Fooling the feeling of doing: a goal perspective on illusions of agency
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Chapter 1

Introduction

A Goal Perspective on Illusions of Agency
People often feel that they can control their own actions and thereby also events in the world. If they want, they can press a switch in order to turn on the light, the computer, or the TV. They can write a manuscript to advance their career, hit the button at a traffic light to cross the street faster, or play on a gambling machine in order to win money. Feelings of control over events caused by one’s own actions are useful to select appropriate actions in the future and to reach intended outcomes. If people feel that it was them, and not someone or something else, who made an event happen (e.g. it is me who can influence the gambling machine’s outcome) they have a sense of competence, confidence and self-determination (Ryan & Deci, 2000; Skinner, 1995; White, 1959). Control feelings over events caused by oneself are commonly referred to as experiences of agency (alternatively used labels are authorship experiences or experiences of personal causation; Aarts, Custers, & Wegner, 2005; Wegner, 2002).

Agency experiences are based on the inference that if thinking about an event is followed by the actual perception of the event, one must have caused it. After all, if an event seems to follow one’s action as expected, one is likely to be the cause. This inference rests on the common experience that when people try to willfully bring about an event, they imagine beforehand what is going to happen or what they intend to accomplish - they form a prior mental representation of the event. However, coincidentally, someone or something else might have caused whatever one is seeing as a result of an action. As the direct perception of the causal relationship between intentions, actions and events is not possible (Wegner, 2002), one can sometimes mistakenly feel as the cause or agent of an event (Langer, 1975). For instance, people may infer that it was them who made the traffic light turn green by hitting the button when in reality the traffic light was externally controlled. As another example, people may incorrectly infer that their action made them extract a lot of money from a gambling machine when in reality the machine was preprogrammed. When people mistakenly infer that it was them who caused an event, they experience illusions of agency.

During mundane events such as traffic lights turning green, illusions of agency may have little or no negative consequences. However, in other cases having agency illusions may have profound adverse effects. For instance, a gambler may conclude from a recent streak of luck that she or he is able to influence the machine and may thus feel confident enough to risk a fortune. A visitor to a shopping mall may mistakenly infer that it was her or his intention to buy an
overpriced product if in fact she or he was seduced by a clever advertisement. In these and similar cases, it may be harmful to wrongfully infer that one was the agent, as this could give rise to unrealistic beliefs and distorted self-views.

Despite the potential negative consequences of illusions of agency, little is known about which situations are most likely to trigger or reduce them. The aim of the present dissertation is to systematically investigate this issue. The question will be approached from a goal perspective. Briefly, this perspective entails that people process information – including information about actions and events – differently depending on their motivation (e.g. Have I recently succeeded or failed in an important goal?) and their social role in pursuing goals (e.g. Am I powerless or powerful?). The general idea that is investigated in this dissertation is that agency illusions are more likely to occur in situations that make people intensively process information about desirable events (e.g. a failure experience makes people think more intensively about their goal) compared to situations in which people are relatively careless as to what the consequences of their actions may be and are unlikely to spend much thought on them (e.g. after goal completion).

In the remainder of this introductory chapter, I will provide an overview of the existing literature on agency illusions. I will then develop a theoretical framework that will allow predicting in which situations agency illusions are more or less likely to occur. From this framework I will derive hypotheses, and finally give an overview of the empirical part of this dissertation where these hypotheses were tested.

**The Psychology of Illusions of Agency**

In many everyday situations, people probably correctly discern whether they have caused an event to happen by their action. However, there are notable cases in which people underestimate or overestimate their agency for an event. For instance, some notorious mental diseases are characterized by low feelings of agency. One symptom of schizophrenia is the inability to recognize thoughts, internal speech or movements of limbs as originating from oneself (American Psychiatric Association, 2000). Instead, schizophrenic patients often claim that someone is in their head, controlling their thoughts or the movement of their body. As the experience of agency is based on the observation that a relevant thought about a future event occurs to the acting self before action, it has been suggested that schizophrenic patients lack the ability to form such thoughts about the future consequences of their action (Haggard, Martin, Tay-
lor-Clarke, Jeannerod, & Franck, 2003). Thus, for schizophrenic patients the inability to perceive agency for self-generated events is pronounced and likely to be based on their inability to anticipate future events as a consequence of their action (Frith, Blakemore, & Wolpert, 2000; Blakemore, 2003).

