

The role of meta-cognitive processes in emotional intelligence

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Emotional thoughts are often accompanied by a host of additional or second order thoughts relevant for perceiving and regulating emotion and emotion-management processes. These meta-cognitive thoughts can play an important role in understanding psychological processes relevant to Emotional Intelligence. In the present article, we first provide a general meta-cognitive framework useful for classifying secondary thoughts according to dimensions, such as target, origin, valence, number, confidence, and evaluation. Having described a framework for meta-cognition, we next review different lines of research concerning 1) how primary emotional thoughts are affected by meta-cognitive confidence, 2) how emotional thoughts at the second level of cognition (meta-cognition) can influence first level cognition, 3) how emotional thoughts at the primary and secondary levels can influence one another, and 4) how mood and emotional thoughts can play multiple roles in cognition and meta-cognition depending on the circumstances.

El papel de los procesos metacognitivos en la inteligencia emocional. Los pensamientos emocionales se acompañan frecuentemente de una multitud de pensamientos adicionales o de segundo orden relevantes para la percepción y regulación de las emociones y para los procesos de manejo de emociones. Estos pensamientos metacognitivos juegan un papel importante en la comprensión de los procesos psicológicos relevantes para la inteligencia emocional. En el presente artículo presentamos primero un marco metacognitivo general útil para clasificar los pensamientos secundarios de acuerdo con dimensiones como objetivo, origen, valencia, número, confianza y evaluación. Después de haber descrito el marco para la metacognición, revisamos las diferentes líneas de investigación sobre: 1) cómo los pensamientos emocionales primarios son afectados por la confianza metacognitiva; 2) cómo los pensamientos emocionales en el segundo nivel de cognición (metacognición) pueden influir en la cognición de primer nivel; 3) cómo los pensamientos emocionales en los niveles primario y secundario pueden influir unos sobre otros; y 4) cómo el ánimo y los pensamientos emocionales pueden jugar múltiples papeles en la cognición y metacognición dependiendo de las circunstancias.

Mayer and Salovey (1997) coined the term «emotional intelligence» to describe the human capacity to reason about emotions. The notion of emotional intelligence (EI) includes the idea that people have the ability to perceive, appraise, and express emotions; the ability to access or generate feelings that facilitate thought; the ability to understand emotions and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth (for similar definitions see Baron, 2000, 2006; Goleman, 1995; for a critical review see Matthews, Roberts, & Zeidner, 2004).

The conceptualization of emotion depicted in the discussion of EI implies that the primary emotional experience can be accompanied by a host of additional or secondary processes. Such secondary processes consist of people's thoughts and perceptions about their emotions as well as their emotion-management processes (Mayer & Gaschke, 1988; for additional reviews, see,

e.g., Brackett & Salovey, 2006; Fernández-Berrocal & Ramos, 2002; Mayer, Salovey, & Caruso, 2004; Zaccagnini, 2004). At the direct, primary level, mood appears to be perceived along pleasant-unpleasant and arousal-calm dimensions (Russell, 1978; Russell & Bullock, 1986) or their rotated variants (Diener & Emmons, 1984). These dimensions organize not only emotions, such as happiness, anger, fear, sadness, and surprise (Ekman, Levenson, & Friesen, 1983; Izard, 1977), but also the emotional content of thoughts or cognitions (Abelson & Sermat, 1962).

Along with these direct experiences of emotion and emotional thoughts, there can be other reflective, secondary experiences. That is, in addition to the primary emotion experienced and the thoughts that accompany that emotion, people might have additional cognitions that monitor a given mood (Scheier & Carver, 1982), evaluate the relation between mood and judgment (Mayer & Volanth, 1985), strive to maintain good moods (Isen, 1984), or engage thoughts to cope with and repair bad moods (Folkman, Lazarus, Funkel-Schetter, DeLongis, & Gruen, 1986; Smith & Petty, 1995). These secondary steps can be understood as meta-cognitions that accompany primary emotional thoughts. They are «meta-cognitive» because, as we will discuss in more detail shortly, they reflect a secondary thought about the original experience of thinking about affective states. In the present article,

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we present different lines of research tied to the common theme of examining the interplay between mood, cognition, and meta-cognition. First, however, we delineate our meta-cognition framework.

