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Cultural and Universal Routes to Authorship Ascription: Effects of Outcome Priming on Experienced Self-Agency in the Netherlands and Japan

Henk Aarts[1], Masanori Oikawa[2], and Haruka Oikawa[3]

Abstract

The experience of self-agency is a fundamental feature of human experience. Recent research has suggested that self-agency experiences are driven by an unconscious authorship ascription process that relies on an online match between accessible outcome representations and the production of the outcome. Extending this work, this study explores the role of culture in the manifestation of this unconscious authorship ascription process by testing whether subliminal priming of the outcome of an action prior to occurrence increased experiences of self-agency in Dutch and Japanese participants. Results show that outcome priming enhances the experience of self-agency independently of cultural background. However, Dutch participants experienced higher levels of self-agency than did Japanese participants, and this cultural effect was mediated by differences in beliefs of self-determination. These findings suggest that the experience of self-agency has a universal, nonconscious component that operates independently from a more cultural one, reflecting differences in conscious beliefs about the role of the self in choice and control.

Keywords

authorship ascription, cultural and universal component, outcome priming, self-determination

The ability to become aware of one's own actions and their consequences is a uniquely human trait. It enables people to distinguish between outcomes that result from the actions of others and outcomes that are produced by oneself and to attribute them to the proper agent. The ascription of personal authorship thus constitutes a fundamental aspect of human social communication in particular and our society in general (Bermúdez, Marcel, & Eilan, 1995; Heider, 1958). Furthermore, experiencing oneself as the cause of one's own actions and their outcomes serves as an important building block for our concept of the self and free choice and as such is central to our

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social beliefs about whether we can and do have an influence on our own actions and resulting outcomes (Cohen, Hoshino-Browne, & Leung, 2007).

The experience of self-agency appears quite natural to us. Whether our jokes make our colleagues smile or lights turn on when we push the switch as part of our routine of entering the office in the morning, our actions and their effects in the external environment are often felt to be caused by ourselves. However, although our experiences of self-agency are pervasive and socially well shared, they are sensitive to context and are prone to illusion. Such biased experiences may arise from two separate sources. First, the sense of self-agency is shaped by beliefs and values that people have about the role of the self in choice and control. People differ in the degree to which they endorse their actions as being determined by the self and engage in the actions with a full sense of choice (Deci & Ryan, 1985; Elliot & McGregor, 2001). Accordingly, our experiences of self-agency in a concrete instance, such as pressing a key to switch on a light, may be influenced by these consciously held beliefs and values. Second, on a more basic level of action performance, the experience of self-agency is an inference that occurs quite automatically and is not accurate per se. This inferential character of self-agency has become apparent in a number of recent studies (Aarts, Custers, & Wegner, 2005; Jones, de-Wit, Ferneyhough, & Meinz, 2008; Wegner & Wheatley, 1999), demonstrating that these experiences are the result of an online match between the outcome of an action and knowledge about the outcome that was made active just prior to its occurrence.

Building on and extending this previous research on the self in social cognitive processes of choice and action control (Aarts et al., 2005; Aarts, Custers, & Marien, 2008; Jones et al., 2008; Wegner & Wheatley, 1999; Yamaguchi, Gelfand, & Zemba, 2005), the present study examines the process of self-agency in the context of differences between Western and Eastern cultures. Specifically, we study people's online experiences of causing outcomes by their own actions and propose that there are both cultural and universal components to this manifestation of experience of self-agency. Our line of reasoning is based on two arguments. First, all human beings are equipped with a social cognitive mechanism that is tuned to easily signal oneself as the current agent for outcomes, regardless of whether or not one intended to produce these outcomes (Aarts et al., 2005; Wegner & Wheatley, 1999). Second, people from Western society primarily identify themselves as individual units who are free to choose and do what they want, whereas people from Eastern society primarily identify themselves as group members who are constrained by social rules and conventions in which the role of the self in choice and control is less emphasized (Markus & Kitayama, 1991; Menon, Morris, Chiu, & Hong, 1999; Miller, 1984). Accordingly, the sense of self-agency may arise from a universal authorship ascription process cognitively ingrained in all humans, and yet it may also be restrained by culture. We present an experimental study to examine the intriguing possibility.

