Fooling the feeling of doing: a goal perspective on illusions of agency

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Chapter 4

Having The Power To Do It.
Power Reduces Illusions of Agency

One of the most fundamental human experiences is to have personal control over one’s actions and action effects. People are predisposed to see themselves as willful agents whose actions produce corresponding outcomes in the world (DeCharms, 1968). The cognitive basis for such feelings of agency does not lie in people’s direct perception of causality between actions and outcomes (Michotte, 1963). Instead, people infer agency indirectly when thoughts about the anticipated outcome of an action occur prior to perceptions of the actual outcome (David, Newen, & Vogeley, 2008; Wegner & Wheatley, 1999). For example, people are likely to experience agency when they anticipate stopping a slot machine at a particular picture, and then seeing it actually happen. Importantly, even if the picture is preprogrammed and has not reacted to the gamblers’ intervention, feelings of agency are likely to arise and can thus be mere illusions (Wegner, 2002; cf. Langer, 1975).

Illusions of agency can make people unknowingly vulnerable to distorted self-views, unrealistic expectations, and social influence (Pronin, Wegner, McCarthy, & Rodriguez, 2006). In light of these unfavorable consequences, it is surprising - and perhaps worrisome - how easily people can be led to infer agency even when an event has occurred by mere coincidence or was set up by a different party. Indeed, a number of studies using different research methods suggest that agency illusions are highly prevalent and robust (e.g. Aarts, Custers, & Wegner, 2005; Haggard, Clark, & Kalogeras, 2002; Linser & Goschke, 2007; Wegner, Sparrow, Winerman, 2004).

In the present research, we test whether having power offers protection against illusions of agency. Our reasoning is based on the notion that agency illusions occur primarily when people are preoccupied with the expected outcomes of their actions and thus maintain corresponding mental representations (Custers, Aarts, Oikawa, & Elliot, 2009; Van der Weiden, Aarts, & Ruys, 2010). Power is associated with the propensity to act immediately rather than to think extensively about the outcomes and related consequences of one’s actions (Galinsky, Gruenfeld, & Magee, 2003; Keltner, Gruenfeld, & Anderson, 2003; Lammers & Stapel, 2009). Because such action readiness reduces extensive thinking about action consequences, we expect agency illusions to be reduced under high power. In neutral control conditions or under conditions of low power, however, illusions of agency are expected to be present. In the following paragraphs we first review the literature on agency illusions and power and then present three studies that tested our theoretical analysis.
What are Illusions of Agency?

How do people infer personal agency? Because it is generally difficult to introspect about the mental processes that transform intentions into behavior and events, people often use other cues to infer agency or authorship. One important source is the observation that one usually thinks about an outcome before acting, and then perceives something to happen that corresponds to the anticipated outcome. When the real agent remains ambiguous or invisible, this observation can trigger agency illusions (Hommel, 1997; Michotte, 1963; Wegner & Wheatley, 1999).

Sophisticated experiments have shown that priming an outcome shortly before it occurs can lure people into illusions of agency. In one common paradigm, for instance, the participant and the computer both rotate an individual gray square around a circle of white tiles in a wheel-of-fortune game (Aarts et al., 2005). When given the instruction to stop the rotation, both squares vanish for a short moment before one of them reappears in the form of a black square on any of the tiles. Participants are then asked to indicate to what extent they feel that it was them (and not the computer) who made the square stop on the indicated location. Participants are more likely to say that they stopped the square on the indicated location when this position turned dark for a few milliseconds (i.e. it was primed) before the stop signal, compared to when it remained white.

The wheel-of-fortune paradigm and related paradigms illustrate that activating mental representations of outcomes heightens illusions of agency. Notably, this is only the case when people are prepared to process outcome-related information. For example, in one study, participants who expected a successful outcome claimed less agency for an unsuccessful outcome, but more agency for a successful outcome than participants who did not expect a specific outcome to occur (Custers et al., 2009). Another line of research observed that it is possible to reduce illusions of agency by diminishing people’s propensity to process their behavior on a high level of representation with a focus on outcomes. In this research, framing the wheel-of-fortune paradigm in terms of the concrete action itself (i.e. pushing a button) rather than in terms of the purpose (i.e. outcome or consequence) reduced illusions of agency (Van der Weiden et al., 2010). Together, these findings indicate that illusions of agency are significantly reduced when people stop being concerned with the consequences of their actions.
Power Reduces Illusions of Agency

One important function of outcome representations is to help people think about the reasons why particular behavior should be enacted (Vallacher & Wegner, 1987). Such why-focus can be contrasted with a focus on the actual implementation of behavior (i.e. a how-focus). In the latter case, readiness to act is higher. The propensity for action readiness is strongly determined by the social context. One variable that has been show to influence people’s action readiness is power.

