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Dimensions of Metacognitive Judgment *Implications for Attitude Change*

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INTRODUCTION

Just as people can evaluate social and physical objects, so too can they evaluate their own thoughts and thought processes. The human capacity for self-reflection has long been recognized by philosophers and psychologists alike (James, 1890/1983). In recent decades, researchers have examined how people's judgments about their own thoughts and feelings can impact the attitudes and behaviors that they ultimately exhibit. Critically, this process of thinking about one's own thinking—namely, *metacognition*—involves a distinction between *primary* and *secondary cognition*. Primary cognition involves the immediate associations between attitude objects and traits, whereas secondary cognition refers to the reflective judgments that are made about primary cognitions.

In this chapter, we will delineate the multiple dimensions on which people can evaluate their primary cognitions and will also consider the consequences of these evaluations in terms of attitude change. Some of the same categories that have traditionally proven effective for classifying primary thoughts can also be used to describe metacognitive thoughts (Petty, Briñol, Tormala, & Wegener, 2007). In this chapter, we organized metacognitive thoughts in terms of the perception of the (a) valence, (b) number, (c) target, (d) origin, (e) confidence, and (f) summary evaluation of primary cognition. After a general description of these dimensions of thinking about thinking, the second section of this chapter provides a description of how each of these categories can be consequential for attitudes and persuasion. In the final part of the chapter, we examine the possibility that, just as we think about our primary cognitions, we can also have higher order (e.g., third level)

metacognitions (i.e., cognitions about metacognitions), with further implications for attitude change.

DIMENSIONS OF THOUGHTS IN RESPONSE TO PERSUASION

Over the past 50 years, researchers have developed numerous theories of persuasion (see Eagly & Chaiken, 1993; Petty & Briñol, 2010). One of the earliest assumptions was that effective influence required a sequence of steps leading to absorption of the content of a message (e.g., exposure, attention, comprehension, learning, retention; see McGuire, 1985). However, the available research evidence shows that message learning can occur in the absence of attitude change and that attitudes can change without learning the specific information in the communication (Petty & Cacioppo, 1981).

Cognitive response theory (Greenwald, 1968; Petty, Ostrom, & Brock, 1981) was developed explicitly to account for the low correlation between message learning and persuasion observed in many studies, and for the processes responsible for yielding to messages. In contrast to the traditional learning view, the cognitive response approach contended that persuasion depends on the extent to which individuals articulate and rehearse their own idiosyncratic thoughts about the information presented. According to this framework, appeals that elicit issue-relevant thoughts that are primarily favorable toward a particular recommendation produce agreement, whereas appeals that elicit unfavorable thoughts toward the recommendation are ineffective in achieving attitude change—regardless of message learning. The extent to which a thought was favorable (or unfavorable) toward the position advocated by the persuasive proposal was termed *valence* and served as a chief determinant of persuasion.

In addition to the *valence* of a recipient's thoughts, a second feature of thoughts that is important for persuasion is the *number* of thoughts that the person generates. Number is important in two ways. First, the greater the number of positive or negative thoughts a person generates, the greater the extent of attitude change or resistance that is expected. Second, attitudes that are based on a relatively high number of thoughts are generally more persistent over time, more resistant to change, and more likely to produce attitude-consistent behavior than are attitudes based on a relatively low number of thoughts (Petty, Haugtvedt, & Smith, 1995).

The thoughts that people generate can vary on several dimensions in addition to valence and number. In the attitude-change literature, thoughts generated in response to a persuasive message are also classified according to their target (i.e., subject) and their origin (i.e., their original source). We describe these categories in detail in the next section. Importantly, thoughts can be coded according to these categories by external judges as well as by the participants who generated the thoughts. To the extent that people evaluate their own thoughts using these categories, they are forming metacognitive judgments.

In addition to valence, number, target, and origin, a few other dimensions of metacognitive judgment warrant discussion. Specifically, these include thought confidence and a dimension that is best characterized as thought evaluation.

Thought *confidence* refers to assessments of the validity or correctness of one's thoughts, and thought confidence—also known as thought certainty—is perhaps the most thoroughly studied of all of the metacognitive dimensions (Briñol & Petty, 2009). The *evaluation* dimension of metacognition involves people's judgments about whether they like or dislike a particular thought (regardless of whether it is perceived to be positive or negative, valid or invalid).

In the next section, we describe how each of these six dimensions of metacognition is relevant for attitudes and persuasion. Then, we describe research exploring the notion that people can have metacognitions about their own metacognitions. Finally, we discuss the impact of persuasion on attitude structure, paying special attention to the possibility that people can store metacognitive judgments in memory and that these metacognitive judgments can impact downstream information-processing, judgment and behavior.

