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Abstract thinking increases one's sense of power

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Abstract

One's subjective sense of power often has greater influence on behavior than the amount of power one actually possesses. We propose that this sense of power may be determined in part by one's style of information processing. As abstract thought is less constraining than concrete thought, and having power leads to more abstract thought [Smith, P. K., & Trope, Y. (2006). You focus on the forest when you're in charge of the trees: Power priming and abstract information processing. *Journal of Personality and Social Psychology, 90*, 578–596.], we predicted that thinking more abstractly would make one feel more powerful. Indeed, in four experiments, abstract thought led to a greater sense of power, greater preference for high-power roles, and more feelings of control over the environment, relative to both a concrete-thought and a control condition. This bidirectional relationship between power and abstract thinking suggests one way in which power hierarchies may be unintentionally perpetuated.

Keywords: Subjective power; Sense of power; Concrete vs. abstract thought; Bidirectional relationship; Unintentional maintenance of hierarchies

How do we know our place in society, whether we are a top dog or the low man on the totem pole? In daily life, people's sense of power is more of a determinant of their behavior than their actual power (e.g., Haidt & Rodin, 1999). Extending recent work on power and information processing, the present research explores how thinking styles might affect one's subjective sense of power.

Power is a primary dimension of relationships and broader societal dynamics (Fiske, 1992; Mazur, 1985). Those who have power have more access to resources and control how these are distributed to those without power (e.g., Dépret & Fiske, 1993; Keltner, Gruenfeld, & Anderson, 2003; Thibaut & Kelley, 1959). That is, the powerful control the powerless. The amount of power individuals possess determines what behavior is acceptable, whether they may "be themselves" or must follow social norms (Keltner et al., 2003). Thus, it is critical for individuals to know how much power they have.

Faced with this dilemma, one might seek objective information about one's level of power. Though such information may illuminate the official power structure, it may not accurately predict how people think and behave. Instead, individuals' subjective sense of power generally drives the psychological effects of actual power (e.g., Anderson & Berdahl, 2002; Haidt & Rodin, 1999). When objective and subjective appraisals of one's power conflict, subjective appraisals dominate and guide behavior (Bugental, Lyon, Krantz, & Cortez, 1997).

But what determines this sense of power? We propose that it may be determined in part by one's style of information processing, by whether one thinks abstractly vs. concretely. Consider the nature of abstract vs. concrete thinking. Because abstract thinking moves beyond the details of a stimulus (e.g., Levy, Freitas, & Salovey, 2002; Liberman, Sagristano, & Trope, 2002), it is less constrain-

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ing than concrete thinking. Abstract thinking involves generalization, which allows for more freedom and flexibility. Viewing a chair as a piece of furniture leaves open more possibilities for interpretation and action (e.g., Let's use it to reach that burned-out light bulb) than viewing that same chair as a La-Z-Boy recliner. In this way, thinking abstractly allows a person to take more control of the environment. Indeed, Vallacher and Wegner (1989) found that describing actions in more abstract terms is related to a more internal locus of control. Concrete thinking, in contrast, narrows one's focus and ties one to the particular details in the environment.

Concrete thought is also associated with thinking more about feasibility than abstract thought (e.g., Liberman & Trope, 1998). Individuals who think more concretely are more concerned with the difficulty of a course of action. They are less likely to choose to do something that is hard, even if it would result in a desired outcome, than individuals who think more abstractly. It is not surprising, then, that being in an eager promotion state (i.e., focusing on hopes and aspirations) is correlated with using more abstract language than being in a vigilant prevention state (i.e., focusing on duties and responsibilities; Semin, Higgins, de Montes, Estourget, & Valencia, 2005).

Thus, thinking abstractly should lead individuals to feel more powerful than thinking concretely. This prediction also follows from recent work on the relationship between power and abstract thought. Smith and Trope (2006) demonstrated that the concept of having power is inherently linked to abstract thinking, and the concept of lacking power to concrete thinking. Priming people with having power caused them to think more abstractly than priming them with lacking power, even though these individuals were unaware that the concept of power was activated. Given that power and abstract thinking are so intimately linked, the converse may also be true: abstract thinking may lead individuals to feel more powerful.

