CHAPTER

28 Social Power and Cognition

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Abstract

This chapter examines the links between social power and the mind. It reviews empirical evidence about how having or lacking power affects cognitive processes that underlie judgment and behavior. It focuses on the major components of the cognitive toolbox, such as attention allocation, attentional control, flexibility, memory, and construct accessibility. It also considers neuroscientific evidence and discusses dynamical conceptions of cognition and self-regulation as they unfold across different contexts and states of the perceiver. The evidence indicates that power enhances cognitive abilities and goal focus, but also the propensity to fast and frugal processing. Compared with individuals who lack power, power holders are more susceptible to effectively influence others, pursue goals, and satisfy their needs, while also being more influenced by constructs that are temporarily activated on a moment-to-moment basis. Thus, having power enhances situated responses and behavior variability.

Key Words: power, attention, social cognition, self-regulation

Power asymmetries are common among social animals, and humans are no exception (Boehm & Flack, 2010). Whether in informal small groups, families, organizations, or nations, some enjoy more control and influence than others. These differences in power have an important impact on the ways individuals feel, think, and act. Not surprisingly, social scientists have considered power to be a fundamental concept in social sciences. Some have argued that power is central to social science in the same way that energy is central to physics (Russell, 1938).

In social psychology, there is a long-standing interest in power (e.g., Kipnis, 1972; Lewin, 1941), with a remarkable proliferation of knowledge in the past two decades. Recently, social cognition has emerged as an indispensable level of analysis for the understanding of how and why being in a powerful or powerless position affects individuals. This chapter reviews literature about how having or lacking power affects cognitive processes and their influence on judgment and behavior. It examines how power affects the major components of the cognitive toolbox, such as attention and memory. The chapter addresses questions such as: How does power affect attention allocation and the ability to control attention? How does it affect memory and the ways that knowledge is activated and used? How are powerholders' cognitive processes and neurobiology implicated in their judgments and behavior? Last, but not least, what does power research tell us about the ways the mind works?

The chapter starts with definitions of power and conceptual considerations. It then examines how power affects attention, memory, and the activation and use of constructs. Finally, the chapter proceeds to discuss how cognition is implemented and how it affects powerholders' judgments and behavior. Together, the evidence reviewed suggests that power increases selective and flexible information processing, equipping powerholders with the capacity to pursue goals efficiently, form judgments easily, and

make decisions promptly. Powerholders possess malleable information processing strategies. They make use of automatic and controlled processes, as well as subjective experiences and conceptual knowledge, in a dynamic way, depending on the task at hand and their motivation. Powerholders are ultimately guided by the primary constructs activated on a moment-to-moment basis, showing greater reliance on constructs that easily come to mind, along with greater variability in judgment and behavior.

What Is Power and Why Does Power Affect Cognition?

Power originates from the Latin word *potere*, meaning *to be able,* and has been associated with the ability to produce desired outcomes (e.g., Locke, 1690). Power has been conceptualized in terms of the potential to influence others in psychologically meaningful ways (French & Raven, 1959) through the giving or withholding of rewards or punishments (Fiske, 2003; Keltner, Gruenfeld, & Anderson, 2003; Vescio, Snyder, & Butz, 2003). According to this conception, power refers to the *potential* to influence others and may be present even when no direct behavioral effects are observed. Furthermore, *influence* refers to effects on the ways people feel, think, or behave. Finally, power may be exerted through "soft" influence tactics (e.g., charisma, knowledge) or "hard" tactics (e.g., physical punishment; Raven, Schwarzwald, & Koslowsky, 1998), and may occur between individuals or between groups (see Keltner et al., 2003).

Power can be exercised with varied aims. Most commonly, it is used to obtain valued outcomes and basic resources for the self (Weber, 1954) and to coordinate and advance collective interests (Parsons, 1963; Van Vugt, Hogan, & Kaiser, 2008). Those who dominate can more easily secure resources and desired outcomes, often through force or ideological manipulation (Glick & Fiske, 1996; Pfeffer & Salancik, 1978). This is facilitated by the fact that powerless individuals are dependent on powerholders and often offer little resistance. The self-serving nature of power is supported by studies indicating that power often promotes corruption (Kipnis, 1972) and a focus on self-interest (Keltner, Gruenfeld, Galinsky, & Kraus, 2010; Winter, 2010), while decreasing attention toward others (Fiske, 1993) and increasing prejudice (Guinote, Willis, & Martellotta, 2010).

At the same time, power has group-serving functions (Parsons, 1963). These functions can be seen, for example, in times of crisis, when within-group hierarchies sharpen and leaders emerge (Sherif & Sherif, 1953). From an evolutionary point of view, power evolved to deal with problems of social coordination that emerged in ancestral environments (see Caporeal, 2004). Powerholders were necessary because they helped solve problems of group movement, intragroup peacekeeping and intergroup competition (Van Vugt et al., 2008). From this perspective, power roles involve social responsibility.

Nevertheless, the fact that powerlessness decreases cognitive abilities and well-being (Guinote, 2007b; Marmot et al., 1991) supports the notion that power relations have primarily self-related consequences. Also in support of this notion is the fact that from 38 milliseconds of observing a face, humans automatically detect the relative dominance of others (Willis & Todorov, 2006). They also automatically adopt complementary power postures (Tiedens & Fragale, 2003). Complementary reactions to another's dominance are common in social animals and have been interpreted as a signal that maximizes the chances of individual survival (Boehm & Flack, 2010).Rather than asking whether power has selfish or prosocial aims, one should ask *when* power has selfish or prosocial aims.

Power seems to affect individuals primarily because it increases their sense of control (e.g., Van Dijke & Poppe, 2006), opening up opportunities and the freedom to attain desired outcomes (Fiske, 1993). These changes automatically affect cognitive processes in ways that serve adaptive needs (see Fiske, 1992; Fiske & Dépret, 1996).