Research on cultural differences in social cognition and behavior has increased considerably in the past two decades. Much of this work has departed from the assumption that cultural differences in social cognition result from or reflect differences in cultural beliefs and values, particularly cultural differences in what is broadly known as individualism–collectivism (Triandis, 1995) and related constructions of the self (e.g., Jobson & O'Kearney, 2008; Markus & Kitayama, 1991; Mesquita, 2001). Moreover, research clearly indicates that people's causal analyses of social behavior are influenced by their culture's predominant patterns of action and interaction (e.g., Chao, Zhang, & Chiu, 2008; Menon et al., 1999; Miller, 1984). For instance, people from Western society are more inclined to attribute causes of social behavior described in scenarios and real stories to internal dispositions of the actor, whereas people from Eastern society seem to favor a situational attribution account. Moreover, such cultural differences in attributions do even show up in animated films featuring nonhuman objects (Heider & Simmel, 1944) that represent a social event, but not when representing a physical event (Morris & Peng, 1994). Importantly, what these findings indicate is that Western people project their values and

beliefs about the role of the self in choice and action control on social events, whereas people from Eastern countries seem to use their values and beliefs about the force of the situation and the marginal influence of the self in choice and control in their causal analyses of social behavior (cf. Cohen et al., 2007).

Interestingly, although the relation between culture and social cognitive processes underlying causal attributions of other people's behavior seems evident (e.g., Miller, 1984; Morris & Peng, 1994), far less empirical attention has been devoted to the question of whether cultural differences also play a role in self-causation analysis during online performance of behavior. According to self-determination theory, one of the dominant theories relevant to the present issue, people can vary in the extent to which they consider or appreciate the self to play a vital role in making choices and controlling behavior (Deci & Ryan, 1985; Ryan & Deci, 2000). Specifically, self-determination theory allows for cultural differences in the endorsement of beliefs and values about being self-determined in life, and this diversity in beliefs and values that are differentially endorsed across cultures should show up when people consciously reflect on their sense of self in relation to choice and control. However, although it seems plausible that beliefs in self-determination may vary as a function of culture, the majority of data on differences in such beliefs (as measured by the Self-Determination Scale [SDS]; e.g., Sheldon, Ryan, & Reis, 1996) have been collected from Western samples (especially the United States; e.g., Elliot & McGregor, 2001; Sheldon, 1995; Sheldon et al., 1996; Thrash & Elliot, 2002). Accordingly, the first goal of the present study was to examine whether people from Eastern (Japanese) compared to Western (Dutch) culture may generally consider themselves as being less self-determined in their lives and, if so, whether these general beliefs about self-determination influence the process and online experience of self-agency over concrete outcome of actions.

Apart from the cultural route alluded to above, experiences of self-agency may also compose a more universal component. As we have briefly discussed before, experiences of self-agency depend on an inference process that connects behavioral outcomes to one's own actions (Aarts, 2007; Aarts, Custers, & Marien, 2009; Wegner & Wheatley, 1999). Recent research has shown that we are quite capable of fluently and perfunctorily ascribing authorship of an observed outcome to oneself, and this process can operate even outside of our conscious awareness (Aarts et al., 2005; Wegner & Sparrow, 2004). Such an unconscious process of authorship ascription is likely to occur because people heavily rely on outcome-specific information to establish a sense of personal authorship. That is, we feel to have produced an outcome when there is a match between the actual outcome and the outcome that we presaged in our mind. Although we usually experience self-agency as being the result of our conscious intentions to produce the outcome, the authorship ascription process may be susceptible to primes that render the representation of action outcomes accessible before one performs an action and observes the corresponding outcome.