In short, we propose that the link between power and abstract thinking is bidirectional. Just as activating the concept of power activates the associated representation of abstract thinking (Smith & Trope, 2006), inducing people to think more abstractly should activate a representation of abstract thinking, in turn activating the associated construct of power. Our theorizing is similar to that of Mussweiler (2006) in the domain of the perception-behavior link. He demonstrated the bidirectionality of the relationship between stereotype activation and stereotype-consistent behavior. Not only does activating a stereotype lead to stereotype-consistent behavior (Dijksterhuis & Bargh, 2001), but inducing individuals to behave in a stereotype-consistent way also activates the associated stereotype. Such reversals are found in a variety of domains. For example, the relationship between expectancies and language abstraction is bidirectional. When a target person's behavior is consistent with people's expectancies, they describe the behavior in more abstract terms (e.g., Maass, Salvi, Arcuri, & Semin, 1989), a phenomenon known as the linguistic expectancy bias (LEB). Wigboldus, Semin, and Spears (2000) demonstrated that the reverse also occurs: When information about a target is described in abstract terms, people make more dispositional inferences, thus reinforcing their expectancies.

In addition to contributing to our limited understanding of the basis of people's sense of power, such a bidirectional link has important implications regarding the stability of hierarchies. Though shifts and upheavals do occur, power hierarchies are often stable (Sidanius & Pratto, 1999). Theories regarding this stability traditionally rely on deliberate, intentional explanations. For example, system justification theory posits that people are motivated to view existing social arrangements as legitimate, even when this justifies their own disadvantaged positions (Jost & Hunyady, 2002; Pratto, Sidanius, Stallworth, & Malle, 1994). Such theories place a certain degree of blame or responsibility on the shoulders of the powerful, the powerless, or both. In contrast, the bidirectional relationship between power and abstract thinking suggests that such hierarchies may also be *unintentionally* maintained. Those with power should automatically engage in more abstract thought than those without power. If our hypothesis proves correct, those with power should automatically feel more powerful than those without power due to these differences in thought, thus reinforcing already existing power differences. That is, hierarchies may be more tenacious than previously thought.

The following four experiments explore this link between abstract thinking and power. Concrete or abstract thinking was always primed in a purportedly unrelated task before participants' feelings of power were assessed. We used three different measures: self-reported standing on power-relevant traits, preference for higher- vs. lower-power roles, and sense of control over the environment. These measures allow us to explore the effects of different styles of thinking on both general preferences and concrete experiences.

Experiment 1

Actions can be construed at varying levels of abstraction. Thinking about how to perform an action is more concrete, whereas thinking about why one would perform an action is more abstract (Trope & Liberman, 2003; Vallacher & Wegner, 1987). To prime concrete vs. abstract thought in this experiment, participants wrote repeatedly about either how to pursue a given goal or why one would pursue that same goal (Freitas, Gollwitzer, & Trope, 2004). Then they rated themselves on a series of traits, including traits that measured their sense of power.

Method

Participants

One hundred sixteen undergraduate students from the University of Amsterdam participated in the experiment

as part of a course requirement or for €7. Four participants were dropped from the analyses for not following directions. Thus, 112 participants (37 males, 75 females)[1] were included in the final analyses. Average age was 20.81 years ($SD = 3.14$).

Procedure and materials

Participants began with the how/why task (Freitas et al., 2004). Concrete-thought participants were told this was a thought exercise in which people think about how their ultimate life goals can be expressed through specific actions. An initial example walked participants, step-by-step, through the process of how one might find happiness in life, ending with the very concrete step of "participating in a psychology experiment." Participants were then asked to think themselves, step-by-step, about how they might improve and maintain their health. First they were asked, "How do you improve and maintain good physical health?" After answering, they were asked how they would do this. For example, a participant who responded, "Exercise regularly," to the first question was then asked, "How do you exercise regularly?" Their response to this second question was then used for another "how" question. In this way, concrete-thought participants provided four "how" responses.

Abstract-thought participants were told this was a thought exercise in which people think about how their actions relate to their ultimate life goals. An initial example walked participants, step-by-step, through the reasons why one might participate in a psychology experiment, ending with the very abstract reason of "to find happiness in life." Participants were then asked to think themselves, step-by-step, about why they might improve and maintain their health. First they were asked, "Why do you improve and maintain good physical health?" After answering, they were asked why they would do this. For example, a participant who responded, "To lose weight," to the first question was then asked, "Why do you want to lose weight?" Their response to this second question was then used for another "why" question. In this way, abstract-thought participants provided four "why" responses.

