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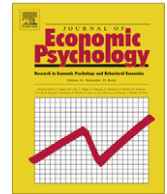
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## The effects of power on prosocial outcomes: A self-validation analysis

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## ABSTRACT

The present research distinguishes between primary (cognitive) and secondary (metacognitive) processes in the domain of power. Power is a central construct in economic decision making, influencing people's thoughts and behavior in organizational, political, consumer, and interpersonal contexts. Whereas most research has discussed ways that power can influence primary cognition (e.g., increased self-focused thoughts, heuristic processing), we examine how power can influence secondary cognition (i.e., thinking about thinking). We argue that high (relative to low) power can increase reliance on one's current thoughts, magnifying their influence on judgment. If thoughts are antisocial (prosocial), increased power will produce more antisocial (prosocial) judgments and behavior. We activated prosocial or antisocial concepts through priming before activating powerfulness or powerlessness. As predicted, primes impacted people's self-perceptions of cooperation (Experiment 1) and the extent to which they were willing to help others (Experiment 2) when induced to feel powerful, but not when led to feel powerless.

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## 1. Introduction

Dual process and dual system theories have had a profound influence on social psychology, advancing our field's understanding of a diverse set of phenomena from persuasion to stereotyping to attribution processes (for reviews, see Carver, 2005; Chaiken & Trope, 1999; Deutsch & Strack, 2006). Most of these theories distinguish between simple or automatic versus more deliberative or controlled processes (e.g., Bargh, 1994; Devine, 1989; Gilbert, Pelham, & Krull, 1988; Petty & Cacioppo, 1986; Schneider & Shiffrin, 1977) or between impulsive and reflective systems of thought (e.g., Deutsch & Strack, 2006; Smith & DeCoster, 2000). These distinctions acknowledge that some mental processes are more likely to operate more efficiently than others depending on the circumstances, and some may even occur without intent or awareness (e.g., Bargh, 1994). In this paper, we focus on another form a duality in human thought: between primary and secondary cognition. We then apply this distinction to understanding an important construct in the social and economic domains: power.

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### 1.1. Primary versus secondary cognition

Research on metacognition distinguishes between primary thoughts and secondary thoughts (Flavell, 1979). Primary thoughts are those that occur at the direct level of cognition, and are often about some stimulus (e.g., “I should help that person in trouble”). Secondary thoughts, meanwhile, are those that are reflections on primary thoughts (e.g., “I am certain that I should help that person”) or thoughts about thought processes (e.g., “My thoughts in response to this other person might have been biased by my positive mood;” for reviews, see Briñol & DeMarree, 2012b; Dunlosky & Metcalfe, 2009; Petty, Briñol, Tormala, & Wegener, 2007).

These secondary, metacognitive thoughts can take many forms (Briñol & DeMarree, 2012a; Wagner, Briñol, & Petty, 2012). For example, Dunlosky and Metcalfe (2009; see also Serra & Metcalfe, 2009) distinguish between metacognitive knowledge (i.e., beliefs or lay theories about one’s cognition; e.g., “re-reading my lecture notes will help me remember the material”), monitoring (evaluating one’s cognition; “I’m likely to remember this information on the test”), and control (regulating or changing one’s cognition; e.g., allocating one’s study time to focus on information you don’t yet know; see also Nelson & Narens, 1990). Ultimately, metacognitive control, which is informed by metacognitive knowledge and monitoring, is of central interest to people who study decision making, because such control is how metacognition can magnify, attenuate, or even reverse the impact of primary cognition on subsequent judgments and behavior (Petty et al., 2007).

In recent years, metacognition has assumed a prominent role not only in cognitive (for a review, see Dunlosky & Metcalfe, 2009) and social psychology (Bless, Keller, & Igou, 2009; Jost, Kruglanski, & Nelson, 1998), but also in clinical psychology (Wells, 2012), judgment and decision making (Dunning, 2012), organizational behavior (Thompson & Cohen, 2012), and consumer behavior (Rucker & Tormala, 2012). The central goal of the current work is to examine a metacognitive perspective on power, based on the *self-validation hypothesis* (Petty, Briñol, & Tormala, 2002; for a review, see Briñol & Petty, 2009). The self-validation hypothesis holds that accessible mental contents are used to the extent that they are seen as a valid basis for judgment and action and that many incidental variables can influence thought confidence. According to this view, a person’s primary thoughts will be magnified when they are perceived as valid, and attenuated, or even reversed when they are perceived as invalid (Briñol, DeMarree, & Petty, 2010; DeMarree et al., in press). Perceptions of thought validity are a form of metacognitive monitoring, and the modification of the impact of these thoughts on judgment and behavior are a form of metacognitive control.