Meta-cognition

The idea of meta-cognition relies on the distinction between two types of cognitions: primary and secondary. «Primary cognitions» involve our initial associations of some object with some attribute, or a projection of some object on some dimension of judgment (McGuire & McGuire, 1991). Primary thoughts are those that occur at a direct level of cognition such as «that flower is red» or «I feel very happy today.» Following a primary thought, people can also generate «secondary cognitions» or thoughts which involve reflections on the first level thoughts (e.g., «Is that flower really red or might it be pink?», «I am not very certain about how well I am feeling today»). Thus, consistent with the bulk of prior literature (for a review see Jost, Kruglanski, & Nelson, 1998), we define *meta-cognition* as second order thoughts, or thoughts about one's primary thoughts or thought processes.

Petty, Briñol, Tormala and Wegener (in press) suggest the dimensions of meta-cognitive thought can be organized along many of the same dimensions that have proven useful for understanding primary thoughts, as well as several unique dimensions (see figure 1). For example, classic research on cognition within social psychology has coded primary thoughts or cognitions for target, origin, valence, and number (e.g., Cacioppo, Harkins, & Petty, 1981). Furthermore, this has provided a very fruitful approach for understanding some of the psychological processes that underlie attitude formation and change (see Eagly & Chaiken, 1993; Petty, Ostrom, & Brock, 1981). Applied to second order thoughts, the *target* dimension of meta-cognition refers not to what the thought is actually about, but what the person perceives it to be about. Among other things, this type of meta-cognition can help individuals classify their thoughts into categories as a first step in marking them for further control and change (e.g., Ellis, 1973). Thus, this meta-cognitive dimension seems be critical from the point of view of EI since identifying an emotional thought as being part of one category (e.g., «this is an emotional thought) might determine whether it facilitates or hinders one's ability to achieve one's goals.

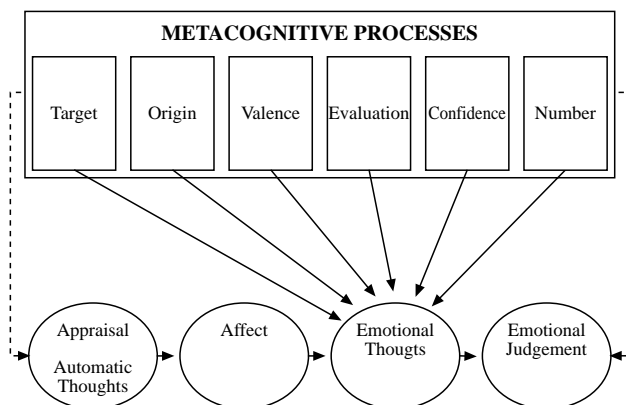


Figure 1. Dimensions of meta-cognition relevant to emotional thoughts

The *origin* of a thought refers to its source. Where did the person believe the thought came from? That is, a person can wonder if the thought was self-generated, or if it merely reflects the statements or sentiments of others, and this can influence the impact of the thought (e.g., DeMarree, Wheeler, & Petty, 2005). Perhaps the most commonly studied aspect of thought is its *valence*. That is, regardless of the target of the thought or its origin, does the person perceive it to reflect something positive or negative with respect to its target (Petty et al., 1981; Petty & Cacioppo, 1986). Finally, *number* refers not to how many thoughts are actually generated, but to the perceived quantity of thoughts. For example, people might think that they possess very few or many thoughts about a given topic, and as we review shortly, such thought attributions have important implications for social judgment and behavior (e.g., Schwarz et al., 1991).

In addition to these aspects of thought, two additional dimensions are uniquely meta-cognitive and have achieved the most conceptual and empirical attention. First, one can assess one's *evaluation* of a thought. That is, regardless of the target, origin, valence, or number of thoughts generated, people can perceive their thoughts as good or bad, desirable or undesirable, facilitating or hindering, appropriate and wanted, or not. When thoughts are unwanted, people might try to suppress them (e.g., Wegner, 1994); or, when thoughts are seen as inappropriate or bad, people might try to correct for their likely impact (Wegener & Petty, 1997). For example, the meta-cognitive evaluation of an emotional thought as appropriate or inappropriate might influence a person's overall emotional experience. Thus, a negative emotional thought that is evaluated as out of control, unacceptable, and long-lasting is likely to be devastating for an individual; however, if the same negative emotional thought is instead evaluated as under control, acceptable, and short-lived, the same emotional thought is likely to be less detrimental to one's well being.