Participants next rated themselves on 25 items. Each item consisted of a 9-point scale, anchored on each end by a trait. For example, "boring" and "fun" anchored one item's scale. Above the scale was the stem "To what extent would you say you are:" Scattered throughout these items were 7 trait pairs related to power: submissive–dominant, passive–active, unassertive–assertive, timid–firm, uncertain–certain, insecure–confident, and dependent–independent. These traits have been used in previous research to measure individuals' sense of power or dominance (e.g., Stapel & Van der Zee, 2006; Tiedens & Jimenez, 2003; Wiggins, Trapnell, & Phillips, 1988).

[1] In all experiments, participant gender did not significantly moderate thought effects.

Next participants indicated on 9-point scales (0 = *not at all*, 8 = *very much*) how difficult, interesting and enjoyable the how/why task was. Finally, they were probed for suspicion and debriefed.

Results

Self ratings on power-relevant traits

Responses to the 7 trait pairs related to power were averaged together ($\alpha = .83$). Abstract-thought participants ($M = 6.08$, $SD = 1.03$) rated themselves higher on these power-relevant traits than concrete-thought participants ($M = 5.61$, $SD = 1.14$), $F(1, 110) = 5.27$, $p = .02$, $\eta_p^2 = .05$.

Perhaps our thought manipulation simply led to a response bias so that participants who thought abstractly rated themselves higher on all traits. Most of the remaining trait pairs (e.g., young–old, short–tall, and ugly–beautiful) were fillers unrelated to each other. However, 5 of these remaining trait pairs—unpleasant–pleasant, unlikeable–likeable, unfriendly–friendly, cold–warm, and nice–mean (reverse-coded)—tapped into the general construct of sociability ($\alpha = .82$). If our effects are specific to power, thought condition should not have affected participants' self ratings on these sociability items. Indeed, thought condition had no effect on the average of these items, $F < 1$.

Additional measures

Thought condition had no effects on the additional measures, $ps > .11$.

Experiment 2

Individuals who first thought abstractly expressed an elevated sense of power. One possible consequence is that these individuals may also be more interested in higher-power roles. Such a pattern occurs with personality dominance: Individuals high in dominance are much more likely to want to become a leader than are individuals low in dominance (Fleischer & Chertkoff, 1986). Given that abstract thought makes an individual feel more powerful or dominant, that person might then feel more comfortable taking on a high-power job. To test this idea, in Experiment 2 participants completed the how/why task from Experiment 1. Then they read a series of three scenarios, each describing two available roles within a business. One role was relatively low in power, the other relatively high in power. Participants rated which of the two roles they preferred to have. We predicted that participants who first thought abstractly would show greater relative preference for the high-power role than participants who first thought concretely.

Method

Participants

Ninety-six undergraduate students from the University of Amsterdam took part in the experiment as part of a

course requirement or for €7. Two participants were dropped from analyses for not following directions. Thus, 94 participants (27 males, 67 females) were included in the final analyses. Average age was 21.93 years ($SD = 2.93$).

Procedure and materials

First participants completed the how/why task as in Experiment 1. Immediately afterwards, they reported how they felt on an 11-point scale ($-5 = very\ bad$, $+5 = very\ good$). Then they read and responded to a series of three scenarios involving a construction company, a toy company, and an art gallery. Each scenario described two roles within that group (e.g., supervisor and employee for the construction company). One was a high-power role that involved supervising and evaluating others, assigning tasks to others, and making final decisions. The other was a low-power role. The tasks for the low-power role varied by scenario (e.g., construction company employees performed "both construction/architecture tasks and interior/exterior design tasks, depending on their personal skills and interests"), but this role always involved being supervised and evaluated by the person in the high-power role. The scenarios were carefully designed so that the low- and high-power roles were similar in desirability. After reading each scenario, participants rated which role they would prefer to have on a single 5-point scale anchored by the two roles ($1 = definitely\ Role\ A$, $2 = maybe\ Role\ A$, $3 = don't\ know$, $4 = maybe\ Role\ B$, $5 = definitely\ Role\ B$). The order of the anchors (low-power role first vs. high-power role first) and the order of the scenarios were counterbalanced.

