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8 Embodied Persuasion

Fundamental Processes By Which Bodily Responses Can Impact Attitudes

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This chapter concerns embodiment and people's attitudes. Attitudes commonly refer to the general evaluations people hold regarding various objects, issues, and people (e.g., Petty & Cacioppo, 1981). The link between the attitude concept and bodily responses has a long history, going back to the use of the term *attitude* to refer to the posture of one's body (Galton, 1884) and to expressive motor behaviors (e.g., a scowling face was said to indicate a hostile attitude; Darwin, 1965). Today, we still ask for people's *position* on an issue though the meaning refers to an evaluative rather than a physical orientation.

In this chapter, we review research focused on the impact of a person's own bodily responses on attitudes such as when vertical head movements lead to more favorable attitudes than horizontal (Wells & Petty, 1980). As we describe in this review, a large number of bodily movements have been studied and many effects found. We use the term *embodiment* to refer to the idea that the body contributes to the acquisition, change, and use of attitudes.

We review contemporary social psychological literature with a focus on how the body can influence attitudes. In particular, we will: outline a general framework that articulates the key psychological processes by which one's body can affect attitudes; describe how different bodily postures and movements have been postulated to influence persuasion by each of these fundamental mechanisms; highlight a recently discovered new mechanism called *self-validation* and describe how this mechanism can contribute to understanding bodily influences on evaluation; and outline some remaining issues and directions for future research.

FUNDAMENTAL PROCESSES OF EMBODIED PERSUASION

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 this influence occurs. Understanding these processes is essential to predict whether, when, and how attitudes change, as well as to predict whether, when, and how attitudes would result in further behavioral changes. Next, we describe the processes by which any behavior of the recipient can influence attitudes.

Consistent with the Elaboration Likelihood Model (ELM) of persuasion (Petty & Cacioppo, 1981, 1986; Petty, Priester, & Briñol, 2002; Petty & Wegener, 1999), we argue that the psychological processes relevant to attitude change can be organized into a finite set. The ELM specifies several discrete mechanisms of attitude change and holds that these processes operate at different points along an elaboration continuum ranging from little or no thought about the attitude object to complete and extensive thought about the attitude object. A person's bodily movements or responses, like other variables in persuasion settings, can influence attitudes by affecting one or more of these underlying processes: affecting the amount of issue-relevant thinking that occurs; producing a bias to the thoughts that come to mind; affecting structural properties of the thoughts such as thought confidence; serving as persuasive evidence (i.e., arguments); and serving as simple peripheral cues to change. At the low end of the thinking continuum (i.e., when motivation and ability to think are highly constrained), variables are most likely to serve as simple cues. At the high end of the thinking continuum, variables are examined as evidence, bias the ongoing thoughts, or affect thought confidence. When thinking is not constrained to be high or low, variables affect the extent of thinking.

According to the ELM, understanding the process by which bodily responses affect attitudes is important for a number of reasons. For example, when behavior influences attitudes through low thinking processes (e.g., serving as a cue), the attitudes formed are less persistent, resistant to change, and predictive of subsequent behaviors than when the same behavior produces the same amount of change by a high thinking process (e.g., biasing the thoughts generated). Thus, identifying the processes by which bodily movements affect attitudes is informative about the immediate and long-term consequences of persuasion (Petty, Haugtvedt, & Smith, 1995). Next, we review each of the mechanisms by which bodily responses can affect attitudes according to the ELM. After reviewing how the body can affect each

process, we explain how any one bodily response can affect attitudes via multiple processes in different situations.

Bodily Responses Can Serve as Simple Cues

Perhaps the simplest way in which the body can affect attitudes is by serving as a simple cue when the extent of thinking about the attitude object is low. Much prior research has shown that under low thinking conditions, attitudes are influenced by a variety of low effort processes that can emerge from the recipient's own behavior, such as mere association (Cacioppo, Marshall-Goodell, Tassinary, & Petty 1992) or reliance on simple heuristics, such as drawing direct inferences from one's body (e.g., if my heart is beating fast, I must like it; Valins, 1966). When bodily responses serve as simple cues, the impact on attitudes is consistent with the perceived valence of the bodily response.

Basic Associative Processes

A simple mechanism by which a bodily response can affect attitudes is evaluative conditioning. When an initially unconditioned (neutral) stimulus is encountered along with a conditioning stimulus that is already strongly associated with positive or negative reactions, the initially neutral stimulus can come to elicit positive or negative reactions. Given that contractions of certain muscles are associated with positive or negative affect, they can influence attitudes by serving as conditioning stimuli. In line with this logic, Cacioppo, Priester, and Berntson (1993) observed that neutral Chinese ideographs presented during arm flexion (approach behavior) were subsequently evaluated more favorably than ideographs presented during arm extension (avoidance behavior).

Consistent with the idea that arm movements can affect attitudes through a relatively low-effort conditioning process, Priester, Cacioppo, and Petty (1996) found that isometric flexion versus extension of upper arm muscles influenced preferences for neutral non-words (which, of course, were not associated with any preexisting meaning or knowledge) more than for neutral, previously known words. Also using a conditioning conceptualization, Tom, Pettersen, Lau, Burton, and Cook (1991) asked participants to move their heads up and down or side to side and found that nodding resulted in the establishment of an increased preference for a previously neutral object (e.g., a pen), whereas shaking the head led to a decline in preference for the neutral pen. According to their interpretation, because head movements are associated with positive reactions, these may have become

associated with the neutral product through a low elaboration conditioning process.

