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

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To be able to behave according to one’s will lies at the core of the experience of being human (Bandura, 2001; James, 1890; White, 1959). This experience of agency is closely linked to people’s subjective self-regulatory capacities, because it signals that one is able to bring about desired outcomes in the world and enact even difficult intentions that require the conscious control of behavior (Kuhl, 2001; Stillman, Baumeister, & Mele, 2011). Because one’s agentic involvement in an event is often not directly observable (Michotte, 1963), people use agency indicators when determining which outcomes they did or did not bring about (Wegner & Sparrow, 2004). If these indicators are not correctly interpreted, because causation for an event is ambiguous, agency can be illusory (Wegner, 2002). In the present research we propose that the susceptibility to illusions of agency depends on whether goal pursuit has been successfully completed or not. Specifically, we suggest that acting according to one’s will in a goal-directed manner, and thereby successfully completing goal pursuit, reduces illusions of agency, whereas illusions should be present when goal pursuit failed. In the following, we will outline the rationale behind this hypothesis and present two studies.

Illusions of Agency and Goal Pursuit

People usually feel responsible for outcomes that they previously anticipated in the form of a mental representation (Wegner & Wheatley, 1999; Wegner, 2002). When true causation is ambiguous, subliminally priming such a mental preview of an action’s outcome can simulate these outcome representations and fool people into perceiving agency that is illusory (e.g. Aarts, Custers, & Wegner, 2005; Linser & Goschke, 2007). For instance, in a study by Aarts and colleagues the participant and the computer simultaneously rotated a square across a path on the computer screen in a wheel-of-fortune game. When the participants were asked to stop the rotation of their square by pressing a key, both squares disappeared before the stop position of only one square was displayed, that could represent the participant’s square or the computer’s square, which rendered causation for this outcome ambiguous. When this outcome was primed by visually presenting the stop location subliminally before participants acted, they were more likely to claim agency for this outcome than when it was not primed.

This effect of outcome priming on illusory agency has been shown to be very robust across measures (Aarts, Custers, & Marien, 2009; Aarts, Wegner, & Dijksterhuis, 2006; Haggard, Clark, & Kalogerias, 2002; Linser & Goschke, 2007;
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Wegner, Sparrow, Winerman, 2004), but it primarily occurs when behavior is represented on a high level of abstraction, with a focus on action outcomes and consequences, rather than on a low abstraction level (Van der Weiden, Aarts, & Ruys, 2010; cf. Vallacher & Wegner, 1987). Specifically, participants who were asked to focus on the high-level outcome in the wheel-of-fortune paradigm (i.e. they were instructed to “stop the square”) were more susceptible to illusions of agency elicited by outcome-priming than those with a focus on the low-level action itself (i.e. they were instructed to “press a key”) (Van der Weiden et al., 2010).

People frequently activate representations of action outcomes when they are pursuing a goal and thereby direct behavior towards a desired end-state (Fishbach & Ferguson, 2007). People are especially likely to actively maintain these goal-related cognitions – including representations of outcomes – when the goal is not trivial and cannot be pursued on an automatic level (see Bargh, 1994; Bongers & Dijksterhuis, 2009; Kazén & Kuhl, 2005; Kuhl & Kazén, 1999). These representations remain active until goal completion (Goschke & Kuhl, 1993; Förster, Liberman, & Friedman, 2007; Förster, Liberman, & Higgins, 2005; Jostmann & Koole, 2009; Moskowitz, 2002). Given that the concern with outcome-related cognitions is reduced after successful goal-directed action, and given that these cognitions contribute substantially to the susceptibility to illusions of agency, we hypothesize in the present research that agency illusions are reduced after successful completion of goal pursuit. In contrast, illusions should be prominent when goal pursuit is unsuccessful and thus remains incomplete.

We tested this hypothesis in two studies, in which we manipulated goal completion by giving participants bogus success or failure feedback on their performance in a flanker task (Study 2.1) or by having participants recall a situation in which they could or could not successfully pursue a personal goal (Study 2.2). Subsequently, we measured illusions of agency with the wheel-of-fortune paradigm (Aarts et al., 2005).

**Study 2.1**

In Study 2.1 we induced completed goal pursuit in a situation where goal-directed action was difficult. We had participants perform a flanker task (Eriksen & Eriksen, 1974) where immediate responses elicited by distractor stimuli needed to be overridden and controlled in order to correctly respond to a target stimulus. Then we gave participants bogus success (or failure) feed-
back on their performance and subsequently measured illusions of agency (Aarts et al., 2005).

**Method**

**Participants and Design.** Participants were 71 undergraduates (55 females, $M_{age} = 21$) who were randomly assigned to either the completed or failed goal pursuit condition.

