotion. Participants completed a manipulation check for the emotion induction. Specifically, participants were asked to report how they felt on a series of scales designed to tap into happiness versus sadness. Responses to the adjectives happy, good, content, pleasant, sad, down, and negative were given on 1- to 6-point scales, anchored by *not at all* and *very much*. Ratings on these items were highly intercorrelated ($\alpha = .91$), so after reverse scoring negative items, they were averaged to form one overall emotion index.

Distraction. To assess extent of engagement on the task, we asked participants to rate the extent to which they paid attention or were distracted and alert while thinking about the exam proposal. Distraction was rated on three 9-point semantic differential scales anchored at 1 (*not at all*) and 9 (*extremely*), including "attention," "alert," and "distracted" (reverse scored). Responses to these items were intercorrelated ($\alpha = .69$) and were averaged to create a composite measure of attention.

Results

Emotion

The 3 × 2 ANOVA conducted on the emotion manipulation check index revealed a successful manipulation of emotion, $F(1, 78) = 66.9$, $p < .0001$. Participants reported feeling significantly better after writing about happy ($M = 4.96$, $SD = 0.94$) rather than neutral ($M = 4.28$, $SD = 0.72$) and sad ($M = 2.22$, $SD = 0.68$) personal episodes ($p < .01$ and $p < .0001$, respectively). Participants also reported feeling significantly better in the neutral than in the sad condition ($p < .0001$). There were no other significant effects (Fs < 1).

Distraction

The 3 × 2 ANOVA conducted on the distraction index did not reveal any significant effects for emotion, $F(1, 78) = 0.06$, $p = .93$, argument quality, $F(1, 78) = 0.45$, $p = .50$, or the interaction of the two, $F(1, 78) = 0.44$, $p = .64$. No significant effects emerged when each of the items was analyzed separately (Fs < 1).

Behavioral Intentions

Responses to the behavioral intentions items were scored so that higher values represented more favorable intentions toward the proposal. The 3 × 2 ANOVA revealed that the predicted two-way interaction between argument quality and emotion was significant, $F(1, 97) = 5.86$, $p = .005$. To understand this interaction, we conducted a series of 2 × 2 interaction contrasts to compare the happy versus sad, happy versus neutral, and sad versus neutral conditions. As illustrated in Figure 4, a 2 × 2 interaction contrast of argument quality with happy–sad revealed that the effect of argument quality on behavioral intentions was greater for happy than for sad participants, conceptually replicating our previous studies, $F(1, 45) = 5.81$, $p = .001$.

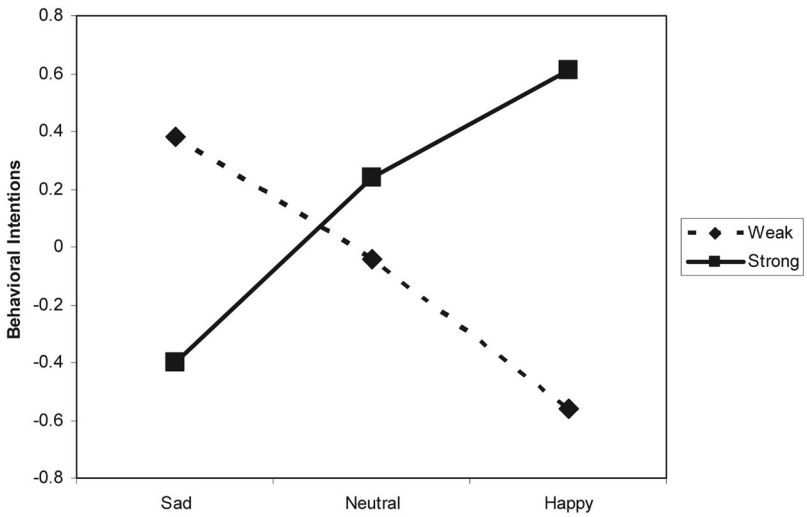

Figure 4. Experiment 4. Behavioral intentions toward the proposal as a function of argument quality and emotion.