In line with Darwin's idea that facial and postural feedback facilitates the emergence of related emotions, research has also found that approach-avoidance behavior directly triggers compatible responses. For example, in one study, Strack, Martin, and Stepper (1988) asked participants either to hold a pen between their teeth (which facilitates a facial expressing similar to smiling) or to hold a pen between their lips (which inhibits smiling) while watching cartoons. Although participants did not recognize the meaning of their facial expression, they judged cartoons to be more humorous in the former than the latter condition (see also Stepper & Strack, 1993; Ito et al., 2006). In another series of studies, Zajonc, Murphy, and Inglehart (1989) asked participants to repeatedly make sounds like the "u" sound of German, which makes a facial expression like disgust. When making this sound, the participants reported less pleasant feelings. Thus, bodily responses influence associated evaluations and affective states (for a review, see Laird & Bresler, 1992).

Simple Inferences from Bodily Responses

Another simple mechanism by which bodily responses can have an impact on attitudes is via self-perception processes (Bem, 1972). Bem reasoned that just as people assume that the behavior of others and the context in which it occurs provides information about the presumed attitudes of others, so too does a person's own behavior provide information about the person's own attitude (see Olson & Hafer, 1990). Of most relevance here, research shows that physiological responses emanating from the body can lead people to infer that they like or dislike something due to misattribution processes. In particular, if people are feeling pleasant, they will look to the environment for a cause of this feeling and may misattribute the feeling to any plausible object in the environment. The opposite is true for negative feelings – a search is made for plausible negative causes (Petty & Cacioppo, 1983).

As noted earlier, according to the ELM, people should be more likely to rely on simple processes such as inferring an attitude directly from a bodily response when the overall extent of thinking is low. Consistent with this view, in one study, Taylor (1975) asked women to evaluate pictures of men who they believed they would actually meet (high relevance inducing high thinking) or not (low relevance inducing low thinking). Participants received false feedback about their "positive physiological responses" toward some of the men. The false information provided about their body influenced the women's reported attitudes when they were not expecting a meeting with the man in the picture but not when a meeting was anticipated.

In the research by Taylor (1975), the women assumed that their bodily responses were due to their positive reaction to the men. In general, when people experience unexplained arousal, they will seek some explanation, and salient factors in the current situation can be used to explain the bodily reactions. As suggested in the classic study by Schachter and Singer (1962), participants may interpret any ambiguous arousal (e.g., from an injection of epinephrine) as happiness or anger depending on the contextual cues available (e.g., the behavior of a confederate placed in the same room who acts in a happy or angry manner). These and many similar findings suggest that bodily responses (even false feedback) can influence attitudes by triggering simple inferences, and that such an effect is more likely to occur when motivation to think is relatively low (see also Chaiken & Baldwin, 1981).

Bodily Responses Can Influence the Amount of Thinking

One of the most fundamental things that the body can do to influence attitudes is to affect the amount of thinking a person does. That is, various behaviors can influence attitudes by increasing or decreasing the amount of thinking in which people engage when making a social judgment. According to the ELM, this effect is most likely to occur when the likelihood of thinking is not already constrained to be high or low by other variables, and therefore thinking is free to vary in any direction. Importantly, an attitude formed as a result of effortful information processing will be well articulated and bolstered by supporting information, and as a consequence it should be strong (Petty et al., 1995). If a bodily variable increases thinking, attitudes will be more favorable when the increased thinking leads to favorable thoughts, such as when the arguments in a message are strong. However, increased thinking can lead to less favorable attitudes when the increased thinking produces more negative thoughts, such as when the arguments in a message are weak.

Body Postures

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 a new headphone to rate its qualities. Some participants were then told to stand while testing the headphone, whereas others were told to lie down. After the participants were in the appropriate body position, participants listened to a persuasive message composed of either strong or weak arguments. Varying the quality of the arguments in a message allows evaluating different mechanisms for the effects of any variable on persuasion (Petty & Cacioppo,

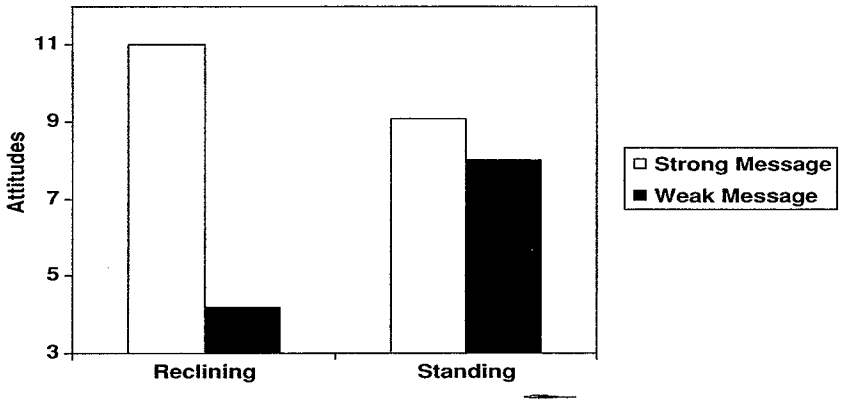

Figure 8.1. Attitudes as a function of argument quality and body position (data from Petty & Cacioppo, 1983).