Finally, participants answered several questions on 9-point scales ($0 = not\ at\ all$, $8 = very\ much$) to rule out alternative explanations, such as differences in mood and motivation between thought conditions. They rated how difficult, interesting and enjoyable the how/why and scenario tasks were. They also indicated how much effort they put into the scenario task, as well as how they felt ($-5 = very\ bad$, $+5 = very\ good$). Finally, they were probed for suspicion and debriefed.

Results

Role preference

Responses were recoded so that higher numbers indicated greater preference for the high-power role, and then averaged together. Concrete-thought participants ($M = 2.79$, $SD = 0.86$) showed more preference for the low-power role (relative to the high-power role) than abstract-thought participants ($M = 3.21$, $SD = 0.89$), $F(1, 92) = 5.22$, $p = .02$, $\eta_p^2 = .05$.

Additional measures

Abstract-thought participants ($M = 3.60$, $SD = 1.95$) found the how/why task more difficult than concrete-thought participants ($M = 2.70$, $SD = 1.72$), $F(1, 92) = 5.55$, $p = .02$, $\eta_p^2 = .06$. However, difficulty was not related to role preferences, $r(92) = -.13$, $p > .19$, and including difficulty as a covariate somewhat strengthened the effect of thought condition on role preferences, $F(1, 91) = 7.40$, $p = .008$, $\eta_p^2 = .08$. Thought condition did not affect the other measures, Fs < 1.

Experiment 3

Experiments 1 and 2 demonstrated that having participants think in terms of "why" made them feel more powerful and made them more interested in a high-power role than having them think in terms of "how." In both experiments, abstract-thought priming involved thinking about high-level goals and values, whereas concrete-thought priming involved thinking about details of specific procedures. However, the high-power roles in Experiment 2 also involved monitoring and pursuing the larger goals of the group (e.g., supervising and evaluating others), and the low-power roles involved working on specific tasks (e.g., selecting furniture). After completing the thought task, participants' ability to think about either high-level goals (abstract thought) or details (concrete thought) might have been salient, and participants then picked their roles accordingly. Such a direct mapping of procedures from one task to another is not the same as our proposed general effect of concrete or abstract thought on experienced power.

We addressed this alternative explanation in Experiment 3 by using a perceptual manipulation of concrete/abstract thought involving hierarchical figures, larger figures made up of an arrangement of smaller figures, such as an *O* made up of *T*s (Navon, 1977). Abstract or holistic thinking may be primed by having participants focus on the overall shape of these figures (the *O*), and concrete thinking by having them focus on the smaller components (the *T*s; Macrae & Lewis, 2002). This procedure does not directly map onto the duties described for the low- and high-power roles. Again we predicted that abstract-thought participants would show a greater relative preference for high-power roles than concrete-thought participants. Additionally, we added a control condition to explore the direction of the effects.

Method

Participants

One hundred forty-eight undergraduate students from the University of Amsterdam took part in the experiment as part of a course requirement or for €7. Four participants were dropped from the analyses for not following directions. Thus, 144 participants (52 males, 92 females) were included in the final analyses. Average age was 21.04 years ($SD = 2.32$).

Procedure and materials

Participants in the concrete- and abstract-thought conditions first completed a letter-identification task (Macrae

& Lewis, 2002; Navon, 1977). They were presented with a series of 112 composite letters, large letters composed of smaller letters. The small letters always differed from the larger overall letter (e.g., an *S* composed of *E*s). For each figure, concrete-thought participants reported "the small letter that the figure is made up of," whereas abstract-thought participants reported "the large letter formed by the overall shape of the figure." Control participants completed unrelated filler tasks for an equivalent amount of time (2–3 min). All participants then reported how they felt ($-5 = very\ bad$, $+5 = very\ good$). Next they read the scenarios from Experiment 2. After each scenario, participants rated separately how interested they were in each of the two roles ($0 = not\ at\ all$, $8 = very\ much$). Question order and scenario order were counterbalanced.

Finally, participants answered several questions on 9-point scales ($0 = not\ at\ all$, $8 = very\ much$). Concrete- and abstract-thought participants rated how difficult, interesting and enjoyable the letter-identification task was. All participants also indicated how difficult, interesting and enjoyable the scenario task was and how much effort they put into it. Finally, participants were probed for suspicion and debriefed.

