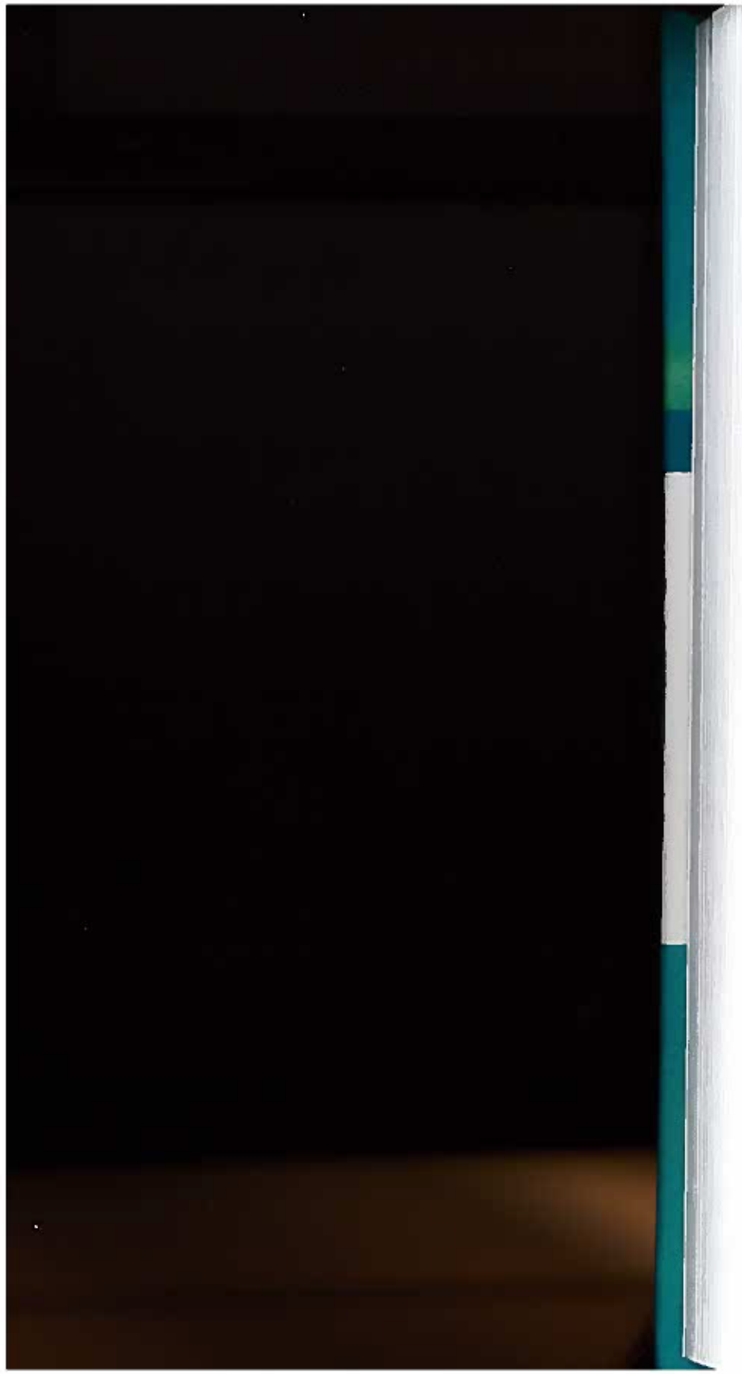


From: B. Jackson, J. Dimmock, & J, Compton (Eds). (2018). Persuasion and Communication in Sport, Exercise, and Physical Activity. Abington, UK: Routeledge.