The opposite case, where people perceive more agency than they actually have, also exists. As one illustration, illusions of agency can go as far as magical thinking. In magical thinking, people are likely to overestimate the causal influence of their own thoughts, wishes, or actions on the outer world (Zusne & Jones, 1989). For instance, football or basketball fans may feel that they can influence a game’s outcome if they think about it before and during the game (Pronin, Wegner, McCarthy, & Rodriguez, 2006). Again, thinking about an event in the future (the game’s outcome), and then observing its occurrence, can trigger illusions of agency even if control about the outcome is impossible (it is unlikely that an onlooker at home influences a game’s outcome in the stadium). Remarkably, even unintended events can elicit a feeling of agency when the person has engaged in relevant thoughts before its occurrence (Pronin et al., 2006). This situation is common to the experience of jinxing an event. The jinx refers to the belief that thinking or talking about something positive that is to happen will actually cause it not to happen. In sum, through prior reflection on an outcome a person can sometimes see herself as causal to the event’s (non-) occurrence. Superstitious beliefs of agency when causality is clearly not possible may just be an extreme example of illusions of agency.

Are mistakes in inferences of agency a rare and somewhat obscure phenomenon that only afflicts people who suffer from mental illness or superstitious beliefs? In fact, less extreme instances of illusions of agency seem to occur often in daily life. Sometimes one may think that pressing the button on the elevator multiple times will make it arrive faster; that one has turned on the projector in a lecture hall by pressing some buttons, while it was actually the technician with his remote control; or, when trying to cross the street, one may believe that by pressing the button on the traffic light once again - after four other people have already done so - a green light is more likely to appear. In sum, while it may not be evident, illusions of agency occur frequently, often every day. An important question to address before discussing which situations can trigger illusions of agency is of the cognitive conditions that give rise to illusions of agency. What is the cognitive basis that gives rise to these illusions? Why do people experience illusions of agency instead of correctly rejecting agency when an event has occurred without personal intervention?
The Cognitive Basis of Experiences and Illusions of Agency

The experience of agency is an experience of authorship or personal causation of an action or event (Aarts et al., 2005; Dijksterhuis, Preston, Wegner, & Aarts, 2008; Wegner, 2002). Here, the term agency refers to the experience of doing something on purpose with the goal of voluntarily realizing a desired outcome in the world. When people want to reach a goal, they usually have a forethought about the desired end-state before acting (Bandura, 2001). A forethought (or preview) is a mental representation of the future event. In the following, such a mental representation will be referred to as outcome representation. Outcome representations include events as the consequence of one’s intended actions and also specifications of how one will make the outcome happen. When people maintain outcome representations before acting, and then observe this outcome to actually happen after acting, they are likely to conclude that they have caused (i.e. that they are the agent of) the event.

Why do people rely on outcome representations to infer agency? The main reason lies in the fact that causality between an individual’s intentions and events in the world cannot be observed directly. Rather, agency needs to be constructed on the basis of information that is available to the person (Wegner, 2002). A basis for these inferences, then, is information that can be observed by the actor; for example, one may observe one’s own behavior and whether the event actually occurred or not; one may know whether one intended the event or not; and one may examine whether the event matches one’s mental anticipation - to all these aspects one may have access. However, whether having a mental representation of a future event is indicative of causation cannot be directly observed, and people have to indirectly infer or construct their agentic involvement in the event.

In their theory of apparent mental causation, Wegner and Wheatley (1999) describe processes of agency inferences in detail. In agreement with others (e.g., Aarts et al., 2005; Bandura, 2008; James, 1890), they posit that thinking about the effect of one’s action before acting (i.e. maintaining an outcome representation) is an important indicator for the experience of agency. If people have a specific outcome in mind before its actual occurrence, causality for an action and resulting event is likely to be attributed to the self. This rule of thumb is based on the frequent observation that when one intends to reach an outcome, one mentally represents it before engaging in relevant action (Wegner, 2002; Wegner & Wheatley, 1999; see also current theories on predictive motor control for a similar proposed mechanism for the recognition of self-produced ac-
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tion; Daprati et al., 1997; Georgieff & Jeannerod, 1998; Blakemore, Wolpert, & Frith, 1998; Frith, 2005; Blakemore, Frith, & Wolpert, 1999).