1986). For example, the standing posture can facilitate the production of negative thoughts (biasing thinking) or produce discomfort that can serve as a simple negative cue (e.g., evaluative conditioning process). Both the biased processing and cue accounts predict a main effect for the posture manipulation regardless of the quality of the arguments. In contrast, if body posture influences persuasion by affecting the amount (rather than the direction) of thinking, an interaction between posture and argument quality should be observed. For example, if a standing posture reduces thinking relative to reclining, then the attitudes of reclining participants should be more polarized in response to the strong and weak arguments than the attitudes of standing participants. This result is because if reclining participants are thinking more about the message, they should better recognize the flaws in the weak arguments and the virtues in the strong ones.

Consistent with the idea that posture can affect thinking, this study showed that reclining participants were differentially persuaded by the strong and weak arguments but standing participants were not (see Figure 8.1). This research is consistent with the idea that the physical posture of the message recipient can affect the extent of message processing and thereby their susceptibility to persuasion. In line with the attitudinal findings and with this interpretation, the interaction between argument quality and posture also was found on a measure of the valenced thoughts that participants generated in response to the proposal.[1]

[1] In a series of studies, Caicoppo (1979) found that internal body changes can influence attitudes by affecting the amount of thinking. For example, in one study elevated (versus decreased) heart rate reduced persuasion by increasing counter-argumentation. Although a more definitive

The findings for posture and persuasion are consistent with research conducted in other domains that has shown that various body postures can influence motivation and ability to think. For example, Riskind and Gotay (1982) found that slumped-over, relative to upright, physical posture affected the amount of thinking by reducing the amount of time spent on various tasks. One interesting possibility is that posture may have affected information processing in prior studies by influencing participants' sense of power. That is, wisdom and anecdotal evidence suggest that people in a standing posture are seen as (and may feel) more powerful than people who are seated, slumped over, or lying down. We turn next to a more detailed analysis of the body and power.

Bodily States Indicating Power

One of the ways in which our bodies are used is to exert power, and people can infer power from different bodily states. For example, research indicates that people who are standing are viewed as more dominant than people who are sitting (Schwartz, Tesser, & Powell, 1982), that big people hit little people (Felson, 2002), and the victor in a fight is typically on top. Indeed, children learn that their taller parents are more powerful and that taller siblings or other taller children are able to coerce them physically (e.g., Argyle, 1988).

In accord with metaphorical evidence that suggest that power equals "up" (Lakoff & Johnson, 1999), recent research has shown that judgments of power are influenced by the vertical position in space in which some target appears and the motor responses implying vertical movement in which a person engages (Schubert, 2005). If people who are standing also feel more powerful than people who are seated or reclining, this may predispose them to feel confident (e.g., Keltner & Haidt, 2003), thereby reducing their motivation to process information compared to individuals in a reclining position (Tiedens & Linton, 2001).[2]

To examine more closely the link between power-related behaviors and confidence, and also to test whether behaviors other than posture can also influence attitude change by affecting the amount of thinking, Briñol, Petty, Valle, Rucker, and Becerra (2007, Experiment 2) randomly assigned

support for the view that an elevated heart rate enhances processing in general (and not counterarguing in particular) would have required including a message that elicits predominantly favorable thoughts, these studies suggest that heart rate acceleration is associated with cognitive effort.

[2] Meier and Robinson (2004) found that a vertical spatial dimension is also associated with valence, such as *good* is "up" and *bad* is "down."

participants to engage in a group of behaviors associated with relatively high or low power. Specifically, students were assigned either to a boss role (high power condition), or to an employee role (low power condition) and were asked to engage in work meeting role-playing. Importantly, the person assigned to play the role of the manager was sitting down in a taller and better-looking chair than the one playing the role of the subordinate. Previous studies have also revealed that merely displaying a single behavior as if possessing power (e.g., a male making a fist; Schubert, 2004) can create differential levels of power.

In the Briñol, Petty, Valle, et al. study, after the behavior-based power induction, the extent to which participants processed information was assessed by varying the quality of the arguments contained within a persuasive message and by measuring the impact of the arguments on attitudes. Participants received a persuasive message consisting of an advertisement for a new mobile phone. As illustrated in Figure 8.2 (top panel), this research found that being placed in a position of high or low power prior to receipt of a message affected attitudes toward it. In particular, behaviors associated with power decreased the impact of an argument quality manipulation on attitudes, consistent with the idea that power can reduce information processing.

Bodily Responses Can Influence the Direction of Thinking[3]

Our bodies can influence persuasion not only by affecting the amount of thinking but also by affecting the direction of that thinking. Perhaps the most extensively explored idea is that one's bodily responses can shape attitudes by affecting the valence (positive or negative) of the thoughts that come to mind when thinking about an attitude object. According to the ELM, bodily responses can influence attitudes by biasing the valence of one's thoughts when the likelihood of thinking is relatively high. That is, when motivation and ability to think are high, people are engaging in careful thought about a proposal, but that thinking can be biased by a person's own behavior. This is important because, as noted earlier, attitude change is a function of the number and valence of thoughts that come to mind when elaboration is high. Next, we discuss some key variables that have been postulated to affect the valence of thoughts.

[3] In this review, we focus on relatively simple overt behaviors that are compatible with either positive or negative thinking. It is important to note that more complex behaviors can also induce attitude change by affecting the thoughts that come to mind, as illustrated by the classic role-playing (Janis & King, 1954) and dissonance paradigms (Festinger, 1957).