13 Embodiment in sport

Strength, readiness, aggression, and beyond

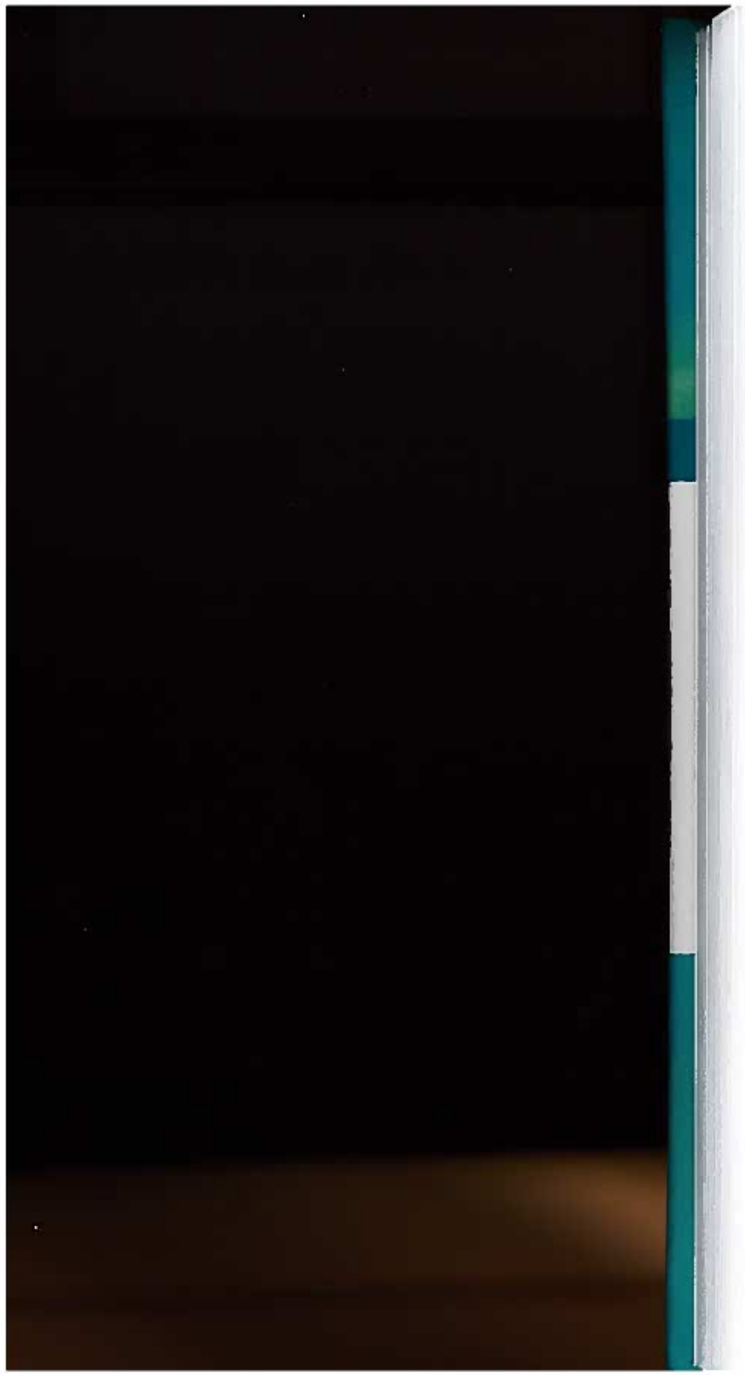
Pablo Briñol, Richard E. Petty, and Luke Hinsenkamp

Introduction

Our minds and our own bodies are very closely linked. Understanding how a person's own behavior can impact his or her thoughts and attitudes is an essential element in the domain of sport and exercise. For example, athletes may pump their fists, nod their heads, or smile after performing well or in between plays, expressing their satisfaction, rewarding themselves, and presumably demonstrating a positive attitude (1). Not only professional athletes, but also fans can engage in positive overt behaviors such as nodding and smiling in order to communicate positive attitudes toward their teams (2). Other times, athletes and audiences shake their heads and frown as if they do not like or cannot believe what is happening. In this chapter, we describe recent research on embodiment that can shed light on understanding how such bodily responses (e.g., nodding, smiling) can affect people's judgments and actions through multiple psychological processes. As we describe shortly, understanding these processes is essential in order to predict *whether*, *when*, and *how* judgments and behaviors are affected.

The ability of bodily movements to influence judgments seems to be a well-established phenomenon. For example, in an early study on *embodied cognition*, individuals who were induced to nod their heads (i.e., agreement behavior) while listening to a persuasive message were more favorable to the proposal than people who were induced to shake their heads (i.e., disagreement behavior [3]). In another line of research, Ostinelli et al. (4) found that upward vertical movements made people feel good about themselves. Other studies have shown that people can draw direct inferences about their attitudes based on their bodily states (e.g., "if my heart is beating fast, I must be enjoying this game" [5,6]; "if I am smiling I might like it" [7]; "if I am slumped over, I might not be feeling good" [8,9]).

Similar findings have been found for a large number of behaviors, postures, and bodily movements (10–13). For example, using one's dominant hand (vs. non-dominant hand) to write thoughts has been found to increase confidence in those thoughts, presumably by giving people a sense of fluency (14). Indeed, fluency feelings can play a critical role in many sports, and those feelings can



emerge from many different sources, such as from engaging in easy, repetitive, and familiar movements and rituals (15), from the speed of locomotion (16), from the grace of motion (17), or even from merely synchronizing with others (18).

Briñol et al. (19) organized the literature on embodied change around the basic mechanisms of influence specified by the Elaboration Likelihood Model (ELM) of persuasion (20). The ELM holds that a person's bodily movements or responses, like other variables in persuasion settings, can influence attitudes by affecting one or more underlying processes (see Chapter 2, this volume). In particular, if thinking is low, bodily responses can serve as simple cues to evaluation (e.g., "if I am smiling, I must like it"). If thinking is high, bodily responses can bias thinking (e.g., smiling can make positive thoughts more accessible), serve as arguments (e.g., smiling can be seen as evidence that a joke is good), or validate thoughts (e.g., smiling can make you like your thoughts more). If thinking is not constrained to be high or low, bodily responses can affect how much thinking occurs (e.g., smiling, if it makes people feel that everything is fine, could reduce thinking about a message; see [21,22] for a full discussion of the multiple processes by which bodily responses can affect evaluation according to the ELM).