Critically, we argue that high power, relative to low power, is typically associated with increased confidence (i.e., perceptions of validity) in one’s thoughts (Briñol, Petty, Valle, Rucker, & Becerra, 2007). This secondary appraisal of confidence determines the extent to which people rely on their primary cognitions. Interestingly, this perspective holds that increases in power can magnify (and decreases in power can attenuate or even reverse) the impact of *any* accessible thoughts, whether they are antisocial, prosocial, or asocial (e.g., one’s evaluation of a potential investment). Thus, this perspective has the potential to account for a wide range of effects of power. Before going into more detail about this prediction, however, we first discuss existing research examining the diverse effects of power.

### 1.2. Psychological effects of power

Power has been recognized as a central motivating force in human activities (Emerson, 1962; Fiske, 1993; Parker & Rubenstein, 1981; Thibaut & Kelley, 1959), influencing decisions in organizational (Goodwin, Gubin, Fiske, & Yzerbyt, 2000; Shukla, 1982), political (Nullmeier & Pritzlaff, 2010; Salancik & Pfeffer, 1974), consumer (Rucker & Galinsky, 2008), and interpersonal contexts (Gallagher, Rostovsky, Welsh, & Kawaguchi, 1999; Richeson & Ambady, 2003). Consequently, social scientists have argued for the importance of understanding the origins of power and its influence on a variety of outcomes. In accord with most of the social psychological literature (e.g., Emerson, 1962; Fiske, 1993; Keltner, Gruenfeld, & Anderson, 2003; Overbeck & Park, 2001; Thibaut & Kelley, 1959), we define power as an individual’s perceived ability to control others’ outcomes by providing or withholding rewards or punishments.

Power has wide ranging impacts on people’s cognition and behavior. The majority of research has focused on antisocial consequences of power, such as teasing (Keltner, Young, Heerey, Oemig, & Monarch, 1998); crime (Green, Wong, & Strolovitch, 1996); reckless drinking, gambling, and sexual activity (Winter & Barenbaum, 1985); and aggressive or hostile behavior (Bugental, Blue, & Cruzcosa, 1989; Howard, Blumstein, & Schwartz, 1986; Keltner, Capps, Kring, Young, & Heerey, 2001; Malamuth, 1996). However, experiencing power sometimes is also associated with relatively more positive and even prosocial consequences such as increased diligence (DeWall, Baumeister, Mead, & Vohs, 2011) and forgiveness of others (Karremans & Smith, 2010).

The proposed mechanisms by which power is thought to exert its influence are as wide-ranging as its effects. For example, power is hypothesized to increase abstract thought (Smith & Trope, 2006), produce approach- (Keltner et al., 2003; Smith & Bargh, 2008) or goal-oriented behavior (Chen, Lee-Chai, & Bargh, 2001; Galinsky, Gruenfeld, & Magee, 2003; Guinote, 2007b), increase attentional focus and flexibility of thought (Guinote, 2007a), and increase self-focus (Galinsky, Magee, Inesi, & Gruenfeld, 2006). Power can also bias people’s thoughts to be consistent with their initial preferences, reinforcing these inclinations (Copeland, 1994; Fischer, Fischer, Englich, Aydin, & Frey, 2011). Thus, there is a lot of research that has demonstrated that power can influence the types of thoughts a person has.

We should note that power cannot only change the content or style of thought, but it can also change the amount of thought. Most notably, people high in power are more likely to rely on stereotypes and other simple cues, rather than engag-

ing in more effortful thought (e.g., Fiske, 1993; Goodwin et al., 2000; Guinote, Judd, & Brauer, 2002; Jost & Banaji, 1994; Keltner & Robinson, 1996; Keltner & Robinson, 1997; Ng, 1980). Thus, in terms of popular dual process models of judgment, powerful people are more likely to use relatively low rather than high thought routes to judgment.

In the present research, we argue that power not only influences the content and amount of thoughts (dimensions of primary cognition) but also how people think about their thoughts (secondary cognition). Specifically, we argue that high power, relative to low power, is associated with increased confidence (i.e., perceptions of validity) in one's thoughts (Briñol et al., 2007). This increased confidence can then determine the extent to which people rely on their primary cognitions. Using the typology of metacognition discussed by Dunlosky and Metcalfe (2009), the confidence produced by power can be attributed to an evaluation (i.e., a monitoring process) of one's primary cognitions, and thus can influence metacognitive control processes which determine the extent to which the primary cognition is (or is not) utilized.