The theory of apparent mental causation further proposes that three conditions, or “principles”, should be met before the presence of an outcome representation can give rise to the experience of agency. In a nutshell, an outcome representation has to occur before an event (priority principle), has to be consistent with the observed event (consistency principle), and there should be no alternative causes present for the event (exclusivity principle) (Wegner & Wheatley, 1999; see also Hommel, 1997; James, 1890; Michotte, 1963).

The priority principle entails that causes precede their effects. In order to see oneself as an agent, a relevant thought of the intended outcome has to be present shortly before the occurrence of the outcome (see also Bandura, 2001). As for the exact time window of prior outcome representations and ensuing outcomes, it has been suggested that an outcome representation needs to appear shortly before (1 to 5 seconds) or simultaneously to the observed outcome (Wegner, 2002; but see Aarts, Custers, & Marien, 2009).

The consistency principle describes the basic notion that the outcome representation needs to be an image of the event, or at least highly related to it (Wegner, 2002). This means that when I intend to turn on the light and push the switch, but the TV turns on instead, my experience of agency is reduced. Thus, if the outcome representation is compatible with the later observation, people will be likely to infer that they caused it, and consequently feel as agents.

The last principle relates to exclusivity. The exclusivity principle entails that the extent to which an outcome representation leads to the experience of agency depends on the relative presence of other potential causes for an event, besides one’s own intentions. These causes can be external, such as other people or non-human agents (e.g. gods, computers, etc.), or internal (e.g. reflexes, impulses, or emotions). For example, studies could show that priming the concept of “God” before an action (performing a lexical decision task in competition with the computer) reduces feelings of agency for the self (Dijksterhuis et al., 2008). Presumably, the presence of another external, and in this case omnipotent, agent reduced the tendency to infer personal agency (interestingly, this effect only occurred when people believed in God and thus accepted Him as a potential agent). A more mundane example of the violation of the exclusivity principle might be two people who can initiate the same action on a
shared computer screen, each with their own joystick. When both perform the same action before they observe a respective outcome, experiences of agency may be more ambiguous, because the other agent could have potentially caused the event. Thus, the inference that I was the agent is more likely the fewer other potential causes for an event are present.

In sum, maintaining an outcome representation before the outcome occurs is key for agency experiences. In addition, the outcome representation should be consistent with the actual outcome. Finally, agency experiences are less likely if causation is ambiguous due to the presence of other potential agents. If the situation meets these requirements, agency is usually - and in most cases rightfully - attributed to the self. In the next section, it will be outlined how violations of these conditions can give rise to illusions of agency.

**Triggering Illusions of Agency**

The three principles of apparent mental causation specify when people regard themselves as agents. Research has shown that manipulating any of these principles can fool people into feeling that they have caused an outcome they actually had no control over (Aarts, 2007; Aarts et al., 2005; Aarts et al., 2009; Wegner, 2002; Wegner & Wheatley, 1999). In order to demonstrate the importance of a prior outcome representation for people’s feelings of agency, researchers have experimentally obscured the exclusivity indicator. In this research, participants observed an outcome that could have been the result of their own action or the result of another person’s (or the computer’s) action. The idea is that this ambiguity increases the susceptibility of participants to take cues related to outcomes into account. If outcomes are externally primed in a subtle way before they actually occur, participants are thought to mistake them for an internal outcome representation. In line with this idea, priming outcomes before they occur leads to higher experiences of agency compared to situations where no outcome is primed. Because only the subjective - but not the objective - agency changes, increased agency due to outcome priming is taken as an indication of illusion of agency.

One frequently used paradigm to study agency illusions was developed by Aarts and colleagues (2005; 2007; see also Linser & Goschke, 2007). In this paradigm, agency illusions are measured through explicit self-reports. In a computer task resembling a wheel-of-fortune game, the participant is told that she can control a gray square that is traversing a path of eight white tiles on the computer screen. At the same time, the computer rotates a differently shaded gray
square in the opposite direction. When, after some time, the participant is asked to press a key to stop the rotation of her square, she sees a square stopping on one of the white tiles. It is unclear to the participant whether this is her square or the computer’s square. In other words, the exclusivity principle is obscured. Then, the participant is asked to what extent she feels that it was her, rather than the computer, who made the square stop on the indicated location (see Figure 1.1).