In the present chapter, we focus on bodily responses and postures that are particularly relevant in the domain of sport and exercise (i.e., those postures associated with feelings of power, readiness, and aggression). Furthermore, although as just noted, postures can work to influence evaluations in multiple ways, in this review we focus on how our bodies can influence attitudes by affecting confidence and liking for our thoughts, a meta-cognitive process called *self-validation*. According to this perspective (23), if a posture makes people like their thoughts more, or have more confidence in them, this will make people rely on their thoughts more than if a posture makes people dislike their thoughts or doubt their validity.

Power

Power is associated with confidence

Although power is associated with many effects (e.g., feelings of approach, agency, control), we focus on the link between power and feelings of confidence. People who possess power often act as if they are confident (e.g., expressing their opinions in public [24]), and people who lack power act as if they are doubtful (e.g., speaking more passively and showing more hesitations [25]). The association between power and confidence is learned through life. Children learn that their more powerful parents can grant privileges and punishment and that older, physically stronger (i.e., more powerful) siblings, or other, taller children are able to coerce them physically (26). Metaphorical evidence also suggests that power is associated with being on top, such as when someone has a high status, or is toward the top of a hierarchy. Powerful people can oversee, control, and

dominate others who have lower status, potentially making powerful people feel confident. Given the link between power and confidence, Briñol et al. (27) introduced and tested the idea that feeling powerful can lead people to feel confident in their thoughts and therefore rely upon them more, whereas feeling powerless can lead people to doubt their thoughts and therefore mentally discard them. In the next sections, we describe examples of how power validates thoughts that are particularly relevant to the domain of sport and exercise psychology, and describe how the same feelings of power can influence evaluation and persuasion through other mechanisms, depending on the circumstances.

Powerful postures can make people feel stronger or weaker

In line with the self-validation hypothesis, we hypothesized that having a powerful body posture increases reliance on self-relevant thoughts compared with having a powerless posture. In one study, Briñol et al. (19) asked participants to think about and write down their best or worst qualities while sitting with their backs erect, chests inflated (i.e., powerful posture potentially associated with high confidence) or while sitting slouched forward, backs curved (i.e., low-power posture associated with low confidence). Then, participants completed a number of measures, including self-esteem. It was predicted and found that the self-relevant thoughts generated affected self-evaluation more in the confident, powerful posture. Importantly, changes in self-esteem were mediated by differences in participants' confidence about the self-beliefs (thoughts) that they had listed. Notably, this pattern is likely to emerge when the power induction follows (or accompanies), rather than precedes, the generation of thoughts. As we will describe later, when power precedes thinking, it is more likely to serve in another role such as determining the extent of thinking. Indeed, timing is a key moderating variable that determinates the psychological process by which power influences attitudes and persuasion.

These results reveal that people do not invariably feel bad when they are in powerless postures, because a powerless posture can undermine use of any negative thoughts about the self. This example also demonstrates a unique implication of the self-validation logic: "Adding" doubt due to feeling powerless can ironically lead to an overall reduction in negative feelings about the self when the doubt invalidates one's primary negative cognitions. Furthermore, this research suggests an important caveat to the recent trend of encouraging "power posing" as a means of becoming more successful across different domains of life ([28,29]; see also Chapter 16, this volume). Rather than being inherently positive, the confidence that comes from body postures magnifies whatever its mental target is, at least when powerful postures operate through a self-validation mechanism. A football (soccer) player who is confident in her chances of "nailing" an interview and joining the team (positive thought) will probably "nail" it. If the same player is confident in her likelihood of "bombing" the interview or performance test (negative thought), she will probably "bomb" it. Similarly, confidence would validate both negative thoughts about athletic

performance (e.g., worries about upcoming performances for which there is apprehension) as well as positive thoughts (e.g., optimistic expectations about success).

Power makes people more or less competitive

The confidence that emerges from one's power can magnify the effect of anything that is currently available in people's minds, including not only their thoughts about personal skills, but also their goals. To investigate the idea that confidence applies to whatever mental contents are salient, DeMarree and colleagues ([30], Study 1) examined whether power could validate people's goals. In this study, participants were first primed with words related to being competitive (e.g., compete, win) or cooperative (e.g., help, share) using a word completion task. Following this induction, participants wrote about times when they had power over someone else or when someone else had power over them. Thus, instead of having participants in powerful or powerless postures, a semantic induction of power based on word completion was used. Finally, participants engaged in simulated economic games, where they had an opportunity to share money with another participant or not. Consistent with the idea that power produces confidence (and powerlessness produces doubt), the primed goal affected participants' behavior in the economic games to a greater extent when they subsequently wrote about high power. That is, under these (high power) conditions, cooperation-primed participants gave more money to their partner in the economic games than did competition-primed participants. Again, self-validation effects are more likely to operate in high elaboration conditions and when power follows or occurs alongside, rather than precedes, one's thinking.