**Materials and Procedure.** Participants first received an arrow version of the flanker task that was introduced as a behavioral control task and allegedly measured the extent to which people can act according to their will. Participants had to respond as quickly and as accurately as possible to a target arrow pointing left or right that was flanked by two or more distractor arrows. Each trial began with a white fixation cross (500 ms) in the middle of a black screen, followed by distractor arrows (100 ms) that were presented left, right, above, and/or below the fixation cross and could either have the same orientation as the target (i.e. congruent) or opposite (i.e. incongruent). Lastly, the target arrow was presented in the middle of the screen (50 ms). Then participants saw a blank screen until they made a response. In total, participants worked on 154 trials (52 congruent, 102 incongruent).

After they had completed all trials, participants in the completed goal pursuit condition received computer-based feedback that their performance was among the best 15% of all students we tested so far and that they were very good at keeping their reactions under control. Participants in the incomplete goal pursuit condition received failure feedback and were told that they scored among the worst 15% of all students we tested so far and were not very good at keeping their reactions under control. To check if people believed the bogus feedback, we asked them afterwards how influenced they felt by the flankers (1-not at all; 7-very much).

In the second part of the experiment, participants worked on the ostensibly unrelated wheel-of-fortune task (see Aarts et al., 2005). In this task, participants rotated a dark-gray square across a rectangular path of 8 white tiles, while the computer simultaneously rotated a lighter-gray square across the same path in the opposite direction. After 8, 9 or 10 rounds around the path, the word STOP appeared in the middle of the screen and participants had to press a designated key to stop the square’s rotation. As a result of this action participants saw after 100 ms that one tile on the path was colored black, possibly representing
the stop location of their square or of the computer’s square. Agency over this ambiguous outcome was measured by asking, after each of 16 trials, “To what extent do you think you let the square stop on the indicated location?” (1-not at all me; 10-absolutely me). To simulate an anticipated outcome and trigger illusions of agency, the stop location was subliminally primed in half of the trials by having it light up for 34 ms in the gray-shade of the participant’s square before the stop-signal was displayed.

Funnel debriefing in both studies confirmed that participants were not aware of the priming or the purpose of the study. After the studies, participants were thanked and debriefed.

**Results and Discussion**

**Flanker Task.** Replicating the well-established flanker effect, participants made more errors on incongruent ($M = 9.54, SD = 10.74$) than on congruent trials ($M = 1.04, SD = 1.70$), $t(70) = 7.27, p < .001, d = 1.11$, and were slower (in ms) when responding to incongruent ($M = 434.45, SD = 87.33$) than to congruent trials ($M = 256.67, SD = 55.25$), $t(70) = 10.10, p < .001, d = 2.43$. Importantly, the number of errors or reaction times did not differ between conditions, all $ps > .12$. Participants in the failed goal pursuit condition reported feeling more influenced by the flankers ($M = 3.67, SD = 1.24$) than participants who received success feedback ($M = 2.79, SD = 1.34$), $t(69) = 2.85, p < .01, d = .68$, which indicates that our feedback had the intended effect.

**Illusions of Agency.** In order to examine whether success feedback, implying completed goal pursuit through the voluntary control of behavior, reduced illusions of agency in contrast to failure feedback (and thus goal incompletion), we first averaged agency self-reports over the 8 trials with an outcome prime and the 8 trials without an outcome prime (Aarts et al., 2005). A repeated-measured ANOVA on those scores revealed a significant main effect of outcome prime in that participant claimed more agency when an outcome prime was present ($M = 4.39, SD = 1.79$) than when it was absent ($M = 3.63, SD = 1.75$), $F(1,69) = 19.75, p < .001, \eta_p^2 = .22$. In line with predictions, this main effect was qualified by a significant interaction effect with goal pursuit condition, $F(1,69) = 4.06, p < .05, \eta_p^2 = .60$. Planned contrasts using a Bonferroni correction showed that participants who had received success feedback did not claim significantly more agency after the presentation of an outcome prime ($M = 4.08, SD = 1.85$) relative to trials where no prime was presented ($M = 3.65, SD = 1.80$), $F(1,69) = 3.17, p = .08, \eta_p^2 = .04$. In contrast, participants who had re-
ceived failure feedback reported significantly more agency on trials with an outcome prime ($M = 4.74, SD = 1.66$) than on trials without an outcome prime ($M = 3.61, SD = 1.73$), $F(1,69) = 19.49, p < .001, \eta^2_p = .22$. Further, no main effect of goal pursuit condition emerged, $F(1,69) = 0.66, p = .42, \eta^2_p = .009$.

**Study 2.2**

To broaden the applicability of the present findings and be able to apply it to situations that people encounter in their personal lives, in Study 2.2 we asked participants to recall an idiosyncratic situation where they either could (completed goal pursuit) or could not (failed goal pursuit) do exactly what they wanted. We predicted again that recalling completed goal pursuit decreases susceptibility to agency illusions, in contrast to recalling failed goal pursuit. Additionally, we asked participants after the manipulation to report their current mood and their motivation to perform the next task.

**Method**

*Participants and Design.* Participants were 37 undergraduates (24 female, $M_{\text{age}} = 22$) who were randomly assigned to the completed or failed goal pursuit condition.