A second dimension unique to meta-cognitive thought consists of the degree of *confidence* people place in their thoughts, ranging from extreme certainty to extreme doubt. Thus, two people might have the *same* emotional thought with regard to an emotional experience, but one person might have considerably greater confidence in that emotional thought than the other. Primary cognitions held with more confidence have a larger impact on judgments (Petty, Briñol, & Tormala, 2002). Thus, attitudes and thoughts that are held with relatively high confidence tend to be more consequential for subsequent stability, resistance and prediction of behavior than attitudes and thoughts held with relatively less certainty (e.g., Petty & Krosnick, 1995; Rucker & Petty, 2004; Tormala & Petty, 2002). For example, people who report greater certainty about their self-beliefs have been found to be more stable in their self-views and more motivated to verify confidently held aspects of the self (e.g., Pelham, 1991).

Conceptually consistent with these findings, Sedikides (1995) found that, relative to participants who reported uncertainty about their traits, those who expressed more self-belief certainty were more resistant to the biasing influences of a mood induction. This research suggests that being certain about oneself can lead to more resistance to information about both the specific beliefs about which one is certain and the general factors capable of influencing those beliefs. In a different line of research, Baumgardner (1990) found evidence suggesting that certainty in self-attributes not only causes people to be more resistant and to behave in a more consistent and stable way, but it can also promote a sense of

control over future outcomes, thus generating positive affect. Furthermore, Briñol and Petty (2003) found self-belief confidence can influence self-esteem. As part of a supposed graphology study, participants were required to think about and then write down their best or worst qualities using their dominant or non-dominant hand. As expected, using the non-dominant hand decreased the confidence with which people held the self-beliefs they listed. As a consequence of the differential self-belief confidence, the effect of the direction of self-beliefs (best vs. worst qualities) on self-esteem was significantly greater when participants wrote their beliefs with their dominant rather than their non-dominant hand (see figure 2).

As these examples illustrate, meta-cognition is important because second order cognition magnifies, attenuates, or even reverses first order cognition (for a recent review, see, Petty et al., in press). Before closing this overview of the meta-cognitive framework, it is also important to note that the meta-cognitive findings previously discussed have been most pronounced under high elaboration or high thinking conditions. Relatively high elaboration presumably enhances meta-cognitive impact for a least two reasons. First, if people have few thoughts (or none), then thought confidence and other meta-cognitive dimensions will have little effect, as there is little substance for meta-cognitions to be based upon. Second, the same variables that would increase elaboration (e.g., personal involvement; Petty & Cacioppo, 1979) would also likely increase caring and thinking 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 other aspects of their thoughts (see Petty et al., in press).

Having provided a framework for categorizing meta-cognition, we next describe 1) how primary emotional thoughts are affected by meta-cognitive confidence, 2) how emotional thoughts at the second level of cognition (meta-cognition) can influence first level cognition, 3) how emotional thoughts at the primary and secondary level of experience can influence one another, and 4) how mood and emotional thoughts can play multiple roles in cognition and meta-cognition depending on the circumstances.

The influence of meta-cognition on primary emotional thoughts

The studies described earlier revealed that considering meta-cognitive confidence is important mainly because confidence affects whether people translate their individual thoughts into more general judgments or evaluations, and whether these judgments in turn are influential in guiding behavior. There is a great deal of empirical evidence suggesting that attitudes held with

conviction are a more potent foundation for judgment and behavior than more tentatively held attitudes (e.g., Briñol & Petty, 2004; Fazio & Zanna, 1978; Gross, Holtz, & Miller, 1995; Rucker & Petty, 2004).