Notably, the argument quality effect in the neutral condition fell in between the effects in the happy and sad conditions. Thus, the 2 × 2 interaction contrast of argument quality with happy–neutral showed that the effect of argument quality on intentions tended to be greater for happy than for neutral participants, $F(1, 59) = 3.07$, $p = .08$. Finally the 2 × 2 interaction contrast of argument quality with neutral–sad revealed that the typical effect of argument quality on intentions tended to be greater for neutral than for sad participants, $F(1, 52) = 3.64$, $p = .06$. Indeed, for the latter group, the argument quality effect tended to be reversed. This pattern would be expected if sadness produced so much doubt that people wanted to do the opposite of their thoughts.[7]

Discussion

Study 4 provided additional evidence that reveals how emotion can influence evaluative responses by affecting the extent to which people rely on their thoughts. Consistent with the self-validation hypothesis, we found happy participants showed greater argument quality effects than did sad participants, replicating our previous studies. It is important that this study suggested that both happiness and sadness contributed to the self-validation effects, as illustrated by the results of the neutral condition that fell in between the happy and sad conditions.

Furthermore, the results of Study 4 showed that positive and negative emotion conditions did not differ in the attention and distraction people reported regarding their own thoughts. Although this is an argument based on a null effect, a similar measure has proven sensitive in other studies that explicitly varied attention (e.g., see Tormala, Petty, & Briñol, 2002). We believe that this finding, in combination with prior literature and the other patterns of the current data, provide little reason to believe that distraction rather than thought confidence is responsible for the obtained findings. Finally, this study demonstrated that the self-validation effects of emotion can influence very concrete behavioral intentions. These findings support the notion that the current results have general, real-world implications.

General Discussion

The present research has demonstrated that a new psychological process can be responsible for the effects of emotion on evaluative judgments. In separate studies using a variety of topics and different measures and manipulations, we found that thoughts in response to persuasive messages had a greater impact on evaluative responses (attitudes and behavioral intentions) when participants were happy rather than sad or neutral. In four studies, we induced happiness or sadness after participants had processed a persuasive message. We found that being happy after message processing increased the effect of argument quality in persuasion compared with being sad or neutral.

This pattern of data in our four studies provided a replication of a rare pattern first observed by Bless et al. (1992), but notably we postulated a different explanation for the effect. First, the interaction between emotion and argument quality predicted by the self-validation hypothesis was not affected by the global mental representation of arguments (Experiment 1). More relevant for the present framework, the confidence with which people held their thoughts to persuasive messages was shown to be influenced by emotion, with happy participants reporting more confidence in their thoughts than sad participants. Furthermore, the thought confidence induced by emotion, and assessed by global (Experiment 2) or individual thought ratings (Experiment 3), had a significant impact on attitudes. The self-validation effects of emotion were shown to be independent of whether confidence was assessed before (Experiment 2) or after (Experiment 3) reporting attitudes. Taken together, the self-validation processes occurred regardless of whether (Experiments 2 and 3) or not (Experiments 1 and 4), when (before or after reporting attitudes), or how (individually or globally) thought confidence was assessed. Thus, the effects of emotion still appear to hold no matter what the specific conditions of measurement of thoughts, thought confidence, and evaluations. It is important that the obtained self-validation effects of affect can influence both attitudes (Experiments 1, 2, and 3) and concrete behavioral intentions (Experiment 4), increasing the potential applicability of the present findings.

Of most importance, we demonstrated for the first time that the effects of emotion on attitude change can be mediated by changes in thought confidence (Experiments 2 and 3). Furthermore, the conditions under which emotion induced thought confidence influences persuasion were also specified, restricting its effects to high elaboration conditions (i.e., high NC individuals; Experiment 3). Under these circumstances, consistent with the self-validation hypothesis, we found that argument quality had a larger impact on attitudes for happy than for sad participants. On the other hand, when thinking was low (i.e., low NC individuals) emotion was just used as a peripheral cue, with participants being more persuaded when they were induced to feel happy rather than sad. Considering both findings together, these results are consistent with the notion of multiple roles for variables as specified by ELM of persuasion (Petty & Cacioppo, 1986; Petty & Wegener, 1998). That is, the current research reinforces the view that emotion can influence persuasion by several means in different situations or for different people (see also Briñol, Petty, & Rucker, 2006).