There is some recent research pointing to this possibility. In a study by Aarts and colleagues (2005; Aarts, 2007), participants and the computer each moved a single gray square in opposite directions on a rectangular path consisting of eight white tiles. The participants' task was to press a key to stop the rapid movement of the squares. This action turned one of the eight tiles black. In reality, the computer determined which of the tiles would turn black. From the participants' perspective, though, this black tile could represent the location of either their square or the computer's square at the time they pressed stop. Thus, the participant or computer could have caused the square to stop on the position, rendering the exclusivity of causes of outcomes ambiguous (cf. Wegner & Wheatley, 1999). Participants either set the intention to stop on a position or were subliminally primed with that position just before they saw the presented stop on the corresponding location. To measure experiences of self-agency, participants rated the extent to which they felt to have caused the square to stop on the presented location. Results showed that both intention and priming lead to an increased sense of self-agency, suggesting that online self-agency experiences were primarily based on a match between preactivated and actual outcomes,

irrespective of the (conscious or nonconscious) source of this activation. Further experimentation revealed that this priming effect on illusory experiences of self-causation occurs even in depressed persons who are commonly thought to be less sensitive to such control illusions (Aarts, Wegner, & Dijksterhuis, 2006) and emerges irrespective of differences in diagnosed psychopathological conditions that are supposed to interfere with explicit agency ascriptions (Jones et al., 2008).

These results speak to the robustness and the ingrained nature of the authorship ascription process that automatically compare accessible foreknowledge and the observation of an outcome to produce sense of agency. Although important and intriguing, this recently discovered unconscious authorship ascription process and the utility of the new research paradigm to test it have been demonstrated and validated only in Western countries. Given the lack of clarity of cross-cultural differences in beliefs about self-determination and experiences of self-agency, we cannot speak confidently of a "basic" authorship ascription process without showing this process in persons from Eastern society and directly comparing the results obtained in the new research paradigm between people from Western and Eastern societies. A second goal of the present study was to explore this issue.

Accordingly, we followed the experimental paradigm designed by Aarts et al. (2005) to explore whether the causal inference process automatically produces experiences of self-agency in both Western and Eastern societies. Specifically, we tested whether subliminal priming of the outcome of an action prior to occurrence increases experiences of self-agency in Dutch and Japanese participants. Furthermore, we tested whether there are cross-cultural variations in overall levels of experienced personal authorship over specific outcomes of one's actions and if these variations are mediated by individual differences in self-determination.

The general expectation was that regardless of countries, priming of the location of the outcome information (the stop location) before the action would enhance the participants' experience that this position was the result of their own action, or in other words, that they were the cause of the presented outcome. This is expected because when the actual behavioral outcome is rendered accessible by the previous priming event, the automatic comparator offers a signal to the actor that the outcome is self-generated. Note that this mechanism needs no access to fully fledged intentions (Blakemore & Frith, 2003). In addition, we examined the possibility that Japanese compared to Dutch participants have lower experiences of self-agency in the specific task at hand and that this effect of culture may be mediated by general levels of self-determination measured on the SDS (Sheldon et al., 1996). In other words, cultural differences in general beliefs about the role of the self in choice and control may modulate concrete experiences of self-agency. Thus, apart from the signal arising from the match between the primed and actual behavioral outcome, culturally endorsed and self-integrated beliefs about self-determination may be another source of information that people rely on to establish a sense of self-agency. Note however that we predict no interaction effect of country and prime. We assume the two sources to be distinct, one reflecting a universal component and the other reflecting a cultural component. In other words, experiences of self-agency result from two separate paths: an automatic inferential process that is not mediated by conscious application of declarative knowledge (e.g., beliefs about self-determination) and a more deliberate process that is mediated by application of declarative knowledge (also see Chiu & Hong, 2007).

