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Embodied Validation *Our Bodies Can Change and Also Validate Our Thoughts*

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INTRODUCTION

Embodied persuasion refers to the idea that people's own behaviors can impact their attitudes (i.e., their likes and dislikes). As one example, when we smile, we tend to see everything in a more positive light than when we frown. Also, when we nod our heads, we tend to like things better than when we shake our heads. In one early embodiment study, individuals who were induced to nod their heads (i.e., agreement behavior) while listening to a persuasive message over headphones were more favorable to the proposal than people who were induced to shake their heads (i.e., disagreement behavior) while listening to the same message (Wells & Petty, 1980). Other research has found that information presented while performing an approach behavior (e.g., using one's hands to pull up from underneath a table) is evaluated more positively than information presented during an avoidance behavior (e.g., pushing down on a table top surface; Cacioppo, Priester, & Bernston, 1993). Similar findings have been found for a large number of behaviors, postures, and bodily movements (for a recent review on embodied persuasion, see Briñol & Petty, 2008).

Although the ability of bodily movements to influence attitudes seems to be a well-established phenomenon, most research on this topic has not focused on the psychological mechanisms by which the body affects attitudes. Understanding these processes is essential in order to predict *whether, when,* and *how* attitudes will change, as well as to predict whether, when, and how

attitudes will result in further behavioral changes. That is, although we might often like something more when we smile (vs. frown) or when we nod (vs. shake) our heads, it is important to understand the processes responsible for these changes in evaluation so that we can appreciate the consequences of these embodied attitudes.

Consistent with the elaboration likelihood model (ELM) of persuasion (Petty & Cacioppo, 1986), we argue that the psychological processes relevant to embodied attitude change can be organized into a finite set that operates at different points along an elaboration continuum. Under low-thinking conditions, bodily responses, like other variables, can influence attitudes via a variety of low-effort processes. When the likelihood of thinking is relatively high, these same bodily responses can impact persuasion by affecting the direction of the thoughts that come to mind or by serving as a piece of evidence (argument). Furthermore, body postures and actions can influence attitudes by influencing the amount of thinking when elaboration is not constrained to be very low or high.

We begin the present chapter by reviewing how our body can influence these psychological processes, focusing on primary or first-order cognition. Primary thoughts are those that occur at a direct level of cognition and involve our initial associations of some object with some attribute. Following a primary thought, people can also generate other thoughts, which occur at a second level and involve reflections on the first-level thoughts. *Metacognition* refers to these second-order thoughts, or thoughts about other thoughts or thought processes (Petty, Briñol, Tormala, & Wegener, 2007).

In the second part of the chapter, we focus on this secondary form of cognition, describing recent work on embodiment that reveals that our body can influence attitudes by affecting confidence in our thoughts—a metacognitive process called self-validation. According to the *self-validation* perspective (Petty, Briñol, & Tormala, 2002), although our body can serve as a cue for or influence the amount and direction of thoughts, it can also affect what we think about our thoughts, especially the extent to which we are certain in the validity of these thoughts. We refer to this idea as *embodied validation*. In line with this metacognitive process, in the second part of the chapter, we describe different lines of research revealing that the confidence (or doubt) that emerges from bodily responses can magnify (or attenuate) the effect of anything that is currently available in people's minds. The research described in that section is organized around the content of the primary thoughts that are validated (or invalidated) by the body, ranging from thoughts in response to persuasion to emotional thoughts and other primed psychological constructs.

Third, we distinguish among the processes by which bodily responses operate and specify the conditions under which metacognitive processes such as self-validation are particularly likely to occur. A final section compares self-validation with other metacognitive perspectives, highlighting the unique features of our framework. In closing this chapter, we outline some general conclusions and highlight a number of current and future issues relevant to the research on embodied change and validation.

BODILY RESPONSES AFFECT PRIMARY COGNITION

The ELM has described four ways in which our body, like any other variable present in the persuasion setting, can affect attitudes: (1) serving as a simple cue, (2) affecting the extent of information processing by influencing motivation or ability to think, (3) affecting the direction of processing (i.e., introducing a bias to the ongoing thinking), and (4) serving as a piece of substantive evidence (i.e., an argument). In this section we briefly describe how our bodily responses can influence attitudes by affecting each of these primary cognition processes at different points along the elaboration continuum (see also Briñol & Petty, 2008).

Bodily Responses Serve as Simple Cues to Persuasion

Our body posture, our facial expressions, and the way we move can all influence our opinions in very subtle ways. In fact, because bodily responses belong to our physical nature, researchers have tended to think that they have to operate in our minds through very simple, automatic mechanisms. Indeed, our actions can influence our opinions on a topic even when we do not think about the information we receive (Cacioppo, Marshall-Goodell, Tassinary, & Petty, 1992) showed that neutral Chinese ideographs (i.e., irrelevant stimuli for the sample of participants) presented during arm flexion were subsequently evaluated more favorably than ideographs presented during arm extension (for another classic example using facial expressions, see Stepper & Strack, 1993; Strack, Martin, & Stepper, 1988).

Aside from using mere associations such as with arm flexion, smiling, or head nodding, people can also rely on simple heuristics when forming or changing attitudes. For instance, people can draw direct inferences about their attitudes based on their body states (e.g., if my heart is beating fast, I must like this object; Bem, 1972; Valins, 1966). Thus, the body can serve as a simple cue to persuasion when motivation and ability to think are low.