Multiple Roles for Emotion

The current research provides evidence for a new role that emotion can take in affecting evaluative judgments. As noted earlier, prior research has focused on four roles that emotion can assume in influencing attitudes according to the ELM. That is, emotion has been found to do the following: have a direct influence on attitudes when elaboration is constrained to be low, affect the amount of thinking when elaboration is not constrained to be high or low, and serve as an argument or bias the direction of thinking when elaboration is high (see Petty et al., 2003, for a review).

[7] In general, although we have a clear replication of differences between happy and sad conditions, there are many background factors that can determine whether happy or sad induction groups will show a greater difference from a neutral control group. For example, had we used a message topic for which default confidence was very high, it is likely that the sad group would differ more from the control group, but if we used a topic for which default confidence was very low, it is more likely that the happy group would differ more from the control group. In this particular case, the effects are relatively symmetric.

In addition to replicating the effects of emotion as a cue in the low elaboration conditions of Study 3, the present research has shown that emotional states can also affect the confidence people have in their thoughts when elaboration is high. Notably, our pattern of data suggested that happiness increased confidence in favorable (positive) and unfavorable (negative) thoughts alike, and sadness reduced confidence in both kinds of thoughts. Although the study was based on current conceptualizations of mood congruency effects in memory (e.g., Bower, 1991; Forgas, 1995; Halbertstadt & Niedenthal, 1997; Lerner & Tiedens, 2006), it might have been possible to predict that happiness would especially increase confidence in positive thoughts and that sadness would increase confidence in negative thoughts. However, this did not appear to be the case. Nevertheless, future work might explore whether there are more specific emotion matching effects on confidence, such as happiness increasing confidence in happy thoughts relative to sad ones (cf., DeSteno, Petty, Wegener, & Rucker, 2000).

Our findings also suggest that the object and even the meaning of emotional experience can change from one situation and one person to another. For example, it might have been that following the message, everybody was wondering, "How do I feel about this?" When thinking about the issue was low and few relevant thoughts were available, emotion was directly associated with the attitude object, as participants simply reasoned that they were feeling good (or bad) about the message. Accordingly, there was a main effect of emotion on judgment under these conditions. However, for those individuals who generated thoughts (e.g., high NCs) emotion interacted with thought valence to determine judgments. High thinking individuals presumably considered how they felt about their thoughts before expressing attitudes.[8]

In line with our findings, although early informational approaches to emotion emphasized how the valence of an emotional state informed the individual about whether a situation was relatively safe (Schwarz & Clore, 1983), a more specific appraisal interpretation of the informative approach (Schwarz, 2002) would suggest that emotions might also indicate whether the situation is certain or uncertain. Our self-validation hypothesis is consistent with the latter view, with the novel addition that emotions can be informative about a person's own thoughts.

Multiple Roles for Confidence

The present research adds to the growing body of research indicating that emotional states can affect confidence. We share with previous work conducted from the appraisal approach (e.g., Keltner et al., 1993; Smith & Ellsworth, 1985) the notion that there are relevant dimensions of emotion other than valence. In line with this argument, we also agree with prior research that confidence is one of those dimensions (e.g., Tiedens & Linton, 2001).

What we consider to be the unique aspect of our research is the mechanism by which the confidence associated with affect can influence attitude change. Previous research has demonstrated that confidence can affect persuasion by affecting the amount of thinking during message processing when emotion is varied prior to message exposure. In one study reported by Tiedens and Linton (2001), for instance, participants were induced to experience emotions characterized by either certainty (contentment, anger) or uncertainty (worry, surprise) prior to a persuasive message that was composed of either strong or weak arguments. Consistent with predictions, certainty emotions led participants to process less, so their attitudes were not sensitive to the argument quality manipulation, whereas there was a significant argument quality effect on attitudes following uncertainty emotions.