Following the theory of apparent mental causation, the participant should be more likely to disambiguate the situation such that she believes to have caused the square to stop on the location, rather than the computer, if she had previously ‘envisioned’ where the square was going to stop. Controlled foreseeing of the end state in this paradigm is realized with a subliminal priming technique, where the stop position is visually presented for 34 ms before the outcome (the stopping of the square) occurred. This subliminal priming technique ensures that the presented outcome representation is perceived below the participant’s threshold of awareness, but still exerts an influence on their judgment of agency. Notably, also giving participants the conscious goal to stop the square on a particular position yields similar results; however, subliminal priming is preferable, because it is likely to be devoid of more reflective inference processes. As a result, self-attributions of agency over the observed outcome are reliably increased when the future outcome (the stop-position) is activated (subliminally or supraliminally) before acting, compared to trials where no outcome representation is primed (Aarts et al., 2005).

In other research, a different paradigm assessing explicit agency self-reports was used and demonstrated comparable effects of outcome priming on illusions of agency. Specifically, in one experiment participants saw rapidly alternating
pictures of objects. At some point the sequence stopped and participants saw one of the objects. It was ambiguous whether the presented object had been stopped by the participant or by the computer. When the name of the object was primed subliminally shortly before the object’s picture stopped on the screen, participants were more likely to say it was them who stopped the picture rather than the computer (Van der Weiden, Aarts, & Ruys, 2010; see also Linser & Goschke, 2007; Sato, 2009). This research indicates that the influence of outcome priming on illusions of agency expands from priming a visual image of an action outcome to semantic information in different modalities (i.e. words instead of pictures).

Given that experiences of agency are subjective, they are often assessed through explicit self-reports. As in the studies reported above, participants are typically asked to what degree they feel that it was them who brought about a certain event. However, there also exist more implicit measures of agency that do not rely on self-reports. One example is the so-called temporal binding paradigm. Temporal binding rests on the idea that intentional actions and their causal consequences are bound together in time (Haggard, Clark, & Kalogereras, 2002; Engbert, Wohlschläger, Thomas, & Haggard, 2007). Put differently, events caused by oneself seem to occur faster than events caused by someone else. To illustrate the temporal binding effect with an everyday life example, when someone stands in an elevator and wants the doors to close it will seem to happen faster if he pushes the ‘close-door’ button than if he just stands and waits for the doors to close, even if the objective amount of time is the same.

Temporal binding has been identified as an implicit measure of the experience of agency, as it has been found to correlate with agency self-reports (Ebert & Wegner, 2010; Moore & Haggard, 2010). Indirect measures of cognitions, such as temporal binding, are an important supplement to explicit investigations, because they are likely to be free from response biases and social desirability concerns (DeHouwer, 2006). Importantly, also illusions of agency can be triggered in the temporal binding paradigm (Moore & Haggard, 2008; Moore, Wegner, & Haggard, 2009). Specifically, also in this indirect measurement the presence of an outcome representation was shown to enhance temporal binding and hence agency illusions (Ebert & Wegner, 2010; Moore & Haggard, 2010). For instance, in one experiment participants pressed a button to elicit a tone that appeared at some later, but unpredictable, point in time. It was the participants’ task to judge the time between the button press and the tone. The time between the two events was judged to be shorter when an identical tone (which served to activate a consistent prior outcome representation) preceded
the action compared to when the prior tone was different in frequency (i.e., higher or lower in Hz). Put differently, the presence of a preview of a future event can contract the subjective latency with which an effect follows one’s action.

In sum, exclusivity of the self as an agent is an important factor influencing illusions of agency, as very few actions are performed completely independently of other potential agents or causes. Additionally, the presence of a future outcome representation can bias people’s agency experiences. When an outcome is primed, people are more likely to claim illusory agency for an event than when no outcome is primed. Further, illusions of agency after outcome priming have been observed in explicit self-reports of agency, as well as implicit measures such as temporal binding.