Of course, competition and cooperation are key components to most sports, and both will thus be highly salient concepts in players' minds on different occasions. However, many specific contexts and individual play styles may activate one more than the other. National Basketball Association all-time assist leader John Stockton might be considered a cooperative player, and increasing his confidence would likely validate his team-oriented mindset, probably leading to quite a different outcome than validating a competitive player more focused on his own shots, like Kobe Bryant. Similarly, the core motivation for some athletes choosing a career in sport may be their competitive spirit, whereas others may simply love the feel of being a part of team, or the glory (and financial reward) that comes with being part of a winning team. The confidence gained with the power and fame of success will have very different effects on each of these kinds of players because confidence magnifies any available thoughts when operating through self-validation processes.

Power increases hurting (but also helping) others

The previous section revealed that, across a wide range of paradigms, when people experience the ability to control other people (i.e., high power), they rely

more on their current thoughts. This self-validation logic held whether power was induced by a powerful posture or by recalling instances of power. It also held whether the thoughts that were validated were about the self or stemmed from a goal prime. Research on self-validation has replicated and extended these findings to social behavior. In one study, DeMarree et al. (31) first activated prosocial or antisocial mental content using a memory task in which participants had to recall past personal experiences in which they either helped or hurt another person. Participants' experience of power was then manipulated using a word completion task in which they had to complete words associated with high power (e.g., dominate, boss) or low power (e.g., obedience, subordinate). Subsequently, high power, relative to low, led participants to imagine greater anticipated prosocial behavior in the future, but only when people were instructed to remember past instances of behaving prosocially.

This research suggests that self-validation can accommodate apparently contradictory sets of results by showing that power can both increase (32) and decrease anti-social behavior depending on the dominant thoughts people are having. This is important because it can help to specify when the classic assertion that *power tends to corrupt* is more likely to be true, an idea easy to conclude in the sport domain. Many of Major League Baseball's biggest stars over the past decade have been haunted by accusations of using performance-enhancing drugs, as have many Olympic contenders. The National Football League has had several high-profile domestic abuse situations in recent years. Why this high concentration of wrongdoing among star athletes? Although it is possible that the power and fame these athletes have attained can lead them to moral corruption (increasing the quantity or heinousness of their negative thoughts) we argue that this need not always be the case. Instead, they may simply trust more in their own (positive or negative) thoughts and are therefore more willing to act on any given thought than non-powerful individuals.

Power can paralyze people, leading to inaction

Past research suggests that more power generally leads people to be more likely to take action (32,33), whereas ambivalence – the feeling of mixed, conflicting evaluations of something – leads to *less* action. These observations allow for the simple conclusion that two main effects should emerge in a situation where people vary both in power and ambivalence. People should be most inclined to act when they are powerful and have consistent thoughts and be least inclined to act when they are powerless and have ambivalent thoughts. However, if power validates individuals' ambivalent thoughts, then power should magnify the extent to which this ambivalence was trusted and thus reduce participants' propensity to act, a novel hypothesis from the self-validation approach.

A recent set of experiments tested the interaction between power and ambivalence. Durso et al. (34) had participants read information about an employee whose behavior was either consistent (entirely good or entirely bad) or ambivalent (both good and bad). Subsequently, participants were induced to feel more

or less powerful. Next, participants indicated the extent to which they preferred action versus inaction in making a decision about the employee. Finally, they were required to make a final call as to promote or fire that person, and the time invested in making that decision was recorded. Consistent with previous work demonstrating that power leads to action, among participants who received consistent information, participants induced with power were more likely to express a preference for taking action and actually acted more quickly when rendering their decisions compared to low-power participants. In contrast, among participants who received ambivalent information, those who were made to feel more powerful were more likely to prefer *inaction* toward making decisions, and acted more *slowly* when required to make their decisions. Thus, when individuals' thoughts were ambivalent, power validated these conflicting reactions, which ironically caused power to lead to *inaction*. This is important because action and inaction has been shown to play a role in many sports, like when a soccer goalkeeper is trying to decide whether to do something when facing a penalty (the most preferred option is moving to one side or the other) or remain static in the middle of the goal (the most successful option [35]). The notion of power increasing inaction is also relevant from the perspective of exercising. It is common that people will have ambivalence about participating in a single bout (e.g., "it'll be good for me, but I'm not sure I have the time today") or in decisions regarding longer-term participation (e.g., signing a contract for annual gym membership – "it might be good for my health, but I'm not sure that I want to spend so much time away from my kids"). According to our results, power has the potential to strengthen such ambivalence when operating through validation processes, which may ultimately result in less physical activity. Also relevant, Durso et al. (36) suggest that merely *expecting* this ambivalence can reduce the feelings of conflict that can lead to this preference for inaction.