Rather than revisit this question, we chose to focus on the more novel issue of how confidence deriving from emotional experience might have an impact when an emotional state followed the persuasive message. Thus, we have demonstrated for the first time that emotion can influence persuasion through self-validation processes, which is a totally different mechanism than that examined in prior work on emotion and persuasion. In our work, the extent of thinking during message processing is held constant, and incidental emotion influences the confidence in thoughts people have already generated. Not only are the underlying psychological processes different in our work and previous research but so too are the consequences (i.e., confidence leading to larger as opposed to smaller argument quality effects), the processing conditions (e.g., high as opposed to unconstrained elaboration conditions), and the timing of the emotion (e.g., after as opposed to before the message). Thus, the current research differs from prior research in terms of the mechanism, outcomes, and moderating conditions.

Taken together, it seems likely that confidence, like other variables (Petty & Cacioppo, 1986), can take on multiple roles in persuasion settings. When confidence is induced prior to message exposure, and elaboration is not constrained to be high or low, confidence (whether stemming from affect or other factors) appears to affect the extent of information processing, with confident people engaging in less thought than people lacking in confidence (Tiedens & Linton, 2001). If confidence is induced after extensive message processing, as we tested in the current research, however, it was expected and was found to affect confidence in the thoughts that had already been generated. Indeed, these findings are consistent with current theories of emotion that suggest that emotion can influence one's confidence in the validity of available mental contents (e.g., Clore, Gaspar, & Garvin, 2001) and provide individuals with information about the appropriateness of relying on their knowledge (e.g., Bless et al., 1996).

Contribution to Self-Validation Processes

The findings of the current research provide an important extension to prior work on self-validation processes and social judgment. For example, previous research has found that people's overt behavior (i.e., head nodding; Briñol & Petty, 2003) can influence persuasion by increasing (e.g., nodding) or decreasing (e.g., shaking) the confidence with which people hold their own thoughts in response to a message. The present studies extend this line of research by demonstrating that emotion can also be amenable to a self-validation analysis, further extending the utility of this mechanism of persuasion.

In sum, we have introduced a new psychological process by which emotion can affect evaluation. It is important that although

[8] It is worth noting that individuals low in NC can behave similarly to those high in NC when the situation requires them to engage in deeper thinking, such as when the message is of high personal relevance (e.g., Axsom, Yates, & Chaiken, 1987).

inducing emotion after message processing has proven useful in leaving the number and direction of thoughts unaffected, one might wonder about the extent to which this reflects real-life situations. We suspect that there are many situations in which emotional reactions occur following (rather than preceding) thinking. For example, consider a situation in which, after having discussed a given proposal in a meeting someone makes a funny joke and everybody laughs, or consider a situation in which following the expression of some ideas you relate them to a recent sad event. In these circumstances, mood follows thought generation and, according to the present research, its effects on judgment can be understood in terms of self-validation process. Indeed, there may be many life circumstances in which some thinking takes place only to be followed in short order by a nice meal (happy) or sad song on the radio. The current research suggests that these irrelevant life events could affect the use of one's thoughts.

Most simply we might validate or invalidate the thoughts of others by smiling or frowning following their comments. Consistent with this reasoning, Stepper and Strack (1993) found that when people recalled behaviors of self-assurance when smiling rather than frowning, they felt more self-assured, but when they recalled behaviors of low self-assurance, they felt less self-assured when smiling than when frowning. If smiling enhances confidence in the recalled behaviors compared with frowning, the self-validation hypothesis can explain these results.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Thousand Oaks, CA: Sage.

Axsom, D., Yates, S. M., & Chaiken, S. (1987). Audience response as a heuristic cue in persuasion. *Journal of Personality and Social Psychology, 53,* 30–40.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Blaney, P. I. I. (1986). Affect and memory: A review. *Psychological Bulletin, 99,* 229–246.