### 1.3. Self-validation and power

Why might power lead to increased confidence in one's thoughts? Past research has argued that powerful people are more likely to engage in approach behaviors (Keltner et al., 2003) or take action on their environment (Galinsky et al., 2003; see also Hirsh, Galinsky, & Zhong, 2011). Because action requires that people overcome any doubts, powerful people could, quite generally, feel more confident than those low in power. Indeed, prior research manipulating power has shown that it influences perceptions of self-confidence (Briñol et al., 2007). In addition, lack of power can produce anxiety (Fiske, Morling, & Stevens, 1996), an emotion associated with doubt (Raghunathan & Pham, 1999). Thus, although a metacognitive perspective on power is novel, it is still quite consistent with existing perspectives on power.

As noted above, the self-validation perspective on power has the potential to account for a range of consequences of power. Essentially, according to the self-validation hypothesis, high power can increase the impact of any accessible thought on judgment and behavior compared with low power. If accessible thoughts are antisocial in nature, power will lead to increased antisocial judgment and behavior. However, if accessible thoughts are prosocial in nature, power will lead to increased prosocial judgment and behavior. It does not matter if these thoughts are chronically present (e.g., because of differences in personality) or are situationally present (e.g., because of a current goal, need, or informational context). Thus, this perspective can account for the presence of increased antisocial behavior among the powerful versus the powerless (e.g., aggressive or hostile behavior; Bugental et al., 1989; Howard et al., 1986; Keltner et al., 2001; Malamuth, 1996) as well as the increased presence of prosocial behavior among the powerful (Chen, Ybarra, & Kiefer, 2004; Gruenfeld, Inesi, Magee, & Galinsky, 2008; Overbeck & Park, 2001; Overbeck & Park, 2006; Vescio, Snyder, & Butz, 2003). Of course, ours is not the only perspective that has been used to explain both prosocial and antisocial consequences of power and these alternatives are discussed next.

### 1.4. Multiple mechanisms for the effects of power

As noted earlier, models of power that postulate increased approach or goal-oriented behavior among the powerful form the basis of the self-validation predictions (Galinsky et al., 2003; Hirsh et al., 2011; Keltner et al., 2003), and as such, can account for prosocial behavior when prosocial goals are present. Other perspectives do exist, however. For example, Chen et al. (2001) argue that different types of people might associate power with different goals (see also Bargh, Raymond, Pryor, & Strack, 1995; Kopelman, 2009). In line with Bargh's (1990) automotive model, after a lifetime of some people (e.g., those high in communal orientation) repeatedly pursuing the same goals (e.g., social responsibility goals) when in a powerful role, these goals become paired with power. As a result, power itself automatically activates these goals (a difference in the content of thought, or primary cognition), causing people to non-consciously pursue them (Chen et al., 2001). Because power activates *different goals* for communal versus exchange orientated people, these different people are more likely to act differently when in a powerful versus non-powerful state.

In contrast, Howard, Gardner, and Thompson (2007) argue that people who vary in their mental contents might *use their power differently*. They argue that interdependent individuals (or those primed with interdependence) use their power in an interdependent manner, causing them to be more prosocial when they have power in interpersonal disputes and more pro-group in when they have power in intergroup disputes. One apparent assumption of this perspective is that "high power" people need actual power in order to use this power in line with their chronic or primed predispositions. As such, Howard and colleague's model focuses on explaining outcomes when participants actually possess power, and is less applicable to situations where people merely *feel* powerful (e.g., Chen et al., 2001; Galinsky et al., 2003). From this perspective, power does not affect primary or secondary cognition, but rather represents a situational affordance through which a person's primary cognitions can influence behavior and decision making.

According to the self-validation perspective on power, however, it is not necessary for power to become associated with different mental contents for different people (Chen et al., 2001) or for different people to use their power differently (e.g., Howard et al., 2007). Rather, power validates whatever mental content is currently available and leads people to rely more on it. That is, metacognitive confidence can potentially be relevant to *any* mental content. An initial test of the self-validation idea with respect to power was conducted in the domain of persuasion (Briñol et al., 2007). In this research, Briñol and colleagues found that when power was induced after people had thought about a persuasive message, people made to feel pow-

erful were more confident in and demonstrated attitudes more congruent with their accessible thoughts than did people made to feel powerless.

### 1.5. Disentangling the proposed accounts of power

The accounts of the role of power discussed above all offer explanations for why different people might vary in their responses to feeling powerful (versus not powerful). In most situations, these perspectives make the same predictions. In our studies, we attempt to tease apart these accounts using procedures that differ in important ways from past experiments. First, to examine the possible differential use of power (Howard et al., 2007), we relied on paradigms where participants did not have any power to be used, but instead they simply varied in the extent to which they *felt* powerful. If differences in pro or anti-social behavior only occur due to the differences in the way that power is used, then such behavior should not vary as a function of power in these studies.