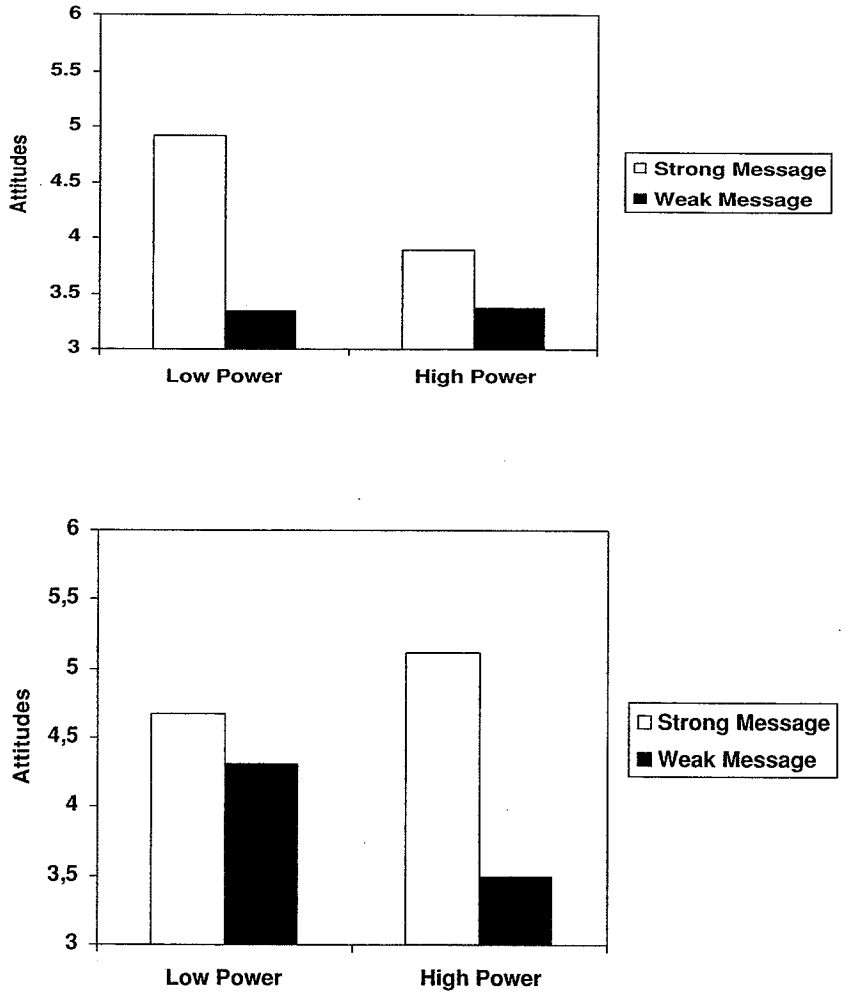

Figure 8.2. Attitudes as a function of argument quality and power, when power is induced before (top panel) or after (bottom panel) information processing (data from Briñol, Petty, Valle, et al., under review).

Head Movements

In the original research on head nodding and persuasion, Wells and Petty (1980) asked participants to move their heads in an up-and-down (vertical, or nodding "yes") manner, in a side-to-side (horizontal, or shaking "no") manner, or gave no instructions about head movements (control) as they listened to music and an editorial over headphones. The ostensible purpose of this was to conduct a consumer test of whether the headphones would

perform adequately during walking, jogging, dancing, and so forth. Following the message, participants provided ratings of the headphones as well as attitudes toward the editorial. The results showed that nodders agreed with the message more than shakers, with the control group falling in between.

Wells and Petty suggested that when nodding, favorable thoughts to the message would be facilitated and unfavorable thoughts would be inhibited, but when shaking, unfavorable thoughts would be facilitated and favorable thoughts would be inhibited. Although this is a plausible account if the message arguments were somewhat ambiguous and the extent of thinking was high, additional mechanisms are possible. Thus, we noted earlier that Tom and colleagues (1991) suggested that head nodding can serve as a simple cue if motivation to think is low. In a subsequent section, we describe research by Briñol and Petty (2003) suggesting that head nodding can also affect confidence in one's thoughts if the likelihood of thinking is high and the message arguments are clearly strong or weak.

In line with the Wells and Petty proposal about behavior biasing thinking, Neumann, Förster, and Strack (2000) argued that overt behavior can directly trigger compatible thoughts that facilitate the encoding and processing of evaluatively congruent information. These compatible thoughts can in turn influence evaluations by affecting how people encode and respond to the information that is received. In one demonstration, Förster and Strack (1996) found that participants who nodded while encoding positive and negative words were more likely to show enhanced recognition of the positive words. In contrast, participants who shook their heads while encoding were better at recognizing the negative words. In another relevant study by Förster (2004), valenced objects were presented moving vertically or horizontally on a screen, thereby inducing either head nodding or head shaking. Nodding led to more favorable evaluations of positively valenced products but did not affect the evaluation of negatively valenced ones. In contrast, head shaking led to more unfavorable evaluations of negatively valenced products but did not affect the evaluations of positive ones.