Results

Role preferences

A 3 (Thought condition: concrete vs. control vs. abstract) × 2 (Role: low-power vs. high-power) mixed-model ANOVA was run on ratings of interest in the roles, with the last factor within participants. Only the two-way interaction was significant, $F(2,141) = 3.27$, $p = .04$, $\eta_p^2 = .04$. The means are listed in Table 1. Concrete-thought and control participants expressed equal interest in having the low-power and high-power roles, Fs < 1.5. Abstract-thought participants, however, were more interested in the high-power role than the low-power role, $F(1,46) = 4.73$, $p = .03$, $\eta_p^2 = .09$. In short, abstract-thought participants showed greater relative preference for the high-power role than both control, $p = .05$, and concrete-thought participants, $p = .02$, who did not differ, $p = .68$.

Looking at the two job types separately, abstract-thought participants were more interested in the high-power job than both control, $p = .003$, and concrete-thought participants, $p = .02$, who did not differ, $p = .49$. The three conditions did not differ in their interest in a low-power job, $F < 1$.

Table 1
Interest in holding low- and high-power jobs by primed mindset, Experiment 3

Job	Control		Concrete		Abstract	
	M	*SD*	*M*	*SD*	*M*	*SD*
Low power	4.99_a	1.36	5.01_a	1.49	4.82_a	1.57
High power	4.64_a	1.30	4.84_a	1.56	5.49_b	1.28

Note. Means in the same row or column that do not share subscripts differ at $p < .05$.

Additional measures

Control participants ($M = 2.75$, $SD = 1.33$) felt better than concrete- ($M = 1.40$, $SD = 2.38$) and abstract-thought participants ($M = 1.83$, $SD = 1.88$), $F(2,141) = 6.57$, $p = .002$, and abstract-thought participants ($M = 1.53$, $SD = 1.65$) found the letter task more difficult than concrete-thought participants ($M = 0.93$, $SD = 1.19$), $F(1,90) = 3.93$, $p = .05$. However, these variables were uncorrelated with role preferences, except for a marginal relationship between mood and interest in having a low-power role, $r(142) = .15$, $p = .07$. Including either variable as a covariate in the above mixed-model ANOVA did not reduce the effect of thought condition on job preferences. Thought condition did not affect the other measures, ps $> .22$.

Experiment 4

Experiments 2 and 3 demonstrated that thinking more abstractly made participants express more interest in exercising power over others. Such effects reflect social power, which involves relationships between people or groups. However, power also involves intrapersonal control or personal power (e.g., reflexive control: Thibaut & Kelley, 1959), one's ability to control one's own outcomes and environment (see Overbeck & Park, 2001 for more on the distinction between social and personal power). This final experiment explored whether priming concrete vs. abstract thought can influence personal power.

Participants completed the how/why task from Experiments 1 and 2. They then did a lexical decision task where they tried to respond to a letter string before the computer erased this string from the screen (Dijksterhuis, Preston, Wegner, & Aarts, in press). We predicted that participants who first thought abstractly would be more likely to think they had removed the word themselves, and thus had more control over the situation, than participants who first thought concretely.

Method

Participants

Sixty-five native Dutch speakers from the University of Amsterdam took part in the experiment as part of a course requirement or for €7. Seven participants were dropped from the analyses: five for not following directions and two due to computer crashes. Thus, 58 participants (12 males, 46 females) were included in the final analyses. Average age was 20.44 years ($SD = 1.69$).

Procedure and materials

First participants completed the how/why task. The lexical decision task followed (Dijksterhuis et al., in press). Participants were told they would classify letter strings as

words or nonwords by pressing the *D* or *K* key as quickly as possible. Pressing a key removed a letter string from the screen. However, the instructions also explained that the computer could remove the letter string before they responded. Participants were told to try to respond quickly enough to beat the computer. After each trial they would rate who removed the string: themselves or the computer.

Participants first completed 12 practice trials, then 72 experimental trials. Each trial began with a 300 ms fixation (XXX), followed by a letter string. In half the trials, the string was a random letter string. In the remaining half, it was a 4–7 letter, medium to high frequency Dutch word (e.g., *BERG* [mountain]). The string was automatically removed either after the participant had responded or after a maximum word time, whichever came first. The maximum time was 450, 500, 550, 600, 650, or 700 ms. Each maximum time was used on 2 practice trials and 12 experimental trials, counterbalanced between words and nonwords. To ensure participants actually saw each string, participants had to respond to the string by pressing a key even if the computer had removed it first.