**Moderators to Illusions of Agency**

The previous section suggests that the outcome priming effect is robust across experimental paradigms and affects explicit and implicit agency measures alike. Further evidence for the effect’s robustness comes from the observation that the effect occurs not only among healthy people, but also in depressed participants (Aarts, Wegner, & Dijksterhuis, 2006), and even across different cultures (Aarts, Oikawa, & Oikawa, 2010). Nevertheless, recent research indicates that there might be boundary conditions to the influence of outcome priming on illusions of agency.

It was demonstrated that the level at which people represent their behavior is a key factor in the susceptibility to illusions of agency. Representations of behavior are thought to be arranged in a hierarchical order from lower level behavioral identities to higher level behavioral identities (Vallacher & Wegner, 1987). Lower levels indicate how an action is done, whereas higher levels concern why an action is done, with a focus on the consequences of an action (Fujita, Eyal, Chaiken, Trope, & Liberman, 2008; Liberman & Trope, 2008; Vallacher & Wegner, 1987). To give an example, a behavior such as “turning on the light” can be represented on a relatively low level, focusing on the motor action of “pressing a switch”, or on a high level concerned with the consequence, such as “illuminating the room”.

When people anticipate an outcome, this is done on rather high levels of behavioral representation because outcome representations are about why a certain action was performed (e.g. stopping the square in the wheel-of-fortune
paradigm) rather than describing how to achieve that end on a low level of representation (e.g. by pressing a button). In line with this argument, Van der Weiden and colleagues (2010) predicted that agency illusions should primarily occur when people represent their behavior on a high, outcome-focused level, but should be reduced when behavior is represented on a low, action-focused level. In a series of studies, two groups of participants, a high-level representation group and a low-level representation group, were examined as to their susceptibility to illusions of agency. The high/low-level distinction was realized by either measuring people’s chronic representation level of behavior (which differs across individuals; Vallacher & Wegner, 1987) or instructing them in the wheel-of-fortune paradigm to focus on the high-level outcome (i.e. stopping the square) versus the low-level action (i.e. pressing a key). The high-level group that focused on outcomes, and thus was probably concerned with why they were doing something, were more susceptible to illusions of agency elicited by outcome priming than the low-level group, whose focus was on the action and how to do something (Van der Weiden et al., 2010).

Another factor that has been shown to influence the susceptibility to agency illusions is people’s belief in free will. The concept of free will refers to the belief of being able to determine one’s own outcomes (Stillman, Baumeister, & Mele, 2011). Research could show that those who believe more in free will - according to self-reports - show stronger illusions of agency on explicit and implicit measures than those who believe less in free will (Aarts & Van den Bos, 2011).

This evidence suggests that there are some boundary conditions to the occurrence of illusions of agency. The question arises as to whether the shown moderators have something in common and are perhaps based on a similar principle. Specifically, what do the level of behavioral representation and belief in free will have in common? Is there an integrative account of how the susceptibility to outcome priming can be modulated?

In this dissertation, I examine the possibility that illusions of agency are more likely to occur in situations that prepare people to process outcome representations of their intended actions. Specifically, a higher preparedness to process outcome representation renders information about intended events more available or accessible (Bruner, 1957). This idea is based on the assumption that in some situations outcome representations may receive preferred access to cognition and information processing than in others. The central proposition in this dissertation is therefore that in situations in which people are more prepared
to process outcome information, they are more likely to experience (illusions of) agency if outcomes are primed, relative to when they are not primed (Aarts et al., 2005; Aarts, 2007; Moore et al., 2009). I further propose that this is valid in situations in which agency is ambiguous (Aarts et al., 2005; Wegner, 2002; Wegner & Wheatley, 1999).

The aforementioned research on moderators is consistent with this idea. For example, if a high level of behavioral representation prepares people to process outcome information in relation to their own behavior, outcome primes might be more likely to trigger illusions of agency. Conversely, when the focus is on low level actions, this might not prepare people to process outcome information when establishing one’s agency (cf. Van der Weiden et al., 2010). Furthermore, people with a stronger belief in free will are more concerned with controlling outcomes, and they are more attentive to or more likely to represent their actions and behavior in terms of these outcomes. Consequently, they seem to process signals that relate to intentional action outcomes more strongly than others, which might be the reason why they are more susceptible to outcome priming and illusions of agency (cf. Aarts & Van den Bos, 2011).