According to the approach theory of power (Keltner et al., 2003), power activates approach-oriented behavior, positive affect, attention to rewards, automatic cognition, and disinhibited behavior. From a cognitive perspective, it is proposed that power directs attention toward rewarding stimuli, such as food, sex, money, or rewarding social cues. Furthermore, power triggers effortless cognition, associated with simple rules for making judgments, such as heuristics (see also Fiske, 1993).

It has been also suggested that power affects individuals through the activation of goals and thoughts that individuals associate with power (Bargh & Raymond, 1995; Chen, Lee-Chai, & Bargh, 2001). Individuals in power tend to engage in extreme behavior that they associate with power. This occurs because when one has power, goals associated with power easily come to mind, directing attention and effort toward their attainment. For example, individuals who see power as an opportunity to obtain

resources for the self act more selfishly when given power. Conversely, individuals who see power in terms of social responsibilities act more prosocially when given power (Chen et al., 2001).

The situated focus theory of power (Guinote, 2007a, 2010) proposes that power affects motivation and information processing in ways that lead to more situated responses in powerholders compared with powerless individuals. Like Bargh and colleagues, it proposes that power affects behavior through the constructs that easily come to mind (i.e., are accessible). It proposes, however, that powerholders rely more on *any* accessible constructs, not only on goals associated with power. Powerholders process information more selectively in line with the primary constructs activated on a moment-to-moment basis, which can be linked to goals, needs, subjective experiences, or information present in the environment. Furthermore, powerholders are flexible in their deployment of effort and deliberation and use a wider range of processes to guide judgment and behavior. For example, depending on the task at hand and their level of motivation, they can rely on feelings, subjective experiences, and simple rules (heuristics) to construct their judgments, or they can rely on effortful deliberative reasoning. Consequently, the judgments and actions of powerholders are more situated and varied across different contexts than the judgments and actions of powerless individuals.

The effects of power described in this chapter pertain mainly to experimental work that reproduces power experiences in the laboratory. When assigned to typical powerful or powerless roles, individuals usually treat power as fair and legitimate (see Jost & Banaji, 1994; Kay, Banfield, & Laurin, 2010). Illegitimate power elicits specific effects that will not be contemplated in this chapter (see Lammers, Galinsky, Gordijn, & Otten, 2008; Willis, Guinote, & Rodríguez-Bailón, 2010).

The Powerful Mind

This section reviews literature regarding the ways that power affects the mind. Power affects the central components of the cognitive toolbox, including attention, memory, and judgment. These effects are discussed in sequence below.

Cognition and the Selection Problem

The first attempt to understand how power affects social cognition focused on attention (e.g., Fiske, 1993; Fiske & Dépret, 1996). To understand the world around us, form judgments, and select actions, we need to process information selectively (Driver, 2001; Posner & Snyder, 1975). Only a small part of the information available in the environment or in memory is processed more extensively and affects our experiences (see Chapter 15). Attention is guided by cues in the environment, such as opportunities for action or affordances, and the individuals' top-down orientation (e.g., goals, expectations, frequently used constructs; see Driver, 2001; Posner & Snyder, 1975).

The top-down influences entail signals activated in the prefrontal cortex that bias information processing (see Miller & Cohen, 2001). For example, goals, needs, or affective states activate relevant sensory inputs (through attention allocation), memories, and motor responses that are consistent with these goals, needs, or states. This biasing process encompasses not only excitation of sensory inputs and memories but also the management of competition that may arise between multiple influences (e.g., when dominant responses are not desired or when distracting information is present in the external environment; see Friedman & Miyake, 2004). Finally, cognitive control also entails recruitment of the deliberation and effort needed for completion of the task at hand (Norman & Shallice, 1986).

A central contribution of social cognition to the understanding of powerholders' behavior has been to demonstrate that power affects this very basic mechanism of processing selectivity and cognitive control. It affects both the *content* of information that is processed and the *process* or ways that information is processed. Powerholders can easily attain their goals (Fiske 1993), have their needs satisfied (Henry & Pratto, 2010), and often live in reward-rich environments (Keltner et al., 2003). Therefore, their motivations and contents of working memory (the information that is more active in their minds) differ from those of powerless individuals. Research suggests that the information held in working memory by powerholders is primarily related to rewards and opportunities (Keltner et al., 2003), or is information that is relevant to the maintenance of their privileged positions (see Maner, Gailliot, Butz, & Peruche, 2007), along with chronically accessible constructs (Guinote, Weick, & Cai, 2012). In contrast, powerless individuals' working memory primarily holds information pertaining to their lack of control. For example, their attention is oriented toward those who control them (Fiske & Dépret, 1996). They are generally more vigilant and deliberate more in order to predict the future and increase control.

At the same time, power affects the ways that individuals process information. Powerholders have more cognitive resources available: in particular, working memory capacity (Guinote, 2007a). Therefore, they are better able to focus attention in line with active goals or needs and disregard distracting information (i.e., they control better attention than powerless individuals; DeWall, Baumeister, Mead, & Vohs, 2011; Guinote, 2007b, 2010; see also Smith, Jostman, Galinsky, & Van Dijk, 2008). Furthermore, compared with powerless individuals, powerful individuals rely more narrowly on constructs that easily come to mind (i.e., are accessible) and make more flexible use of cognitive processes that guide judgment and behavior, such as feelings, heuristics, and systematic information processing (Guinote, 2008; Guinote et al., 2012). As we will see later, reliance on accessible constructs implies that powerholders are not always guided by personal and chronically accessible constructs (e.g., dispositions) but also by temporarily activated constructs.