Arm Flexion Versus Extension

Different behaviors other than head movements have been postulated to show similar compatibility effects. For example, as noted earlier, because people seek to minimize the distance between themselves and desirable objects (approach behavior), and seek to maximize the distance between themselves and undesirable objects (avoidance behavior), approach and avoidance movements are postulated to be linked to valence (Cacioppo et al., 1993), and thus can be linked to valenced thinking. For example, in an early

study by Solarz (1960), participants were required to push cards with words either toward or away from their bodies. In this study, participants were faster at moving words forward (approach) when words were positive rather than negative. When the task was to push the words away (avoidance), they responded faster to negative than positive words. In another relevant study, Chen and Bargh (1999) asked participants to evaluate words on a computer screen as good or bad by either pushing or pulling a lever. Consistent with previous findings, participants were faster at evaluating positive words when pulling the lever toward them but were faster at evaluating negative words when pushing the lever away (see Lang et al., 1990, for a conceptually similar effect using the blink reflex as an avoidance behavior).

Although in most of these studies thoughts were not assessed, they support the idea that certain behaviors can activate thoughts and actions that are compatible with the valence of the behavior, facilitating encoding, categorization, and processing of positive or negative information. In subsequent research, Neumann and Strack (2000) also found that positive words were categorized faster than negative words when participants flexed both arms, whereas negative words were categorized faster than positive words when participants extended their arms (for additional examples, see Förster & Stepper, 2000; Stepper & Strack, 1993).[4] It is important to note that the precise processes underlying the compatibility effects observed in these studies is not completely clear; that is, the compatibility between certain bodily movements with certain valences can be a result of biased processing (as assumed by some authors reviewed in this section) or to simple association processes as reviewed earlier (e.g., Cacioppo et al., 1993). Thus, although it seems clear that some bodily movements are more compatible with some valences than others, the mediation of these effects has not been carefully explored. As we have argued throughout, and has been the case with other types of compatibility phenomenon (e.g., Petty, Wheeler, & Bizer, 2000), designing studies that allow the identification of the underlying psychological processes is essential.

Bodily Responses Can Influence Thought-Confidence

So far, we have described evidence revealing that the body can influence attitudes by serving as simple cues and by affecting either the amount or

[4] A recent line of research suggests that these motor compatibility effects can occur even when extension and flexion arm movements are performed with only one of the arms, as long as that arm is the dominant one (Cretenet & Dru, 2004).

direction of thinking. Recently, we have proposed and documented another mechanism through which behavior can work that also appears to have considerable integrative potential. Unlike the previous processes, which focus on primary or first-order cognition, this new process emphasizes secondary or metacognition. 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 generate additional thoughts that occur at a second level that involve reflection upon the first level thoughts. *Metacognition* refers to these second-order thoughts, or our thoughts about our thoughts or thought processes (e.g., Petty, Briñol, Tormala & Wegener, 2007). We propose that behavior not only can influence the amount and direction of primary cognition but also what people think about their thoughts.

An essential and much studied dimension of metacognitive thought consists of the degree of confidence people place in their thoughts, ranging from extreme certainty to extreme doubt in the validity of one's thoughts. 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, the greater its impact on judgment. 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 them to have an impact on judgments; rather, one must also have confidence in them. We have argued that the body, like any other variable, can influence persuasion by affecting the confidence with which people hold their thoughts (Briñol & Petty, 2003). In fact, the self-validation view argues that the confidence that emerges from behavior can magnify the effect of anything that is currently available in people's minds, including not only their thoughts to a persuasive message but also other cognitions, emotions, goals, and so forth.

Head Movements

Consider the research on head nodding described earlier that had assumed that nodding one's head in a vertical (versus horizontal) manner produced more positive attitudes either because vertical head nodding biased thinking in a favorable direction (Wells & Petty, 1980) or because head nodding served as a relatively simple affective cue (Tom et al., 1991). The self-validation hypothesis (Petty et al., 2002) suggests another possibility – that just as vertical head movements from others give us confidence in what we are saying, our own vertical head movements could give us confidence in what we are thinking. In a series of studies, Briñol and Petty (2003) found that head movements affected the confidence people had in their thoughts, and thereby had

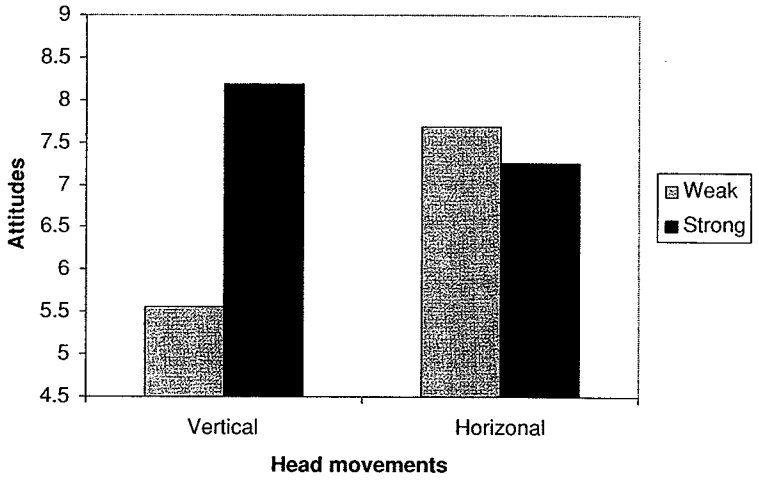

Figure 8.3. Attitudes as a function of head movements and argument quality (data from Briñol & Petty, 2003).

an impact on attitudes. Thus, as illustrated in Figure 8.3, when people listened through headphones to the strong arguments in an editorial advocating that students be required to carry personal identification cards on campus, vertical movements led to more favorable attitudes than when horizontal movements were made as would be expected if vertical movements increased confidence in the favorable thoughts. However, when people listened to weak arguments toward the magnetic cards, vertical movements led to less favorable attitudes than when horizontal movements were made, as would be expected if vertical movements increased confidence in the negative thoughts. Additional analyses indicated that the head movements did not have any impact on the number or valence of thoughts listed but did have an impact on the confidence with which people held their thoughts. Furthermore, this thought confidence mediated the impact of head movements on attitudes.