Other factors might allow us to disentangle mechanisms positing different goal associations of power and the self-validating role of power. Recall from above that according to Chen and colleagues (2001), links between goals and power develop over a lifetime for people varying in their chronic prosocial orientation. When examining chronic individual differences, this perspective makes the same predictions as the self-validation perspective. However, when mental contents are *manipulated*, their perspective does not predict differential behavior as a function of these mental contents, whereas the self-validation perspective does. This is because manipulated mental states should not have the lifetime of consistent pairings of mental-state-congruent goals with power predicted to exist for chronic individual differences. Thus, for manipulated mental contents, the self-validation perspective predicts responses in line with one's accessible mental contents will be greater in high (relative to low) power situations, whereas the differential goal associations of power perspective does not.

In our studies, we activated either competitive or cooperative (Study 1) or prosocial or antisocial (Study 2) mental contents prior to the activation of high or low power. From a metacognitive perspective, the prosocial or antisocial prime was intended to influence people's primary cognitions, whereas the high or low power induction was intended to influence people's secondary cognitions. We then examined the impact of these inductions on self-perceptions (Experiment 1) and behavioral intentions (Experiment 2). We predicted the primes would have an assimilative effect on these outcomes, but only when participants felt powerful.

## 2. Experiment 1

### 2.1. Method

#### 2.1.1. Participants and design

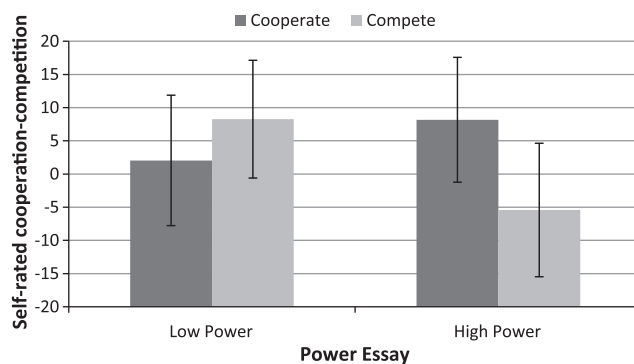
Participants were 94 undergraduates at Ohio State University who engaged in the study for partial course credit. Participants sat in a room with partitioned cubicles so that they could not view each other. Before beginning, we obtained informed consent and assured participants of the anonymity and confidentiality of their responses. The experiment was a 2 (Prime: competition versus cooperation)  $\times$  2 (Power: high versus low) between-subjects design, with random assignment to condition. Although the cooperation–competition dimension does not map perfectly onto the prosocial–antisocial dimension, in most situations, cooperation with others tends to be the more prosocial response (e.g., in resource dilemma situations, cooperation tends to produce greater collective outcomes).

#### 2.1.2. Procedure

Participants were primed with the construct of competition or cooperation using a word completion task. They were then induced to feel powerful or powerless using a memory task. Participants were instructed to read all materials carefully to foster high thinking conditions because metacognitive processes typically require a high degree of thought (Petty et al., 2007). Participants then rated themselves on a number of traits, including competition and cooperation. Finally, participants were probed for suspicion and debriefed.

#### 2.1.3. Materials

**2.1.3.1. Prime.** For the priming manipulation, participants completed a word-completion task, ostensibly as a test of language processes. Instructions asked participants to determine what word could be created by filling in the 1–2 missing letters for each trial (e.g., *\_hoes*, *v\_cuu\_*). Prime words included in this task were associated with competition (compete, victory, battle, strive, succeed, loser, best, worst, pedestal, executive) or cooperation (cooperate, together, assist, help, support, mutual, team, reciprocal, share, collective), whereas the 22 filler words were unrelated to either prime (e.g., bridge, shoes, sweater, recliner). Similar tasks have been used successfully to prime other constructs (e.g., Petty, DeMarree, Briñol, Horcajo, & Strathman, 2008) and prime words were similar to those used in past research that has primed the constructs of competition or cooperation (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Kay & Ross, 2003). The order of prime and filler words was random for each participant.



**Fig. 1.** Self-ratings (cooperative – competitive) as a function of competition versus cooperation prime and high versus low power essay conditions. Higher values indicate more cooperative self-views. Error bars represent 95% confidence interval.

**2.1.3.2. Power.** Immediately following the prime task, participants wrote a brief essay to induce feelings of high or low power (from Galinsky et al., 2003, Study 2), ostensibly to help develop a life-events inventory. Participants in the high power condition described two experiences when they had power over another person or persons (i.e., had control over their outcomes or evaluations), including the details of the situation, how they felt, and so forth. Participants in the low power condition described two experiences when someone else had power over them.