Just as attitude confidence is an important determinant of which attitudes predict behavior, thought confidence is an important determinant of which thoughts predict attitudes. For instance, following exposure to a message containing strong or weak arguments and a typical thought listing task (see Petty et al., 1981), Petty et al. (2002) asked people to think about situations in which they had felt confident or doubtful in their thinking. Those who generated instances of confidence became more certain of the validity of their thoughts than those who generated instances of doubt. Furthermore, as illustrated in figure 3, 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 to the strong arguments and the unfavorable thoughts they generated to the 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 those induced to feel confidence. In follow-up research, we also found that, just as vertical head movements from others give us confidence in what we are saying, our own vertical head movements could give us confidence in what we are thinking (Briñol & Petty, 2003; see figure 4).

Following this self-validation logic, we conducted research in order to test whether and how meta-cognitive confidence can influence primary emotional thoughts. That is, we examined how confidence in one's emotional thoughts would influence the experience of emotion. For example, in one study, Rucker, Briñol and Petty (2005) asked participants to think and write about recent situations in which they felt happy or sad. After describing those

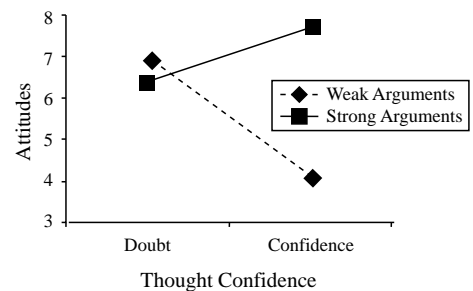


Figure 3. Attitudes as a function of confidence and argument quality. Taken from Petty, Briñol and Tormala (2002)

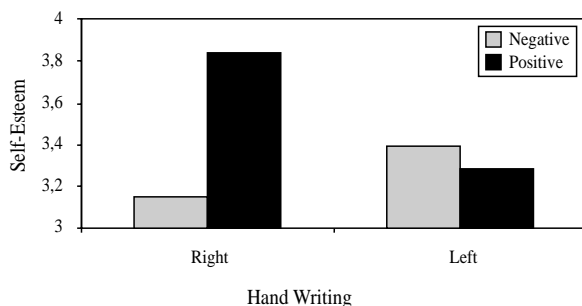


Figure 2. Self-esteem as a function of hand writing and thought-direction. Taken from Briñol and Petty (2003, Experiment 4)

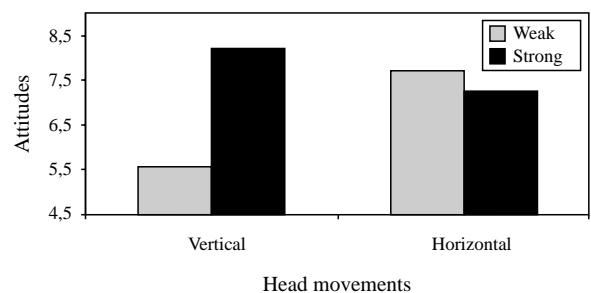


Figure 4. Attitudes as a function of head movement and argument quality. Taken from Briñol and Petty (2003, Experiment 1)

emotional episodes, and as part of an apparently unrelated study, we manipulated confidence by asking 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 previously induced emotional thoughts than those who generated instances of doubt. Thus, participants reported feeling happier after thinking about happy situations when they were induced to trust those emotional thoughts (confidence condition) than when they were induced to doubt those emotional thoughts (doubt condition). Viewed differently, this interaction between the mood and confidence inductions revealed that the direction of the primary emotional thoughts only influenced the affective state reported by confident participants. This is expected because only confidence led people to rely on the emotional thoughts generated.

In a follow up study, Rucker et al. (2005) replicated these findings using an ease-of retrieval paradigm as a way to induce meta-cognitive confidence. Previous research has clearly established that the confidence with which people hold their thoughts can be affected by the ease with which those thoughts come to mind (Tormala, Petty, & Briñol, 2002; see also Wänke & Bless, 2000). In the original ease-of-retrieval research, Schwarz, Bless et al. (1991) asked participants to rate their assertiveness after recalling 6 versus 12 examples of their own assertive (or unassertive) behavior. The result was that people viewed themselves as more assertive after generating 6 rather than 12 examples of assertive behaviors. When people recalled unassertive behaviors, the outcome was reversed. Recent research has demonstrated that these ease-of-retrieval effects can be due to changes in thought-confidence.