Method

Participants and Design

In all, 154 undergraduates (74 from the Utrecht area of the Netherlands and 80 from the Tokyo area of Japan) participated in the experiment, receiving course credits or a small incentive in

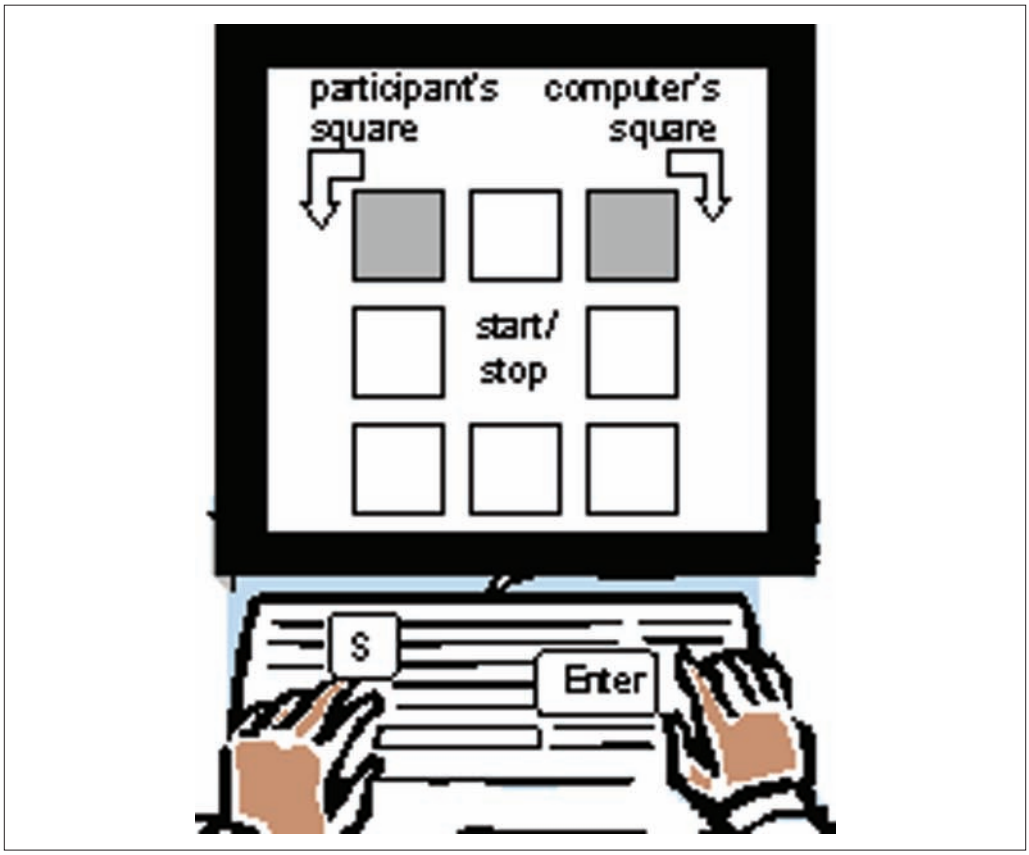

Figure 1. Illustration of the experimental task showing how the squares move in opposite directions

return. All participants either were primed with outcome information (the stop location) or were not, and this factor thus constituted a within-participants variable. Age (M = 22.20, SD = 4.88) and gender (39% men) were evenly distributed across the two different country samples.

Experimental Task and Procedure

We took great care to ensure that participants in both countries were tested under similar conditions. Participants worked in a cubicle on the task. They learned that the study was designed to examine people's experiences of personal causation and choice and how these experiences come and go. For this purpose, participants had to move a gray square rapidly traversing a rectangular path in a counterclockwise direction by pressing and holding the *s* key. This path consisted of eight white tiles. The computer independently moved another gray square along the path at the same speed but in the opposite direction (clockwise). At a certain point in time, participants had to immediately stop the movement by pressing the *enter* key (for an illustration of the task, see Figure 1). This action turned one of the eight white tiles black, representing the location of either their square or the computer's at the time they pressed stop. Thus, the black square either did or did not represent the effect of their action. Note, however, that stops were always determined by the computer, and hence actual control was absent. Cues for responding were displayed in the middle of the rectangular path. Participants were instructed to keep focused on it during the task.