The effects of power on information processing will now be reviewed in the domains of attention allocation, attentional control, attention to information organized hierarchically, and memory. Finally, the neurobiology of power will also be examined.

Motivated Attention Allocation

William James wrote, "Each one of us literally chooses, by his way of attending to things, what sort of universe he shall appear to himself to inhabit" (James, 1890/1983, p. 416). Individuals choose which information to attend to in line with their motivations. For example, when reading a newspaper, a reader may choose to read news about some topics, but not about others. The news that the reader chooses to read presumably reflects the interests or motivations of the reader.

According to the situated focus theory of power (Guinote 2007a, 2010), power promotes a narrow focus of attention consistent with the primary constructs that emerge on a moment-to-moment basis, as individuals relate to their environments. That is, constructs that are accessible because they are relevant to goals, needs, or affordances of the environment, or that have been recently or frequently used. Some constructs may have regular priority, being primary most of the time, in most situations (e.g., constructs linked to schemas, habits, personal dispositions, enduring goals, and other chronically accessible constructs). These influences are responsible for some stability in the behavior of powerholders. In addition, a primary role may be played by temporarily activated constructs, such as those associated with feelings and states (Guinote, 2007a; Guinote, 2010; Keltner et al., 2003; Weick & Guinote, 2008), primes (Guinote et al., 2013), situationally activated actions (Galinsky et al., 2003), and opportunities for action (i.e., affordances; Guinote, 2008).

Research has shown that powerholders, compared with powerless individuals, deploy attention more selectively, regardless of the content of the information that is processed. Powerholders consistently deem some types of information to be more important, whereas powerless individuals weight different types of information more equally. These powerless individuals attempt to predict the future and regain control through increased attention (Fiske & Dépret, 1996) and deliberation (see Guinote, Brown, & Fiske, 2006).

Fiske and her colleagues (Fiske, 1993; Fiske & Dépret, 1996) examined the links between power and attention to stereotypic information. In a typical study, participants were given power by evaluating and making decisions that affected others. Participants then read information about a target person. Powerholders, compared with control participants, attended preferentially to stereotype-consistent (vs. inconsistent) information. That is, when stereotypical cues were present, and stereotypes accessible, powerholders paid more attention to this stereotype-congruent information than did powerless individuals, who deemed stereotype-incongruent information to be important as well. Similar results were obtained with actual managers in the hotel industry (Guinote & Phillips, 2010).

In a similar vein, power increased reliance on automatic negative associations about low-status social groups, as assessed through a series of implicit prejudice measures (Guinote et al., 2010). These studies indicate that powerholders have a preference for stereotypic information and show implicit prejudice. Both stereotypes and prejudice are familiar and accessible constructs for powerful individuals.

However, different findings were obtained when non-stereotypic information or alternative group associations were activated. In that case, powerholders attended more selectively to these alternatives (e.g., Overbeck & Park, 2006; Vescio et al., 2003). For instance, Vescio et al. (2003) found that individuals in powerful positions were not guided by stereotypes of low-status subordinates when stereotypes were not informative with regard to the powerful individuals' social influence strategies.

Subjective experiences that arise while processing information can affect the construction of judgments (Schwarz et al., 1991). Powerful individuals are more guided by these experiences than are powerless individuals (Guinote, 2010; Weick & Guinote, 2008). For example, after being asked to think of a small number of differences between men and women, participants who had been primed with power perceived men and women in more stereotypic ways than did their powerless counterparts (Weick & Guinote, 2008). A reverse tendency occurred when participants thought of many differences between men and women. Because generating many differences was difficult, power-primed participants inferred that, after all, men and women are not very different. This tendency was not observed among powerless individuals.

Powerholders' tendency to allocate attention more selectively in line with primary constructs can be seen outside the social realm, for example, during goal striving. In one study (Guinote, 2008), participants performed either a work or a social goal and read information at their own pace that was relevant to work or social life. In the work context, compared with powerless participants, powerful participants allocated more attentional resources to information related to work, reading about it longer. Conversely, when pursuing a social goal, powerful participants allocated more attentional resources to social than to work information.

In sum, when powerful and powerless individuals allocate attention at will, powerholders preferentially allocate attention to information that is related to accessible constructs (e.g., stereotypes, goals, affordances) and disregard other information. Conversely, powerless individuals attend more evenly to different sources of information. For these individuals, all information is seemingly of some relevance.

Attentional Control, Orienting, and Flexibility

Imagine that our reader of the newspaper mentioned above approaches an article with the aim of counting, as quickly as possible, the number of words in the article. Reading the actual content of the words would interfere with the task of counting. To perform a task such as this one, individuals need not only to facilitate or amplify the signal of important stimuli (here, each word as a countable unit) through attention allocation but also to *inhibit* dominant responses (such as reading the meaning of the words), memories, and information present in the environment that can interfere with task completion (see Friedman & Miyake, 2004). This management of information in working memory requires attentional resources (e.g., Lavie, 2005). When attentional resources are limited, for example, because perceivers are cognitively busy, they have less capacity to inhibit task-irrelevant information.

The differences in attention allocation of powerful and powerless individuals have implications for their ability to prioritize goals and to execute the mental operations necessary for the coordination of cognitive processes. Powerless individuals pay attention to multiple sources of information, deliberate more, and form more complex representations than powerful individuals (Guinote, 2001). Powerless individuals operate, therefore, under divided attention. As a consequence, compared with powerful individuals, they have fewer cognitive resources and less ability to resist distracting interferences (see Guinote, 2007b; Smith et al., 2008). For example, in one study (Guinote, 2008), participants were assigned to a powerful or a powerless condition and asked to plan the first day of their holiday. They then encountered incidental information that was either consistent (an opportunity for a visit at the sea side) or inconsistent (an invitation to attend a talk by the Dean) with their holiday goals. When inconsistent (distracting) information was present, powerless, but not powerful, participants changed their commitment to their goal priorities. They engaged more in activities that were irrelevant to their focal goal.