Bless, H., Clore, G. L., Schwarz, N., Golisano, V., Rabe, C., & Woelke, M. (1996). Mood and the use of scripts: Does being in a happy mood really lead to mindlessness? *Journal of Personality and Social Psychology, 717,* 665–679.

Bless, H., Mackie, D. M., & Schwarz, N. (1992). Mood effects on attitude judgments: Independent effects of mood before and after message elaboration. *Journal of Personality and Social Psychology, 63,* 585–595.

Bodenhausen, G. V., Sheppard, L. A., & Kramer, G. P. (1994). Negative affect and social judgment: The differential impact of anger and sadness. *European Journal of Social Psychology, 24,* 45–62.

Bower, G. H. (1981). Mood and memory. *American Psychologist, 36,* 129–148.

Bower, G. H. (1991). Mood congruity of social judgment. In J. Forgas (Ed.), *Emotion and social judgment* (pp. 31–54). Oxford, England: Pergamon Press.

Briñol, P., & Petty, R. E. (2003). Overt head movements and persuasion: A self-validation analysis. *Journal of Personality and Social Psychology, 84,* 1123–1139.

Briñol, P., & Petty, R. E. (2005). Individual differences in persuasion. In D. Albarracín, B. T. Johnson, & M. P. Zanna (Eds.), *The handbook of attitudes and attitude change* (pp. 575–616). Hillsdale, NJ: Erlbaum.

Briñol, P., Petty, R. E., & Rucker, D. D. (2006). The role of meta-cognitive processes in emotional intelligence. *Psicothema, 18,* 26–33.

Briñol, P., Petty, R. E., & Tormala, Z. L. (2004). The self-validation of cognitive responses to advertisements. *Journal of Consumer Research, 30,* 559–573.

Cacioppo, J. T., & Petty, R. E. (1981). Social psychological procedures for cognitive response assessment: The thought listing technique. In T. Merluzzi, C. Glass, & M. Genest (Eds.), *Cognitive assessment* (pp. 309–342). New York: Guilford.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42,* 116–131.

Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin, 119,* 197–253.

Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48,* 306–307.

Chaiken, S. (1987). The heuristic model of persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), *Social influence: The Ontario symposium* (Vol. 5, pp. 3–39). Hillsdale, NJ: Erlbaum.

Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 212–252). New York: Guilford Press.

Clark, M. S., & Isen, A. M. (1982). Toward understanding the relationship between feelings states and social behavior. In A. H. Hastorf & A. M. Isen (Eds.), *Cognitive social psychology* (pp. 73–108). Amsterdam: Elsevier/North-Holland.

Clore, G. L., Gasper, K., & Garvin, E. (2001). Affect as information. In J. P. Forgas (Ed.), *Handbook of affect and social cognition* (pp. 121–144). Mahwah, NJ: Erlbaum.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavior sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

DeSteno, D., Petty, R. E., Rucker, D. D., Wegener, D. T., & Braverman, J. (2004). Discrete emotions and persuasion: The role of emotion-induced expectancies. *Journal of Personality and Social Psychology, 86,* 43–56.

DeSteno, D., Petty, R. E., Wegener, D. T., & Rucker, D. D. (2000). Beyond valence in the perception of likelihood: The role of emotion specificity. *Journal of Personality and Social Psychology, 78,* 397–416.

Dunn, J. R., & Schweitzer, M. E. (2005). Feeling and believing: The influence of emotion on trust. *Journal of Personality and Social Psychology, 88,* 736–748.

Ellsworth, P. C., & Smith, C. A. (1988). From appraisal to emotion: Differences among unpleasant feelings. *Motivation and Emotion, 12,* 271–302.

Fazio, R. H., & Zanna, M. P. (1978). Attitudinal qualities relating to the strength of the attitude–behavior relationship. *Journal of Experimental Social Psychology, 14,* 398–408.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior.* Reading, MA: Addison-Wesley.

Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin, 117,* 39–66.

Forgas, J. P. (2001). *The handbook of affect and social cognition.* Mahwah, NJ: Erlbaum.

Fredrickson, B. L., & Branigan, C. (2004). Positive emotions broaden the scope of attention and thought–action repertoires. *Cognition and Emotion, 19,* 313–332.

Frost, R. O., & Green, M. L. (1982). Velten mood induction procedure effects: Duration and post-experimental removal. *Personality and Social Psychology Bulletin, 8,* 341–347.

Gasper, K., & Clore, G. L. (2002). Attending to the big picture: Mood and global versus local processing of visual information. *Psychological Science, 13,* 34–40.

Gleicher, F., & Weary, G. (1991). The effect of depression on the quantity and quality of social inferences. *Journal of Personality and Social Psychology, 61,* 105–114.

Halbertstadt, J. B., & Niedenthal, P. M. (1997). Emotional state and the use of stimulus dimensions in judgment. *Journal of Personality and Social Psychology, 72,* 1017–1033.

Isen, A. M. (1999a). On the relation between affect and creative problem solving. In S. R. Russ (Ed.), *Affect, creative experience, and psychological adjustment* (pp. 3–17). Philadelphia: Taylor & Francis.

Isen, A. M. (1999b). Positive affect. In T. Dalgliesh & M. J. Power (Eds.), *Handbook of cognition and emotion* (pp. 521–539). Chichester, England: Wiley.

Isen, A. M., & Daubman, K. A. (1984). The influence of affect on categorization. *Journal of Personality and Social Psychology, 47,* 1206–1217.

Jarvis, W. B. G. (2000). MediaLab (Version Beta 2000) [Computer software]. Columbus, OH: Empirisoft.

Judd, C. M., & Lusk, C. M. (1984). Knowledge structures and evaluative judgments: Effects of structural variables on judgment extremity. *Journal of Personality and Social Psychology, 46,* 1193–1207.

Kahn, B. E., & Isen, A. M. (1993). The influence of positive affect on variety-seeking among safe, enjoyable products. *Journal of Consumer Research, 20,* 257–270.

Keltner, D., Ellsworth, P. C., & Edwards, K. (1993). Beyond simple pessimism: Effects of sadness and anger on social perception. *Journal of Personality and Social Psychology, 64,* 740–752.

Larsen, R. J., & Sinnett, L. M. (1991). Meta-analysis of experimental manipulations: Some factors affecting the Velten Mood induction procedure. *Personality and Social Psychology Bulletin, 17,* 323–334.

Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgment and choice. *Cognition and Emotion, 14,* 473–493.

Lerner, J. S., & Tiedens, L. S. (2006). Portrait of the angry decision maker: How appraisal tendencies shape anger's influence on cognition. *Journal of Behavioral Decision Making, 19,* 115–137.

Mackie, D. M., & Worth, L. T. (1989). Cognitive deficits and the mediation of positive affect in persuasion. *Journal of Personality and Social Psychology, 57,* 27–40.

Martin, L. L. (2000). Moods do not convey information: Moods in context do. In J. P. Forgas (Ed.), *Feeling and thinking: The role of affect in social cognition* (pp. 153–177). Cambridge, England: Cambridge University Press.

Parrot, W. G., & Sabini, J. (1990). Mood and memory under natural conditions: Evidence for mood incongruent recall. *Journal of Personality and Social Psychology, 59,* 321–336.

Petty, R. E., Briñol, P., & Tormala, Z. L. (2002). Thought confidence as a determinant of persuasion: The self-validation hypothesis. *Journal of Personality and Social Psychology, 82,* 722–741.

Petty, R. E., Briñol, P., Tormala, Z. L., & Wegener, D. T. (2007). The role of meta-cognition in social judgment. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: A handbook of basic principles* (2nd ed., pp. 254–284). New York: Guilford Press.

Petty, R. E., & Cacioppo, J. T. (1979). Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology, 37,* 1915–1926.

Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change.* New York: Springer-Verlag.

Petty, R. E., Fabrigar, L. R., & Wegener, D. T. (2003). Emotional factors in attitudes and persuasion. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 752–772). Oxford, England: Oxford University Press.

Petty, R. E., Schumann, D. W., Richman, S. A., & Strathman, A. J. (1993). Positive mood and persuasion: Different roles for affect under high and low elaboration conditions. *Journal of Personality and Social Psychology, 64,* 5–20.

Petty, R. E., & Wegener, D. T. (1998). Attitude change: Multiple roles for persuasion variables. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vol. 1, pp. 323–390). New York: McGraw-Hill.

Petty, R. E., Wells, G. L., & Brock, T. C. (1976). Distraction can enhance or reduce yielding to propaganda: Thought disruption versus effort justification. *Journal of Personality and Social Psychology, 34,* 874–884.

Pratto, F., & John, O. P. (1991). Automatic vigilance: The attention-grabbing power of negative social information. *Journal of Personality and Social Psychology, 61,* 380–391.

Roseman, I. J. (1984). Cognitive determinants of emotion: A structural theory. *Review of Personality and Social Psychology, 5,* 11–36.

Scherer, K. R. (1984). Emotion as process: Function, origin, and regulation. *Social Science Information, 21,* 555–570.

Schwarz, N. (2002). Where are the unique predictions? *Psychological Inquiry, 13,* 87–89.

Schwarz, N., Bless, H., & Bohner, G. (1991). Mood and persuasion: Affective states influence the processing of persuasive communications. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 24, pp. 161–197). San Diego, CA: Academic Press.

Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology, 45,* 512–523.

Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology, 48,* 813–838.

Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equations models. In S. Leinhart (Ed.), *Sociological methodology* (pp. 290–312). San Francisco: Jossey-Bass.

Staats, A. W., & Staats, C. K. (1958). Attitudes established by classical conditioning. *Journal of Abnormal and Social Psychology, 57,* 37–40.

Stepper, S., & Strack, F. (1993). Proprioceptive determinants of emotional and nonemotional feelings. *Journal of Personality and Social Psychology, 64,* 211–220.

Stroessner, S. J., & Mackie, D. M. (1992). The impact of induced affect on the perception of variability in social groups. *Personality and Social Psychology Bulletin, 18,* 546–554.

Tiedens, L. Z., & Linton, S. (2001). Judgment under emotional certainty and uncertainty: The effects of specific emotions on information processing. *Journal of Personality and Social Psychology, 81,* 973–988.

Tormala, Z. L., Briñol, P., & Petty, R. E. (2006). When credibility attacks: The reverse impact of source credibility on persuasion. *Journal of Experimental Social Psychology, 42,* 684–691.

Tormala, Z. L., Petty, R. E., & Briñol, P. (2002). Ease of retrieval effects in persuasion: The roles of elaboration and thought-confidence. *Personality and Social Psychology Bulletin, 28,* 1700–1712.

Velten, E. (1968). A laboratory task for induction of mood states. *Behavior Research and Therapy, 6,* 473–482.

Wegener, D. T., Petty, R. E., & Klein, D. J. (1994). Effects of mood on high elaboration attitude change: The mediating role of likelihood judgments. *European Journal of Social Psychology, 23,* 25–44.

Wegener, D. T., Petty, R. E., & Smith, S. M. (1995). Positive mood can increase or decrease message scrutiny: The hedonic contingency view of mood and message processing. *Journal of Personality and Social Psychology, 69,* 5–15.

Wyer, R. S., Jr., Clore, G. L., & Isbell, L. M. (1999). Affect and information processing. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 31, pp. 1–77). San Diego: Academic Press.

Zillmann, D. (1978). Attribution and misattribution of excitatory reactions. In J. H. Harvey, W. J. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research* (Vol. 2, pp. 335–370). Hillsdale, NJ: Erlbaum.

Received February 2, 2006
Revision received May 21, 2007
Accepted June 3, 2007 ■