After each response participants were asked, "Was it you or was it the computer that removed the letter string?" Responses were on a 6-point scale (1 = *I'm sure it was me*, 2 = *I think it was me*, 3 = *If I would have to guess I'd say it was me*, 4 = *If I would have to guess I'd say it was the computer*, 5 = *I think it was the computer*, 6 = *I'm sure it was the computer*).

After the lexical decision task, participants also reported what percentage of time (0–100%) they thought they removed the letter strings themselves. Several additional questions were asked on 9-point scales (0 = *not at all*, 8 = *very much*). Participants rated how difficult, interesting, and enjoyable the how/why and lexical decision tasks were. They answered additional questions about the lexical decision task: how well they thought they did, how much effort they put into it, and how important it was for them to do well and beat the computer. Participants also reported how they felt (−5 = *very bad*, +5 = *very good*). Finally, they were probed for suspicion and debriefed.

Results and discussion

Performance on lexical decision task

Concrete- and abstract-thought participants did not differ in their percentage of correct responses or their average response time, $ps > .15$. Abstract-thought participants ($M = 98.0\%$, $SD = 3.4$) tended to remove the letter strings from the screen themselves a greater percentage of the time than did concrete-thought participants ($M = 96.5\%$, $SD = 2.3$), $F(1,56) = 3.71$, $p = .06$, $\eta_p^2 = .06$.

Sense of control

Ratings of who removed the string were averaged across the 72 experimental trials. Lower numbers indicate a greater sense that the participant controlled the removal of the word. Abstract-thought participants ($M = 2.29$, $SD = 0.83$) were more certain that the letter string had been removed by themselves, than concrete-thought participants ($M = 2.80$, $SD = 0.98$), $F(1,56) = 4.39$, $p = .04$, $\eta_p^2 = .07$. This was not moderated by whether the letter string was a word or nonword, $F < 1$.

Of course, since abstract-thought participants indeed tended to remove the strings themselves more often, this heightened sense of control may have merely reflected reality. However, when only the trials in which participants removed the string themselves were examined,[2] abstract-thought participants ($M = 2.23$, $SD = 0.85$) still rated themselves as more definitely in control than concrete-thought participants ($M = 2.72$, $SD = 1.00$), $F(1,56) = 4.02$, $p < .05$, $\eta_p^2 = .07$. Furthermore, actual performance did not mediate the relationship between thought and rated sense of control according to a Sobel test (Baron & Kenny, 1986), $z = -1.17$, $p = .24$.

At the end of the experiment, abstract-thought participants ($M = 66.59$, $SD = 19.56$) also said they removed a higher percentage of the words themselves than concrete-thought participants ($M = 53.74$, $SD = 24.86$), $F(1,56) = 4.68$, $p = .03$, $\eta_p^2 = .08$. Actual performance did not mediate this effect according to a Sobel test, $z = 0.49$, $p = .62$.

Additional measures

Thought condition had no effects on the additional measures, $ps > .09$.

General discussion

Across two concrete/abstract thought manipulations and three measures of perceived power, priming participants with abstract thought made them feel more powerful than priming them with concrete thought, or not priming them at all. These results cannot be explained by changes in mood or motivation, or by a simple mapping of the procedures in the thought task onto the procedures of the power measures. Instead, the less constraining nature of abstract thought in itself increased participants' sense of power. These experiments extend the finding of Smith and Trope (2006) that merely priming people with having power made them think more abstractly than priming them with lacking power. The causality also appears to work in the opposite direction.