As noted earlier, the confidence that emerges from the body can be applied to whatever the salient or available mental contents are at the time. Thus, in a subsequent line of research examining self-validation processes in the domain of intergroup attitudes, DeMarree, Briñol and Petty (under review) subliminally primed participants with words related to the black (vs. white) stereotype. Following this induction, participants were instructed to follow a ball moving vertically or horizontally on the screen with their heads. Consistent with the self-validation logic, DeMarree et al. 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 a stereotype-congruent fashion in the head nodding but not the head shaking condition. Thus, as was the case with head nodding affecting confidence in thoughts to a persuasive message, so too did it appear to affect the validity and use of subtly activated mental content. Also consistent with the idea that head nodding validates mental content compared to shaking, the effects of self-generated anchors in an anchor and adjust paradigm (Epley & Gilovich, 2001) and emotional thoughts (Tamir et al., 2004) have been found to be larger when nodding than shaking.

Dominant Versus Non-Dominant Hand

A relevant question is whether the self-validation effects observed for head nodding could also emerge for different behaviors and in different attitudinal domains. In one exploration of this possibility (Briñol & Petty, 2003, Experiment 4), we asked participants, as part of a presumed graphology study, to think about and write down their best or worst qualities (thought-direction manipulation) using their dominant or non-dominant hand (overt behavior manipulation). Then participants rated the confidence in their thoughts and reported their self-esteem. Because writing with the non-dominant hand is very infrequent and difficult, and whatever is written with the non-dominant may appear "shaky," we expected and found that using the non-dominant hand decreased the confidence with which people held the thoughts they just listed. As a consequence, the effect of the direction of thoughts (positive/negative) on current self-esteem was significantly greater when participants wrote their thoughts with their dominant rather than their non-dominant hand. That is, writing positive thoughts about oneself with the dominant hand increased self-esteem relative to writing positive thoughts with the non-dominant hand, but writing negative thoughts with the dominant hand resulted in the reverse pattern.

Follow-up research has demonstrated that the self-validation effects of handwriting also influence the extent to which people rely on their internal states when making emotional judgments. In particular, in one study (Rucker, Briñol, & Petty, under review) participants were asked to write about instances in the past when they were either happy or sad with either their dominant or their non-dominant hand. The prior emotional experiences written had a greater impact on reported emotions when written with the dominant than the non-dominant hand consistent with the self-validation hypothesis (for a demonstration that a facial expression associated with mental

difficulty can impact judgments of perceived fame, see Strack & Neumann, 2000).

Behavioral Indicators of Power

As a final example of the potential of self-validation to explain some of the mechanisms underlying the influence of behavioral factors on attitudes, consider the research on a recipient's power and persuasion described earlier. Recall that this research found power-related behaviors to be associated with confidence, and that increased confidence from power affected persuasion by reducing elaboration of the message (Briñol, Petty, Valle et al., 2007; see Figure 8.2, top panel). In that research, people were placed in a state of high or low power prior to receiving the message, and the likelihood of thinking was not constrained to be high or low. In this situation power should validate pre-message mental content (i.e., prior attitudes), making the need to process new information less necessary. In contrast, low power individuals should have doubt in their views, leading to more processing. However, under different conditions, power-related behavior should influence attitudes by different mechanisms. For example, when elaboration is very low, people might simply assume they are correct if they are of high power and incorrect if they are of low power with little thinking. On the other hand, when motivation and the ability to think are high and people have already processed the persuasive information, we have found that power behaviors can affect attitudes by influencing confidence in the thoughts recently generated to the message.

More specifically, the self-validation prediction is that when induced to feel powerful following thinking, people should be more confident in their thoughts. This prediction is in line with prior research that suggests a link between power and approach tendencies (e.g., Keltner, Gruenfeld, & Anderson, 2003). In one study testing this idea (Briñol, Petty, Valle et al., 2007; Experiment 3), participants were first led to generate either positive or negative thoughts about a new cell phone by manipulating the quality of the arguments contained in the message. Then participants were assigned either to a boss role in a taller chair (high power condition) or to a subordinate role in a lower chair (low power condition). Relative to powerless individuals, those induced to have power following message processing were expected to have greater confidence in their recently generated thoughts about the cell phone. As shown in Figure 8.2 (bottom panel), this research found that the effect of the direction of the thoughts generated by participants on attitudes was greater when power was high rather than low. Further studies in this line of research demonstrated that thought-confidence mediated the observed

effects on persuasion. As in prior self-validation studies, these effects only occurred under high elaboration conditions and only when power followed thought generation.[5]

In a subsequent line of research, we have shown that under high elaboration circumstances, other body postures that do not involve changes in verticality can also affect attitudes by influencing thought confidence. For example, in one study, we (Briñol & Petty, 2007) asked participants to read a message containing either strong or weak arguments while they were sitting down with their back erect and pushing their chest out (confident posture) or slouched forward with their back curved (doubt posture). In line with the self-validation hypothesis, we found that the direction of the thoughts generated in response to the messages only affected attitudes in the relatively high confident posture. Taken together, this group of studies reveals that body actions, such as head nodding, handwriting, postures, and behavioral roles can all influence persuasion by affecting thought-confidence.