Specifically, participants in the Tormala et al. (2002) research were instructed to read a persuasive message and to generate either a low or high number of positive (or negative) thoughts in response to it. Consistent with the self-validation logic, under high elaboration conditions, generating a high number of thoughts was difficult, and thus people relied on these thoughts less than when generating a smaller and easier number of thoughts. Consequently, people had more positive (or negative) attitudes when instructed to generate 2 versus 10 positive thoughts. The effect of generation difficulty on attitudes was mediated by the confidence participants had in the thoughts they listed. Under low elaboration conditions, thought-confidence did not matter, since under these conditions, participants are less motivated (or able) to attend to their own thinking. In accord with prior research on the numerosity heuristic (Petty and Cacioppo, 1984), low elaboration participants were more influenced by the actual number of thoughts they generated (e.g., favoring the issue more after listing 10 than 2 favorable thoughts, see figure 5).

As mentioned, we have also followed this ease-of-retrieval paradigm in order to manipulate the confidence that people have in their emotional thoughts. In one study, for example, Rucker et al. (2005) asked participants to think and write about recent situations in which they felt happy. In order to vary the confidence associated with those emotional thoughts, we asked half of the participants to generate few (2) or many (10) of those happy events. To compare the role of thought confidence for individuals engaged in relatively more versus less thinking, participants' need for cognition (NC; Cacioppo & Petty, 1982) was measured at the end of the study. Considerable prior research has shown that high NC individuals engage in more elaboration and meta-cognition

activity than low NC individuals (for a review, see, Briñol & Petty, 2005a; Cacioppo et al., 1996). As expected, we found that high elaboration participants reported feeling happier after generating few rather than many episodes of happiness. This finding suggests that experienced ease of generating affective information can increase the impact of that primary mental content on subsequent emotional judgments. That is, the easier it felt to generate thoughts about happy events (because only few were requested), the more confidence one had in those emotional thoughts, and the more positive mood that resulted. In contrast, low elaboration participants were more influenced by the actual number of emotional thoughts generated, reporting feeling better after listing ten than two happy episodes. This replicates previous results on the numerosity heuristic (Petty & Cacioppo, 1984; Tormala et al., 2002).

In sum, the studies described in this section demonstrate that the effect of thinking about previous emotional episodes is affected by the confidence with which people hold their emotional thoughts. Across different paradigms in which confidence in emotional thoughts was manipulated by asking people to think of confidence (vs. doubt) stories or to generate few (vs. many) episodes, we have shown that the impact of emotional thoughts on affective judgments is greater when people have high rather than low confidence in that mental information. In these examples, emotional thoughts played a role at the primary level of cognition, with thought-confidence being manipulated at the second, meta-cognitive level. In the next section, we describe the effect of emotional thoughts at the second (rather than primary) level of cognition, and its effects on primary cognition and judgment.

The influence of meta-cognitive affect on primary thoughts

In another line of research, we examined whether mood can influence attitude change by affecting thought-confidence. This signifies a situation where primary cognitions are influenced by emotional secondary thoughts. Indeed, according to appraisal theories, one of the critical dimensions along which emotional experience varies is the certainty-uncertainty dimension (Smith & Ellsworth, 1985). If mood can influence confidence, then people in a happy mood should be more reliant on their thoughts than people in a sad mood. Previous research has clearly established a link between happy mood and confidence (Clore, Gasper, & Garvin, 2001; see also, Tiedens & Linton, 2001). As a consequence of this relationship, the self-validation notion predicts that mood can increase or decrease persuasion depending

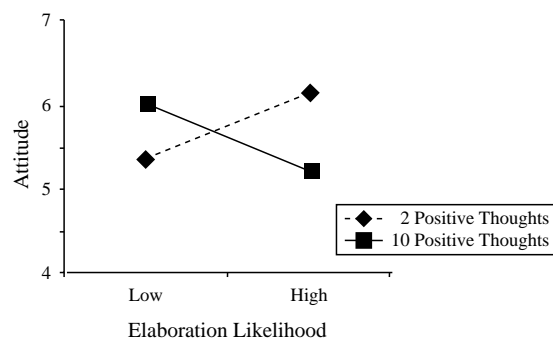


Figure 5. Attitudes as a function of number of thoughts and elaboration. Taken from Tormala, Petty and Briñol (2002)

on the direction of the thoughts generated in response to the message. That is, attitudes should reflect the valence of thoughts to a greater extent when participants are placed in a happy mood following the message as opposed to a sad mood because happy mood would increase reliance on the generated thoughts.