Bodily Responses Influence the Amount of Thinking

Our bodies can also make us think about things to a greater or lesser degree. Our postures, facial expressions, and movements sometimes distract us from what is going on, but at other times those same actions can help us to think about things. That is, bodily responses can affect the amount of thinking a person does. Because people tend to think less when they are happy, secure, and confident rather than sad or doubtful (e.g., Briñol, Petty, & Barden, 2007; Tiedens & Linton, 2001), people might think less when smiling than when frowning, or when nodding the head than when shaking it.

In an early demonstration that body posture can affect susceptibility to a persuasive communication by affecting the extent of thinking, Petty, Wells, Heesacker, Brock, and Cacioppo (1983) asked undergraduate students to try new headphones to rate the headphones' qualities. Some participants were then told to stand while testing the headphones, whereas others were told to lie down while testing them.

Importantly, a persuasive message was played for participants as they “tested” the headphones. The message consisted of either strong or weak arguments favoring a tuition increase at their university. Consistent with the idea that posture can affect thinking, this study showed that although reclining participants were differentially persuaded by the strong and weak arguments (i.e., suggesting that they paid careful attention to the message), standing participants were not. Importantly, the body affects the amount of thinking, particularly when the person has not decided whether to think carefully about the topic or issue.

Recent research has demonstrated that not only body postures but also other embodied variables can influence attitude change by affecting how much people think about persuasive proposals. For example, Jostmann, Lakens, and Schubert (2009) found that participants holding a heavy (vs. light) clipboard were more persuaded by strong rather than weak arguments, suggesting that they engaged in more processing of the proposal. This finding may suggest that just as weight makes people invest more physical effort in dealing with material objects, it also makes people invest more cognitive effort in dealing with ideas.

Important practical implications flow from the possibility that embodied manipulations can induce persuasion by affecting the amount of thinking in which the individual engages. For example, the practice of brainwashing often involves a massive assault on the body in which the victim is frequently starved, drugged, tortured, and emotionally agitated. In other domains, attempts at persuasion may involve the direct control of a person’s behavior, including alteration in appearance (e.g., clothing, posture, hairstyle), public behaviors (e.g., self-criticism), and escalation of commitment, in which a recruit is asked, over time, to engage in increasingly costly behaviors that are hard to undo (e.g., donating his or her personal possessions to the group, recruiting new members). The combination of physical deprivation and behavior modification has been argued to reduce a person’s motivation and ability to think, thus rendering that person more susceptible to what would ordinarily have been weak arguments (e.g., faulty logic, incomplete verification, erroneous and stereotypical information; for a review, see Baron, 2000). These simplistic, weak messages could presumably be easily counterargued if people were not so physically depleted (e.g., Wheeler, Briñol, & Hermann, 2007).

Bodily Responses Influence the Direction of Thinking

Our bodies can influence persuasion not only by affecting the amount of thinking but also by affecting the direction of that thinking. Obviously, for the body to influence thoughts, people need to be thinking. One extensively explored idea is that bodily responses can shape attitudes by affecting the valence (i.e., positivity or negativity) of the thoughts that come to mind when thinking about an attitude object. For example, in the original research on head movements and persuasion, Wells and Petty (1980) speculated that participants’ past experiences had made nodding compatible with “approval” and favorable thinking, whereas head shaking was more compatible with “disapproval” and unfavorable thinking. In line with the Wells and Petty proposal about behavior biasing thinking, Neumann, Förster, and Strack (2003) argued that overt behaviors can directly

trigger compatible thoughts that facilitate encoding and processing of evaluatively congruent information (Förster & Strack, 1996).

Bodily Responses Serving as Arguments

When the amount of thinking is high, people assess the relevance of *all* of the information in the context that comes to mind in order to determine the merits of the attitude object under consideration. That is, people can examine their own bodily responses as possible arguments or reasons for favoring or disfavoring the attitude object. For example, when thinking carefully, people can be influenced by their own bodily information, such as smiling when rating how good they look that day.

In sum, it might be helpful for some people to know that their actions can influence their likes and dislikes. In fact, our bodies can provide us with valuable information in many cases (e.g., elevated heart rate and stomach butterflies when encountering a person inform us that we like that person). However, if people who believe that their judgments are somehow biased or influenced by their bodily actions do not want this to occur, they may adjust their judgments in a direction opposite to the expected bias (*correction processes*; Wegener & Petty, 1997; see Chapter 5, this volume).

BODILY RESPONSES AFFECT SECONDARY COGNITION

In the first section, we have seen how the body can influence attitudes by serving as a simple cue and by affecting either the amount or direction of thinking. Recently, we have proposed that behavior not only can influence what people think about attitude objects, but also can impact what people think about their own thoughts (i.e., metacognition). This idea is referred to as the *self-validation hypothesis* (Petty et al., 2002). The key notion is that generating thoughts is not sufficient for these thoughts to have an impact on judgments. Rather, one must also have confidence in one's thoughts.

The main idea behind the concept of *embodied validation* is that people's own behaviors can impact their judgments by affecting thought confidence. In other words, the confidence that emerges from one's body and its position or movements can magnify the effect of anything that is currently available in people's minds, including not only thoughts about a persuasive message, but also other cognitions, emotions, goals, and so forth. That is, confidence applies to whatever mental contents are salient and available at the time (see Briñol & Petty, 2009a, for a review). In this section, we describe research on self-validation organized around the content of the primary cognitions that are validated by the confidence that emerges from the body.