THE IMPACT OF METACOGNITIVE JUDGMENTS ON PERSUASION

Perceived Valence of Primary Thoughts

We have already noted that according to the cognitive response theory of attitude change (Greenwald, 1968; Petty et al., 1981), persuasion occurs not so much because people learned message arguments or source cues, but rather because they cognitively responded to them with either favorable or unfavorable thoughts. Thus, a person might learn an argument but resist it by counterarguing, or not learn an argument but succumb to it because of a favorable thought that was generated. In essence, the cognitive response approach to persuasion holds that virtually all attitude change is ultimately self-persuasion in that even external messages are influential primarily because of the idiosyncratic favorable or unfavorable thoughts that people have in response to the messages (Petty & Cacioppo, 1981). The cognitive response approach provides a useful framework for understanding persuasion when people are motivated and able to think about a message (Petty & Cacioppo, 1986).¹

Notably, the original formation of the cognitive response approach assumed that the person would perceive a thought to be favorable when the thought was actually favorable toward the proposal, whereas an unfavorable thought would be perceived as a counterargument. This assumption is largely correct, as suggested by the high correlation between the ratings of favorability from external coders and the ratings of favorability from the participants that generated the thoughts (see Cacioppo, Harkins, & Petty, 1981). In some cases, though, a person might believe that his or her thought is favorable toward the position advocated in the message at the same time that an external coder could rate this thought as being unfavorable (or vice versa). For instance, a person who enjoys a challenge might say to himself, "This argument is hard to understand." The person who generated this thought could label it as "favorable," whereas an external coder who does not know that individual could label it as "unfavorable." Future research should explore the potential causes—and effects—of the divergence between self- and other-rated

thought valences. As has been the case with other discrepancies between objective and subjective judgments, it is likely that the message recipient's own perception of valences is more important in determining persuasion than the perception of others is.

Perceived Number of Primary Thoughts

As noted, according to the cognitive response model, an appeal that elicits issue-relevant thoughts that are (or are perceived to be) favorable toward a particular recommendation produce agreement, whereas an appeal that elicits thoughts that are (or are perceived to be) unfavorable toward the recommendation is ineffective in achieving attitude change. In addition to affecting persuasion by influencing the *valence* (favorable or unfavorable) of thoughts that came to mind, early work on the cognitive response approach also emphasized how persuasion could be affected when variables influenced the *number* of thoughts of a particular valence that were generated. For example, if a person would normally be counterarguing a proposal, introducing some distraction would disrupt these negative thoughts, thereby producing more persuasion than if no distraction were present (Osterhouse & Brock, 1970). However, if a person would normally be thinking favorable thoughts, distraction has the opposite effect (Petty, Wells, & Brock, 1976).

The actual number of thoughts that people generate has to do with the primary level of cognition. From the point of view of metacognition, what matters is the subjective perception of the number of thoughts that the person has generated. One way that people can make metacognitive judgments about number of thoughts involves the ease with which thoughts come to mind. Specifically, people can use the ease with which they generate thoughts as a cue indicating the prevalence of such thoughts, with greater ease indicating greater availability (Tversky & Kahneman, 1973). Interestingly, in some cases the implications of ease of retrieval are at odds with the implications of the actual number of thoughts one has generated. For instance, in the classic study on ease, Schwarz and colleagues (1991) demonstrated that people experience difficulty in generating a high number of aggressive behaviors that they have performed, whereas they find it relatively easy to name just a few examples of aggressive behavior. As such, people judge themselves to be more aggressive when listing only a few behaviors than when listing many, reflecting the use of ease of retrieval as a heuristic cue indicating prevalence or probability (Tversky & Kahneman, 1973; for a more thorough discussion of ease, see Sanna & Lundberg, Chapter 10, this volume).

In the context of persuasion, people infer that the easier it is to generate information in favor of a position (e.g., one's own assertiveness), the more supportive information there must be. Conversely, having difficulty in generating such information would be associated with perceptions that there is little support available for that particular position. These inferences about the availability of information could then impact persuasion. This interpretation provides an excellent illustration of how the perceived number of thoughts (availability) rather than the actual number of thoughts matters for the influence of ease on attitude change. Although this heuristic explanation makes sense when people have limited ability to think

and when the ease is salient before judgment (Kuhnen, 2010), more recent work has suggested that when people are engaged in thoughtful judgments, ease affects attitudes by affecting thought confidence (Tormala, Falces, Briñol, & Petty, 2007; Tormala, Petty, & Briñol, 2002). Although this *self-validation* interpretation is described in more detail in the section on confidence, for now it is sufficient to note that it allows us to understand the effects of ease under high-thinking conditions and the explanation is not based on perceptions of the number of thoughts, but rather on the perceptions of the validity of the thoughts.