Summary

Multiple effects, processes, and meanings of power

We have shown that a wide variety of power inductions can magnify the impact of current thoughts via the self-validation process. However, we should note that these effects are dependent on various contextual factors such as the specific levels of elaboration, the order in which events occur, and the meaning associated with power. First, the self-validation mechanism requires a level of elaboration that is sufficiently high for individuals to both generate thoughts and to consider their validity (see Chapter 2, this volume). Second, power primes are more likely to influence judgments by self-validation when induced following or during (rather than preceding) the generation of thoughts. Third, for most people in most situations, it seems that feeling powerful would have a clear and positive association. However, as noted earlier, the meaning associated with power can vary across individuals, situations, and cultures. For example, the experience of power can include appraisals of negative *valence* (e.g., power is bad because it is associated

with corruption and abuse) and *uncertainty* (e.g., powerful people are sometimes wrong due to incompetence, carelessness, selfish myopia), and an *avoidance orientation* (e.g., power can paralyze when it is associated with ambivalence and conflict during decision-making [34]; when perceived as undesirable [32]; or as illegitimate). For example, Schubert (37) found that performing a single physical display of power (i.e., making a fist) increased feelings of power in men while activating feelings related to frustration and loss of power in women.

Readiness

Feeling prepared is enough to increase thought reliance

Feeling prepared increases subjective feelings of confidence. Preparation often involves acquiring more knowledge and experience, facilitating subsequent performance, promoting feelings of self-efficacy, agency, and control. We argue that the feelings of confidence that emerge from being prepared can be misattributed to any thoughts in mind at the time, including thoughts irrelevant to the domain of preparation. Carroll et al. (38) conducted a study to test this idea in which participants wrote positive or negative thoughts about a tuition increase proposal. Next, participants completed words related to preparedness or control words and reported their evaluations of the tuition proposal. Prime words included in this task were associated with preparedness (e.g., prepare, ready) or with neutral, control meanings (e.g., horse, moon). Consistent with self-validation theory, results showed that the direction of thoughts (positive/negative) affected attitudes toward tuition greater when participants completed preparedness than control words. A second study replicated these findings using a different topic (genetically modified food) and a more natural induction of preparedness (actual preparation for receiving negative feedback). Moreover, this study demonstrated that the effects of preparedness on attitude change were mediated by thought-confidence.

As in the case of power, the effects of preparedness are likely to depend upon the meaning of preparedness. Although this work demonstrates that preparedness has positive effects on confidence, the observed effects could be attenuated or even reversed when preparedness is viewed as a bad thing (e.g., preparedness is a symptom of excessive worry and threatening fear rather than readiness to act). In addition to considering meaning, this research needs to separate the relative effect of preparation from expectation, two dimensions that are relevant in the domain of sport, where people often feel prepared but not knowing what to expect, and where people can see clearly what is about to happen but still not feel prepared for it.

Arousal can polarize thoughts

In addition to confidence appraisals, there is another aspect of bodily response that may accompany being prepared – arousal. A number of studies have shown

that arousal can magnify the effect of any thought previously activated in people's minds, polarizing subsequent judgments (39). To date, however, it is not yet clear if this is due to arousal validating thoughts or some other mechanism such as arousal affecting the extent of thinking. We argue that arousal would influence the extent of information processing when it precedes the message but could affect validation processes when it follows processing.

Indeed, arousal has been postulated to increase processing of persuasive messages and produce enhanced argument quality effects when it gives people the burst of energy they need to think (40). However, arousal has also been argued to decrease processing of persuasive messages (reducing argument quality effects) when it is experienced as stressful and difficult to handle (41). In addition to the level of arousal, other factors can moderate the impact of arousal on information processing and persuasion, such as the extent to which people want to maintain their current level of arousal, the meaning associated with arousal, and the extent to which it is perceived to be a biasing factor. The research on arousal and response polarization is relevant when thinking about phenomena such as "choking" under pressure and "social facilitation." In general, knowing your individual performance is being observed and evaluated by others tends to enhance your "dominant response" (42). As was the case with power and readiness, the increased arousal from being watched makes the good get better and the bad get worse (43).

Aggressive states can make people feel strong or weak

Mental and physical states associated with aggression can lead people to increase their reliance on their own thoughts via the self-validation mechanism. This proposition is based on the link between aggression and a number of variables associated with confidence such as power, arousal, preparedness, overcoming threats, and anger.

In line with this logic, the results of two experiments conducted by Briñol et al. (44) showed that the effect of the direction of thoughts (positive vs. negative) on self-evaluation was greater after receiving an aggressive (e.g., having participants showing their canine teeth as if about attack) than after receiving a control priming induction (e.g., participants covering their teeth with their lips in a neutral pose). Among participants listing negative self-attributes, those in the aggressive (vs. control) prime condition reported more negative self-attitudes. However, among participants listing positive traits, the aggressive (vs. neutral) primes led to more favorable self-attitudes, reversing traditional effects of aggression in self-evaluation. These findings confirmed that aggressive primes were capable of affecting reliance on one's thoughts at least under the circumstances present in these two studies, such as when primes were induced following or during (rather than preceding) the generation of self-traits, and thinking was high.