Additional High Elaboration Processes for Bodily Responses

Guided by the ELM, we have described four ways in which behavior can affect attitudes: serving as simple cues, affecting the extent of thinking, affecting the direction of thinking, and affecting confidence in thinking. It is important to note that when people are thinking about an attitude object, people assess the relevance of all the information in the context and that comes to mind to determine the merits of the attitude object under consideration (Petty & Cacioppo, 1986). Thus, when thinking is high, people can examine their own body and behavior as possible arguments for favoring or disfavoring the attitude object. That is, a final role for variables within the ELM is that the body can influence persuasion by serving as an argument itself. This is likely to be the case when behavior itself is potentially informative regarding the merits of the object. For example, a very muscular person might use his or her body shape as a relevant argument to decide whether he or she likes certain professional careers, such as sports or modeling.

It is worth noting that if people believe that their thoughts are somehow being biased or influenced by their bodily actions in some way, and they do not

[5] We conducted another study (Briñol, Petty, Valle, et al., under review; Experiment 5) in which the message was presented either immediately before or after participants engaged in the power induction role-playing manipulation. Replicating our findings described earlier (see Figure 8.2) within the same design, the results of this study revealed that the same power behaviors can have different (and opposite) effects in persuasive settings depending on when the manipulation is introduced.

want this to occur, they can adjust their judgments in a direction opposite to the expected bias (*correction processes*; Wegener & Petty, 1997). For example, if people felt they were slumping in a chair because they were sick, they might expect this to bias their assessment of a movie and therefore correct their judgment in a positive direction when asked how good the movie was. These correction processes have the greatest impact when the amount of thinking is high because it is only in such situations that people have a substantial number of issue-relevant thoughts with the potential to shape attitudes. Furthermore, a high amount of thinking suggests that people care about the issue or object under consideration and thus might be most motivated to be accurate in their assessment. Thus, individual and situational differences in the extent of thinking moderate these potential correction processes.

Distinguishing Between the Different Processes by Which the Body Affects Attitudes

The processes described in this chapter are dependent upon various contextual factors such as the specific levels of elaboration, the ambiguity of information presented, or the order in which events occur (Petty & Cacioppo, 1986). For example, our studies on power suggest that the same body actions can influence persuasion by different mechanisms (e.g., affecting the amount of thinking or thought confidence) depending on the circumstances (see Figure 8.2).

As just one example of the multiple roles that a variable can play in persuasion depending on the extent of thinking in the situation, consider how a person's incidental emotions – whether induced via facial expressions or some other means – can impact evaluative judgments according to the ELM. First, when thinking is constrained to be low, emotions tend to serve as simple associative cues and produce evaluations consistent with their valence regardless of the merits of the arguments presented (e.g., Petty, Schumann, Richman, & Strathman, 1993). When the likelihood of thinking is not constrained to be high or low by other variables, then emotions can affect the extent of thinking. For example, people may think about messages more when in a sad than a happy state either because sadness signals a problem to be solved (Schwarz, Bless, & Bohner, 1991) or conveys a sense of uncertainty (Tiedens & Linton, 2001). If people think more in a sad than a happy state, then sad individuals will be more persuaded than happy people by a strong message but less persuaded by a weak one. When thinking is high, emotions can bias the ongoing thoughts (Petty et al., 1993). For example, positive consequences seem more likely when people are in a happy than a sad state (DeSteno, Petty, Wegener, & Rucker, 2000). When thinking is high, people also assess their emotions as an argument. For example, people might report liking a poignant drama the more sad it makes them because emotion induction is relevant to the merits of the movie (see Martin, Abend, Sedikides, & Green, 1997; for a review of the multiple mechanisms by which emotions affect attitudes, see Petty et al., 2003).

Research on the self-validation hypothesis has shown that emotion can also 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 (Tiedens & Linton, 2001). If emotion influences thought confidence, then ~~peop~~le in a happy state should be more reliant on their thoughts than people in a sad state, at least when the extent of thinking is high and emotion follows thought generation. In one study examining this idea, Briñol, Petty, and Barden (2007) had participants read a persuasive message about a new foster care program composed of either strong or weak arguments. The message was presented prior to receiving an emotion manipulation described as a part of a research project for the art school designed to assess participants' dramatic skills. Emotion inductions were accomplished by having participants complete the Velten (1968) technique in which people are required to behave according to a happy or sad script. As predicted by the self-validation perspective (and shown in the bottom panel of Figure 8.4), when participants received a strong message (and thoughts were thus mostly favorable), those who were asked to act as if they were happy following message processing were more persuaded than those asked to act as if they were sad. However, when participants received a weak message on the same topic (and thoughts were mostly unfavorable), the effects of the emotion induction were reversed. Furthermore, the effects of emotion on attitudes was mediated by the confidence people placed in their thoughts, with happy individuals expressing more thought confidence than those who were sad.