Because the prime induction might have affected the power episodes participants recalled (e.g., cooperation-primed participants might retrieve episodes in which they used their power to cooperate), we asked several judges to code the power essays. Specifically, they coded the essays on two dimensions: (a) the extent to which essays reflected a high or low powered role and (b) whether power (participants' own or another person's) was used in a competitive or a cooperative manner.<sup>1</sup> The prime did not affect either of these ratings nor did it interact with power condition ( $F_s < 1.6$ ,  $p_s > .23$ ). The power induction did affect both of these variables, with high power people writing both more powerful as well as more competitive essays ( $F_s > 5.8$ ,  $p_s < .02$ ).

**2.1.3.3. Trait ratings.** Immediately after the power induction, participants completed an anonymous survey that asked them to indicate the self-descriptiveness of several traits, from 0 (*not at all*) to 99 (*completely*). Participants typed in a numerical value to indicate the self-descriptiveness of the trait. Critical to the present investigation were the two primed constructs: competitive and cooperative. These items were randomly interspersed among several other traits (e.g., intelligent, religious, athletic). We subtracted participants' self-rated competitiveness from their cooperativeness to create a single dependent measure, with higher values indicating more self-perceived cooperativeness. Past research has demonstrated the ability of primes to impact automatic (DeMarree, Wheeler, & Petty, 2005; Dijksterhuis et al., 1998) and deliberative (DeMarree & Loersch, 2009; Schubert & Häfner, 2003) self-perceptions, and theory suggests that the impact of primes on self-perceptions should be moderated by the extent to which the content activated by the prime is viewed as a valid basis for judgment (Brinöl & Petty, 2009; DeMarree et al., in press; Loersch & Payne, 2011; Wheeler & DeMarree, 2009; Wheeler, DeMarree, & Petty, 2007).

## 2.2. Results

Self-ratings were submitted to a Prime (competition versus cooperation)  $\times$  Power (high versus low) ANOVA. The only significant effect was the predicted Prime  $\times$  Power interaction,  $F(1,90) = 4.26$ ,  $p < .05$  (see Fig. 1). Decomposition of this interaction revealed a main effect of the prime on self-perceptions when people were made to feel powerful  $F(1,90) = 3.86$ ,  $p = .05$ , such that people in the cooperation condition viewed themselves as relatively more cooperative than people in the competition condition. In the low power condition, no significant effect of prime emerged,  $F(1,90) = .87$ ,  $p > .35$ , although the tendency was for cooperative-primed participants to feel less cooperative than competition-primed participants. The interaction of power and prime did not emerge on any other traits ( $F_s < 1.6$ ,  $p_s > .20$ ).<sup>2</sup>

## 2.3. Discussion

This experiment provided evidence of greater assimilation in self-ratings to primed constructs among participants in the high than the low power conditions. Specifically, high (but not low) power participants primed with cooperation felt more

<sup>1</sup> Because of computer problems, we were only able to code the essays of 69 participants.

<sup>2</sup> Another way to analyze the data is to consider each trait (competitive vs. cooperative) as a within subject factor, and submit these to a Trait  $\times$  Prime  $\times$  Power mixed ANOVA. This analysis revealed a significant 3-way interaction,  $F(1,90) = 4.26$ ,  $p < .05$ . The pattern was consistent with the analyses conducted on the difference score, with non-significant tendencies for assimilation on both traits in the high power conditions, and for contrast in the low power conditions.



cooperative than those primed with competition. This is particularly noteworthy because power has generally been associated with competition in both past research (e.g., Magee, Galinsky, & Gruenfeld, 2007) and in our coding of participants' power essays. Consistent with the metacognitive notion that power validates ongoing primary cognitions, when we primed thoughts that are stereotypically opposed to power (i.e., cooperation), this standard effect of power was not present, and even tended to reverse.

Recall that Chen and colleagues (2001) argued that differential goal associations with power developed over a lifetime of experiences of pursuing disposition-congruent goals when in high power positions. This mechanism does not seem likely as an explanation for the current data, as we manipulated participants "dispositions" using a memory task. As such, our "competitive" (cooperative) participants did not have a lifetime of experiences that would automatically associate competition (cooperation) goals with power.

Furthermore, in the current paradigm, participants were primed with a power memory task, but did not possess any actual power. As such, it seems unlikely that people who completed the different versions of the word completion task could use power differently (cf. Howard et al., 2007), as people in high and low power situations had the same amount of power (i.e., none), but evinced different effects on self-perceptions. The analysis of the content of the power induction essays further supports the idea that the power participants wrote about did not differ as a function of the prime induction.

Finally, by examining self-perceptions in the current study we were also able to demonstrate the same pattern of moderation observed in previous research (Chen et al., 2001; Howard et al., 2007) on an outcome not predicted by previous accounts of the effects of power. We should note, however, that the current study examined self-perceptions, an outcome that the other perspectives were not developed to explain. So, although this study may offer unique support for the self-validation mechanism of power, it may not have sufficiently addressed the key issues by examining an outcome more closely tied to behavior. In our next study we examine behavioral intentions as the dependent variable to help ameliorate this concern.