Power is commonly defined as freedom from constraints, combined with the ability to control and influence others (Keltner et al., 2003). One of the most replicated findings in research on power is its facilitating effect on approach-related behavior (e.g. Anderson & Berdahl, 2002; Galinsky et al., 2003; Smith & Bargh, 2008), even if such behavior is difficult to implement or has unforeseeable consequences (e.g. it involves neglecting distracting information; Guinote, 2007a; or disregarding social norms; Galinsky et al., 2003).

Furthermore, high power makes people deliberate their actions less than low power (Galinsky et al., 2003; Gruenfeld, 1995), which goes together with reduced processing of possible action outcomes and consequences. Thus, given that power facilitates action readiness, and given that action readiness may be incompatible with the processing of outcome representations, it is plausible that illusory agency may be reduced among people who experience high power.

The Present Research

We conducted three studies to examine whether power reduces illusions of agency. The procedure was similar across the studies. Participants were first primed with either high or low power. In Studies 4.1 and 4.3 we used an experiential recall task to induce power (Galinsky et al., 2003), while Study 4.2 primed power through a scrambled sentence procedure (Smith & Trope, 2006). In all studies the power prime was followed by a measure of illusory agency. In Studies 4.1 and 4.2 illusions of agency were measured through explicit agency self-reports (Aarts et al., 2005), whereas in Study 4.3, we used a more implicit measure of illusions of agency (Moore, Wegner, & Haggard, 2009).

Study 4.1

In Study 4.1, we primed high and low levels of power by means of an experiential recall task and subsequently assessed illusions of agency in a wheel-of-
fortune paradigm. We expected that among participants primed with high power, illusions of agency would be reduced compared to those primed with low power.

Method

Participants and Design. Participants were 110 undergraduates from a Dutch university (18 men; $M_{\text{age}} = 21$ years) and were randomly assigned to the high power or low power condition.

Procedure and Materials. Participants first received a recall task that manipulated power. Participants in the low power condition received instructions to recall and write about a personal situation in which someone else had power over them, whereas those in the high power condition were instructed to recall and write about a situation in which they had power over someone else (Galinsky et al., 2003). Participants had 2 minutes to work on the task and were subsequently asked to mark a line on a continuous scale to indicate how powerful they felt in the situation (0-not at all; 100-very much).

After completing the power manipulation, participants answered a general mood question “How do you feel right now?” (0-very bad; 7-very good). They continued with the ostensibly unrelated wheel-of-fortune task (adapted from Aarts et al., 2005) that was introduced as measuring participants’ reactions in a complex perceptual environment. They had to keep the $S$-key pressed with their left index finger in order to make a dark gray square rotate around a circle of eight white tiles. At the same time, a light gray square was rotated by the computer in the opposite direction. After a couple of rounds the word “STOP” appeared at the center of the circle. Both squares disappeared immediately. At this moment, participants had to release the $S$-key as quickly as possible and press the Enter-key with their right index finger to ostensibly stop the (continuing but hidden) rotation of their square.

After the Enter-key was pressed one of the tiles turned black and participants were told that this black tile was the final location on which either they had landed their own square or the computer had landed its square. In reality all final locations were preprogrammed. Next, participants indicated on a scale from 1 (not at all me) to 10 (absolutely me) “To what extent do you think you let the square stop on the indicated location?” The number of rounds before the stop signal appeared was randomized across trials and varied between 8 and 10 rounds. During eight of 16 total trials the final location turned black for
34 ms shortly before the stop sign occurred. These trials thus included an outcome prime, whereas the remaining trials did not.

After the wheel-of-fortune task, participants were thanked and debriefed. In none of the studies reported in this chapter did participants guess the true nature of the task, nor did they see a relation between the power priming and the agency tasks.

**Results and Discussion**

**Manipulation Check.** Participants primed with high power experienced more power (\(M = 68.39, SD = 21.74\)) than participants primed with low power (\(M = 30.28, SD = 21.08\)), \(t(1, 108) = 9.32, p < .001, d = 1.78\), indicating that the manipulation was effective. After the power manipulation we measured general mood, which did not change as a function of power in any of the present studies, \(p_s > .10\), and had no effect on illusions of agency, \(F_s < 1\).