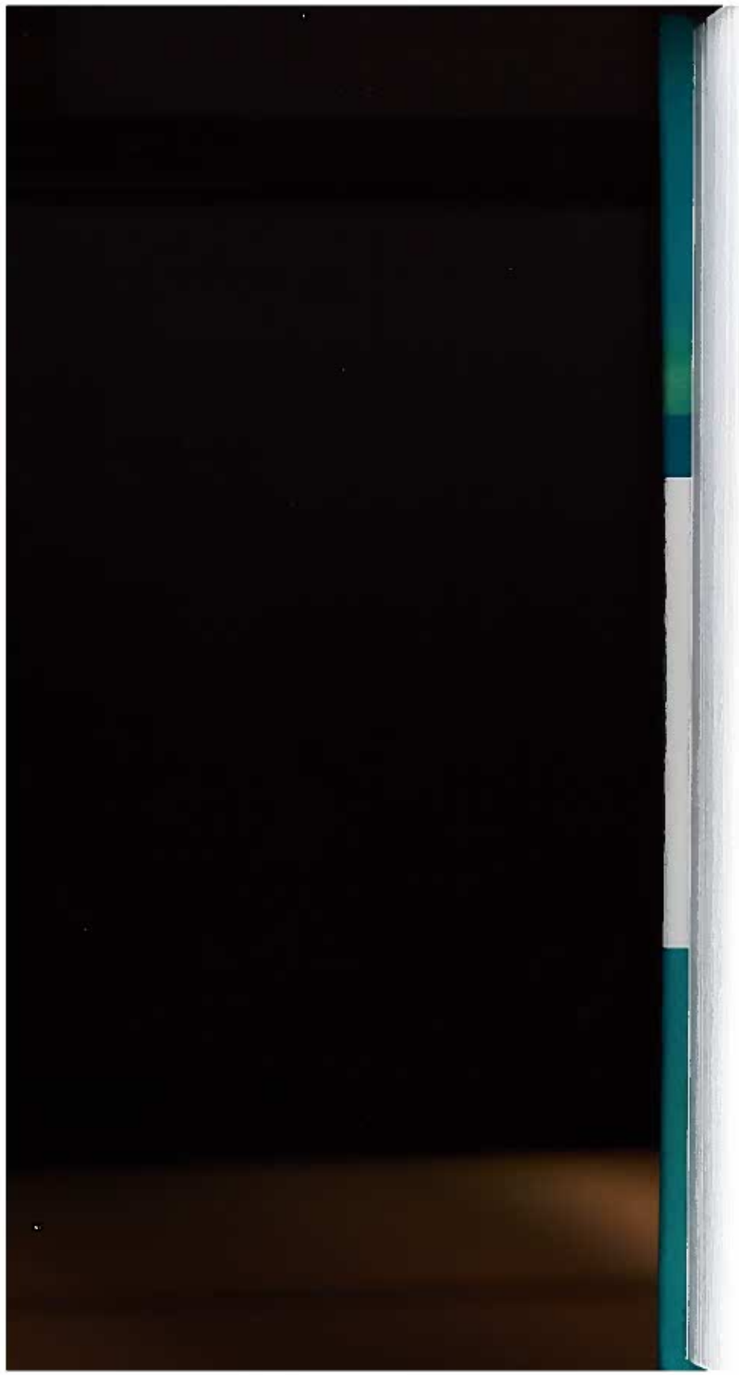
Playing violent video games versus playing sport games

The research described above reveals that being ready to attack and engaging in actions associated with aggression (e.g., baring teeth) can validate thoughts. In this section, we describe another line of research suggesting that playing aggressive video games can validate thoughts. Importantly, the research also specifies for whom acting aggressively may validate salient thoughts. The general idea is that people are likely to have more confidence in their thoughts when they do something that matches or fits their own nature rather than when their actions do not fit. For example, a person high (vs. low) in trait aggressiveness should be more likely to rely on their thoughts following violent action.

In a study designed to examine this possibility, Santos et al. (45) first asked participants to read a strong or weak message about a new (fictional) company. This manipulation was designed to influence the favorability of participants' thoughts. After generating positive or negative thoughts toward the company, participants were randomly assigned to play either a violent video game (i.e., *Grand Theft Auto: Vice City*) or a control video game (i.e., *Burnout Paradise*). These video games were selected because they are similar in terms of entertainment and engagement, but different in terms of violence. The violent game included weapons, blood, and killing people whereas the control video was a driving game in which players can compete in several types of races. Finally, participants reported their attitudes toward the company they read about.

As predicted, in conditions that matched the level of violence (i.e., high trait aggressiveness and violent video game; low aggressiveness and control, neutral video game) there was a higher use of thoughts relative to more discrepant conditions (i.e., high aggressive people playing neutral video games, and low aggressive people playing violent video games). Thus, matching the aggressiveness of the person and the situation increased the impact of one's thoughts on judgments relative to mismatching those variables, presumably because their thoughts "feel right," or are easier to process, or because they might feel particularly powerful. Importantly, the self-validation effect that emerges from this aggression-matching was observed in conditions in which thinking was high and the match became salient after message processing. Any variable – including the very same match between aggressiveness and violence – can lead to attitude change through different processes under other circumstances (see Chapter 2, this volume).