After each stop, participants indicated how much they felt to have caused the square to stop on that position. This authorship judgment was measured on a 10-point answer scale (1 = *not at all me*, 10 = *absolutely me*). The stopped location was presented twice on each of the eight tiles of the path. The experimental task thus consisted of 16 trials. Trials were randomly presented.

Events in a trial. Each trial started with a warning signal. Next, the message "start" was presented until participants pressed the *s* key. One second after they pressed (and held) the *s* key, their and the computer's square started to move along the path in alternating motion (i.e., the squares were displayed one after the other). Squares were displayed for 60 ms on each position. Thus, the speed of one lap was 960 ms (60 ms × 8 positions × 2 squares [participant's and computer's]). The number of laps in a trial that were completed before the message "stop" appeared could vary between 8 and 10 and was randomly determined by the computer. From the moment that the message "stop" was presented, only the eight empty white tiles were visible until the participant pressed *enter*. On that response, a black square was presented after 100 ms, for 1 s. The placement of this square was always four positions farther than the last position of the participant's square before the message "stop" had appeared. So, for example, the black square was presented in the lower-right-corner position after the participant's last square was presented in the upper-left-corner position, the black square was presented in the right-middle position after the participant's last square was presented in the left-middle position, and so on. Thus, participants did not have actual control, as the position of the black square did not depend on their action.

Outcome priming. In eight trials, the black square that would be displayed on a stopped position was flashed on that position before the message "stop" appeared on the screen. Thus, the primed location always corresponded with the presented location of the black square. The position prime (e.g., lower-right corner) occurred 40 ms after the last presentation of the participant's square (e.g., upper-left corner). Position primes were presented for 34 ms and were followed by the message "stop" 46 ms later (the total time for the priming event thus is 120 ms). In the no-outcome-priming condition, the position of the black square was not flashed (the position was presented in white for 34 ms). The priming event was employed for every possible location, resulting in eight replications of the outcome-priming condition and the no-outcome-priming condition.

After the experimental task, a questionnaire was administered. This questionnaire included the SDS, a mood scale, and a self-reported task importance scale.

Measurement of SDS. The SDS is designed to assess individual differences in the extent to which people believe they play an essential role in choices and control in their lives. The scale consists of 10 items (5-point scales) that were combined into an overall SDS score ($\alpha = .71$). A higher score reflects a stronger tendency to consider oneself as a self-determined person.

Measurement of mood. Because mood or emotional states have been shown to correlate with the SDS (Sheldon et al., 1996), mood can differ between Western and Eastern people (Scollon, Diener, Oishi, & Biswas-Diener, 2004), and mood can affect self-agency ascriptions (Aarts et al., 2006), we measured mood to explore whether it plays a role in the relation between culture and experienced self-agency in the present experimental task. For this purpose, the mood items from the modified version of Salovey and Birnbaum's (1989) Affect-Arousal Scale were administered. The items aim to differentiate feelings of mood on 10-point scales. The mood items were *bad–good*, *sad–happy*, and *displeased–pleased*. Participants responded to each item in terms of how they felt about themselves ($\alpha = .67$).

Measurement of self-reported task importance. To check whether participants from the Netherlands and Japan perceived the self-agency task as equally important, two questions were posed that measured participants' perceived importance and value of the task (1 = *not at all*, 10 = *very much*). These two ratings were averaged ($r = .41$) into an index of self-reported task importance.