Bodily Responses Validate Thoughts in Response to a Persuasive Message

Consider the research on head nodding described earlier, which had assumed that moving one's head in a vertical (versus horizontal) manner produced more

positive attitudes either because vertical head nodding biased thinking in a favorable direction or because head nodding served as a relatively simple affective cue (Wells & Petty, 1980). The self-validation hypothesis suggests another possibility. Specifically, this hypothesis suggests that just as vertical head movements from others give us confidence in what we are saying, our own vertical head movements can give us confidence in what we are thinking.

In the first series of studies on embodied validation, Briñol and Petty (2003) found that head movements affected the confidence people had in their thoughts and thereby had an impact on attitudes. Thus, when people listened through headphones to strong arguments advocating that students be required to carry personal identification cards on campus, vertical head movements led to more favorable attitudes than horizontal movements, as would be expected if vertical movements increased confidence in one's favorable thoughts. However, when people listened to weak arguments in favor of the identification cards, vertical movements led to less favorable attitudes than horizontal movements, as would be expected if vertical movements increased confidence in one's negative thoughts.

This was the first study on the effects of head movements through self-validation processes, and it was conducted in a traditional persuasion setting in which attitudes changed with respect to a particular proposal. Having demonstrated that body movements can determine the extent of influence by affecting thought confidence, we have started to examine whether our bodies can validate other kinds of thoughts and thus whether other social psychological phenomena can similarly benefit from a consideration of self-validation processes. We next describe how our bodily responses not only can validate thoughts in response to a persuasive proposal, but also can validate other kinds of cognitions, such as self-related thoughts, emotional thoughts, and primed thoughts.

Bodily Responses Validate Self-Relevant Thoughts

The confidence that our body makes us feel applies to whatever the salient or available mental contents are at the time. Thus, the self-validation framework can be applied to attitude domains other than traditional persuasive messages about external issues. Consider recent work on attitudes about oneself (i.e., self-esteem). In one example of research applying self-validation to self-evaluation (Briñol & Petty, 2003, Experiment 4), participants were asked, as part of a presumed graphology study, to think about and write down their best or worst qualities (i.e., thought-direction manipulation) using their dominant or nondominant hands (i.e., overt behavior manipulation). Then, participants rated the confidence in the thoughts they listed and reported their self-esteem. Writing with the nondominant hand happens infrequently and is very difficult, so whatever is written with the nondominant may appear "shaky"; thus, we expected and found that using the nondominant hand decreased the confidence with which people held the thoughts they had listed. As a consequence, the effect of the direction of thoughts (i.e., positive vs. negative) on state self-esteem was significantly greater when participants wrote their thoughts with their dominant hand than when they wrote their thoughts with their nondominant hand.

That is, writing positive thoughts about oneself with the dominant hand increased self-esteem relative to writing positive thoughts with the nondominant hand, but writing negative thoughts with the dominant hand resulted in the reverse pattern. When writing about the things we do not like about ourselves, we feel better if we use the nondominant (vs. dominant) hand. This pattern of findings is interesting because it reveals that people do not feel too badly about themselves even after listing negative self-relevant thoughts in objectively unattractive handwriting. This is a unique implication of the self-validation logic.

In another more recent illustration, Briñol, Petty, and Wagner (2009) asked participants to think about and write down their best or worst qualities while sitting with their backs erect, pushing their chests out (i.e., confident posture), or while sitting slouched forward with their backs curved (i.e., doubtful posture). Then, participants completed a number of measures, including self-esteem. In line with the self-validation hypothesis, it was predicted and found that the thoughts generated about the self only affected self-attitudes in the confident posture. Conceptually similar to the previous study, the effect of the direction of thoughts on self-esteem was greater when participants wrote their thoughts in the confident rather than the doubtful body posture. Thus, this research demonstrated that relatively static body responses, such as postures, are able to influence individuals' reliance on their own thoughts; previous research had shown that reliance on one's thoughts could be influenced by more dynamic behaviors such as head movements.

These two studies demonstrated that inducing doubts about possessing positive qualities tended to undermine self-esteem, whereas inducing doubts about possessing negative qualities tended to enhance self-esteem. Importantly, both studies showed that these changes in self-evaluation were mediated by changes in certainty about the self-beliefs that were listed; these changes in certainty were, in turn, provoked by different bodily responses. Subsequent research has replicated these effects on self-thoughts using other validating variables (for a review, see Briñol, DeMarree, & Petty, 2010).

Other Bodily Responses (Facial Expressions) *Validate Self-Relevant Thoughts*

The experiments described before reveal that bodily responses such as head movements and handwriting can influence self-evaluation by affecting the confidence with which people hold their self-related thoughts. In this section, we describe three lines of research in which other bodily responses (i.e., facial expressions) affected self-attitudes by validating thoughts. The main idea inspiring this research is that emotion can affect thought confidence. This possibility follows directly from the finding that emotional states can relate to confidence, with happy people being more certain and confident than sad individuals (e.g., Smith & Ellsworth, 1985). If emotion influences thought confidence, then people in a happy state should be more reliant on their thoughts than people in a sad state. Consistent with this idea, Briñol et al. (2007) found that when people were placed in a happy state following message processing, attitudes and behavioral intentions were more influenced by

the recipients' thoughts about the arguments than when they were placed in a sad state following the message.