One implication of this research on matching for the research described previously on power is that for people who might dislike power or be uncomfortable with it, being assigned to have power would create a mismatch, potentially leading to doubts (rather than confidence) in thoughts. Thus, our work on matching can serve to specify who is more likely to rely on their thoughts when induced to feel powerful: those who already like having power.



Mimicry and synchrony also increase thought usage

There are many features that can be matched beyond personality and behavior. For example, consider research on behavioral mimicry where one person matches another's behavior. Relevant to this domain, Briñol et al. (46) found that participants felt more confident when they were mimicked by others. The thought-confidence that emerges from this mimicry was found to validate positive and negative thoughts about a persuasive proposal unrelated to the domain in which they were being mimicked. In addition to subtle behavioral mimicry, deliberative mutual efforts at coordinated movements have also been shown to increase positive feelings of rapport and entitativity, or a sense of "oneness" (18,47). This sense of fit with those around you should provide both an affective (because social cohesion feels good) and cognitive (because achieving synchrony is the right thing to do when "playing as a team") potential source of validation. Future research should examine whether the confidence that emerges from this social synchrony and social validation can boost performance when players' thoughts are positive (replicating the classic finding in this domain), but decrease performance and satisfaction when thoughts are negative (reversing the traditional effect [23]).

Affect versus cognition

Anger magnifies responses: differential appraisals

We have recently compared the effects on validation of anger (a complex emotion, as it is relatively unpleasant but associated with confidence) and surprise (another complex emotion, relatively pleasant but associated with doubt). For example, in one study, Briñol et al. (48) first asked participants to think about their best or worst qualities as job candidates. Following this thought direction manipulation, participants were assigned to write about personal episodes in which they felt anger or surprise. After participants completed both inductions, the critical mindset manipulation was introduced in order to focus participants' attention on the affective (pleasantness/unpleasantness) appraisal of their emotion or the cognitive (confidence/doubt) appraisal. The mindset manipulation required participants to fill in the blanks of words related to cognition (e.g., thought) or emotion (e.g., feel). As predicted, when in the cognitive mindset, angry individuals used their thoughts more than surprised participants (presumably reflecting confidence from anger and doubt from surprise), but when in the affective mindset, angry individuals used their thoughts less than surprised participants (presumably reflecting an unpleasantness appraisal from anger and a relatively pleasant appraisal from surprise). The results of this study were replicated in subsequent experiments revealing that anger and surprise can lead to opposite patterns of results (i.e., larger or smaller impact of the direction of the thoughts) depending on the appraisals of the emotions that predominate at the time of judgment, which in turn were determined by the mindset that was salient. This

line of research suggests that negative emotions associated with confidence can enhance thought use relative to positive emotions, but only if people are in a cognitive mindset, interpreting their emotions along a confidence-versus-doubt continuum. Also, these studies are important in revealing that the same emotion can sometimes increase thought use and sometimes decrease thought use. An implication relevant to athletes is that performance would be negative if the confidence that comes from anger makes them sure they do not have any talent, but the same certainty that comes from anger would increase performance if it is associated with perceptions of great talent. In contrast, if anger operates through unpleasantness then it will make people feel bad about their thoughts, potentially reducing performance for positive thoughts and increasing performance for negative thoughts.

In closing this section, it is important to note once again: in addition to influencing thought validation (when emotions follow or occur alongside processing), one's emotions, like power or threats to others, can also operate through other processes when thinking is high and emotions precede the generation of thoughts. For example, emotions can be evaluated as evidence (e.g., negative emotions such as sadness or fear can lead to positive evaluations of a movie if these are the intended states), emotions can bias the ongoing thoughts (e.g., positive consequences seem more likely when people are in a happy than sad state), and emotions can even affect whether people engage in thinking. Of course, emotions can change people's minds through other low thinking processes when motivation and ability to think are relatively low (49).

Baseball caps, helmets, and lucky objects influence cognition and evaluation

In this section, we also rely on the distinction between affect and cognition, but this time we do so to specify the conditions under which wearing physical objects can influence attitudes and persuasion. Research on situated cognition provides a number of illustrations showing that physical objects can influence cognition, playing multiple roles in persuasion. For example, research has revealed that wearing a white coat labeled as a doctor's coat increased attention on a visual perception task compared to those who did not wear the coat (50). In a similar vein, research on objectification has shown that wearing a bathing suit compared with a sweater led women to perform worse on a test of mathematical ability in the absence of variables that constrained elaboration to be either high or low (51).