*Materials and Procedure.* Participants began with a recall task, where they were asked in the completed (failed) goal pursuit condition to recall and write down a situation where they could (not) do exactly what they wanted and thus could (not) behave according to their own will. After participants noted down their personal memory without time constraints, we asked them to report “How do you feel right now” and “How motivated are you to perform the following task?” (1-very bad/not at all motivated; 100-very good/very much motivated). Then, the wheel-of-fortune task, as used in Study 2.1, was introduced.

**Results and Discussion**

*Illusions of Agency.* Agency illusions were calculated in the same way as in Study 2.1. A repeated-measured ANOVA on those scores again revealed a main effect of outcome prime in that participants claimed more agency when an outcome prime was present ($M = 5.07, SD = 1.86$) than when it was absent ($M = 3.52, SD = 1.77$), $F(1,35) = 16.40, p < .001, \eta^2_p = .32$. This main effect was qualified by a significant interaction effect with goal pursuit condition, $F(1,35) = 4.45, p < .05, \eta^2_p = .11$. Planned contrasts using a Bonferroni correction revealed that participants who recalled an instance of goal pursuit completion,
where they were able to act according to their will, did not report significantly more agency for trials with an outcome prime ($M = 4.52$, $SD = 1.49$) than without an outcome prime ($M = 3.79$, $SD = 1.54$), $F(1,35) = 1.83$, $p = .19$, $\eta^2_p = .05$. On the other hand, those participants who recalled an instance of goal incompletion, where they could not act according their will, did report significantly more agency when an outcome prime was present ($M = 5.59$, $SD = 2.07$) than when it was absent ($M = 3.27$, $SD = 1.97$), $F(1,35) = 19.49$, $p < .001$, $\eta^2_p = .36$. The main effect of goal pursuit condition did not reach significance, $F(1,35) = 0.36$, $p = .55$, $\eta^2_p = .01$.

Importantly, mood and motivation did not differ between the two recall conditions, $ps > .13$, and did not change the effect of goal pursuit on illusions of agency. In sum, Study 2.2 replicated the findings from Study 2.1 with a different manipulation of goal pursuit completion. When participants recalled a completed, and thus successful, goal pursuit they were less susceptible to illusions of agency than when they recalled a failed goal pursuit.

**General Discussion**

In the present research we could show that completed goal pursuit reduces illusions of agency. Specifically, people who allegedly could successfully control their reactions in a flanker task (Study 2.1) or recalled an instance of goal completion (Study 2.2), were less susceptible to illusions of agency elicited by outcome priming. In contrast, participants who supposedly could not successfully control their reactions in the flanker task (Study 2.1) or recalled a situation of goal incompletion (Study 2.2) experienced relatively more illusions of agency. We interpret the present results such that complete goal pursuit makes people less prepared to process outcome representations than incomplete goal pursuit.

An alternative interpretation of the present data could be that failed goal pursuit heightens illusions of agency. However, this interpretation is contradicted by the observation that the magnitude of illusions of agency in the failed goal pursuit condition is comparable to that found in neutral control conditions in other studies (e.g., Aarts et al., 2005). Thus, while illusions of agency have been found robustly, the contribution of the present findings, lies in the decreased susceptibility to illusions of agency after people experienced or recalled completed goal pursuit.
In the present research we wanted to show that the susceptibility to illusions of agency is influenced by the status of people’s goal pursuit. For this, it was important to rule out that other factors such as mood or motivation influenced the found effects. Firstly, goal completion or incompletion could trigger positive or negative mood states respectively. These mood states might latently influence the preparedness to process certain types of information (in this case outcome information). However, a manipulation check did not show any changes in mood resulting from the manipulation and participant’s self-reports of mood did not change the effect of goal completion on illusions of agency. Presumably, the induced goal completion and incompletion was subtle enough not to influence the affective state of the participant, but changed their preparedness to process outcome information. Secondly, one might argue that goal completion or incompletion enhances or reduces the motivation to engage in any following task (in this case the wheel-of-fortune task). A manipulation check asking for self-reported motivation, could also rule out that people were more or less willing in any of the conditions to continue with the experimental task. The changes in illusions of agency were thus a function of goal pursuit completion and no other factors.

The temporary reduction in illusions of agency when goal pursuit is completed may play an important role within people’s perception of action effectiveness. It may be that actors are generally tuned to the perception of agency, and agency illusions, when it is important for them to bring about certain outcomes in the world. When an action has had the intended effects, such as after completed goal pursuit, the actor may temporarily neglect agency and agency cues. The possible advantages and disadvantages that illusions of agency might bear for self-regulatory functioning promises to be an exciting avenue for future research.

To conclude, the present studies could show that an independent manipulation of goal pursuit completion could spill over to the ostensibly unrelated wheel-of-fortune task and reduced agency illusions. As a next step, it would be interesting to investigate what happens when a goal has failed and thus remains incomplete. Do people remain susceptible to illusions of agency no matter what? This will be investigated in the next chapter.