In closing this section, it is important to note that although perceptions regarding the number of thoughts that a person has generated can influence attitude change, so too can perceptions of the amount of elaboration that the person has performed influence *attitude strength*, which refers to the extent to which an attitude is durable and impactful (Krosnick & Petty, 1995). In one relevant study, Barden and Petty (2008) asked undergraduate participants to generate thoughts about the adoption of wireless Internet (WiFi) networks at their university. After participants listed their thoughts, they were randomly assigned to receive bogus feedback indicating that they had, on average, listed fewer (i.e., low-thought condition) or more (i.e., high-thought condition) thoughts than their peers.

Of course, no differences in actual number of thoughts listed were observed between the two feedback groups. Nonetheless, participants who were told that they had listed fewer thoughts than their peers perceived that they had thought less about the topic than did participants who were told that they had listed more thoughts than their peers. Additionally, these perceptions of amount of thinking influenced attitude confidence, with greater perceived thinking predicting greater attitude certainty. Perhaps most notably, these effects were independent of the actual amount of thinking that participants engaged in, demonstrating that metacognitive perceptions involving extent of thinking are consequential for attitude strength (see also Rucker, Petty, & Briñol, 2008).

Perceived Target of Primary Thoughts

The target dimension refers to what the person perceives the thought to be about. Possible targets for primary cognitions involve the self, other people, and groups, as well as any number of physical objects or abstract ideas that a person can consider. For example, in the context of persuasion a person might wonder: Does the thought refer to the message (i.e., “This argument is very convincing!”), the source (i.e., “The speaker is very attractive!”), or to something else (i.e., “This room is very hot!”)? Thus, *target* refers to the referent of a thought. In fact, thoughts can be about anything. However, what matters for the purposes of metacognitive judgment is not what the thought is actually about, but rather the person’s judgment about the thought’s referent. Because human judgment is subjective and is beset by several biases and distortions (Griffin & Ross, 1991), it is perhaps unsurprising that judgments about the referent of one’s thoughts can be shaped by factors that are irrelevant to the thoughts’ actual referents.

Research on attitude change has examined the possibility of classifying thoughts in response to persuasive proposals as a function of perceived target. For

example, Chaiken and Maheswaran (1994) presented participants with a message about a consumer product. This message ostensibly originated from a high- or low-credibility source. After processing the message and reporting their attitudes toward the product, participants were given 3 minutes to list the thoughts that they had during the experiment. Later, these thoughts were coded by independent raters for the thoughts' target and valence. Findings demonstrated that thoughts about the source and thoughts about the product's attributes exerted independent effects on participants' attitudes toward the product. Thus, we can see that the target of a person's thoughts is an important determinant of persuasion. Although in this particular research thoughts were coded by external judges, it is common for research in persuasion to have participants code their own thoughts as well (e.g., Rucker, Briñol, & Petty, 2010), and similar findings would be expected in such a case.

Perceived Origin of Primary Thoughts

The origin of thoughts refers to the perceived source of a particular primary cognition. People can ask themselves questions such as "Where did this thought come from?" and "Did I think of this myself, or did I hear somebody else say it?" Additionally, people may ask themselves whether their thoughts originate in their emotions or from their knowledge and beliefs. Critically, a number of consequences can flow from individuals' judgments about the origin (or origins) of their thoughts. For example, people are more satisfied with their lives when they attribute their positive thoughts to internal characteristics than when they attribute these same positive thoughts to external factors (e.g., weather, a soundproof room; Schwarz & Clore, 1983). Additionally, people who are able to attribute negative physiological arousal stemming from cognitive dissonance to external factors (e.g., the ingestion of a pill) are less likely to attempt to resolve the underlying dissonance than are individuals who cannot attribute their negative arousal to the effects of a pill (Zanna & Cooper, 1974; see also Schachter & Singer, 1962).²

The social psychological literature is rich in these kinds of examples. One context in which metacognitive judgments about thought origins seems to be particularly consequential has to do with eyewitness memory. One notable controversy in this domain involves cases in which people "recover" memories about past episodes of abuse. Specifically, some have argued (e.g., Loftus & Ketcham, 1994) that individuals who claim to have uncovered repressed memories of traumatic episodes are, in fact, "recalling" events that they previously imagined or that somebody else described to them. Underlying these effects, presumably, are errors in *source monitoring*, a process whereby individuals misjudge the origins of a particular thought or memory (see Johnson, 2006). As we can see, thoughts that are initially generated by other people can, in some cases, be mistaken for thoughts generated by the self or for memories of events that the self has actually experienced. Once (mis)attributed to the self, the thoughts can have greater impact than they would have if they were attributed to external origins.