Subsequent research has replicated these effects by inducing emotions through facial expressions, which validated self-relevant thoughts rather than thoughts in response to persuasive messages. For example, in one study, Briñol, Stavraki, Paredes, & Petty (2011) asked participants to think about and write down their good or bad qualities as job candidates while they were smiling or frowning. In line with our previous studies, it was predicted and found that the thoughts participants generated only affected self-evaluations among those in the happy face condition. Not only happiness but also other emotions related to confidence can influence evaluations by self-validation, such as anger (Briñol, Petty, Stavraki, & Wagner, 2009) and disgust (Wagner, Briñol, & Petty, 2009).

Bodily Responses Can Validate Emotional Thoughts

We have already explained how facial expressions related to emotions can validate thoughts about the self and about persuasive messages. We argue here that embodied manipulations can also validate (or invalidate) thoughts about current emotional states. Specifically, we postulate that one's emotion-relevant thoughts can be validated or invalidated by embodied manipulations, thereby affecting the person's emotional experience. In a test of this idea, Rucker, Briñol, and Petty (2011) asked participants to write about happy or sad experiences with either their dominant or nondominant hand. As noted earlier, writing emotional experiences with the dominant hand should lead to greater confidence in the emotional experiences and, consequently, stronger emotions than should writing with the nondominant hand. In line with this assumption, writing about emotional experiences with the dominant hand led to a larger biasing impact of the activated emotion on subsequent judgments of the likelihood of irrelevant emotional events than did writing about emotional experiences with the nondominant hand. This research revealed that emotion-relevant thoughts can be affected by metacognitive confidence, thereby influencing the emotion that is experienced.

Bodily Responses Can Validate Even Confidence-Related Thoughts

We have described how the thought confidence induced by bodily movements and facial expressions can influence evaluative judgments by affecting metacognitive processes. Our review on the effects of self-validation processes has also examined some cases in which these bodily responses influenced not only thoughts in response to a persuasive proposal, but also other kinds of cognitions, such as self-related thoughts and emotional thoughts. As mentioned earlier, research on self-validation suggests that the confidence that emerges from the body can also be applied to any primary cognition.

Given that metacognitive confidence can be applied to any cognition, an interesting case to examine would be that in which people have confidence in (or doubt about) their own confidence or doubt. Especially interesting would be the case in which people doubt their own doubts. In one study about doubting one's own doubt

due to bodily responses (Wichman et al., 2010), participants were first primed with doubt or certainty and then exposed to a head movement manipulation.

Specifically, the initial writing task used to prime uncertainty asked participants to write about a time when they were uncertain and doubtful or about a time when they were certain and confident. Following this task, participants completed a head movement induction, which was described as a study on “motor–eye coordination.” For a few minutes, participants followed, with their heads, a ball moving either vertically (i.e., nodding condition) or horizontally (i.e., shaking condition) on a computer screen. Supporting the idea that people can either trust or doubt their own doubts, head nodding (vs. shaking) accentuated (vs. attenuated) the impact of the initial doubt (vs. certainty) manipulation. This study demonstrated that a secondary, embodied manipulation of certainty or uncertainty can interact with an initial induction in the manner specified by the self-validation hypothesis rather than in the additive way that would be expected from prior work on sequential inductions of constructs.

Bodily Responses Can Validate Any Primed Thoughts

Regardless of whether people were asked to think about persuasive messages or to generate self- or emotion-relevant thoughts, all studies described thus far specifically asked participants to think about the object, issue, idea, or proposal under consideration. Although the original research applied confidence to intentionally generated mental contents relevant for persuasion, the research described in this section examines whether people validate whatever thoughts they have in mind, including subtly primed constructs. We argue that the self-validation framework can be applied to domains other than persuasion, such as priming, because metacognitive confidence should apply to whatever the salient or available mental contents are at a given moment. Thoughts caused by primes are also interesting to examine because, unlike the thoughts that participants explicitly generate in response to a persuasive message or request, prime-induced thoughts may occur even though participants do not have a conscious goal to generate them.

Although it is clear that people can be unaware of the source of validation (e.g., they are unaware that their head nodding is the cause of perceived validity), we were interested in examining whether it is possible to validate cognitions that stem from unknown origins rather than being generated with conscious intention. Indeed, it is unclear if there is a role for thought validation when participants do not have an explicit goal to generate thoughts. If people do not have an explicit goal to generate thoughts, then they might also lack a goal to evaluate their thoughts.

We examined these issues by testing whether head nodding would moderate the impact of subtle primes on participants' judgments. Specifically, in one of the studies of this series, DeMarree, Briñol, and Petty (2011) subliminally primed participants with words related to the Black (vs. White) stereotype. Prior research has shown that such primes can affect what people think of themselves (see Wheeler, DeMarree, & Petty, 2007, for a review). Following this induction, participants were instructed to use their heads to follow a ball moving vertically or horizontally on the screen. Consistent with the self-validation logic for vertical versus horizontal head

movements, we found that the direction of the prime affected participants' felt aggression on an implicit measure as well as their deliberative ratings of closeness to African Americans in the head nodding but not in the head shaking condition. Thus, as was the case with head nodding affecting confidence in thoughts to a persuasive message, so too did head nodding appear to affect the validity and use of mental contents that were subtly activated via priming.