This research sheds new light on what determines people's sense of power. We know that feeling like a top dog or bottom beagle can be based on information in the environment that clearly relates to power, such as level of

[2] Nineteen participants removed the word themselves in all trials. If trials where the computer removed the word are analyzed for the other 39 participants, concrete- and abstract-thought participants do not differ in their ratings of control, $F < 1$. This result suggests that the feelings of control engendered by the thought conditions may be bounded by reality. However, since the computer removed the word on an average of 2 trials per participant, and even the slowest participants were beaten by the computer on only 8 trials, it may also be an artifact of the limited data available.

dependence (Bacharach & Lawler, 1976; Hegtvedt, 1988) and others' deference behaviors (e.g., Ellyson & Dovidio, 1985). This previous research tended to imply that a person's sense of power is overtly calculated or derived based on outside input. The present studies represent the first attempt to examine how one's own thought processes can unintentionally influence one's sense of power. Based on their responses to our funnel debriefings, our participants saw our manipulations of concrete/abstract thought as completely unrelated to our dependent measures. Thus, these studies demonstrate an implicit basis for a sense of power, thereby tying into a broader array of work on subtle signs and signals of power. Power cues do not have to be as obvious as a corner office or a king's crown. Even something as simple as vertical position is related to perceptions of power (Schubert, 2005): Placing stimuli higher on a computer screen gains them more respect.

This research also adds to our burgeoning knowledge of how power hierarchies are perpetuated. The bidirectional relationship between power and abstract thinking suggests that hierarchies may be *unintentionally* maintained. When Joan is promoted into a higher power position, she will start thinking more abstractly due to increased power (Smith & Trope, 2006). Based on the present research, this increase in abstract thought will also make her feel more powerful, thus leading again to abstract thought, and so on and so forth.

Our description of Joan's situation raises the additional, untested question of how one person's abstract thinking affects other people's perceptions of that person's power. When Joan's coworkers and subordinates perceive her using more abstract language and generally taking a "big picture" view, will this also make them view her as more powerful? If so, even if their perception of Joan has only changed implicitly, they should be more likely to respond to her in a more subordinate manner (Tiedens & Fragale, 2003), thus further solidifying her place in the hierarchy.

This research also suggests one potential way to subvert existing hierarchies. Martorana, Galinsky, and Rao (2005) propose that one critical component necessary for subordinates to fight the system is a sense of power. If people in low-power positions nonetheless feel powerful, they are more likely to attempt to change the system. But overt manipulations of a sense of power are less likely to work when one clearly has little power. Subtle manipulations, such as simply taking a more abstract perspective, may be the first step that helps the powerless challenge the powerful.

References

Anderson, C., & Berdahl, J. L. (2002). The experience of power: examining the effects of power on approach and inhibition tendencies. *Journal of Personality and Social Psychology, 83*, 1362–1377.

Bacharach, S. B., & Lawler, E. J. (1976). Perception of power. *Social Forces, 55*, 123–134.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.

Bugental, D. B., Lyon, J. E., Krantz, J., & Cortez, V. (1997). Who's the boss? Differential accessibility of dominance ideation in parent–child relationships. *Journal of Personality and Social Psychology, 72*, 1297–1309.

Dépret, E., & Fiske, S. T. (1993). Social cognition and power: some cognitive consequences of social structure as a source of control deprivation. In G. Weary, F. Gleicher, & K. L. Marsh (Eds.), *Control motivation and social cognition* (pp. 176–202). New York: Springer.

Dijksterhuis, A., & Bargh, J. A. (2001). The perception-behavior expressway: automatic effects of social perception on social behavior. In M. P. Zanna (Ed.). *Advances in experimental social psychology* (Vol. 33, pp. 1–40). San Diego, CA: Academic Press.

Dijksterhuis, A., Preston, J., Wegner, D.M., & Aarts, H. Effects of subliminal priming of self and God on self-attribution of authorship for events. Journal of Experimental Social Psychology, *44*, 2–9.

Ellyson, S. L., & Dovidio, J. F. (1985). *Power, dominance, and nonverbal behavior*. New York: Springer.

Fiske, A. P. (1992). The four elementary forms of sociality: framework for a unified theory of social relations. *Psychological Review, 99*, 689–723.

Fleischer, R. A., & Chertkoff, J. M. (1986). Effects of dominance and sex on leader selection in dyadic work groups. *Journal of Personality and Social Psychology, 50*, 94–99.

Freitas, A. L., Gollwitzer, P., & Trope, Y. (2004). The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts. *Journal of Experimental Social Psychology, 40*, 739–752.

Haidt, J., & Rodin, J. (1999). Control and efficacy as interdisciplinary bridges. *Review of General Psychology, 3*, 317–337.