**Illusions of Agency.** Following previous research (Aarts et al., 2005) we averaged agency self-reports separately for trials with an outcome prime and for trials without an outcome prime. From a repeated-measures ANOVA on these two scores emerged a significant main effect of outcome prime, which revealed that agency self-reports were higher following an outcome prime (\(M = 4.70, SD = 1.79\)) than when no prime was present (\(M = 4.07, SD = 1.97\)), \(F(1,108) = 9.10, p < .01, \eta_p^2 = .08\). Importantly, this effect was qualified by a significant interaction effect, \(F(1,108) = 4.26, p < .05, \eta_p^2 = .04\). Planned contrasts showed that participants in the high power condition did not claim significantly more agency after outcome priming (\(M = 4.46, SD = 1.70\)) than when no outcome prime was presented (\(M = 4.26, SD = 2.13\)), \(F(1,108) = 0.47, p = .50, \eta_p^2 = .004\). On the contrary, participants in the low power condition did claim significantly more agency when an outcome prime was present (\(M = 4.95, SD = 1.87\)) rather than absent (\(M = 3.87, SD = 1.79\)), \(F(1,108) = 12.45, p < .001, \eta_p^2 = .10\). The main effect of power condition did not reach significance, \(F(1,108) = 0.04, p = .85, \eta_p^2 < .01\).

Additionally, in Studies 4.1 and 4.2 we measured the time interval between pressing the stop key and the appearance of the final tile location. Interval length did not influence the effects of power on agency illusions, all \(F_s < 1\) (for a discussion on this point, see Aarts et al., 2005). In conclusion, we found our prediction that social power reduces illusory agency confirmed.
Study 4.2

In Study 4.2 we sought to replicate the findings of Study 4.1, but primed power with a scrambled sentence procedure (Smith & Trope, 2006). We additionally included a neutral condition in order to test whether agency illusions are reduced when in high power (as we predicted) rather than increased when in low power. Finally, Study 4.2 included a measure of task motivation to control for the possibility that the high power prime in Study 4.1 had reduced participants’ willingness to comply with task instructions during the agency task.

Method

Participants and Design. Participants were 83 undergraduates from a Dutch university (18 men; M age = 20 years) who were randomly assigned to the high power, low power, or neutral condition.

Procedure and Materials. The procedure was similar to that of Study 4.1, except for the power manipulation. In total, participants solved 17 scrambled sentences, of which nine sentences contained either words related to high power (e.g. ‘dominate’), or words related to low power (e.g. ‘conform’), depending on condition. In the neutral condition, none of the sentences contained any power-related words. After the scrambled sentence task, and before the wheel-of-fortune task, participants reported how motivated they were to work on the next task (0-not at all; 7-very much).

Results and Discussion

Agency illusions were calculated in the same way as in Study 4.1. A significant main effect of outcome prime emerged where participants claimed more agency for trials with (M = 4.57, SD = 1.64) than without (M = 3.63, SD = 1.86) an outcome prime, F(1,80) = 36.71, p < .001, ηp^2 = .31. Importantly, this main effect was qualified by a significant interaction effect with power condition, F(2,80) = 5.60, p < .01, ηp^2 = .12. Planned contrasts showed that participants in the high power condition did not report significantly more agency when an outcome prime was present (M = 4.06, SD = 2.08) relative to when it was absent (M = 3.80, SD = 2.04), F(1,80) = 0.95, p = .33, ηp^2 = .01. Conversely, participants in the low power condition showed significant illusions of agency (M_{outcome prime} = 5.07, SD = 1.19; M_{no outcome prime} = 3.60, SD = 1.77), F(1,80) = 27.91, p < .001, ηp^2 = .26, as did participants in the neutral condition (M_{outcome prime} = 4.66, SD = 1.24; M_{no outcome prime} = 3.43, SD = 1.75), F(1,80) = 16.65, p < .001, ηp^2 = .19.
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Participants in the low power and neutral conditions did not differ significantly in their agency illusion, $F < 1$. No main effect of power condition emerged, $F(2,80) = .05$, $p = .61$, $\eta^2_p = .01$.

Additional analyses, which were replicated in Study 4.3, revealed that participants were equally motivated in all three conditions following the manipulation of power ($M = 5.30$, $SD = 0.97$), $F(2,80) = 1.46$, $ns$, and motivation did not influence the effects of power on illusions of agency, $F < 1$. High power did thus not reduce participants’ willingness to continue with the agency task. In sum, Study 4.2 replicated Study 4.1 by finding reduced agency illusions in the high power condition compared to the low power and the neutral condition.