**A Goal Perspective on Illusions of Agency**

When trying to reach a goal, the experience of agency can inform the person that goal pursuit was successful. Especially the presence of outcome representations are functional in reaching goals, because they let people focus on an intended outcome, direct behavior towards its completion and identify whether the anticipation matches the resulting outcome (James, 1890). Importantly, the extent to which people process outcome information depends on if and how they pursue a goal. Concerns with outcomes should be stronger when people try to reach goals than when they do not (e.g. when they have already successfully accomplished a goal). In addition, how people try to reach a goal should also matter (see Van der Weiden et al., 2010). For instance, when goal pursuit is difficult or has even failed, people usually generate counterfactual thoughts about this failure that comprise alternative goal-conducive actions (Sanna & Turley, 1996). During counterfactual thinking then, concern with the overarching outcome is temporarily dismissed to focus on more specific and effective action.

The preparedness to process outcome information is not only influenced by the state of one’s individual goal pursuit (e.g. have I recently failed or not failed on a personal goal) but also by one’s social roles. For instance, people who ex-
experience high power are generally less inclined to think extensively about the consequences of their actions but rather prefer immediate opportunities to take action (Galinsky, Gruenfeld, & Magee, 2003). They may thus contemplate action outcomes and consequences less than people in low power positions and thus may be less likely to experience agency illusions. Thus, as an underlying moderating effect to agency illusions it is proposed that the way people cognitively represent their own behavior depends highly on the state of their goal pursuit. Inasmuch as illusions of agency are facilitated when people are prepared to process outcome representations, factors like goal completion versus incompletion, counterfactual thinking, and power may predict people’s susceptibility to outcome priming and illusions of agency.

In sum, the goal perspective on illusions of agency entails that people process information about intended outcomes differently depending on whether, how, and in which social role they pursue their goals. Besides general goal completion versus incompletion, it is suggested that counterfactual thinking and social power - concepts that have a profound influence on people’s goal pursuit and information processing - also modulate the cognitive endorsement of action outcomes. Thus, the present dissertation will examine whether otherwise robust illusions of agency after outcome priming may be diminished in situations where people are less concerned with action outcomes. This should be the case after goal completion, after counterfactual thinking, and for people in high power positions. In the following, these three factors will be outlined and their cognitive underpinnings will be analyzed in relation to illusions of agency.

Goal Completion

As I have argued in the previous section, people usually experience agency when they have a mental representation of the to-be-attained outcome prior to an event. This outcome preview is mentally represented as the purpose of a specific action, the end or goal that is intended to be accomplished. Such mental representations of intended events or outcomes are important for goal pursuit to be effective.

When people intend to reach a goal, goal-related mental concepts are “on top of one’s mind” (Anderson, 1983; Förster, Liberman, & Friedman, 2007). The increased accessibility of intended outcomes serves effective goal pursuit, because it lets people recognize objects or situations relevant to attain the goal (Lewin, 1926). When one wants to bring about an intended outcome, one is sensitive to this outcome. In line with this notion, research in social cognition
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has established that representations of goals or intentions are primarily activated while people pursue a goal and have to direct purposeful behavior towards its completion (Kruglanski et al., 2002; Förster, Liberman, & Higgins, 2005; Moskowitz, 2002; Goschke & Kuhl, 1993). When, however, goal pursuit has been successfully completed, the cognitive activation of outcome representations is reduced (see Carver & Scheier, 2001; Förster et al., 2005, 2007; Goschke & Kuhl, 1993; see also Marsh, Hicks, & Bink, 1998; Marsh, Hicks, & Bryan, 1999). Inasmuch as illusions of agency are facilitated when people are prepared to process outcome-related information, one may expect that incomplete goal pursuit renders people susceptible to outcome priming. Completed goal pursuit, on the other hand, reduces the concern with outcome-related information. This relative change in the preparedness to process outcome information in different stages of goal pursuit might then become a psychological basis for modulating the susceptibility to illusions of agency. This idea is examined in Chapter 2.