The perceptions of the origin of thoughts can be also consequential for persuasion. In a recent line of work, Briñol, Petty, Gascó, and Horcajo (2009) asked

participants to generate positive or negative thoughts regarding their bodies. Then, participants were led to believe that their thoughts originated externally (i.e., they arose from societal views) or internally (i.e., they arose from the self). Specifically, thoughts about the body were said to emerge from the “particular views of their culture through socialization” (external origin) or to emerge “from deep down inside of the self.” The results revealed that the direction of the thoughts that participants had generated had a greater impact on reported body satisfaction when the origin of the thoughts was perceived to be the self than when it was perceived to be an external source. As a result, perceiving positive thoughts as coming from the self (vs. others) made people feel better about their body image, but perceiving negative thoughts as coming from the self produced the opposite effect.

In another study in this line of research, we replicated these findings for attitudes toward fast food. Specifically, after thinking about the benefits or costs of eating fast food, participants were led to believe that food-related thoughts were learned from others (external source) or were innate (internal source). As expected, the direction of the thoughts (positive or negative) had a greater impact on attitudes and behavioral intentions regarding eating fast food when people perceived the self (vs. others) as the source of the thoughts. Importantly, these findings were moderated by a number of variables, including self-esteem. Having the perception that thoughts are generated internally only led to a greater influence of thoughts on attitudes among participants with high self-esteem. Moreover, like the ease of retrieval effect described earlier, these effects are assumed to be mediated by thought confidence.

A final way that people can make judgments about the origin of their thoughts involves making judgments about their thoughts' basis. Relevant to illustrating this notion is the *tripartite model* of attitude structure, according to which attitudes are based on (a) affect or feelings; (b) cognitions, or beliefs and knowledge; and (c) behaviors or actions (Breckler, 1984; Zanna & Rempel, 1988). Importantly, the primary basis of one's attitude can have important implications for attitude change. For example, it is generally more effective to change attitudes that are based on emotion with emotional strategies rather than with more cognitive or rational ones (Edwards, 1990; Fabrigar & Petty, 1999).

But although it is sometimes easy for a person to categorize his or her thoughts as being mostly affective or cognitive, this need not be the case. That is, people's beliefs about the basis of their attitudes on a particular subject do not always correspond with the more objective basis of their attitudes (See, Petty, & Fabrigar, 2008). And just as the basis of the attitude object can have important implications for attitude change, so too can the perception of those bases. For instance, See, Petty, and Fabrigar (2008) showed that both the actual and the perceived bases of one's attitude on a particular topic can predict the extent to which people are persuaded by messages that are framed in terms of these bases. Specifically, messages that match (real or perceived) attitudinal bases lead to greater persuasion than do messages that do not match attitudinal bases (for reviews on matching and persuasion, see Briñol & Petty, 2006; Petty, Wheeler, & Bizer, 2000).

Confidence in Primary Thoughts

One of the most essential dimensions of metacognitive thought consists of the degree of *confidence* people place in their thoughts, ranging from extreme certainty to extreme doubt about their thoughts' validity. Thus, two people might have the *same* thought, but one person might have considerably greater confidence in that thought than the other, and the greater confidence in the thought is, the greater its impact on judgment will be. This idea is referred to as the *self-validation hypothesis* (Petty, Briñol, & Tormala, 2002). The key notion is that generating thoughts is not sufficient for them to have an impact on judgments. Rather, one must also have confidence in them. The self-validation hypothesis makes a number of straightforward predictions. First, it suggests that just as assessing attitude confidence has been very useful in determining which attitudes guide behavior (e.g., Fazio & Zanna, 1978), so too would assessing thought confidence be useful in determining which thoughts generated in response to a persuasive communication predict attitudes. In line with this reasoning, Petty and colleagues (2002) found that attitude–thought correlations increased as self-reported thought confidence increased.

Furthermore, direct manipulations of thought confidence can have a similar impact. In one study, for instance, following exposure to a message containing strong or weak arguments in favor of a new university exam policy and a typical thought listing task, Petty and colleagues (2002) asked the college student recipients to think about situations in which they had felt confidence or doubt in their thinking. Those who articulated past instances of confidence became more certain of the validity of their recently generated thoughts than did those who reflected upon instances of doubt. High thought confidence led to greater persuasion when recipients' thoughts were largely favorable, but high thought confidence led to less persuasion when recipients' thoughts were largely unfavorable. Thus, confidence (vs. doubt) increased the impact of thought valence on attitudes.