In another experiment of this series, participants subliminally primed with the concept of resistance (vs. persuasion) showed more resistance to subsequent persuasive proposals. However, this only occurred when participants were nodding (compared with shaking) their heads immediately following the priming induction. In still other studies on priming, a goal was activated, followed by a validation manipulation; in each case, the behavioral effects of the goal were more evident when the goal priming was followed by a confidence (head nodding) than a doubtful (head shaking) behavioral induction (DeMarree et al., 2011). In comparison with our studies exploring the embodied validation of several types of intentionally generated thoughts, our studies on priming extended the range of mental contents that are subject to metacognitive influence.

MODERATING FACTORS OF EMBODIED SELF-VALIDATION

In addition to proposing thought confidence as a general mediator of the impact of bodily responses on judgment, self-validation research also points to unique moderators for this metacognitive process. Thus, another contribution of our research on embodied validation has been to specify the circumstances under which thought confidence is likely to influence judgments. Next, we describe the two moderating conditions about which the most research has been conducted so far.

Elaboration

Petty and colleagues (2002) demonstrated that self-validation is more likely to take place when people have the motivation and ability to attend to and interpret their own cognitive experiences (e.g., if participants are high in need for cognition, Cacioppo & Petty, 1982, or when there is high personal relevance of the persuasion topic, Petty & Cacioppo, 1979). There are at least two reasons for this. First, for validation processes to matter, people need to have some thoughts to validate. Second, people need substantial motivation and ability not only to think at the primary level of cognition but also to think and care about their own thoughts. Thus, the self-validation processes we document have some boundary conditions, including the requirement that people are engaging in relatively high levels of thinking.¹

As an illustration of the moderating role of elaboration, consider the research on arm movements described earlier. Cacioppo and his colleagues (1993) found that arm flexion was associated with more positive evaluations of neutral stimuli than was arm extension, and that these body influences were more likely to occur under relatively low-elaboration conditions. More recently, Centerbar and Clore (2006) found that arm flexion (vs. extension) only led to more positive evaluations

when the stimuli evaluated were already considered positive. Interestingly, arm flexion (vs. extension) was associated with *less* favorable evaluations for previously *negative* stimuli. If one assumes that participants generated either positive or negative thoughts in response to the valenced material, then arm flexion (vs. extension) could have affected attitudes by influencing the confidence with which those thoughts were held. Taken together, these two lines of research imply that, similarly to other behaviors, arm flexion can influence attitude change by serving as a simple cue (i.e., when elaboration is low) or by affecting thought confidence (i.e., when elaboration is high).

In a formal test of this possibility, Wagner, Briñol, Petty, and Cacioppo (2009) conducted a series of studies in which elaboration likelihood was varied along with arm movements and thought direction. Specifically, they assigned participants to the cells of a 2 (stimulus valence: positive vs. negative) \times 2 (arm posture: flexion vs. extension) \times 2 (elaboration: cognitive load vs. no load) between-subjects factorial design. They predicted and found that individuals engaging in arm flexion were more likely to use their thoughts in evaluating novel objects than were individuals engaging in arm extension. One explanation for this finding is that participants in the flexion condition were “approaching” (i.e., using) their thoughts about valenced stimuli, whereas participants in the extension condition were “avoiding” (i.e., not using) their thoughts about the same stimuli.

Further, they found that this effect was observed primarily among individuals who were engaged in much rather than little thought, given that thought validation is a fairly complex cognitive process, unlike classical conditioning. These findings demonstrated that arm posture can affect the extent to which individuals use their own thoughts in evaluating novel objects, provided that the individuals are thinking relatively deeply. In contrast, those who were in low thinking tended to show more favorable evaluation in the arm flexion than in the arm extension condition. Taking together high- and low-thinking conditions, these findings are consistent with the idea that the same bodily response (i.e., arm movement) can influence attitudes by different mechanisms (e.g., as a peripheral cue, by validating thoughts) as a function of elaboration likelihood. Viewed differently, this research suggests that the same behavior can lead to the same outcome (e.g., arm flexion increasing persuasion) by very different underlying processes (e.g., thought validation, classical conditioning).

In another illustration relevant to the role of elaboration likelihood in determining the mechanism by which embodied manipulations affect attitude change, Briñol and Petty (2011) manipulated the “openness” of participants’ body postures. In one study, participants received a persuasive message containing either strong or weak arguments. While reading this message, participants were instructed to keep their knees separated with their legs spread apart (i.e., open posture) or to keep their knees touching with their legs and feet together (i.e., closed posture; McGinley, LeFevre, & McGinley, 1975). Amount of thinking was assessed in this experiment by asking participants to report how much they thought about the message. For participants reporting low thinking about the proposal, a main effect of body posture was found, such that open displays led to more favorable attitudes than closed displays. This finding is consistent with research described earlier

showing that body postures and movements can have a direct impact on attitudes when elaboration is low (e.g., Priester, Cacioppo, & Petty, 1996; Taylor, 1975). For participants reporting high thinking, however, an interaction between argument quality and body posture was found, demonstrating that the same body postures can influence attitudes through self-validation processes.

Timing

Subsequent research has identified another limiting condition on the influence of the body on attitudes via thought validation. That is, the confidence that emerges from the body should be salient *following* (or at least, during) thought generation rather than prior to thought generation. For example, Briñol, Petty, Valle, Rucker, and Becerra (2007) conducted a study in which the order in which the validating variable (power) and message processing took place was varied. Specifically, they manipulated the timing of the power induction to demonstrate the consequences of two different psychological processes: high power decreasing information processing when preceding the message and increasing the use of thoughts compared to low power when following the message.