Briñol, Petty, and Barden (2005) conducted a series of studies to assess this hypothesis regarding the role of self-validation processes in the effect of mood on attitude change. For example, in one experiment, participants received a persuasive message composed of strong or weak arguments. This manipulation was intended to influence the direction of the thoughts generated with more favorable thoughts toward the message after the strong rather than the weak version of the message (Petty & Cacioppo, 1986). Then, as part of an ostensibly unrelated study, participants' mood was manipulated by asking them to write down personal experiences in which they felt happy or sad. Following the mood induction, participants reported their attitudes toward the proposal of the message. Based on the self-validation hypothesis, we predicted and found that mood interacted with argument quality to influence persuasion. As illustrated in figure 6, participants exposed to a strong message (thus generating predominately favorable thoughts) showed greater attitude change with positive mood than negative mood. However, participants who were exposed to the weak version of the message (thus generating mostly unfavorable thoughts) showed greater persuasion with negative than positive mood. Viewed differently, this interaction also indicated that the effect of argument quality on attitudes was greater with positive than negative mood.

Of importance, a second study in which participants reported the confidence they had in their thoughts revealed that people placed in a happy mood expressed more confidence in their thoughts than people in a sad mood, and that thought-confidence mediated the influence of mood on judgement. Also relevant, in accord with the meta-cognitive framework outlined earlier, the self-validation hypothesis predicts that the effects of mood on persuasion should be most apparent when the likelihood of thinking is high. To compare the role of thought confidence for individuals engaged in relatively more versus less thinking, participants' need for cognition (NC; Cacioppo & Petty, 1982) was measured at the end of a final study. As predicted, the findings of this study revealed that the interaction between mood and argument quality was particularly evident under high elaboration conditions. In contrast, for the low elaboration conditions, mood was associated with the message in a more direct way, producing a cue effect such that more persuasion was found for happy than sad participants.

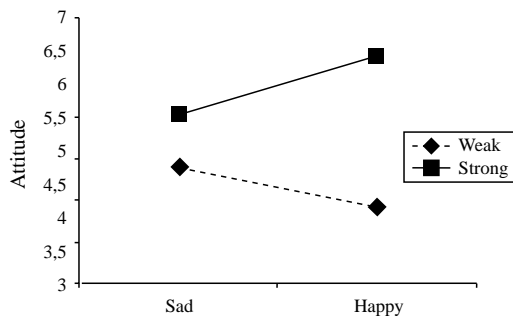


Figure 6. Attitudes as a function of mood and argument quality. Taken from Briñol, Petty and Barden (2005)

Indeed, these findings reveal a new psychological process for mood and persuasion. Prior work had shown that mood could serve as a simple cue, affect the amount of thinking, or bias the thoughts that came to mind (see Petty, DeSteno, & Rucker, 2001, for a review). The more recent work reviewed above shows a new mechanism by which mood can affect judgments that is consistent with other lines of recent research that build on the link between positive mood and confidence. For example, positive mood has been shown to increase the confidence with which people use a wide variety of information that happens to be accessible at the time (Clore, Gasper, & Garvin, 2001), including behavioral scripts (Bless et al., 1996), expectations (Bodenhausen, Kramer, & Susser, 1994), general categories (Dienes, 1996; Isen & Daubman, 1984; Kaplan, Kickul, & Reither, 1996), stereotypes (Wyer, Clore, & Isbell, 1999), technical expertise (Isen, Rosenzweig, & Young, 1991), and primacy information (Sinclair & Mark, 1992; see Clore, Gasper, & Garvin, 2001, for a review). Consistent with these findings, Gleicher and Weary (1991) have also shown that mildly depressed individuals report less confidence in the thoughts that they generated during an impression formation task as compared to individuals who are not depressed. Taken together, these studies suggest that mood can influence the confidence with which people hold their available thoughts, regardless of the type, nature, and origin of those thoughts.