According to the self-validation hypothesis, anything that enhances confidence in thoughts will increase the impact of valenced thoughts on attitudes and anything that enhances doubt will reduce the impact of valenced thoughts. Thus, if people are generating favorable thoughts about themselves or a new proposal, they will be more persuaded if they are nodding their heads or are feeling happy, affirmed, or powerful because these variables instill confidence in the favorable thoughts and lead people to use them more than if they are shaking their heads or are feeling sad, not affirmed, or powerless (see Briñol & Petty, 2009, for a review). However, if people are generating unfavorable thoughts (e.g., because message arguments are weak), then these same variables (e.g., nodding one's head or feeling powerful) will lead to *less* persuasion because people will have confidence in their unfavorable thoughts and will use these thoughts in forming their judgments.

As noted earlier, people also consider their thoughts to be more valid when they are generated with ease rather than difficulty (see also Briñol, Petty, & Wagner, Chapter 12, this volume). Thus, diverse self-validation variables can interact with the direction of people's thoughts to influence judgments. Although we have only discussed self-validation processes in reference to recipient variables so far, self-validation can involve other types of variables as well. As reviewed by Briñol and

Petty (2009), the self-validation framework provides a novel way to understand the effects of source variables (e.g., credibility, similarity), message variables (e.g., matching, repetition), and context variables (social consensus). In each case, this recently discovered mechanism has pointed to new effects and a new understanding of established effects.

In closing, it is important to specify when attitudes are likely to change through self-validation processes. Two critical variables to consider are *timing* and *elaboration*. First, when confidence inductions follow information processing, then confidence is likely to operate via the metacognitive process outlined previously because, if a sense of confidence *precedes* thought generation, the thoughts are not a plausible cause of the confidence. Second, this metacognitive role for confidence is more likely to arise when people are thinking a great deal than when people are not thinking very much because metacognition requires cognitive effort beyond primary cognition. Thus, the self-validation effects described in this section were more apparent in high-thinking situations (e.g., situations fostering high personal relevance; Petty & Cacioppo, 1979) or individuals (e.g., individuals high in need for cognition; Cacioppo & Petty, 1982) and when the validating variable followed thought generation, rather than preceded it. Of course, confidence can play other roles under different circumstances (e.g., affecting the extent of thinking; see Briñol, DeMarree, & Petty, 2010, for a review), but here we have chosen to highlight its metacognitive role.

Evaluation of Primary Thoughts

Lastly, the *evaluation* dimension of metacognition involves people's judgments about the desirability of a particular thought. That is, people can have attitudes toward their own thoughts. People can evaluate whether they like their thoughts or not and to what extent they consider their thoughts to be desirable or appropriate. If people like their own thoughts, then these thoughts are especially likely to affect downstream judgments and behaviors. If people do not like their own thoughts, they might be less influential.

One way in which people can evaluate whether they like their thoughts is by considering how they feel about them, how the thoughts make them feel, and how they felt at the time of thought generation. For instance, if a person feels happy about his thoughts, he is likely to use those thoughts in forming attitudes. Likewise, happiness that is unrelated to one's primary cognitions can lead individuals to rely more on these cognitions in forming summary judgments (e.g., Briñol, Petty, & Barden, 2007; see also Huntsinger & Clore, Chapter 11, this volume). However, emotions can lead to somewhat paradoxical effects, depending upon the appraisals of the emotions that are highlighted. For instance, consider the case of anger. Anger is an unpleasant emotion that is associated with a high degree of confidence (Tiedens & Linton, 2001). If an individual is feeling angry and is focusing on his or her level of confidence, then anger should be able to validate his or her thoughts and lead to corresponding attitudes and judgments. If another individual is feeling angry but is focusing on the unpleasantness associated with that emotion, then he or she may feel bad about his or her primary cognitions, leading to attitudes and judgments that are relatively less affected by the direction of these cognitions

(Briñol, Petty, Stavraki, Wagner, & Díaz, 2010; see also Briñol, Petty, & Wagner, Chapter 12, this volume).

Importantly, the impact of anger on judgment as a function of self-validation or invalidation highlights the distinction between liking one's thoughts and having confidence in one's thoughts. Focusing on the valence of their emotions may lead people to like or dislike their thoughts, whereas focusing on the confidence associated with their emotions may lead people to feel confident or doubtful in their thoughts. In most cases, people like the thoughts they consider valid and dislike the thoughts they consider invalid. However, liking and confidence are not always overlapping constructs. It is possible to like a thought without having much confidence in it: "I like to think that I am great at sports, although I am uncertain that this is really true." Similarly, it is possible to dislike a thought a great deal while having utmost confidence in that thought: "I hate to be right, but I am sure my friend cannot survive that automobile accident."