In this study, participants received a strong message in favor of a new cell phone. The message was presented either immediately before or after participants engaged in a power manipulation (for a review of bodily responses related to power, see Schubert, Waldzus, & Seibt, 2008). Compared to the low-power groups, it was expected and found that the high-power (vs. low-power) conditions reduced persuasion when the power induction came *prior to* the presentation of the message. This is because high-power individuals processed the strong arguments less than did the low-power individuals. However, it was found that high—compared to low—power enhanced persuasion when manipulated *after* processing of the proposal. Presumably, this is because high-power individuals were more reliant on their positive thoughts about the strong arguments than were low-power individuals. These findings suggest that the same power-relevant behaviors can have different (and opposite) effects in persuasive settings depending on when the power manipulations are introduced.

THE UNIQUENESS OF SELF-VALIDATION

New Mediation and Moderation for Ease of Retrieval Effects

Now that the self-validation approach has been described, it is important to note that the self-validation framework shares features with some other metacognitive theories in social psychology, but also has notable differences from these theories. Most relevant to the present review, the self-validation approach agrees with other recent theories on the importance of secondary cognition. However, previous approaches have generally examined and attempted to explain one single source of metacognitive influence. For example, Kruglanski's (1989) lay epistemic theory (LET) has been applied to causal attributions and argues that validation processes are affected by the number of causal explanations generated—the more

alternative explanations that are generated for any given event, the less confidence a person has in any one causal explanation. Generating few explanations, then, leads to greater confidence in each explanation.

Another well-known metacognitive theory involves the role of ease-of-retrieval in social judgment (Schwarz et al., 1991; for a review, see Sanna & Lundberg, this volume). In their classic studies, Schwarz and colleagues demonstrated that when thoughts come to mind easily, those thoughts have more of an impact on judgment than if those same thoughts come to mind less easily. Specifically, these researchers asked participants to generate either two (i.e., easy to generate) or eight (i.e., difficult to generate) occasions on which they had behaved assertively. Somewhat paradoxically, participants judged themselves to be more assertive after listing two—as opposed to eight—instances of assertive behavior. That is, if the number of behaviors listed were the chief determinant of participants' self-judgments (i.e., primary cognition), then participants should have reported being more assertive in the condition in which they listed eight assertive behaviors. However, participants used the ease with which they could generate their thoughts to judge how assertive they were. The original interpretation of this effect is that ease worked in a heuristic fashion, indicating the availability (or prevalence) of assertive behaviors in their entire lives (see also Kahneman & Tversky, 1972).

Meta-cognitive ease could also operate through other mechanisms, depending on specific characteristics of the situation (for a review on ease and persuasion, see Briñol, Tormala, & Petty, in press). For instance, as indicated above, ease-of-retrieval has been assumed to influence judgment through the operation of a relatively simple judgment heuristic linking ease with prevalence, likelihood, and availability. If this is the case, then ease-of-retrieval effects should be particularly pronounced among people who are not thinking very much (e.g., for a low importance topic; see Rothman & Schwarz, 1998). Consistent with the self-validation perspective, however, people can also infer that thoughts that are generated easily are particularly valid, at least in contrast to thoughts that are generated with relatively more difficulty (Tormala, Petty, Briñol, 2002). In this case, the validating (or invalidating) effects of ease (or difficulty) should be most pronounced when people are likely to be thinking carefully about the topic or issue at hand. This is because metacognitive judgments regarding ease (and difficulty) require that individuals be motivated and able to consider not only the primary cognitions that they have generated but, also, the metacognitive experiences accompanying the generation of those primary cognitions. Clearly, such a process involves careful and deliberative thinking, and would not be expected under low-thinking conditions.

Indeed, across a series of studies designed to explore this possibility (Tormala, et al. 2002; Tormala, Briñol, Falces, & Petty, 2007), we found evidence that ease-of-retrieval effects can operate through self-validation processes. Moreover, it was also found that such effects were strongest in high-thinking situations. This is not to say, of course, that ease-of-retrieval cannot affect judgment via the operation of a simple heuristic process. In fact, such a finding seems likely under low-thinking conditions. What is critical, here, is that the self-validation perspective provided both a boundary condition (i.e., moderator: amount of thinking) for ease-of-retrieval effects and a new mechanism (i.e., mediator: validation/invalidation of primary

cognitions) through which ease-of-retrieval can operate. We believe that the novel predictions (and findings) provided by the self-validation perspective reflects the fact that this perspective can be understood as a general account of how meta-cognitive processes can influence social judgments. As such, the self-validation perspective can highlight—or uncover—the possibility that well-studied variables, such as ease-of-retrieval, can operate by validating thoughts. Specifically, because many researchers focus on the study of particular variables, they may not consider the possibility that other, seemingly-unrelated variables, might operate according to similar fundamental processes. The self-validation perspective, as general approach, integrates the operation of different variables (e.g., source credibility, recipient's power, social consensus, message matching; see Briñol & Petty, 2009a) through the same underlying mechanism.