A series of studies examined inhibition of task-irrelevant information. In one study (Guinote, 2007b), participants were assigned to a manager or subordinate role and asked to indicate whether objects appearing on a screen were upright or inverted. The objects (e.g., a cup) had handles that usually activate grasping movements, a dominant response that typically interferes with the task at hand. However, this was not the case for powerful participants. These participants inhibited dominant responses and did not show the typical interference.

In another study, DeWall and colleagues (DeWall et al., 2011) assigned participants to a managerial or a subordinate role or to a control condition. Participants then performed a dichotic listening task. This task required participants to monitor and categorize information presented to one ear and to ignore information presented to the other ear. As expected, powerholders exhibited greater attentional control, as shown by less interference from the nonattended ear, compared with control and powerless participants.

Power also affects additional processes necessary to maintain processing goals and to adjust attention to moment-to-moment task demands. Smith et al. (2008) found that powerless individuals, compared with control and powerful individuals, experienced more difficulty in updating information, that is, in changing the focus of attention in ways that serve primary goals.

Another function of attention is to orient processing to desired locations of the visual field (see Posner & Dehaene, 1994). Orienting attention is important because it improves the perception of the desired targets. Recent studies show that powerholders are better able to orient their attention to specific spatial locations than are powerless individuals (Slabu, Guinote, & Wilkinson, 2013). In particular, powerholders can more easily override the misinformation provided by cues that could potentially point to the location of the target but are invalid. Furthermore, powerholders' better orientation of attention facilitates attentional control in the face of distracting information (Willis, Rodríguez-Bailón, & Lupiáñez, 2011). This work shows that powerholders use better cues present in the visual field to direct attention to goal-relevant information.

Finally, according to the situated focus theory of power, power increases flexibility in information processing strategies so that powerholders more easily attend to information in ways that serve their current demands and motivation. For example, powerholders can more easily vary the breadth of their attentional window. In one study (Guinote, 2007b), participants primed with power were able to focus attention more narrowly on a central object (a line) or to take into consideration the context (the surroundings of the line) more accurately than were powerless participants.

In summary, power enhances selective attention allocation, inhibition of distracting information, orientation of attention across the visual field, and flexible processing. These effects are independent of content and allow powerholders to execute motivated actions, such as the pursuit of goals or the satisfaction of needs, more efficiently.

Ironically, powerless individuals' decreased control of attention is an unintended by-product of their increased efforts to control cognition. Their excess vigilance to multiple sources of information, and their excess deliberation, hinder their ability to effectively resist interference from unwanted influences. Thus, what appears to be a disruption of executive function derives from purposeful differences in what individuals deem to be important.

Although powerless individuals' hypervigilance is detrimental to the control of attention, it is beneficial for low-level cognitive tasks. In particular, lack of power enhances simple visual feature discrimination. Powerless participants performed better in perceptual matching and search tasks involving color, texture, and size discrimination, compared with control and powerful participants (Weick, Guinote, & Wilkinson, 2010).

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Attention to Information Organized Hierarchically

When attending to an object, individuals may focus on its configuration and then attend to its components, or they may attend to the components and then build up the whole object based on the components (Navon, 1977). Similarly, individuals may represent information that they encounter and store in their memories in either a concrete or an abstract way. For example, they can encode an action in concrete (e.g., Person A kicks Person B) or in abstract (e.g., Person A is aggressive) terms (see Semin & Fiedler, 1988).

Powerholders, who, as we have seen, attend to information following parsimonious principles, also prefer simplified representations of events, people, and actions. They prefer to form a gist representation rather than to focus on details (Guinote, 2001; Guinote, Judd, & Brauer, 2002; Magee, Milliken, & Lurie, 2010; Smith & Trope, 2006). Using a model that examines language abstraction (the linguistic category model; Semin & Fiedler, 1988), Guinote (2001) found that members of a powerful group had more abstract ingroup and outgroup representations than did members of a subordinate group. Similarly, Guinote, Judd, and Brauer (2002) found that participants assigned to a powerful role had more abstract self-concepts, as reflected in the use of more traits (i.e., abstract language) when talking about the self, than did participants assigned to a powerless role. The latter defined themselves more in relation to concrete external circumstances.

The tendency for powerholders to think more abstractly than powerless individuals is also found in perceptual and categorical tasks (Smith & Trope, 2006). In one study, Smith and Trope (2006) assigned participants to a powerful, powerless, or control priming condition and asked them to choose the best descriptions of a series of actions. Participants primed with power chose more abstract descriptions of actions compared with control and powerless participants.

Despite the greater tendency for abstraction by powerholders, they show more flexible attention and make more flexible representations than do powerless individuals. That is, they switch between abstract and concrete representations more easily, depending on task requirements. For example, in a task that assessed attention to information organized hierarchically (the Navon Task, Navon, 1977), powerful participants focused their attention either on configurational or on detailed object information, depending on whether the task asked them to attend to the whole or to the details (Guinote, 2007b). In contrast, powerless participants systematically paid attention to the details of objects first, before attending to the configuration of the objects (i.e., they showed local precedence Navon, 1977).