Just as there are situational factors that can influence whether people like their thoughts (e.g., transitory affect), so there are also individual differences in evaluation of thinking. People vary in the extent to which they enjoy effortful thinking (Cacioppo & Petty, 1982), and this variation predicts the likelihood that people will think carefully across situations and topics (for a recent review on need for cognition, see Petty, Briñol, Loersch, & McCaslin, 2009). Thus, we can see that people's metacognitive judgments about whether thinking is good and enjoyable are related to the amount that they think about any given topic. If people evaluate thinking as fun, they are more apt to think carefully when presented with the opportunity to do so; if people dislike thinking, they are relatively unlikely to engage in effortful processing of a particular message (Cacioppo, Petty, & Morris, 1983).

PERCEPTIONS OF SECONDARY THOUGHTS

So far, we have differentiated between thoughts that occur at the primary level of cognition and thoughts about those thoughts, or secondary cognition. Briñol, Rucker, Tormala, and Petty (2004) suggested that it is necessary to distinguish further between two qualitatively different aspects of metacognitive, secondary thoughts. The first is the *nature of the belief itself*—what does a person believe about the content, the amount, or the origin of his or her thoughts? As we have described, these judgments are consequential for attitude change and need not be grounded in reality. A second aspect of a person's metacognitions is a *value judgment of the secondary belief*. Specifically, people may believe that it is either appropriate or inappropriate to think about their own thoughts in one way or another. In other words, just as people think about their thoughts, people can also have thoughts about their metacognitions. In some ways, these thoughts about metacognitions could be considered to occur at the meta meta level, and the same dimensions that are useful to understanding regular metacognition might be relevant for understanding this third level of cognition.

Some initial evidence suggests that what people think about their secondary cognitions can have implications for attitude change. For example, as we have seen, people generally construe ease in retrieving thoughts as evidence that these

thoughts are valid or that these thoughts indicate that the target of these thoughts is especially prevalent or likely. However, people need not perceive metacognitive ease in such positive terms. That is, if people's naïve theories regarding the meaning of ease could vary (or even be changed), then they could form different judgments based on their experiences of ease. In a study investigating this point, Briñol, Petty, and Tormala (2006) asked participants to generate either two or 10 arguments in favor of a counterattitudinal proposal. Additionally, half of participants were told that ease of retrieval in generating thoughts reflected thoughts that were low in complexity and that, in fact, intelligent people often experience more difficulty in generating thoughts than do unintelligent people, given that intelligent people have more neuronal connections, the operation of which can be taxing. The remaining participants were provided opposite information, which reflected the perhaps default association of ease with confidence and validity.

Consistent with expectations, Briñol, Petty, and Tormala (2006) found the traditional ease-of-retrieval effect only among participants who received the "ease is good" instruction. That is, these participants were more confident in their thoughts when these thoughts were relatively easy to generate, meaning that participants listing two arguments (i.e., easy task) reported more favorable attitudes than did participants listing 10 arguments (i.e., difficult task). Among participants who were instructed that "ease is bad," an opposite effect emerged. Specifically, this group reported more favorable attitudes when listing 10 arguments than when listing two arguments. Thus, people's interpretation of the *meaning* of metacognitive ease is critical in determining downstream judgments.

This research by Briñol, Petty, and Tormala (2006) reveals that interpretations regarding the meaning of a variety of metacognitive experiences can impact downstream judgment.³ For instance, people generally associate perceptual fluency with familiarity and perceptual difficulty with unfamiliarity or novelty (e.g., Jacoby, Kelley, Brown, & Jasechko, 1989). However, this naïve theory linking fluency with familiarity is malleable; when induced through a training procedure to associate fluency with unfamiliarity (and difficulty with familiarity), the "typical" effect of fluency on familiarity judgments can be reversed (Unkelbach, 2006). In addition to affecting familiarity judgments, the metacognitive experience of ease (or fluency) can increase positive evaluations of attitude objects (Zajonc, 1968). In the context of goal pursuit, however, metacognitive ease (relative to difficulty) is associated with less favorable evaluations of goal means. That is, because the instrumentality of a behavior (or means) for goal fulfillment positively correlates with the effortfulness of that behavior (or means), people show more positive evaluations of goal means when these means are associated with metacognitive difficulty than when they are associated with metacognitive ease (Labroo & Kim, 2009).

Metacognitive interpretations regarding the meaning of regulatory depletion for attitude certainty can also vary, thereby producing different attitude certainty judgments. In one set of studies, Wen, Rucker, Tormala, and Clarkson (2010, Experiments 1 and 2) showed that people typically associate cognitive depletion with having thought a great deal about a particular subject. Because thinking a lot about a topic—or believing that one has thought a lot about a topic (see Barden & Petty, 2008)—is associated with increased attitude certainty, people who feel

depleted while thinking about a topic report greater certainty in their attitudes for that topic (Wen et al., 2010). However, when induced to associate depletion with uncertainty and nondepletion with certainty (Wen et al., 2010, Experiment 3), this pattern was reversed, such that participants who were feeling depleted reported less attitude certainty than did participants who were not feeling depleted. Thus, we can see that people's judgments regarding the meaning of their metacognitive experiences can impact other, downstream judgments. What is more, people's judgments regarding the meaning of their metacognitive experiences are malleable, indicating that people who are having similar metacognitive experiences may show very different ultimate judgments as a function of their lay theories linking these experiences with meaning (see also Job, Dweck, & Walton, 2010).