The experiments described in this section have revealed that emotional experiences can play an important role in meta-cognition, which can then influence the primary level of cognition. Thus, emotional experiences are relevant at the secondary, meta-cognitive level as mood induces a sense of confidence in one's thoughts. In the next section, we describe how emotional thoughts can play a role simultaneously at the primary and secondary level of cognition.

The influence of meta-cognitive affect on primary affect

Studies described in previous sections revealed that primary emotional thoughts can be affected by secondary, meta-cognitive thoughts. For example, making people certain (or uncertain) of their emotional thoughts can increase (or attenuate) their perceptions of emotion. Our research has also illustrated that primary cognitive thoughts can be influenced by secondary, meta-cognitive *emotional* thoughts. For example, making people feel happy or sad about their thoughts can influence judgment by affecting whether and how they trust their primary cognitions. Since emotional thoughts can play a role at both the primary and the secondary level of cognition, it is quite plausible that emotional thoughts at the second level of cognition can be used to validate or invalidate other emotional thoughts at the first level of cognition. That is, emotional thoughts can provide meta-cognitive information about other emotional thoughts.

Indeed, thoughts about pleasantness-unpleasantness at the primary level of cognition and at the meta-cognitive level are conceptually independent of each other. This makes sense, because one can direct positive emotional thoughts about negative emotional thoughts (e.g., «There's nothing wrong with feeling the way I do» «I am proud of feeling angry at this injustice») and one can direct negative thoughts at thoughts about positive mood (e.g., «I am scared by how happy I feel about this» «I feel guilty about having these positive feelings toward that person»). Based on the

research described in the previous section, it seems reasonable that people might have emotional thoughts about other emotional thoughts and that those second order emotional thoughts might influence the confidence and the evaluation of the primary emotional thoughts. However, to date there has been little empirical research on the role of emotional thoughts affecting other emotional thoughts, leaving it an area ripe for exploration.

Multiple roles of mood in cognition and meta-cognition

The research described so far provides evidence for a relatively new role that mood can take on meta-cognitive processes. Prior research has already established at least four other roles through which mood can influence cognition in different situations. For example, when the elaboration likelihood is relatively low (i.e., when people do not have the ability or/and the motivation to think), mood has been found to have a direct (non-thought mediated) influence on social judgment (e.g., Petty, Schumann, Richmann, & Strathman, 1993). Mood has been also found to influence the amount of information processing when elaboration likelihood is not constrained to be high or low (e.g., Wegener, Petty, & Smith, 1995). Finally, when the elaboration likelihood is high, mood has been found to bias the direction of the ongoing thinking (e.g., Petty et al., 1993). For example, one way in which mood biases thoughts is by affecting how likely people think that different events might be (Wegener, Petty, & Klein, 1994). Research suggests that the effects of moods on perceived likelihoods are quite specific such that sad moods especially increase the perceived likelihood of sad consequences and angering states especially increase the perceived likelihood of angering consequences (DeSteno, Petty, Wegener, & Rucker, 2000; DeSteno, Petty, Rucker, Wegener, & Braverman, 2004).

In addition to biasing thoughts, the research described in the above sections has shown that mood states can also affect the confidence people have in their thoughts when the elaboration likelihood is high (Briñol et al., 2005). Again, these studies revealed that high NC individuals made to feel sad after message exposure came to have less confidence in the thoughts they generated during message exposure than participants who were made to feel happy after message exposure.

It is worth noting that the effects we have outlined for mood under different elaboration conditions assume that moods are not so salient that they are perceived as biasing. When moods are made salient, and people perceive a possible biasing impact, they will often attempt to correct their judgments for the biasing impact of the emotional state. This can cause judgments to move in a direction opposite to people's intuitive theory of bias (Petty & Wegener, 1993; Wegener & Petty, 1997, 2001). Thus, if people think a positive mood has a favorable impact on their judgments, and they overestimate this bias, the corrected judgment in a positive mood can be more negative than the corrected judgment in a negative mood (e.g., DeSteno et al., 2000; Ottati & Isbell, 1996).