Memory and Construct Accessibility

Attention and memory are closely linked, and both are involved in the cascade of processes that guide our perceptions and the ways we respond to the world. For example, memory may be impaired by our limited attention capacity. If attention is directed at multiple tasks during the encoding of information, memory for that information is impaired (Craik, Govoni, Naveh-Benjamin, & Anderson, 1996). Upon learning and storing information, memory processes amplify relevant neural responses in the brain that guide attention to the external world (Rainer, Lee, & Logothetis, 2004). Not surprisingly, the structures of the brain that are recruited during attention and memory tasks overlap, both involving the hippocampus and the medial temporal lobe (see Chun & Turk-Browne, 2007). In sum, attention and memory are fundamentally intertwined; attention determines what is encoded; prior knowledge structures summarize one's knowledge, giving meaning to the incoming information, and guiding attention toward information that has been relevant in the past.

Given that power affects attention, it is not surprising that it also affects memory. Initial evidence suggests that power affects memory recall, recognition, interference, and construct accessibility.

A demonstration of the effects of power on recall and recognition can be found in studies by Overbeck and Park (2001). Participants were assigned to a powerful (e.g., professor) or a powerless (e.g., student) role and were asked to interact with one another via e-mail. In reality, the e-mails were part of a closed circuit that provided participants with standard responses from their partners. Subsequently, powerholders recalled more information about their partners than did powerless participants. This was particularly true for information that was relevant (vs. irrelevant) for the interaction, and was found both for free recall and recognition measures.

Another line of research examined memory interference that can occur between encoding and retrieval of information. Memory is constructive. It is malleable and open to influences that can occur after the information has been encountered (Schachter, Norman, & Koustaal, 2008). For example, when people discuss an event that they have witnessed, they can affect each other's recollections. Such influences often lead to memory conformity: one person's memory affects and becomes incorporated into another person's reported memory. Skagerberg and Wright (2008) showed participants 50 photographs of faces and asked them to enact a powerful or powerless role in pairs. They were then given a face recognition test, such that one partner responded before the other. The results indicated that powerful participants were less influenced by their partners' responses compared with powerless participants. Skagerberg and Wright (2008) proposed that these effects derive from the cognitive busyness and increased working memory load that is typical for powerless individuals. These findings have important implications, for example, regarding eyewitness testimony.

The ability to recall some information available in memory and to ignore other undesired or irrelevant information constitutes a prerequisite for the activation of constructs needed for judgment and action (see Bargh, Bond, Lombardi, & Tota, 1986; Carlston & Smith, 1996). When individuals are cognitively busy, constructs are activated with more difficulty (Gilbert & Hixon, 1991). Based on these findings, Guinote et al. (2012) hypothesized that power facilitates construct activation. In one study (Slabu & Guinote, 2010), participants primed with or without power engaged in the pursuit of a goal, then performed lexical decision tasks. In these tasks, participants made decisions as to whether sequences of letters were words or nonwords. As expected, powerholders were faster than powerless individuals at detecting goal-relevant words.

In short, past research consistently shows that power affects the central components of the cognitive toolbox in ways that enable fast judgment and action, prompt decision making, and efficient pursuit of goals. These aptitudes are crucial for the enactment of power roles. Through enhanced selective allocation of attention, ability to ignore distracting information, memory recall and recognition,

less memory interference, and higher construct accessibility, powerholders are better equipped to make faster decisions and to act purposively than other individuals.

Construct Use

Once constructs are activated, they are ready for use and can guide judgment and action (Bargh et al., 1986; Higgins, 1996). This is particularly the case when constructs are considered to be relevant and sufficient (Higgins, 1996). Powerholders' ease in attaining desired outcomes leads them to trust information at their disposal more readily (e.g., to trust accessible constructs). In contrast, powerless individuals tend to seek more evidence before making judgments (see Fiske, 1993; Keltner et al., 2003). Therefore, once constructs are activated from memory, powerholders use these constructs more readily than do powerless individuals (Guinote et al., 2012). Greater use of activated constructs can be one reason that powerholders often act more in line with their dispositions (Bargh & Raymund, 1995; Chen et al., 2001), given that dispositions tend to be chronically accessible.

Power elicits feelings of pride (Schmidt Mast, Jonas, & Hall, 2009), increasing self-esteem (Wojciszke, & Struzynska-Kujalowicz, 2007) and confidence in one's judgments (see Briñol, Petty, Valle, Rucker, & Becerra, 2007; Georgesen & Harris, 1998). These feelings can contribute to a greater reliance on thoughts that easily come to mind, such as enduring attitudes and opinions. Indeed, compared with powerless individuals, powerholders are less affected by persuasive messages (Briñol et al., 2007), conform less to the opinions of others (Skagerberg & Wright, 2008; see Morison, Rothman, & Soll, 2011), signal signs of competence (Anderson & Kilduff, 2009), and are more likely to seek information that confirms their past decisions (Fischer, Fischer, Englich, Aydin, & Frey, 2011).

In a demonstration of the role of confidence, Briñol et al. (2007) found that when a persuasive message was encountered after a power manipulation, powerholders were less susceptible to persuasion than were their powerless counterparts. However, when the message was presented before participants acquired power, the reverse was true. The authors concluded that powerholders tend to validate whatever thoughts they have in their minds.

Powerholders are also less inclined to take the perspective of other individuals (Galinsky, Magee, Inesi, & Gruenfeld, 2006). For example, in one study, powerholders took the knowledge that other people possess less into account, anchoring their perspectives too heavily in their own vantage point. Similarly, in another study, when asked to draw an "E" on their forehead, powerholders were more likely to do so in a self-oriented direction ("Ǝ"), less spontaneously adopting others' visual perspective. More generally, powerholders misattribute their success to their abilities and attributes (Georgesen & Harris, 1998) and have a tendency to perceive themselves in coherent and consistent ways (Kraus, Chen, & Keltner, 2011).

In summary, powerholders show confidence in their judgments and apply accessible constructs more readily than do powerless individuals. Once constructs are activated, powerholders selectively process information in line with these constructs. As we will see later, this phenomenon is at the origin of powerholders' situated behavior and greater variability across different contexts, compared to powerless individuals. As different constructs become accessible, powerholders rely more on these constructs and vary their responses more than do their powerless counterparts.