Debriefing. As in our earlier work (Aarts et al., 2005; also see Jones et al., 2008), a debriefing showed that none of the participants had seen the position primes. Furthermore, none of the

Table 1. Means and Standard Deviations of Experienced Self-Agency as a Function of Outcome Priming and Country

	Netherlands		Japan	
	M	*SD*	*M*	*SD*
No outcome prime	4.39	1.44	3.91	1.60
Outcome prime	5.14	1.47	4.77	1.61

Table 2. Means and Standard Deviations of the Self-Determination Scale, the Mood Scale, and Self-Reported Task Importance as a Function of Country

	Netherlands		Japan	
	M	*SD*	*M*	*SD*
Self-determination (5-point scale)	3.96	0.50	3.61	0.61
Mood (10-point scale)	5.83	1.40	4.13	1.62
Perceived task importance (10-point scale)	5.77	1.03	5.45	1.15

participants realized the true nature of the study. One participant indicated a misunderstanding of the task instructions and was therefore omitted from the analyses.

Results

Effects on Experienced Self-Agency

There were no reliable main or interaction effects of sex; hence, analyses with this variable are not reported. The average ratings of experienced self-agency across the eight no-outcome-priming trials and eight outcome-priming trials were subjected to a 2 (country: the Netherlands vs. Japan) between-participants × 2 (outcome priming: no vs. yes) within-participants ANOVA. The main effect of outcome priming was reliable, $F(1, 151) = 19.52$, $p < .001$, $\eta^2 = .11$. Experienced self-agency was higher in the outcome-priming condition than in the no-outcome-priming condition. Furthermore, Japanese participants' experienced self-agency was lower than that of the Dutch participants, $F(1, 151) = 6.32$, $p = .01$, $\eta^2 = .04$. This effect, however, was independent of outcome priming, as was revealed by the nonsignificant interaction effect ($F < 1$). The means of each cell in the design are displayed in Table 1.

Differences Between Countries on Self-Determination, Mood, and Self-Reported Task Importance

To examine potential differences between the Netherlands and Japan on self-determination, mood, and self-reported task importance, we submitted the three scales to an ANOVA with country as the independent variable. This analysis yielded significant differences on self-determination and mood; Dutch participants considered themselves to be more self-determined in their lives, $F(1, 151) = 17.62$, $p < .001$, $\eta^2 = .10$, and their experienced mood was more positive than that of Japanese participants, $F(1, 151) = 47.52$, $p < .001$, $\eta^2 = .24$. There were no differences between the two countries on the self-reported importance of the task ($F < 1$). Table 2 presents the means of the scales for both countries.

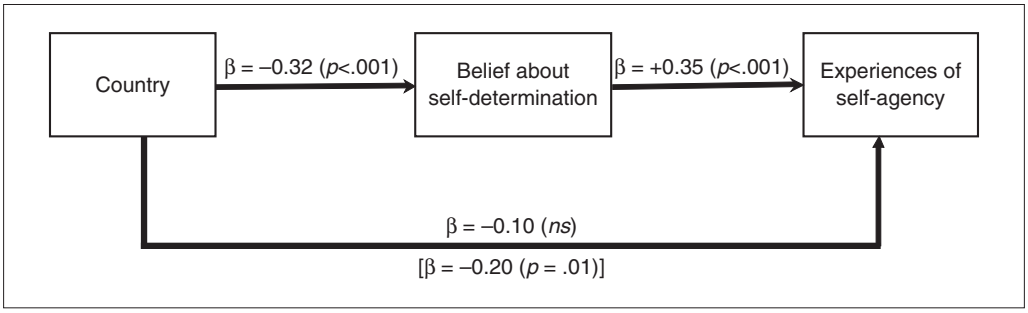

Figure 2. Mediating role of belief about self-determination in the effects of country on experiences of self-agency
Note: The beta in brackets represents the unmediated effect.