It is also important to note that, like much of the previous research on the influence of affect on cognition, the studies described in this article examined the effects of non-specific, undifferentiated mild good or bad moods. Of course, as noted earlier, the effects of more specific emotions, such as joy, fear, anger, and disgust as distinct from general sadness or happiness on judgments also deserve serious attention in future research (e.g., DeSteno et al., 2000; Rusting, 1998). In fact, recent research

conducted by Tiedens and Linton (2001) suggests that specific emotions can affect confidence in a different way, regardless of the valence of the emotion. Thus, anger, a negative emotion, can be more associated with certainty than being surprised, which is a more positive emotion. In line with this argument, we postulated that it is the certainty implication of the affective state rather than the valence of the affective state, which determines whether the affect will increase or decrease the confidence with which an individual holds their thoughts. To test this idea, Briñol and Petty (2005b) conducted a study in which participants were led to feel anger or surprise after generating positive or negative thoughts. Consistent with most of the research presented above, we found that the direction of primary thoughts (positive or negative) only affected subsequent judgments when those thoughts were accompanied by an emotion associated with relatively high (anger) but not low (surprise) confidence.

In sum, general affective states and more specific emotions both can influence judgment by serving different roles in different situations. In the present article, we have focused our review on research in which emotional and non-emotional thoughts can influence the confidence with which people hold other emotional and non emotional thoughts. This research suggests that meta-cognitive processes can play an important role in emotional intelligence by affecting how emotional thoughts are perceived and experienced and by magnifying, attenuating, or even reversing the influence of first order thoughts and emotional thoughts.

In closing, it is worth noting that although the core of this review has focused on the influence of meta-cognitive processes on emotional (and non-emotional) thoughts, there has been also a great deal of research relating meta-cognition directly to judgment (e.g., as illustrated by the dashed line in the right of Figure 1; for a review, see, Petty & Krosnick, 1995). Also importantly, meta-cognitive processes are likely to be linked not only to easily reportable, primary emotional thoughts but also to more automatic, preconscious thoughts (Petty et al., 2005). As illustrated by the dashed left line of figure 1, such a possibility might be of particular interest in the emotional domain since certain thoughts might precede and produce emotions. In accord with Epstein (1998) and Ellis (1973), and in contrast with Goleman's (1995) position in which emotions are assumed to always precede thoughts, we argue that emotions are often produced by the interpretation of events, and that the thoughts that underlie emotions are frequently preconscious and automatic and therefore not easy to control.

As a final example of the potential role of implicit aspects of meta-cognition, consider research on overt behavior and persuasion. Research described in this review on the self-validation hypothesis showed that head-movements (nodding or shaking) can affect thought confidence, which then affects the impact these thoughts have on attitudes (Briñol & Petty, 2003). Work to date on the self-validation hypothesis has looked at thoughts that were consciously available and reportable by participants. In a follow-up line of research, however, Briñol, Petty, and Demarree (2005) extended these findings to show that head movements can have a similar impact on unconsciously induced thoughts. For example, in one of the studies, participants were subliminally primed with words designed to activate the stereotype of African Americans or not. Following this induction, participants completed a head-nodding task, ostensibly a task of «motor-eye coordination.» An interaction between prime and head movement was observed such that

participants in the head-nodding condition showed increased self-perceptions of aggression following an African American prime (a measure that has been used successfully in previous research; DeMarree et al., 2005), while participants in the head-shaking condition showed the opposite effect. This research demonstrates how confidence (presumably induced by head nodding) in unconsciously induced thoughts can be an important moderator of the effects of those thoughts on self-perceptions and subsequent behavior.

In sum, although most of the research covered in this review deals with explicit, easily reportable primary thoughts and judgments and explicit secondary, meta-cognitive thoughts, those primary and secondary thoughts may also operate outside awareness with important consequences for social judgment and behavior. Understanding emotional intelligence is likely to improve with the recognition of the importance of meta-cognitive processes in the thoughts that precede, accompany and follow emotions.

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