Reliance on Experiential Information

Judgment and behavior are to a great extent guided by subjective experiences and by bodily states (e.g., Niedenthal, Barsalou, Winkielman, Karuth-Gruber, & Ric, 2005). Subjective experiences contribute to powerholders' situated judgment and behavior. Two types of experience have been shown to affect powerful more than powerless individuals: bodily experiences and cognitive experiences (see Schwarz & Clore 2007). As mentioned above, those who have power rely more on experiences that accompany thought processes (i.e., cognitive experiences) than do those who do not have power. For example, powerholders' attitudes depend on whether it is easy or difficult to generate arguments in favor of the attitude object (Weick & Guinote, 2008).

Bodily experiences such as hunger, pain, and fatigue derive from proprioceptive cues that concern the state of various bodily systems (Schwarz & Clore, 2007). These cues signal needs and states of the body; for example, hunger signals the need for nourishment (e.g., Nisbett & Kanouse, 1968). Bodily cues inform the behavior of powerholders more than they do the behavior of powerless individuals. For example, in what was supposedly a taste study (Guinote, 2010), powerholders ate more food or less food depending on how hungry

they were, whereas this was not the case for powerless individuals. In another study, powerholders ate more appetizing food (chocolates) and ate less nonappetizing food (radishes) than their powerless counterparts. To summarize, past research shows that powerholders use accessible subjective experiences to guide their judgments and actions, whereas powerless individuals do not.

Neurobiology of Power

Having or lacking power affects physiology and the distribution of activity across the brain. Differences have been found in neural activity in brain regions related to cognitive interference and math performance, dopaminergic activity, cortisol levels, testosterone, and hemispheric dominance. Each of these will be briefly discussed in turn.

Elevated power decreases interference, as shown by reduced neural responses in areas of the left inferior frontal gyrus (IFG), and increases math ability (Harada, Bridge, & Chiao, 2013). These results are consistent with findings showing that power enhances ability to inhibit task irrelevant information, resulting in better performance on attentionally demanding tasks (Guinote, 2010; see also Smith et al., 2008). Studies with nonhuman primates suggest that elevated power enhances dopaminergic activity in the brain (e.g., Kaplan, Manuck, Fontenot, & Mann, 2002; Morgan et al., 2002). Dopamine plays a role in motivation, learning, and reward seeking. It facilitates flexibility and creativity and is associated with goal-directed action and the "wanting" of behavior (Flaherty, 2005).

To examine the links between dominance and dopaminergic activity in nonhuman primates, Morgan et al. (2002) compared the dopamine D2 receptors in monkeys when they were individually housed, and later, when they were living in groups, using positron emission tomography (PET). The monkeys did not differ in D2 dopamine receptor levels when they were living individually. However, when living in groups, dominance hierarchies emerged, and those at the top showed enhanced levels of D2 dopamine receptors, whereas this was not the case for subordinate monkeys. Furthermore, when given the opportunity to self-administer cocaine, a drug that activates the reward pathway, subordinate monkeys self-administered higher doses of cocaine than dominant monkeys. That is, cocaine had a higher reinforcing value for subordinate than for dominant monkeys.

These results are important because they suggest that dopaminergic activity is dependent on one's position in the power hierarchy, as is vulnerability to drug abuse. This notion is supported by the finding that alcohol and drug consumption are higher in individuals from low positions in the hierarchy (e.g., Lemstra et al., 2008). Elevated dopaminergic activity in powerholders is consistent with their elevated cognitive flexibility, action, and goal-directed behavior, as found in behavioral studies (see Galinsky et al., 2003; Guinote, 2007c; Keltner et al., 2003).

Power affects neuroendocrinology by elevating the level of testosterone, a hormone responsible for the development of masculine bodily characteristics, and, in the animal population, for aggressive behaviors (Carney, Cuddy, & Yap, 2010; Rivers & Josephs, 2010). Power also decreases baseline cortisol, a stress hormone. At the same time, it improves cortisol reactivity in the face of acute stressors (Rivers & Josephs, 2010). In contrast, prolonged subordination is related to high basal cortisol and to ill health in humans and other primates (see also Marmot et al., 1991; Sapolsky, 2004). The testosterone and cortisol levels of powerholders together create the appropriate conditions for powerholders' dominance over others, while supporting confidence, self-esteem, and decreased perception of challenge.

It has been suggested that the distribution of activity across the two sides of the brain is affected by an individual's degree of power (e.g., Keltner et al., 2003). Based on electroencephalogram (EEG) activity, Boksem et al. (Boksem, Smolders, & De Cremer, 2009) found support for a preferential activation of the left hemisphere of the brain in powerful individuals and of the right hemisphere in powerless individuals. However, behavioral studies that included a control condition only found brain activity differences for powerless participants (Wilkinson, Guinote, Weick, Molinari, & Graham, 2010). For example, in one study, participants were asked to walk through a narrow passage while balancing a full cup of water on a small tray. Powerless participants bumped more frequently into the right side of the passage compared with powerful and control participants. Bumping more into things on the right side indicates a spatial bias to the left side of the visual field, following enhanced activation of the right hemisphere in powerless participants. Right hemisphere dominance is associated with spatial attention, vigilance, and the processing of novel situations (e.g., Goldberg, 2009). These findings are consistent with powerless individuals' increased vigilance, avoidance orientation, and spatial attention (Guinote, 2007b; Keltner et al., 2003).