### 3. Experiment 2

We designed Experiment 2 with several objectives. We first wanted to provide a conceptual replication of the initial study regarding the metacognitive impact of power on the use of different mental contents. Our second goal was to examine whether the validating effects of power extend beyond self-perceptions. Thus, we examined whether power can change the extent to which activated mental contents predict interpersonal behavioral intentions in a context where the mental contents are manipulated and all participants are equal in the amount of power they actually possess. Demonstrating an effect on behavioral intentions is important because previous research has established that behavioral intentions are typically the best predictors of actual behavior (Fishbein & Ajzen, 1975).

We activated prosocial or antisocial mental contents using a memory task in which participants had to recall past personal experiences in which they attempted to either help or to hurt another person. We then manipulated high or low power using a word completion task adapted from previous research (e.g., Bargh et al., 1995). Changing the manipulations of people's accessible thoughts and of power provides convergent support for our hypothesis and increases the generalizability of our effects.

We examined the impact of these manipulations on subsequent behavioral intentions. In accord with the self-validation logic, we predicted a Memory Task (prosocial versus antisocial)  $\times$  Power (high versus low) interaction, such that high power participants would report behavioral intentions that were more congruent with the previously activated construct than those with relatively low power.

#### 3.1. Method

##### 3.1.1. Participants and design

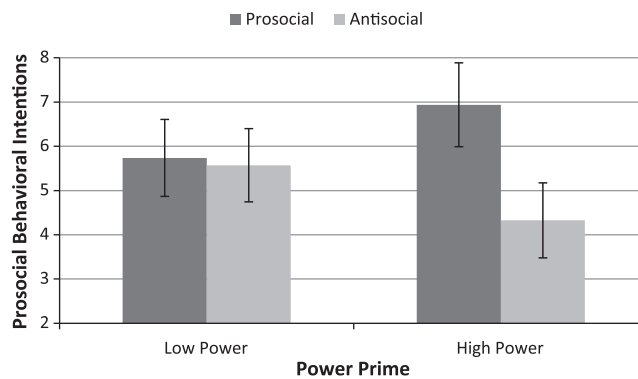
Participants were 76 undergraduates at the Universidad Autónoma de Madrid (Spain) who received partial fulfillment of an introductory psychology course requirement for their participation. Prior to beginning the study, we obtained informed consent and assured participants of the anonymity and confidentiality of their responses. The experiment was a 2 (Memory Task: prosocial versus antisocial)  $\times$  2 (Power: high versus low) between subjects design, with random assignment to condition.

##### 3.1.2. Procedure

Participants recalled instances of prosocial or antisocial behavior before being primed with the concept of high or low power. Participants then rated the likelihood that they would engage in a variety of social behaviors. Finally, participants were probed for suspicion and debriefed. We told participants that their attention to these tasks was very important in order to foster high thinking conditions.

##### 3.1.3. Materials

**3.1.3.1. Memory task.** To activate different mental contents across participants, they recalled two times when they exhibited prosocial (helping another person) or antisocial (verbal or physical aggression) behavior. Asking people to recall past episodes in which they behaved in a given way has been found to influence subsequent judgments and behavior in a congruent manner (e.g., Anderson, 1983; Chaiken & Baldwin, 1981).



**Fig. 2.** Prosocial behavioral intentions as a function of prosocial versus antisocial essay and high versus low power prime. Error bars represent 95% confidence interval.

**3.1.3.2. Power.** For the power induction, participants completed a word-completion task parallel to the prime task used in Experiment 1, ostensibly as a test of language processes. Prime words included in this task were associated with high power (e.g., dominate, boss, supremacy, influence, supervisor, superior) or low power (e.g., obedience, insignificant, subordinate, weak, employee, inferior), whereas the filler words were unrelated to either prime (e.g., city, music, frequent; for a similar procedure, see Bargh et al., 1995; Chen et al., 2001). Prime and filler words were presented in a fixed random order. There were no differences in the number of words completed as a function of the preceding memory task ( $F < 1$ , *ns*).