**Study 4.3**

In Studies 4.1 and 4.2, agency illusions were based on explicit self-reports, which capture the conscious nature of agency experiences. However, because they make it difficult to rule out social desirability concerns, Study 4.3 used a more implicit measure of agency illusions. This measure rests on the idea that the outcomes of actions caused by oneself are experienced to occur faster than those not brought about by oneself. Such temporal binding of causes and outcomes can be induced by outcome priming. Outcome priming more strongly modulates temporal binding for involuntary actions, but also biases temporal judgments for effects of voluntary actions (Moore et al., 2009). Temporal binding is a valid measure of agency illusions, but has the advantage that people are unaware of it (Aarts & Van den Bos, 2011; Engbert, Wohlschläger, Thomas, & Haggard, 2007; Haggard et al., 2002).

In Study 4.3, we used an experiential recall task to prime power and then measured illusions of agency for voluntary actions using a temporal binding task (Moore et al., 2009). We expected that high power would lead to less temporal binding than low power or the neutral condition.

**Method**

*Participants and Design.* Fifty-six undergraduates from a Dutch university (24 men; $M_{age} = 21$ years) participated in the study and were randomly assigned to the high power, low power, or neutral condition.

*Procedure and Materials.* The procedure was identical to that of Study 4.1 except where noted. The experiential recall task included a neutral condition in which participants described the last time they went to the grocery store (Ga-
The temporal binding task (Moore et al., 2009) was introduced as a study on auditory perception. Each experimental trial started with a high (1000 Hz) or low tone (500 Hz) presented for 1 second. Upon hearing this tone, participants were asked to press a key at a time of their choosing. As a result of this button press participants heard a second high or low tone after intervals of 100, 400, or 700 ms (randomly distributed across trials). In half of the trials, the first tone was the same as the second tone, and thus served as an outcome prime because it foreshadowed the future outcome. In the remaining trials, the first tone was different from the second tone.

As a measure of temporal binding, participants were asked after each trial to estimate how much time had passed in milliseconds (from 1-1000 ms) between their key press and the onset of the second tone. We provided reference standards (e.g. “An eye blink takes around 200 ms”) to ensure that participants understood the meaning of the term “millisecond”. The temporal binding task consisted of 24 experimental trials and four practice trials, which were excluded from analysis.

Results and Discussion

Manipulation Check. Participants felt less powerful in the low power condition ($M = 22.39, SD = 16.87$) than participants in the neutral ($M = 67.88, SD = 20.32$) or high power condition ($M = 70.33, SD = 24.08$), $F(2,53) = 30.90$, $p < .001$, $\eta^2_p = .54$. Unexpectedly, participants in the high power and the neutral condition did not significantly differ in feelings of power; however, there was a trend in the predicted direction.

Illusions of Agency. To investigate whether power can influence the effect of outcome priming on temporal binding we first averaged interval estimates across the 12 trials where an outcome prime was present and the 12 where an outcome prime was absent. Drawing on previous research (see Moore et al., 2009), we discarded actual interval length, as this factor was not of interest to us.

Replicating previous effects, participants judged the interval between an action and an outcome as significantly shorter when an outcome prime was present ($M = 291 ms, SD = 119$) than when it was absent ($M = 335 ms, SD = 131$), $F(1,53) = 34.23$, $p < .001$, $\eta^2_p = .39$. Additionally, this main effect was qualified by a significant interaction effect between power and outcome prime, $F(2,53) = 6.78$, $p = .002$, $\eta^2_p = .20$. Planned contrasts showed that participants in the
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high power condition did not estimate the time interval as being significantly shorter when an outcome prime was present \((M = 297 \text{ ms}, SD = 100)\) than when it was absent \((M = 304 \text{ ms}, SD = 118)\), \(F(1,53) = 0.38, p = .54, \eta_p^2 = .007\). In contrast, a prime effect did emerged in the low power \((M_{\text{outcome prime}} = 271 \text{ ms}, SD = 140; M_{\text{no outcome prime}} = 345 \text{ ms}, SD = 145)\), \(F(1,53) = 29.33, p < .001, \eta_p^2 = .36\) and in the neutral condition \((M_{\text{outcome prime}} = 306 \text{ ms}, SD = 119; M_{\text{no outcome prime}} = 361 \text{ ms}, SD = 132)\), \(F(1,53) = 15.12, p < .001, \eta_p^2 = .22\). Participants in the low power and neutral condition did not differ significantly in temporal binding, \(F < 1, ns\). Further, the main effect of power condition did not reach significance, \(F < 1, ns\).