Examining the Mediating Role of Self-Determination and Mood

Given that Japanese participants were lower on self-determination and mood than the Dutch participants, we examined whether these two scales mediated the relation between country and experienced self-agency. Accordingly, we submitted experienced self-agency to two separate regression analyses, with country as the independent variable and the SDS and the mood scale as the mediating variables.

The analysis with the SDS showed that the relation between country and self-agency was significant, $\beta = -.20$, $t(151) = -2.51$, $p = .01$. Furthermore, country was significantly related to self-determination, $\beta = -.32$, $t(151) = 4.20$, $p < .001$, and the regression of the SDS on experienced self-agency was also highly significant, $\beta = .35$, $t(151) = 4.50$, $p < .001$. However, controlling for the SDS wiped out the effect of country on experienced self-agency, $\beta = -.10$, $t(150) = -0.10$, *ns*. A Sobel test revealed that this mediation effect of self-determination was significant ($z = 2.05$, $p = .04$). Furthermore, the correlations between the SDS and the averaged self-agency ratings in the no-prime and prime condition were $r = .25$ ($p = .002$) and $r = .21$ ($p = .007$), respectively, showing that self-determination belief is associated with authorship ascription in both conditions. Importantly, a test of the opposite model was unreliable: A regression analysis examining the effect of country on self-determination while controlling for experienced self-agency did not cancel out the original relation between country and self-determination, $\beta = -.27$, $t(150) = 3.52$, $p < .001$. These findings indicate that the effect of country on self-agency was mediated by self-determination, suggesting that Dutch (in comparison to Japanese) participants experienced more self-agency because they consider themselves to be more self-determined. Figure 2 shows a schematic presentation of this mediation effect.

Second, the analysis with the mood scale showed that regression of the mood scale on experienced self-agency was marginally significant, $\beta = .16$, $t(151) = 1.95$, $p < .06$, and that, after controlling for the mood scale, the effect of country on self-agency was still present, $\beta = -.17$, $t(150) = 2.02$, $p < .05$.

General Discussion

The aim of the present study was to compare participants in Western and Eastern societies to examine the universal and cultural routes to authorship ascription and the experience of self-agency. We hypothesized that the experience of self-agency would arise from two separate routes: a cognitively ingrained authorship ascription process that is automatic and does not rely on declarative knowledge and a more culturally bound reflection process that relies on the

conscious application of declarative knowledge, such as beliefs about the relation among self, control, and responsibility (also see Chiu & Hong, 2007). Our results provide evidence for this notion by showing that the mere priming of outcome information in an action-outcome task, where the cause of the outcomes is ambiguous, enhances the experience of self-agency irrespective of culture. Both Dutch and Japanese participants experienced an augmented sense of personal authorship for the outcomes observed in the experiment when the matching outcome information was briefly flashed in their minds just before the action took place, even when in fact they did not have actual control over the outcomes. These results provide strong initial evidence in support of the cross-cultural validity and the generalizability of nonconscious authorship ascriptions to Eastern populations. The cultural invariance we have witnessed in the present study adds to recent lines of research pointing to the robustness and ingrained nature of a social cognitive mechanism that is tuned to easily signal oneself as the current agent for outcomes resulting from concrete actions (Aarts et al., 2006; Jones et al., 2008).

Furthermore, although the effect of outcome priming was observed to be invariant across the two cultures under investigation, it is also important to note that the experience of self-agency resulting from online matches between the outcome of an action and reactivated knowledge about the outcome also had a clear cultural basis. Dutch compared to Japanese participants experienced higher levels of personal authorship over their action outcomes. Although this relation between culture and self-agency could not be attributed to individual differences in mood states or self-reported importance of the self-agency task, the difference between Dutch and Japanese participants in the experienced levels of self-agency was fully mediated by beliefs about self-determination. Thus, the present findings are novel and extend previous work on the relation between culture and agency-related judgments (e.g., Chirkov, Ryan, Kim, & Kaplan, 2003; Kashima et al., 2005; Yamaguchi et al., 2005) by showing that online experiences of self-agency during action performance may be modulated by and grounded in cultural values and beliefs about the role of the self in choice and control. Importantly, these results also are consistent with the idea that culturally endorsed beliefs about self-determination are another unique source of information that people reflect on when making agency judgments (cf. Cohen et al., 2007; Markus, Kitayama, & Heiman, 1996; Triandis & Gelfand, 1998).