Hegtvedt, K. A. (1988). Social determinants of perception: power, equity, and status effects in an exchange situation. *Social Psychology Quarterly, 51*, 141–153.

Jost, J. T., & Hunyady, O. (2002). The psychology of system justification and the palliative function of ideology. *European Review of Social Psychology, 13*, 111–153.

Keltner, D., Gruenfeld, D. H., & Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review, 110*, 265–284.

Levy, S. R., Freitas, A. L., & Salovey, P. (2002). Construing action abstractly and blurring social distinctions: Implications for perceiving homogeneity among, but also empathizing with and helping, others. *Journal of Personality and Social Psychology, 83*, 1224–1238.

Liberman, N., Sagristano, M. D., & Trope, Y. (2002). The effect of temporal distance on level of mental construal. *Journal of Experimental Social Psychology, 38*, 523–534.

Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology, 75*, 5–18.

Maass, A., Salvi, D., Arcuri, L., & Semin, G. R. (1989). Language use in intergroup contexts: The linguistic intergroup bias. *Journal of Personality and Social Psychology, 57*, 981–993.

Macrae, C. N., & Lewis, H. L. (2002). Do I know you?: Processing orientation and face recognition. *Psychological Science, 13*, 194–196.

Martorana, P. V., Galinsky, A. D., & Rao, H. (2005). From system justification to system condemnation: Antecedents of attempts to change power hierarchies. In E. A. Mannix, M. A. Neale, & M. Thomas-Hunt (Eds.). *Research on managing in teams and groups* (Vol. 7, pp. 285–315). Greenwich, CT: Elsevier Science.

Mazur, A. (1985). A biosocial model of status in face-to-face primate groups. *Social Forces, 64*, 377–402.

Mussweiler, T. (2006). Doing is for thinking! Stereotype activation by stereotypic movements. *Psychological Science, 17*, 17–21.

Navon, D. (1977). Forest before trees: The precedence of global features in visual perception. *Cognitive Psychology, 9*, 353–383.

Overbeck, J. R., & Park, B. (2001). When power does not corrupt: Superior individuation processes among powerful perceivers. *Journal of Personality and Social Psychology, 81*, 549–565.

Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67*, 741–763.

Schubert, T. W. (2005). Your highness: Vertical positions as perceptual symbols of power. *Journal of Personality and Social Psychology, 89*, 1–21.

Semin, G. R., Higgins, T., de Montes, L. G., Estourget, Y., & Valencia, J. F. (2005). Linguistic signatures of regulatory focus: How abstraction fits promotion more than prevention. *Journal of Personality and Social Psychology, 89*, 36–45.

Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge, UK: Cambridge University Press.

Smith, P. K., & Trope, Y. (2006). You focus on the forest when you're in charge of the trees: Power priming and abstract information processing. *Journal of Personality and Social Psychology, 90*, 578–596.

Stapel, D. A., & Van der Zee, K. I. (2006). The self salience model of other-to-self effects: Integrating principles of self-enhancement, complementarity, and imitation. *Journal of Personality and Social Psychology, 90*, 258–271.

Thibaut, J. W., & Kelley, H. H. (1959). Power and dependence. In *The social psychology of groups* (pp. 100–125). New York: Wiley & Sons.

Tiedens, L. Z., & Fragale, A. R. (2003). Power moves: Complementarity in dominant and submissive nonverbal behavior. *Journal of Personality and Social Psychology, 84*, 558–568.

Tiedens, L. Z., & Jimenez, M. C. (2003). Assimilation for affiliation and contrast for control: Complementary self-construals. *Journal of Personality and Social Psychology, 85*, 1049–1061.

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review, 110*, 403–421.

Vallacher, R. R., & Wegner, D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological Review, 94*, 3–15.

Vallacher, R. R., & Wegner, D. M. (1989). Levels of personal agency: Individual variation in action identification. *Journal of Personality and Social Psychology, 57*, 660–671.

Wigboldus, D. H. J., Semin, G. R., & Spears, R. (2000). How do we communicate stereotypes? Linguistic bases and inferential consequences. *Journal of Personality and Social Psychology, 78*, 5–18.

Wiggins, J. S., Trapnell, P., & Phillips, N. (1988). Psychometric and geometric characteristics of the Revised Interpersonal Adjective Scales (IAS-R). *Multivariate Behavioral Research, 23*, 517–530.