Of most importance for the ELM multiple roles idea, the self-validation effects for emotion were confined to situations of high thought, e.g., for individuals high in need for cognition (NC) (Cacioppo & Petty, 1982). In contrast, for people low in NC, emotions had a direct effect on attitudes unmediated by confidence in thoughts. That is, for low NC individuals, behaving in an emotionally positive way following the message acted as a simple cue leading to more positive attitudes when happy than sad, regardless of argument quality (see top panel of Figure 8.4). As noted earlier, this is

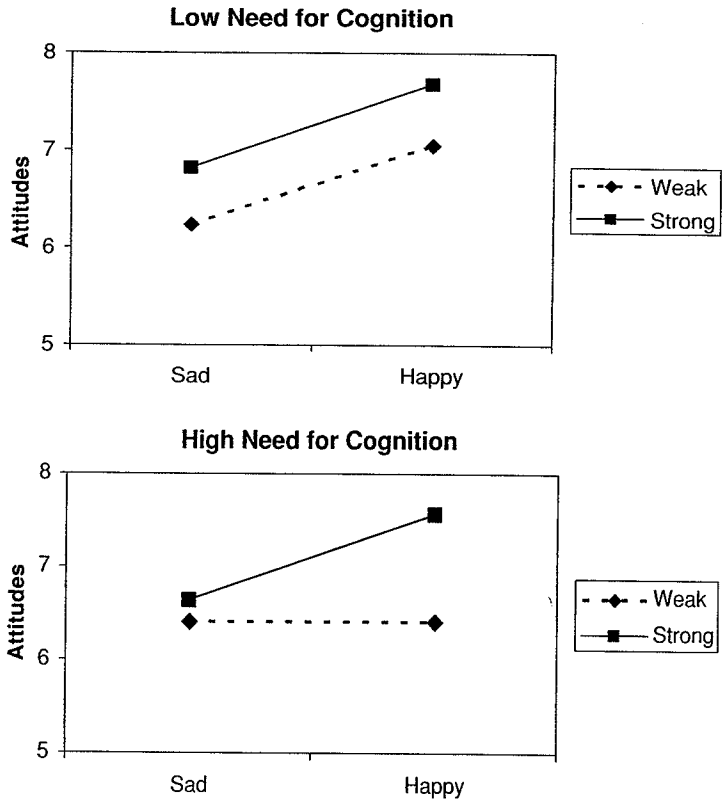

Figure 8.4. Attitudes toward the message as a function of argument quality, emotion, and need for cognition (graphed at ±1 SD; data from Briñol et al., 2007).

consistent with prior research suggesting that low elaboration individuals are more likely to use their emotions as input to an affect heuristic (e.g., Petty et al., 1993).

Also consistent with the idea that emotions can validate cognitions, Stepper and Strack (1993) found that when people recalled behaviors of self-assurance when smiling rather than frowning, they felt more self-assured, but when they recalled behaviors of low self-assurance, they felt less self-assured when smiling than frowning. If smiling enhances confidence in the recalled behaviors compared with frowning, the self-validation hypothesis can explain these results.[6]

[6] As one more example of multiple processes, Cacioppo et al. (1993) found that arm flexion was associated with more positive evaluations than arm extension primarily when the target stimuli had no prior meaning. More recently, Centerbar and Clore (2006) found that arm flexion (versus extension) only led to more positive evaluations when the stimuli evaluated were already considered positive. Interestingly, arm flexion (versus 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 (versus extension) could have affected attitudes by influencing the confidence with which those thoughts were held. Taken together, these two lines of research seem to imply that, similar to other behaviors, arm flexion can influence attitude change by serving as a simple cue (when elaboration is low) or by affecting thought confidence (when elaboration is high). See Clore & Schnall (this volume) for a different interpretation.

Summary and Conclusions

In the present chapter, social psychology's major research findings regarding how one's body affects attitudes and attitudinal processes have been described. These bodily factors have been shown to have an important impact on different aspects (and measures) relevant to attitudes and persuasion. Importantly, the main psychological processes by which bodily responses influence evaluations have been outlined in detail, as well as the antecedents and consequences associated with those mechanisms. Because most of this research was not designed to test these mechanisms, our accounts for many studies are necessarily speculative. However, we hope that future research on embodiment and attitudes will include the necessary conditions and measures to examine the fundamental processes by which previously studied and new behaviors produce their effects.

We conclude by mentioning some remaining issues relevant to embodied persuasion. First, future research might benefit from the exploration of new behaviors other than the ones covered in this review (e.g., a consideration of linguistic behaviors; Lakoff & Johnson, 1999). Second, most of the behaviors used in the experiments described in this review have very clear meanings attached (e.g., nodding is associated with agreement). However, the meaning of those behaviors can vary among individuals and situations. 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 (e.g., Briñol, Petty, & Tormala, 2006). Third, people not only can differ with respect to the meaning associated with behaviors but also with respect to a wide variety of factors potentially relevant to embodiment. For example, Laird and Bresler (1992) have reported that people differ consistently and reliably in how large an impact a bodily state will have on a variety of cognitive processes relevant to attitude change (see also Briñol & Petty, 2005). Fourth, some of the studies described in this chapter suggest that it might not be necessary to physically

act for behavior to produce attitude change. Indeed, merely believing that the behavior occurred, reminding one of past behavior, imaging future behavior, or observing the behaviors of others can often produce effects similar to those obtained from actual motor behavior. We argue that future research should explore whether the different means by which the mental representations of behavior are activated (e.g., by performing versus observing the behavior) are consequential for persuasion.

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