Research recently conducted in our lab has also shown that physical objects can influence attitudes by affecting both elaboration and validation processes. For example, with regard to elaboration processes, Belding et al. (52) found that wearing non-prescription reading glasses prior to exposure to a persuasive message caused participants to pay more attention to the message compared with wearing a baseball cap sideways. In this work, participants read a persuasive message about senior comprehensive exams that contained either strong or weak arguments in a context in which thinking was unconstrained (i.e., in the absence

of any information that may increase or decrease motivation and ability to think). Those who wore the reading glasses (associated with intelligence in prior research [53]) showed a larger effect of argument quality (indicating greater elaboration) compared with those who wore the cap. An important aspect of this research was that the impact of the glasses on information processing occurred only for people who did not routinely wear glasses. It is possible that continual exposure to the item may cause the individual to habituate to the meaning associated with the object, or that wearing glasses that are not one's own could be distracting for those who routinely wear glasses.

The examples described thus far refer to the influence of physical objects (baseball cap, glasses) on elaboration. However, wearing physical objects can also influence attitude change by other roles, such as by affecting validation. For example, Belding et al. (54) examined how reading glasses and baseball caps can both validate and invalidate one's thoughts depending on whether a message recipient is in a cognitive mindset or an affective mindset and if the object is made salient following, rather than prior to, thinking. We hypothesized that wearing reading glasses could validate one's thoughts because they are associated with concepts like intelligence, but that this should only occur if one is in a cognitive mindset. Similarly, wearing a baseball cap could validate one's thoughts because it is associated with being a "partier" and "cool" but that this should only occur in an affective mindset.

To test these hypotheses, all participants read a persuasive message in favor of a tuition increase at their university. After thinking about the proposal, participants were randomly assigned to complete the same mindset manipulation previously described involving completing emotion or cognition-related words, and were then asked to wear either the reading glasses, the baseball cap, or no item. Participants who wore the reading glasses and were in the cognitive mindset condition had more favorable attitudes towards the proposal relative to those who wore the baseball cap in this mindset. However, under the affective mindset, the effect was reversed, and those who wore the baseball cap had more favorable evaluations. Importantly, these effects were mediated by the cognitive and affective mindset manipulation checks, respectively. Thus, wearing reading glasses cognitively validated one's thoughts relative to the baseball cap in a cognitive mindset condition, whereas wearing a baseball cap affectively validated one's thoughts relative to the glasses in the affective mindset condition.

These insights can be applied to other domains relevant to sport and exercise psychology. For example, cognitive and affective mindsets might make a difference when people wear certain clothes (e.g., football pads) or look at the objects worn by others (e.g., boxing gloves). Furthermore, recent research suggests that wearing an object associated with safety (a bicycle helmet) compared to a control object (a baseball cap) increased risk seeking behavior (55). We might expect these results are more likely to be observed when participants are in a cognitive mindset (e.g., cover story focused on calibration) because of the association between helmets and safety or protection, but not in an affective mindset condition when fun associations come to mind.

Conclusions

This review has focused on the various processes by which bodily movements, overt behaviors, subjective feelings, and physical objects can affect our attitudes and behaviors. Importantly, the conditions necessary for each of these fundamental processes have also been specified. An important feature emphasized throughout this review is that most of the behaviors described have very clear meanings attached to them (e.g., power is associated with rightness, synchrony means cohesiveness). However, if the meaning of behaviors changes among individuals and situations, the effect of that behavior on subsequent attitudes or behaviors could also change.

Furthermore, we introduced the novel idea of different appraisals capable of moderating not only the impact of complex emotions (e.g., anger) on attitudes, but also the influence of physical objects (e.g., glasses). This notion has many potential implications to explore in the domain of sport and exercise psychology. Further, we note that it might not be necessary to physically act for behavior to produce change or validate thoughts. Indeed, merely believing that a behavior occurred, reminding oneself of past behaviors, imaging future behaviors, or observing the behaviors of others can often produce effects similar to those obtained from actual behavior.

Participation in sport and exercise makes people feel physically stronger. So, it might be possible that long-term participation in physical activity or sport gives people a more general confidence. Regardless of whether this confidence comes from physical or psychological sources, examining reliable individual differences in confidence would be a desirable avenue for future research. Identifying individual differences in confidence would be useful in predicting thought use, allowing researchers and practitioners to make a priori predictions of thought–attitude correspondence, as well as predictions of attitude–behavior consistency for novel topics for which nothing is known in advance (56).

Another important matter to consider in closing this review is the question of whether power postures, aggressive memories, and wearing objects can be used deliberatively in producing changes in our own psychological processes. Indeed, people use their non-verbal behavior quite deliberatively to influence other people. For example, people often use their power positions strategically in threatening others. However, it is not clear whether people can also use their power and hostile behaviors deliberatively to influence themselves. According to past research, people deliberatively choose to engage in negative emotions such as anger when they think that those emotions can help them to achieve a desired goal (e.g., fighting). In contrast, other research suggests that the effects of most bodily responses (and other incidental inductions, including the retrieval of past memories) are likely to be eliminated when people become aware of their incidental nature (57). Thus, future research should examine the question of whether, when, and how awareness of the effects of incidental experiences of power or aggression can decrease and increase their impact. Future research should also examine the role of awareness and placebo effects

when deliberatively choosing to use physical products designed to change bodily postures (e.g., helping people to keep an erect back) and improve physical activity and sport performance.

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