**3.1.3.3. Behavioral intentions.** Following the experimental inductions, participants indicated the likelihood that they would engage in two common prosocial behaviors in the next 2 months. Specifically, participants indicated the likelihood that they would pass their class-notes to other students (1 = *not at all likely*, 10 = *extremely likely*), and that they would initiate a conversation and introduce themselves to another student (1 = *not at all likely*, 10 = *extremely likely*). Because both dependent variables revealed the same effects, we averaged them to create an index of prosocial behavioral intentions ( $\alpha = .37$ ).<sup>3</sup>

### 3.2. Results

We submitted scores on the behavioral intention measure to a Memory Task (prosocial versus antisocial)  $\times$  Power (high versus low) ANOVA. There was a significant main effect of the memory task,  $F(1, 72) = 9.99$ ,  $p < .01$ , such that participants in the prosocial condition were more likely to report prosocial intentions than those in the antisocial condition. Critically, this was qualified by the predicted Memory Task  $\times$  Power interaction,  $F(1, 72) = 7.75$ ,  $p < .01$  (see Fig. 2). Among participants induced to feel powerful, there was a main effect of the memory task,  $F(1, 72) = 16.71$ ,  $p < .001$ , with people in the prosocial memory task reporting greater likelihood of prosocial behavior than people in the antisocial memory task. No effect was found among participants induced to feel powerless,  $F(1, 72) = .08$ ,  $p = .79$ .

### 3.3. Discussion

Experiment 2 provided evidence of greater assimilation in behavioral intentions to activated constructs among participants in the high than in the low power conditions. Specifically, high but not low power participants who remembered instances of prosocial behavior anticipated more prosocial behavior in the future than people who remembered instances of antisocial behavior. This is consistent with the self-validation notion that power validates currently accessible mental contents, causing them to be more impactful on subsequent judgments and behavior. Thus, using different inductions and measures (i.e., behavioral intentions), this experiment conceptually replicates our initial study in showing that power validates whatever mental contents are currently accessible. Importantly, this happened even though we manipulated participants' mental contents and their power was not relevant to their responses (i.e., participants did not differ in the power they had to use).

## 4. General discussion

The current research examined the distinction between primary and secondary cognition, focusing on the role of an individual's power in influencing secondary cognition. In two studies we experimentally influenced both primary cognition (what people thought) and secondary cognition (what people thought about their primary cognition). Whereas prior research has tended to focus only on how power affects the amount or direction of thoughts or how power is associated with

<sup>3</sup> Each DV represents a separate chance to be prosocial and the prime could affect each person on one outcome or the other or both, so although the individual items are weakly related, together they are informative with respect to the impact of the prime (see Jarvis, MacKenzie, & Podsakoff, 2003). Separate analyses on each revealed parallel effects (interaction  $F$ s  $> 4.14$ ,  $ps < .05$ ).



particular first order (primary) thoughts, the current research focused on the idea that power does not just influence what or how much people think initially, but what people think about their thoughts (i.e., secondary or meta-cognition). Consistent with the self-validation mechanism, we found that people made to feel powerful made judgments more in line with their activated mental contents. This occurred even though the activated mental contents were the same across high and low power conditions and were sometimes inconsistent with stereotypical associations with power (i.e., cooperate rather than compete). Furthermore, these effects held even though the mental contents were not necessarily chronically active, and the participants did not vary in the actual power they had to use. Thus, the results are especially consistent with the self-validation perspective on power, and the models from which the self-validation predictions for power were derived (e.g., Galinsky et al., 2003; Keltner et al., 2003; see Briñol et al., 2007).

Some readers might be curious whether the effects in our studies were driven by magnification of the impact of primes among people in the high power condition or by attenuation among people in the low power condition or if it was a combination of both. Having a control condition where we did not manipulate participants' experience of power would allow for more precise statements, but ultimately this is not critical for our contribution. That is, our findings show that relative differences in power are consequential in the ways predicted by the self-validation framework. Power is a continuous dimension, and each study examined two points on this dimension. Different groups of people might vary in their default level of power, and different manipulations and experiences of high and low power might vary in their ability to produce variations from this default. Thus, a control condition on the power dimension would have some level of "default" power that would fall along this continuum.

#### 4.1. Relationship to other typologies of cognition

As noted in the introduction, a number of different perspectives have been put forth proposing different "types" of thought, including distinctions between high versus low elaborative thought (Petty & Cacioppo, 1986), automatic versus controlled thought (Schneider & Shiffrin, 1977), and impulsive versus reflective thought (Deutsch & Strack, 2006), among others. These theories typically have an emphasis on judgments that are made deliberately with high thought versus more automatically with little thought (for an historical perspective in the domain of evaluative judgments, see Petty & Briñol, 2008). Regardless of whether people think more or less, many (though not all) of the operations examined so far by dual process and system models focus on primary or first-order cognition. As noted, primary thoughts are those that occur at a direct level of cognition and involve our initial associations of some object with some attribute or feeling. Following a primary thought, people can also generate other thoughts that occur at a second level which involve reflections on the first level thoughts. The present research is consistent with the notion that power can operate through a meta-cognitive route affecting the impact of primary thoughts on judgments.