Counterfactual Thinking

Goal pursuit often fails; in this case a common spontaneous reaction is to generate counterfactual thoughts (Sanna & Turley, 1996). Counterfactual thoughts are mental simulations of alternative realities where a certain event would have turned out differently had the person acted in a different way (Kahneman & Miller, 1986). To illustrate, failing to pass an exam might trigger thoughts related to how this event might have turned out differently. Counterfactual thoughts can take the form of upward comparisons, where people imagine a better alternative reality (“If only I had gone to every class, I would have passed”), or downward comparisons in which they simulate a worse alternative reality (“At least I didn’t fail all exams, or it would have been a lot worse”). Downward counterfactuals help people feel better, and they serve an affective function because they emphasize how the situation could have been a lot worse (Roese, 1994). In contrast, upward counterfactuals give rise to feelings of regret (Roese & Summerville, 2005), but also serve a preparatory function for future actions (Epstude & Roese, 2011).

Studies have demonstrated that the generation of upward counterfactuals improves study habits in college students (Nasco & Marsh, 1999) and performance on anagram tasks (Roese, 1994) and on analytical tests (Kray, Galinsky, & Wong, 2006), compared to the generation of downward counterfactuals. Presumably, upward counterfactuals produce concrete behavioral intentions (Smallman & Roese, 2009) that are more specific because they concern the means to reach a
goal (“I should eat less cake”) and are more effective in the regulation of behavior - in contrast to relatively abstract goal intentions (“I need to lose weight”) (Epstude & Roese, 2008; see also Gollwitzer & Brandstätter, 1997; Gollwitzer & Sheeran, 2006). In other words, in order to act, it is beneficial if a goal is translated from a higher level to a lower level of abstraction - a level that typically emphasizes specific actions (Vallacher & Wegner, 1987). This effect, however, occurs primarily when people expect to be able to confront a problem in a similar future situation (Epstude & Roese, 2008). That is, a pronounced focus on action and action planning after goal failure, at the expense of feel-good downward counterfactuals, serves a preparatory function only if people expect to encounter a similar situation in the near future (Epstude & Roese, 2008; Gollwitzer & Sheeran, 2006; Roese & Olson, 1995; Smallman & Roese, 2009).

Applying this notion to illusions of agency, one may suggest that the generation of specific action plans following upward counterfactual thinking can reduce the influence of primed outcome information. The present perspective on illusions of agency entails that upward counterfactual thinking changes people's processing of information. Specifically, information related to specific action plans should be more pronounced, rather than information relating to higher order outcomes. A focus on specific action (which is represented on a lower level of abstraction) rather than on outcomes (which is represented on a higher level of abstraction) after upward counterfactual thinking might reduce people’s susceptibility to illusions of agency. I will examine this possibility in Chapter 3.

Power

Social contexts have an important impact on people’s ability to reach goals. An important variable in this respect is power. Social power refers to people’s ability to influence others and act free from constraints (Keltner, Gruenfeld, & Anderson, 2003). The reason for researchers’ interest in power as a psychological variable stems from the fact that having or lacking power seems to have fundamental effects on people’s behavior, cognitions and information processing. People primed with high power have been shown to be more approach-oriented (e.g. Anderson & Berdahl, 2002; Galinsky et al., 2003; Smith & Bargh, 2008), more disinhibited (Galinsky et al., 2003; Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008), and more likely to express their opinions openly (Anderson & Berdahl, 2002) than people primed with low power. Moreover, powerful people perceive less risk in the world (Anderson & Galinsky, 2006),
see the future as more controllable (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009), and are less distracted by surrounding information (Guinote, 2007a) than powerless people.

Power is thus associated with the propensity to enact one’s intentions quickly rather than to wait and think extensively about the consequences (Galinsky et al., 2003; Guinote, 2007a; Keltner et al., 2003). Consequently, powerful people may be less prepared to process outcome representations than powerless people. One may therefore predict that people in high power positions are less susceptible to illusions of agency than people in low power positions. This possibility is addressed in Chapter 4.