THE IMPACT OF ATTITUDE CHANGE ON ATTITUDE REPRESENTATION

Insights From the Metacognitive Model

The studies described in the previous sections illustrate that metacognitive judgments can change attitudes and attitude strength. In this section we examine how being persuaded can impact attitude structure. According to the metacognitive model (MCM) of attitude structure (Petty & Briñol, 2006; Petty, Briñol, & DeMarree, 2007), attitudes consist of evaluative associations (positive and negative), and the evaluative associations are linked to validity tags that can be represented in various ways, (e.g., confidence/doubt). Essentially, the MCM argues that people attach validity tags to object-association links, storing the entire set of associations in long-term memory. Thus, persuasion can entail the development and metacognitive validation of novel object-association links *as well as* the metacognitive invalidation of existing object-association links.

To illustrate, consider the case of a former smoker. This person may have both positive and negative evaluations of cigarette smoking stored in memory, but may tag the latter as "true" or "valid" while tagging the former as "false" or "invalid." In this case, the person would be endorsing the stored association between "smoking" and "bad" and rejecting the stored association between "smoking" and "good." As such, the person would not acknowledge any explicit conflict with respect to his or her true attitude toward smoking. That is, the former smoker would likely state that he or she had a very negative attitude toward cigarette smoking that was held unambivalently (Petty & Briñol, 2009).

In this situation, explicit attitude measures would show that this individual had been persuaded from a pro- to an antismoking position. However, implicit measures would detect the presence of (rejected) evaluations that conflict with explicitly endorsed evaluations. This is because validity tags are more distantly related to the attitude object than are evaluations of that object, meaning that validity tags are generally less likely to be activated—or are likely to be activated less strongly—than are evaluative associations, assuming that the starting point is activation of the attitude object itself. In cases in which a high amount of cognitive resources are available—as in the case of explicit measures about which respondents can

deliberate—both the object evaluations and the validity tags are activated, meaning that responses reflect the validity information that people have stored regarding the object-evaluation association.

In cases where cognitive resources are constrained, however—as often happens when people respond to implicit measures, particularly those involving speeded responses—people’s responses to attitude objects tend to reflect largely the influence of their automatic evaluative associations and not the influence of validity tags (for a related argument, see Fazio & Olson, 2003.) Thus, the MCM of attitude structure provides an explanation of why, in some cases, explicit and implicit attitude measures yield discordant attitude estimates.

Interestingly, the continued presence of rejected evaluative associations following attitude change can have important implications for attitude strength and information processing. For instance, storing both positive and negative evaluative associations for the same attitude object—even when only one set of these evaluative associations is explicitly endorsed—can produce a state of *implicit attitudinal ambivalence* (Petty & Briñol, 2009). That is, people with both positive and negative evaluative associations toward an attitude object show more ambivalence toward that object on implicit measures than do people who have more univalent evaluative associations (Petty, Tormala, Briñol, & Jarvis, 2006, Experiment 2), despite the fact that the two groups report similar (and low) levels of ambivalence on explicit measures. Further, individuals possessing implicit attitudinal ambivalence report more discomfort with respect to the attitude object (Rydell, McConnell, & Mackie, 2008) and engage in more extensive processing of information related to the attitude object (Petty et al., 2006, Experiments 3 and 4), presumably reflecting an ambivalence-reduction strategy (Briñol, Petty, & Wheeler, 2006; for a recent review on implicit ambivalence, see Petty, Briñol, & Johnson, 2011).

SUMMARY AND CONCLUSIONS

Thoughts generated in response to a persuasive proposal are typically classified into a number of categories by judges or by the people who generated the thoughts, themselves: valence (e.g., “Is the thought favorable or unfavorable toward the proposal?”), number (e.g., “Are there many or few thoughts?”), target (e.g., “What is the thought about?”), and origin (e.g., “From where does the thought come?”). Just as coding thoughts for these dimensions has provided a very fruitful approach for understanding some of the psychological processes that underlie attitude formation and change, coding metacognitions along these same dimensions has also been important for the study of persuasion.