Thus, using temporal binding as an implicit measure of agency illusions yielded analogous effects to the agency self-reports in Studies 4.1 and 4.2. As in the foregoing studies, high power in Study 4.3 reduced agency illusions compared to low power or a neutral condition.

**General Discussion**

Illusions of agency occur when people think about the outcome, or consequence, of a goal-related action and then perceive something similar to happen (Aarts et al., 2005; Wegner & Wheatley, 1999). Previous research has established that the strength of agency illusions depends on whether people are prepared to process outcome representations (Van der Weiden et al., 2010). Based on the assumption that outcome-related representations are less likely to occur when people are about to enact their intentions (rather than to think about the reasons), and the observation that social power facilitates such action readiness (Galinsky et al., 2003; Guinote, 2007a; Smith et al., 2008), we argued that high power should reduce illusions of agency.

To test our hypothesis we set up three experiments using two established manipulations of power and both explicit and implicit measures of agency illusions. In line with predictions, we found a robust reduction of agency illusions among participants primed with high power compared to those primed with low power and those who were not primed at all. We could rule out the alternative hypotheses that high power reduced agency illusions because it changed participants’ mood (Studies 4.1-4.3), task motivation (Studies 4.2 and 4.3), or proneness to comply with explicit task demands (Study 4.3).

The present findings are noteworthy for several reasons. First, they show that a meaningful social context can reduce agency illusions - which are generally
considered to be highly prevalent and robust. Because agency illusions have a number of potential aversive consequences (e.g. unrealistic expectations or increased susceptibility to social influences), it is important to identify boundary conditions for their occurrence. The present research shows that having power offers protection against illusory agency. This observation can be well integrated into the growing literature on agency illusions because it corroborates the general idea that the cognitive basis for these illusions is found in conditions that facilitate the activation of outcome representations (Van der Weiden et al., 2010). Unlike low power or neutral conditions, high power seems to make such representations dispensable.

Second, the present research provides new insights into the psychology of power. High power has traditionally been associated with greater illusions of personal control and optimism about events in the future that are in fact uncontrollable on a personal level, such as macroeconomic development (Anderson & Galinsky, 2006; Fast, Gruenfeld, Sivanathan, & Galinsky, 2009). While at first sight these findings seem to contradict our effects, they can be perfectly integrated in our analysis based on the notion of action readiness. Optimism and related illusions help to prepare action readiness because they remove the necessity to ruminate extensively about the effectiveness and consequences of one’s future actions and to get stuck in too much planning (Scheier & Carver, 1992). In contrast, agency illusions result from a lack of action readiness. Action readiness may thus be the underlying reason why the powerful display greater illusions regarding future actions and reduced illusions regarding past actions.

To be sure, the present findings are preliminary and we warn against overly generalizing conclusions. Even though the powerful have been found to be more ready for action than those in equal or low power positions (Galinsky et al., 2003; Smith & Bargh, 2008), one should not conclude that they are unable to elaborate on the consequences of their actions (see Lammers & Stapel, 2009). Power-fuelled action readiness often leads to quick goal enactment, but it does not impair the ability for planning (Smith, Jostmann, Galinsky, & Van Dijk, 2008). It thus seems plausible that in certain situations (perhaps when the goal is highly important) power helps prepare the processing of outcome representations and thus makes powerful people more prone to illusions of agency. Similar to a situated perspective on power (Guinote, 2007b), we assume that reduced agency illusions in powerful people is simply the default in many situations.
This qualification notwithstanding, the present link between agency and power has some exciting implications. For instance, it may explain why individuals in high power positions often deny responsibility for the failing actions of their subordinates even if these actions result in part from deficient leadership (e.g. in the case of the Abu Ghraib prisoners abuse). A sense of agency is a prerequisite to feel responsible for one’s own actions (Wegner, 2002), and agency illusions may extend responsibility to the actions of others. Future research might explore this intriguing possibility by measuring agency illusions of the powerful for the praise- or blameworthy actions of their subordinates.

In conclusion, one can say that people are inclined to infer personal control over events that they have not produced. The cognitive basis for such illusions of agency lies in people’s preparedness to think about the outcomes of their actions and process corresponding mental representations. The present research demonstrates that high power - a condition in which people do not think much about the consequences before they act - offers protections against illusory agency. On the up-side, this may help the powerful to maintain realistic expectations and to repel external influence. On the down-side, however, it may make them dismiss responsibility - for themselves and for those they were entrusted to lead.