Power in Action: Processing Strategies and Situated Cognition

The previous sections were primarily concerned with basic cognitive processes that derive from the experience of power. This section is concerned with how these processes are implemented on a moment-to-moment basis and with how they translate into powerholders' behavior. The questions that arise are: How do attention, judgment and behavior unfold across the different situations that individuals encounter? How can we reconcile the multiple signatures of power proposed in past research, such as reward orientation, reliance on dispositions, cognitive laziness and goal focus? Which strategies do powerholders deploy when processing information?

Powerholders have been found to act in varied, often contradictory ways. Consider, for example, the links between power and action. Research has shown that power facilitates action (Galinsky et al., 2003) and efficient goal pursuit (Guinote, 2007c; Overbeck & Park, 2006; Vescio et al., 2003, Vescio et al., 2005). However, some studies have shown that power induces behavioral disinhibition, leading to impulsivity and poor self-regulation (see Gray, 1987). For instance, powerholders eat with their mouths open and spread crumbs (Keltner et al., 2003), take more risks (Anderson & Galinsky, 2006), rely more on heuristics (Fiske, 1993), and talk more and interrupt others more (Guinote et al., 2002; Schmidt Mast, 2002). Furthermore, powerholders were found to act more prosocially in some contexts and more selfishly in others (Galinsky et al., 2003).

The mechanisms proposed to explain the effects of power are also often contradictory. For example, it has been claimed that power stimulates self-interest (Keltner et al., 2010; Kipnis, 1972) and reward orientation (Anderson & Galinsky, 2006; Keltner et al, 2003), magnifies dispositions (Bargh & Raymund, 1995; Chen et al., 2001), and potentiates responses in line with inner states (Weick & Guinote, 2008; Keltner et al., 2003). Ironically, these influences are often conflicting, pulling behavior in different directions. For example, a tendency to seek opportunities and rewards for the self (Keltner et al., 2003) contradicts the dispositional tendencies of those who are communally oriented (Chen et al., 2001; Maner & Mead, 2010). A propensity toward risks and heuristics deriving from approach orientation (Anderson & Galinsky, 2006) competes with the desire to maintain the power status quo (Maner et al., 2007) or to attain goals successfully (Guinote, 2007c).

An integrated understanding of the multiple influences and outcomes of power requires the consideration of how cognition unfolds on a moment-to-moment basis and of how it affects individuals' information processing strategies. Cognition does not exist for its own sake and does not operate through static representations of external realities, such as schemas and stereotypes (Smith & Semin, 2004). Perception does not exist to see the world; learning does not exist to acquire knowledge (Purves & Lotto, 2011). The aim of cognition is to form representations and to utilize past experience in ways that help individuals to adapt and to satisfy core needs (see Fiske, 2002). In the case of powerholders, cognition unfolds in ways that are consistent with the satisfaction of their need for control so that they can freely pursue other desires. For powerless individuals, cognition unfolds in ways that aim to restore control and avoid further control losses (see Fiske & Dépret, 1996; Van Dijke & Poppe, 2006).

In a complex world, individuals learn multiple response patterns that they employ in different contexts. Crucially, they can exert some internal control over the patterns that they employ (see Norman & Shallice, 1986). Individuals may prefer stable response options guided by well-learned prior knowledge structures, or they may construe their judgments and actions more flexibly. Similarly, individuals may vary their deployment of effort and the amount of information that they gather before making decisions or selecting actions (e.g., Fiske & Neuberg, 1990). In the early example, a reader may choose to scan the headlines and figures of a newspaper, or read the articles in full.

Behavior flexibility is implemented by two systems: a hippocampal fast-learning system that responds to new situations and a neocortical slow-learning system that encompasses well-learned structures (McClelland, McNaughton, & O'Reilly, 1995). These structures include multiple mappings between inputs, internal states, and outputs (Miller & Cohen, 2001). Individuals may respond in line with chronically accessible constructs that are linked to their dispositions, habits, and enduring attitudes. However, they may also respond in line with their environment and states. For instance, although cooperative individuals usually act in prosocial ways, they act in competitive ways in particular situations, such as in sports events or when primed with competition (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001). The multiple models of response that are potentially available to an individual often compete for expression. The brain is by its nature

competitive, "Different pathways, carrying different sources of information, compete for expression in behavior, and the winners are those with the strongest sources of support" (Miller & Chen, 2001, p. 170). At the cognitive level, the winners depend, in part, on the individuals' top-down information processing strategies, and power is a factor that affects such top-down strategies.

According to the situated focus theory of power (Guinote, 2007a, 2010), power promotes selective processing and flexible use of response patterns, including a flexible use of automatic and controlled processes. Powerholders' selective processing generates clear winners in the cognitive competition for the control of judgment and action (see Kuhl, 1984). Thus, powerholders, compared with powerless individuals, respond in ways that are more unequivocally consistent with the primary drivers of information processing, such as goals, needs, feelings, or affordances of the environment.

When goals or needs are pressing, powerholders control their attention and deploy effort toward the attainment of these goals or the satisfaction of their needs. For example, during goal striving, powerholders persisted longer in the face of obstacles, seized better opportunities to act in a goal-consistent manner (Guinote, 2007c), and provided more correct solutions to the problems that they faced (DeWall et al., 2011). When the context afforded particular courses of action, powerholders pursued the affordances presented to them more promptly (Guinote, 2008). In an emergency, powerholders were more prompt to help a victim in need than were subordinate bystanders (Baumeister, Senders, Chesner, & Tice, 1988).

According to this perspective, power also increases reliance on a wider range of processes that can guide judgment and behavior. Powerholders flexibly switch between automatic and controlled processes, depending on task demands and their motivation. Depending on the situation, they rely on automatic responses and heuristics (Keltner et al., 2003), feelings, and embodied cues (see Guinote, 2010; Weick & Guinote, 2008), but also systematic information processing and controlled attention (DeWall et al., 2011; Guinote, 2007b).