Taken as a whole, then, these findings suggest that there are two independent processes from which the experience of self-agency emanates: a basic authorship ascription process (shared across cultures) and a reflection process that is based on culturally bound beliefs about self-determination. Although the rationale behind the operation of these two separate processes for the experience of self-agency requires further theoretical and empirical scrutiny, it may be plausible to assume that they confer significant adaptive merits. On one hand, a basic and stable process that relies on online matches between expected and actual action outcomes may be essential in maintaining a rigid sense of authorship even at times when narrative conception of the self is disrupted (e.g., in case of severe amnesia or other conditions that may disrupt an explicit authorship ascription process; e.g., Aarts et al., 2006; Jones et al., 2008). On the other hand, agentive judgment about who should be held responsible in a certain situation should be sensitive to cultures and contexts, and thus a more malleable authorship ascription process that is shaped to fit cultural or contextual demands to appropriately downplay or augment the experienced levels of self-agency may prove essential to any human society. It may be an interesting future agenda to examine the idea that the former type of self-agency remains intact under conditions in which the latter type of self-agency is affected and how these separate mechanisms may work together in a complementary manner to yield a consistent yet flexible sense of self-agency that we endorse within and between different cultures.

It should be noted that the present study employed an experimental paradigm that allowed us to demonstrate that participants' experiences of self-agency result from a match between accessible (primed) foreknowledge and the observation of an outcome but that these experiences

occurred independently from actual causation. In a sense, then, their experiences of self-agency were open to illusions. This observation concurs with research in social neuroscience showing that, in general, the production of behaviors and the assessment of authorship are handled by anatomically separate, distinct parts of the brain, that is, motor versus parietal cortex (Chaminade & Decety, 2002; Farrer & Frith, 2002), raising the possibility that we can experience personal authorship quite independent of any actual causal connection among our thoughts, actions, and outcomes. Recent work suggests that the neural substrates involved in a variety of social cognitive processes are often similar across different cultures but sometimes depend on a person's cultural background (Han & Northoff, 2008). Accordingly, it may be a fruitful and interesting endeavor to explore whether the neural mechanisms that underlie authorship ascriptions and the experience of self-agency within the present paradigm are also culture sensitive.

The present work may have some implications for research on cultural variations in self-serving biases. That is, Western people have been shown to be more inclined to attribute positive outcomes (or success) rather than negative ones (or failure) to the self, whereas these self-serving attributional biases are less pronounced in Eastern samples (for a review, see Kitayama, Takagi, & Matsumoto, 1995). Although the present work differs from self-serving bias research in that self-agency emerged from online matches of primes and observed outcomes that were neutral rather than positive or negative, it may be possible that the value of the outcome in question may introduce a potential bias, which may be moderated by culture. The paradigm we have employed in this study may be well suited for addressing these important issues in cross-cultural psychology.

To conclude, we observed that experienced authorship is enhanced through the mere priming of matching outcomes. Such influence is likely to occur as our mental apparatus heavily relies on behavioral outcome information to establish a sense of personal authorship. We also found that Western (Dutch) and Eastern (Japanese) participants differ in their sense of self-agency and that these differences could be attributed to variations in beliefs about self-determination. Previous work has discovered cultural differences in social cognitive processes related to causal analysis of other people's behavior. The present study extends this literature and may offer a way to further understand and examine the universal and cultural components that underlie authorship ascriptions and the experience of self-agency resulting from online matches between primed and observed outcomes of one's own actions.

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