We should note that another typology of thought, between reflective and impulsive processes, might provide a novel alternative to our account.<sup>4</sup> Specifically, if power increases impulsive thinking, this might lead people to impulsively rely on their most accessible thoughts. For the studies in this paper, we cannot distinguish between these accounts because each account predicts enhanced judgment or action in line with one's accessible thoughts. It is notable, however, that these two accounts share some features and are not necessarily independent of each other. For example, if the impulsivity account is correct, the confidence that is conveyed by power could be the critical determinant of the increased impulsivity (e.g., "I'm so sure of what I'm thinking, that additional, reflective processes are not needed"). This more integrative view would be consistent with previous research that has established a link between power and confidence (Briñol et al., 2007), and between power and action (Galinsky et al., 2003). One might imagine that if powerful people are chronically confident in whatever comes to mind, they would develop the tendency to quickly (impulsively) rely on and act upon whatever is in their minds. Thus, it could be that the impulsive alternative actually stems from chronic confidence among the powerful. Of course, in the current research, we manipulated whether people were placed in the high or low power conditions so there could not be chronic differences in power or impulsivity between them. Nevertheless, prior experience with power might be sufficient for power to provide a contextual cue to impulsivity.

#### 4.2. Self-validating effects of power

Our studies were explicitly designed to show that simply placing people in a high versus a low power condition following thought induction can influence the use of their currently accessible mental contents. This self-validation notion is broad, as it predicts that mental contents stemming from any source, including chronic individual differences and temporarily accessible constructs, will be used to a greater extent when power is activated than when it is not. This perspective highlights the importance of considering metacognitive variables and has a great deal of explanatory breadth, which we describe below.

The notion that power can validate mental contents has now received support in two very different contexts – consciously processed persuasive messages (Briñol et al., 2007) and subtly primed mental contents (current studies). This suggests that the self-validation mechanism might account for a broader range of power-related phenomena than previously considered. Perhaps people who feel powerful are more likely to take action (e.g., taking an additional card in blackjack;

<sup>4</sup> We thank an anonymous reviewer for this suggestion.

removing an annoying fan; Galinsky et al., 2003) because power increases the reliance on these individuals' initial inclinations (e.g., "I'd like that fan pointing in a different direction"), leading to increased impact of them. Even differences in creativity (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008) might be due to high powered people trusting creative inclinations enough to express them rather than in differences in the actual occurrence of these inclinations (i.e., differences in secondary rather than primary cognition). Future research should explore the precise mediating mechanisms by which power exerts its impact on judgments and behavior, and we believe that the self-validation mechanism should be among the processes considered.

It is worth noting that there was a hint of contrast among low power participants in Study 1. The self-validation perspective on power predicts that there are conditions under which people might do the *opposite* of their considered thoughts, producing contrast (Briñol et al., 2010). The first is the amount of doubt produced. The more extreme the doubt, the more likely it is that people will do the opposite of their accessible thoughts, at least in the absence of compensatory processes (e.g., uncertainty management). The other is the nature of either the primary cognition under consideration or the judgmental or behavioral outcome. If the either is framed in an "either or" manner, people who are full of doubts will tend to do the opposite of whatever is in their head, because not doing something entails by necessity, doing the opposite (e.g., turning left rather than right at a fork in the road). However, if primary cognitions or behavioral outcomes are of a more continuous nature, contrast among doubtful people should become less likely.

#### 4.3. Other effects of power

It is also important to note that the current studies were not intended to disprove the operation of the other proposed mechanisms in other situations, and they do not do so. This is to say that the other proposed mechanisms of power, although perhaps not applicable to the current studies where participants did not vary in the amount of power they had to use or in chronic associations of power with specific goals, are still quite plausible. For example, and as described in the introduction, it does appear that individuals can vary in the goals they associate with power (Bargh et al., 1995). It also seems very plausible that different people might use their power differently. Indeed, Howard and colleagues presented their participants with a situation where they actually had power (or not) in a negotiation, and as such, there is a clear possibility that this mechanism could operate in their study (Howard et al., 2007). However, we feel that the prior research did not offer *unique* support for the proposed processes with respect to power, and as such, future studies should explore whether and under what conditions each of these processes operate. In the meantime, it is notable that the self-validation hypothesis can account for the results obtained in the prior studies on power and behavior but the mechanisms outlined in those studies cannot easily account for the current results. Future research should examine the conditions under which the self-validation mechanism can explain the effects of power. For example, research on persuasion indicates that the timing of the experience of power (before or after thought) is important in determining the processes by which power affects social judgment (Briñol et al., 2007). Understanding the boundary conditions for each mechanism by which power can influence judgment and behavior is necessary in developing a comprehensive theory of the influence of power.

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