**Summary - A Goal Perspective on Illusions of Agency**

The previous paragraphs sketched several situations in which people are more or less prepared to process outcome representations and thus more or less likely to experience illusions of agency. The feeling that a goal has been successfully completed, the presence of concrete, upward counterfactual thoughts when confronted with goal failure, and high power are conditions in which people are less prepared to process outcome-related information. Because the present goal perspective entails that one has to be prepared to process outcome-related information in order to experience illusions of agency, I predict that goal completion, upward counterfactual thoughts and high power will all reduce illusions of agency.

The next section will give a short overview of the four remaining chapters that comprise the present dissertation.

**Overview of the Present Dissertation**

In Chapters 2 to 4, I will test how and when different phases of goal pursuit, counterfactual thinking, and power can influence people’s susceptibility to illusions of agency. I will then present a conclusion in Chapter 5 in which I critically discuss these findings and provide an outlook for future research.

Chapter 2 focuses on the relationship between goal pursuit and illusions of agency. As mentioned above, it is assumed that incomplete goal pursuit prepares people to process outcome representations, compared to a situation where goals have been successfully completed. Chapter 2 presents a line of research that sought to test whether successful goal completion diminishes people’s susceptibility to illusions of agency. Two studies were conducted in which
participants either received bogus success (goal completion) or failure (goal incompletion) feedback on an experimental task (Study 2.1) or recalled a personal successful (completed) or unsuccessful (incomplete) instance of goal pursuit (Study 2.2). As a measure of illusions of agency, participants then completed the wheel-of-fortune task as an allegedly unrelated study (Aarts et al., 2005). It was found that when participants experienced or recalled a goal failure, they experienced illusions of agency. By contrast, when participants experienced or recalled successful goal pursuit, the susceptibility to outcome priming was reduced and no significant illusions of agency were found.

Chapter 3 further examines the findings of Chapter 2, where failed goal pursuit left participants vulnerable to illusions of agency. Two studies are presented in which all participants were led to experience goal failure. In Study 3.1 participants thought of a personal experience of goal failure and were then led to either generate upward counterfactual thoughts (i.e. “If only I had done X, then things would have turned out better”) or downward counterfactual thoughts (i.e. “At least I didn’t do Y, then things would have turned out even worse”). Next, they completed the wheel-of-fortune task (Aarts et al., 2005) as an allegedly unrelated study. It was found, in line with predictions, that agency illusions were reduced after the generation of upward counterfactuals compared to the generation of downward counterfactuals. In Study 3.2 the effect of Study 3.1 was further examined. Specifically, it was argued that upward counterfactual thoughts should only reduce illusions of agency if participants expected to encounter again the goal failure to which counterfactuals were generated. In line with the postulation that upward counterfactuals serve behavior regulation in terms of preparing effective action for the future, illusions of agency were only reduced after upward counterfactual thinking when participants expected to encounter a similar situation again. In other words, by eliminating the possibility for future behavior modification, the behavior-regulating effects of counterfactuals were apparently diminished. The discussion of these results centers on the possible functional effects that might accompany a (diminished) susceptibility to illusions of agency. After failing to attain a goal, people may be careful to exhibit the actions that will have the desired effect on the environment. In these situations, it is especially crucial that one is not overly attuned to perceiving illusory agency.

Chapter 4 presents research that tested whether people who are primed with high power might be less susceptible to illusions of agency than those primed with low power or those who are not primed at all. In three studies, participants were primed with high power, with low power, or received a neutral con-
trol prime using classic priming techniques (Galinsky et al., 2003; Smith & Trope, 2006). Then, in Studies 4.1 and 4.2, they completed the wheel-of-fortune paradigm (Aarts et al., 2005), whereas in Study 4.3 the experience of agency was measured more implicitly with a temporal binding paradigm (Moore et al., 2009). In line with predictions, participants primed with high power were less susceptible to illusions of agency, as evidenced by self-reports and decreased temporal binding, than participants in the low power or neutral control condition.

In Chapter 5, I summarize and integrate the obtained results. In this concluding chapter I propose that the influence of the presented variables on illusions of agency can inform us about the functional underpinnings of people's experience of agency. Additionally, some limitations of the present research are addressed and avenues for future research are suggested.

Finally, it is important to note that the reader may observe some redundancies in the description of theory and methods across the three empirical chapters. These redundancies are deliberate, as Chapters 2 to 4 have been written as separate manuscripts and allow each chapter to be read and understood independently.