Individuals who do not have power utilize automatic responses less freely, and consider information and monitor their behavior more carefully (see Fiske, 1993; Keltner et al., 2003). Their controlled cognition then overrides other processes that usually inform judgment and action, such as feelings, embodied information, and habitual responses. At the same time, as we have seen, these individuals may not always have the full attentional resources necessary for optimal control of attention and memory during purposive action.

Given that different contexts potentiate different responses, with different responses winning under different conditions, the more selective and flexible processing style of powerholders engenders more situated responses. In contrast, powerless individuals' broader attentional focus creates multiple sources of judgment and action control (see Kuhl, 1984), with no clear winners in the cognitive competition. Powerless individuals, therefore, make less extreme judgments and have less clear priorities.

Reconciling Behavior Biases and Variability

How can we reconcile the major trends in the ways powerholders act, feel, and think with their situated responses? One answer to this question is that power promotes situated and variable behavior. In one study (Guinote et al., 2002), participants were assigned to a powerful or a powerless group, and subsequently introduced themselves to their group. They were unobtrusively videotaped. Observers, who saw the videotapes and were unaware of the power relations between the groups, rated powerful groups as more variable than powerless groups.

According to the situated focus theory of power (Guinote, 2007a, 2010), powerholders respond more selectively in line with the primary drivers of judgment and behavior that unfold on a moment-to-moment basis. They respond more to accessible constructs regardless of whether these constructs are chronically or temporarily accessible. At the same time, when guided by desired actions or motivated judgments, powerholders are capable of inhibiting information that could interfere with their main motivations.

Some stability in powerholders' behavior is ensured by the reactivation of well-learned response patterns, such as enduring attitude representations, schemas, scripts, and dispositional behavior. These response tendencies are chronically accessible. Hence, in many contexts, most of the time, powerholders will respond in line with their dispositions, enduring attitudes, goals, and schemas. However, to the extent that alternatives are rendered accessible, these alternatives compete for the control of judgment and action. They may cancel chronic response patterns or even win the competition for threshold activation. Momentary states and feelings, as well as situationally activated goals, are examples of alternative response modes.

In the domain of dispositional behavior, Guinote et al. (2012) tested the hypothesis that

power increases reliance on accessible constructs, regardless of whether these constructs are chronically or temporarily accessible. This argument implies that power does not magnify the expression of dispositions per se. Instead, dispositions easily guide powerholders' behavior because they are chronically accessible. To the extent that alternative constructs are rendered accessible, for example, through priming, powerholders should move further away from their dispositions than powerless individuals do. This is what happened. For example, when no alternatives were present, powerholders donated money to charities that corresponded more to their chronic preferences. However, when alternatives were presented by asking them to choose a charity from a list, powerholders no longer acted more in line with chronic preferences. This research shows that dispositions and enduring response patterns guide the behavior of powerful more than powerless individuals primarily in neutral contexts, when no alternative constructs compete for expression.

Powerholders also modulate their behavior depending on their motivation. Even though powerholders can employ efficient cognition, as we have seen above, they do not always do so. This was demonstrated by DeWall et al. (2011). Across a series of studies, these authors found that power enhanced self-regulation during solitary tasks. However, when powerholders deemed the task unworthy, they withdrew effort and performed poorly. For example, powerholders performed poorly on simple but arduous multiplication tasks.

Conclusion: Power and How the Mind Works

Power facilitates, and powerlessness hinders, the ability to attain goals (Fiske, 1993; Guinote, 2007a) and satisfy core needs (Fiske & Dépret, 2004; Pratto & Henry, 2010; Vescio et al., 2003). Consequently, having or lacking power affects the motivations and types of goals that individuals pursue and, at the same time, the ways they process information.

In terms of content, power activates schematic behavior (Fiske, 1993), opportunities and rewards (Keltner et al., 2003), and the maintenance of power (Fiske, 1993). In contrast, lack of power elicits the motivation to be accurate and to acquire more knowledge in order to increase predictability and to avoid further losses of control (Fiske & Dépret, 1996).

Many documented differences between powerful and powerless individuals derive, however, from differences in processing style. Power triggers a unique constellation of cognitive signatures. Unlike other forms of approach motivation, which solely drive impulsive behavior and poor self-regulation (see Gray, 1987), power's cognitive signatures are marked by varied, multilayered, but predictable responses. These responses can be automatic or controlled, based on declarative content or on feelings, fast or slow. Power is unique because it magnifies the array of responses and mechanisms that individuals use. It also favors a close connection between automatic and controlled processes; therefore, automatic processes often enter as an input for subsequent controlled responses.

Power increases the potential for efficiency in all main components of the cognitive toolbox. It promotes processing selectivity in attention allocation, control, and orienting, better memory recall and recognition, and decreased memory interference. Finally, the cognitive signatures of powerholders testify to how cognition unfolds at the service of adaptive action (see Fiske, 1992; Smith & Semin, 2004). Having or lacking power is sufficient to alter the basic cognitive processes that we use to understand and respond to the world. These effects vary from perceptual discrimination to selective attention, global precedence, and memory.

Together, research on power and powerlessness contributes to an understanding of basic human needs. Power and other motivational states, such as those associated with anxiety (Eysenck, Deraksham, Santos, & Calvo, 2007), mood (Schwarz & Clore, 2007), and general control deprivation (Pittman & D'Agostino, 1985), all highlight that the operation of cognitive processes requires an understanding of the moment-to-moment states and needs of the individual. By and large cognition is motivated; it does not exist for its own sake. One of the tasks facing social cognition researchers today is to pinpoint exactly how the states and needs of individuals modulate basic cognitive processes, and how these processes serve adaptation.

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