The Self-Validation Perspective and Emotion

As a final example of the utility of the self-validation perspective in providing novel predictions for well-studied social judgment variables, let us consider the case of emotion. As noted earlier, research inspired by the ELM has shown that incidental emotions can influence persuasion through multiple processes (Petty, Fabrigar, & Wegener, 2003). When elaboration is constrained to be low, emotions affect attitudes through the operation of simple cues or heuristics (e.g., “if I am happy, I must be satisfied with my life”; Schwarz & Clore, 1983; Petty, Schumann, Richman, & Strathman, 1993). When elaboration is unconstrained by individual or contextual factors, then emotions can change how much people think about the message or issue under consideration. For example, people may think more when they are sad because sadness can serve as a cue that they are not progressing satisfactorily toward their goals (Carver & Scheier, 1990) and need to engage in problem-solving to eliminate, or at least deal with, the source of the sadness (Bless, Bohner, Schwarz, & Strack, 1991). Conversely, people may think less when they are happy because happiness makes them feel especially certain (Tiedens & Linton, 2001) or because happiness interferes with individuals' ability to engage in careful, deliberate information processing (Mackie & Worth, 1989). When elaboration is constrained at a high level, emotions can bias the content of the thoughts that people generate. For instance, people who are placed in a happy state estimate that positive outcomes are more likely to occur than do people who are placed in a sad state and this can lead them to be more influenced by positive than negative arguments (Wegener, Petty, & Klein, 1994; see also, DeSteno, Petty, Wegener, & Rucker, 2000).

To this set of mechanisms by which incidental emotions can impact persuasion, the self-validation perspective adds one more. Specifically, the self-validation perspective notes that emotions can affect people's general feelings of confidence and doubt (Tiedens & Linton, 2001) and, as such, should also be able to influence the confidence with which people hold their thoughts. In one relevant study, Briñol, Petty, & Barden (2007) exposed undergraduate participants to a persuasive message varying in argument quality. Strong arguments elicited predominantly favorable thoughts toward the proposal (i.e., the adoption of personal identification cards

at the participants' university), whereas weak arguments elicited predominantly unfavorable thoughts. After reading the message, participants were asked to write about a time when they felt either happy or sad. Then, attitudes toward the proposal were measured. Results showed that the direction of participants' thoughts mattered more among participants in the happiness condition than among participants in the sadness condition. Viewed differently, participants who had read the strong message—and who had generated generally favorable thoughts about it—reported more favorable attitudes when they were feeling happy than when they were feeling sad. However, an opposite pattern emerged among participants who had read the weak message. These participants reported more favorable attitudes when they were feeling sad than when they were feeling happy. Mediation analysis indicated that these persuasion effects reflected the impact of emotions on thought confidence, as happy participants reported greater thought confidence than did sad participants. This research illustrates that the self-validation perspective offers novel predictions regarding not only ease but also another well-studied variable such as emotion. Importantly, though, it should be noted that self-validation effects for emotion were anticipated (and found) only in specific situations, namely when emotions were induced *after* message processing and when elaboration likelihood was *high*. As such, the self-validation perspective identified both a new *mediator* (i.e., validating primary thoughts) through which emotion can operate as well as a new *moderator* (i.e., timing of the emotion manipulation) of the effects of emotion on attitudes and judgments (For a review of the role of positive emotions in increasing the use of primary cognitions, see also, Huntsinger & Clore, this volume.)

CONCLUSIONS AND FUTURE DIRECTIONS IN EMBODIED PERSUASION AND VALIDATION

This review has described the various ways in which bodily movements and overt behaviors not only can affect the number and valence of thoughts, but also can validate a person's own thoughts. Thus, self-validation provides a completely new, metacognitive mechanism by which a large number of traditional (e.g., head movements, facial expressions) and more recent (e.g., handwriting, body postures) bodily variables can impact attitudes and judgments. Importantly, the conditions necessary for metacognitive processes to operate have been clearly specified. As described throughout, specifying these moderating conditions is important because our body can influence social judgments through multiple processes relevant to primary and secondary cognition.

Probably due to the very physical nature of these variables (i.e., bodily responses), researchers have usually speculated that the underlying mechanism for embodied persuasion effects has to be a relatively simple, rudimentary, primitive one. Indeed, this "matching assumption" between variables and processes is partially correct because bodily responses can affect attitudes by processes that require very little thinking (e.g., classical conditioning, self-perception). However, bodily responses are capable of affecting attitudes via not only low-thinking processes but also more deliberative ones (e.g., by affecting the direction of the thoughts that come to mind). Importantly, the most recent research described in this chapter has

revealed that behaviors such as head nodding or smiling can validate (rather than merely change) what we are thinking.

Identifying Critical Aspects of the Behavior

The studies we have reviewed examined behaviors ranging from relatively simple bodily movements to more complex behaviors. Indeed, future research might benefit from exploration of new behaviors other than the ones covered in this review (Lakoff & Johnson, 1999). We argue, however, that in addition to identifying new behaviors, it is critical to determine which dimensions of already studied behaviors are responsible for the effects they produce. Potential dimensions of interest are *valence* (i.e., whether the behavior is positive or negative), *certainty* (i.e., whether the behavior is associated with confidence or doubt), *motivation orientation* (i.e., approach–avoidance), *intensity and effort* (i.e., arousing or relaxing), *movement* (i.e., motor action or static pose), and *perceptions of agency* (i.e., self or other, deliberative or involuntary).