In addition to these aspects of secondary cognitions, two additional dimensions are uniquely metacognitive and were covered in our review: one’s *evaluation* of a thought, and one’s *confidence* in that thought. Whether people like their thoughts and whether these thoughts are held with confidence are consequential in terms of the impact of these thoughts on attitudes. The precise distinctions among these dimensions are somewhat arbitrary and overlapping, but they serve as a practical way to organize the growing literature on metacognition and persuasion. By using this framework to organize the chapter, we do not imply that a particular study was

originally designed to assess just one of the specific dimensions. In fact, due to the overlap among dimensions, some of the studies described under one dimension could plausibly be discussed as relating to a different dimension. For example, the research examining whether people think that their thoughts come from the self or from others has been discussed under the *origin* dimension, but it could plausibly fit under the *confidence* dimension because origin influences confidence.

In this chapter, we highlighted the idea that not only does what a person thinks about his or her thoughts matter for persuasion, but it is also important to consider the judgments people make regarding the meaning of these secondary cognitions. Our research has shown that whether ease of retrieval impacts judgments depends on whether people consider that metacognition to be something good or bad (Briñol, Petty et al., 2006). Similar to the work on self-validation processes showing that confidence applies to whatever is in people's minds, we argue that the dimensions outlined in this chapter (including confidence) can be applied not only to assess primary cognitions but also to assess secondary cognitions.

In our final section, we described how being persuaded can change the structure of individuals' attitudes, paying particular attention to the metacognitive validity tags that people attach to their object-evaluation associations. Thus, attitude change can involve not only the creation (and validation) of novel object-evaluation links but also the invalidation of existing object-evaluation links. Importantly, these metacognitive validity tags are stored in memory as part of the overall attitudinal representation, influencing downstream consequences such as information processing of attitude-relevant information and scrutiny of attitude-relevant persuasive communications.

Across each of the sections in this review, we noted that people's metacognitive judgments about their own thoughts, beliefs, and attitudes can be inconsistent with more objective indicators of these same dimensions. As an example, people may believe that an attitude's basis is affective (e.g., feelings) when, in reality, the attitude is based in cognition (e.g., knowledge, beliefs; see See, Petty, & Fabrigar, 2008). Also, people can attribute thoughts to themselves when, in fact, these thoughts originated in others (Briñol et al., 2009; Johnson, 2006; Loftus & Ketcham, 1994). Finally, people's beliefs about the extent to which they have thought about an attitude object or issue are sometimes unrelated to the true extent to which they have thought about that object or issue (Barden & Petty, 2008).

These discrepancies likely arise because people often are unaware of—or unable to verbalize—the true origins and nature of their thoughts, judgments, and behaviors (Nisbett & Wilson, 1977). In fact, when they are asked to consider the basis for their attitudes, people can focus on information that is irrelevant to their attitudes' basis, leading them to use their attitudes less in guiding subsequent behavior (Wilson, Dunn, Bybee, Hyman, & Rotondo, 1984; Wilson et al., 1993). Of course, speculating on the basis of one's attitude need not disrupt the influence of that attitude on behavior; presumably, if individuals contemplate the *actual* basis for their attitudes (e.g., based on high thought), these attitudes can become more, not less, predictive of behavior (e.g., Petty, Haugtvedt, & Smith, 1995).

NOTES

1. When people are unmotivated or unable to think carefully about a message, attitudes are influenced less by message-relevant cognitive responses than by thoughts about simple cues (e.g., "If an expert says it, it must be correct.") or by simple associations to the message that can occur with little if any thinking (Petty & Cacioppo, 1986). Under low-thinking conditions, metacognitive processes are less likely to operate (see Briñol & Petty, 2009).
2. Another case in which judgments regarding the origin of one's thoughts can impact attitudes involves evaluative conditioning. Specifically, Jones, Fazio, and Olson (2009) demonstrated that the affective reactions elicited by valenced unconditioned stimuli (i.e., positively and negatively valenced images) are spontaneously attributed to conditioned stimuli (i.e., novel, neutral objects in close temperospatial contiguity with the unconditioned stimuli) under certain circumstances (i.e., when the conditioned stimulus is particularly salient), thereby leading the conditioned stimuli to "take on" the valence of the unconditioned stimuli. Essentially, such effects reflect the judgment that the origin of one's positive or negative affective reactions is the conditioned stimulus rather than the unconditioned stimuli. It is important to note that this account is based on a relatively low-thought process, unlike most of the metacognitive processes described in this chapter. That is, according to Jones and colleagues, evaluative conditioning relies on a relatively simple misattribution inference similar to the self-perception and heuristic processes that do not require extensive thinking to operate. As noted, metacognitive processes require relatively more elaboration.
3. People can trust (and like) their metacognitions for reasons other than their naïve theories about their secondary thoughts. For example, consistent with the idea that power can validate thoughts (Briñol et al., 2007) regardless of their nature, recent research has shown that high-power individuals are more likely to use their metacognitive experiences of ease (Weick & Guinote, 2008).

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