The Meaning of Behavior

Most of the behaviors used in the experiments described in this review have very clear meanings attached to them. For instance, nodding is often associated with agreement and validation, whereas arm flexion tends to be associated with approaching objects. However, the meaning of these behaviors can vary across individuals and situations. For example, nodding can be associated with disagreement in certain contexts (e.g., yea–yea responding), and arm extension can be seen as approaching in other settings (e.g., extending the arm to reach a desired object). We argue that if the meaning associated with a behavior changes, the effect of that behavior on subsequent attitudes could also change, at least under high-elaboration conditions and when attitudes are assessed with explicit measures (see, for example, Briñol, Petty, & Tormala, 2006). Indeed, it would be interesting to study whether there is a default meaning for certain behaviors tapped in low-thinking conditions or on measures of automatic evaluation that are then modified in high-thinking situations or on deliberative measures. Thus, as has been the case with the attitude domain in general (Petty, Fazio, & Briñol, 2009), future research on embodied persuasion would likely benefit from the inclusion of measures involving automatic rather than deliberative attitudes.

Future research should also explore the conditions and processes by which the meaning of behavior and that of the context interact. Literature on placebo effects can be particularly informative in this domain. Studies on placebo effects often involve participants performing a behavior (e.g., taking pills, using a lotion) for which a particular meaning is “artificially” provided. Extensive research has documented subsequent internal changes consistent with these ascribed meanings (for reviews, see Kirsch, 1999; Moerman, 2002). Also interesting is the fact that this literature has shown that the more extreme the behavior is, the stronger are the placebo effects that result (e.g., taking two pills is better than taking just one, an

injection is better than pills, and placebo surgery is better than other treatments; e.g., Guess, Kleinman, Kusek, & Engel, 2004).

Performing the Behavior

There is substantial evidence suggesting that it might not be necessary to act physically for behavior to produce attitude change. That is, simply imagining behavior might be sufficient for the “behavior” to affect attitudes (e.g., feedback about behavior, Valins, 1966; visual illusions suggesting that we acted, Neumann & Strack, 2000; computer-controlled digital representations of the person acting in a virtual environment, Bailenson & Yee, 2005). Similarly, there is plenty of evidence suggesting that simply imagining or retrieving instances of behavior activates the same areas of the brain as actual behavior, and thus embodiment can have similar effects regardless of whether a given action is performed or a simulation of that experience occurs in the brain (e.g., Anderson, 1983). Recent research has also revealed that the perception of agency can be even more important than the actual agency of the behavior in producing attitude change effects (Taylor, Lord, & Bond, 2009).

Among other things, this notion brings the question of whether physical motor performance adds anything above and beyond the mere activation of the mental representation of behavior. Also important is that it is not entirely clear whether a given behavior has to be perceived as one’s own for it to influence attitudes. That is, merely observing the behaviors of others might produce effects similar to performing the behavior oneself, perhaps by the action of mirror neurons in automatic imitation. For example, consistent with classic studies revealing that people change their behavior to conform to others (Asch, 1955; Sherif, 1936), it has been repeatedly shown that people tend to imitate and mimic the behaviors they observe in others in order to facilitate social interaction (e.g., Byrne, 1971). Also, others’ behavior can function as a prime to activate our own behavior automatically (Chartrand & Bargh, 1999).³ We argue that future research should explore whether the different means by which the mental representations of behavior are activated (e.g., performing vs. observing the behavior) are consequential for persuasion and social judgment.

NOTES

1. It is important to note that this does not mean that it is necessary to ask people explicitly to evaluate their thought confidence in order to observe self-validation effects. In fact, our research has clearly shown that self-validation processes occur regardless of *whether* (or not), *when* (before or after reporting attitudes), and *how* (individually or globally) thought confidence is assessed (for a review, see, Briñol & Petty, 2009a). In other words, the notion that people might not be constantly aware of their confidence in their thoughts does not make it less impactful or any less metacognitive in nature. Indeed, metacognition (like regular, primary cognition) can sometimes have implicit bases and implicit effects. People might not even be able consciously to verbalize or explain the basis of their metacognition when asked to do so (just as they cannot verbalize the basis of their primary cognition). Yet, such cognition could still have an

impact. We have found that when asked to do so, people are capable of reporting their confidence in their thoughts and that this confidence maps onto predictable and potentially important outcomes. However, people are unlikely to have much conscious recognition of the *origins* of this confidence.

2. Although self-validation focuses on confidence as the main metacognitive dimension, it is important to note that other metacognitive factors can also be explored in relation to primary cognitions. For example, it is well established that thoughts and mental constructs that are highly accessible are more consequential in terms of durability and subsequent impact than are less accessible thoughts (e.g., DeMarree, Petty, & Briñol, 2007). Although accessibility and other features of thoughts (e.g., importance) are often related to confidence, these are relatively independent features of cognition (for a review, see Petty et al., 2007). Furthermore, our research on self-validation has also distinguished, on both conceptual and operational levels, between confidence and other previously studied dimensions, such as desirability and likelihood (Briñol, Petty, & Tormala, 2004). We have distinguished thought confidence not only from other dimensions at the primary level of cognition, but also from other approaches to confidence that have focused exclusively on one aspect of confidence, such as confidence in the *likelihood* component of a belief. Thought confidence is a broader concept that incorporates this as well as other sources of confidence (e.g., confidence in desirability, confidence that stems from ease of retrieval of the thought, etc.).
3. Niedenthal, Brauer, Halberstadt, and Innes-Ker (2001) found that when participants were prevented from mimicking others, it took them longer to detect changes in emotional material relative to a group that was free to mimic. This suggests that mimicking might be related to very basic forms of social perception and categorization (see Briñol, DeMarree, & Smith, 2010, for a discussion).

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