Distributed Cognition and the Will

Individual Volition and Social Context

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2 The Puzzle of Coaction

Daniel M. Wegner and Betsy Sparrow

Forward movement creates so many chances for awkward stalls and collisions, decisions about who goes first, right or left, mini-crises that make one conscious of authority and position.

—Francine Prose 2000, *The Blue Angel*

When people do things together, who is the author? There is a puzzle of coaction, for example, in whether Fred Astaire or Ginger Rogers should be credited as the artist who inspired the couple's classic dance duets. Who was really doing the dancing? Cartoonist Bob Thaves remarked that even though Astaire was great, "Rogers did everything he did, backwards and in high heels." In the whirl of their tightly coupled performances, who was to know that he truly led and she followed? And just like their footwork, their romance in the film musical *Top Hat* posed the same puzzle. One reviewer noted: "He plays the role of the pursuer and she the pursued, but it is Rogers who controls the game" (Mueller 1985).

The fact is that for Fred and Ginger, and for every coacting couple, group, or collective, the puzzle of coaction is open to multiple possible solutions at every moment. The perception of the authorship of coaction can shift and shimmer from one coactor to another in our minds, and we may even perceive that the action is being produced by no individual—and instead by the group as a unit. This chapter is concerned with how people go about solving the puzzle of coaction in everyday life, particularly when it comes to perceiving their own role in coaction. As we will see, understanding how people perceive coaction will take us well beyond the matter of sorting out credits among agents—leading eventually to a key insight into the vexing question of why people experience their own actions as consciously willed. The puzzle of coaction may be the reason we each have the experience of acting.

Forms of Coaction

Coaction occurs when one agent's action is influenced by or occurs in the context of another agent's action—and together they do something that is not fully attributable to either one alone. A prototypical case of coaction occurs when a bride and groom together grasp a knife and cut into their wedding cake. The movement is jointly determined, giving immediate rise to the question of authorship. There are several possible forms of coaction, varying in the nature of the linkage between coactors. Although these forms are not necessarily mutually exclusive, they are worth enumerating to review the range of potential coactions.

1. Physically coupled action The most obvious form of coaction occurs when agents are physically linked in some way. Fred and Ginger often held hands, for example, and such coupled action appears as well in many other instances: wrestlers in a clinch, pallbearers carrying a casket, children playing ring-around-the-rosy, a couple having sex, a group at a séance guiding the planchette on a ouija board, runners in a three-legged race, or teams in a tug of war, all share mechanical connections that influence their actions. Coupled action may occur with a designated leader, or it can arise without recognized leadership.
2. Psychologically coordinated action When an agent moves in a way that takes into account the action of another agent, coaction occurs through coordination. This is perhaps the broadest class of coaction, including every sort of turn-taking and all the coactions that involve the synchronized pursuit of action plans. People marching in a band, playing tennis, doing the wave, having a snowball fight, or having a conversation are examples. These kinds of coactions occur by plan or impromptu with or without leaders.
3. Mimicry When one agent copies the action of another, there is coaction. There may also be partial mimicry, as when one agent copies another's action and transforms it. In the case of mimicry, of course, it is typically understood that the first agent to act is the leader. Leadership of mimicry can be unclear when the mimicking is not consciously undertaken, however, and there are also cases of mutual mimicry (After you... no, after *you*... no really, after *you*, etc.) when it becomes progressively more difficult to discern who started the coaction.
4. Obedience and conformity When one agent issues a suggestion or command to another and so guides the other's action, coaction can also be said to have occurred. Obedience includes a whole realm of social activities, from teaching, parenting, and following a recipe or written instructions, to participating in hypnosis, yielding to the influence of the mass media, or following orders to commit an act of war.

Obviously the analysis of coaction involves most of the field of social psychology, not to mention pretty much every other social science. Much is known, then, about why and how people engage in coaction. The specific concern here is how, in the context of coaction, individuals perceive their own authorship and assign causal responsibility to self and others for the actions in question. The point of noting these forms of coaction is to highlight the fact, at the outset, that life is full of opportunities in which it may be unclear who is responsible for what is being done, and in which one's own action can be embedded in complex surroundings that might make the authorship of that action difficult to distinguish. All that is needed to blur one's authorship is a physical connection to another person, an attempt to coordinate action with a person or mimic what is done, or a circumstance in which one follows a person's explicit direction. Every such case occasions the question "Whodunit?"

Authorship Processing

We each have ready answers to questions of our own authorship. Asked whether you are the one reading this sentence, you could quickly concur. This facility for knowing what we are doing suggests that the human being has evolved a set of systems for the purpose of establishing knowledge of authorship of own action (Wegner and Sparrow 2004). These systems are exquisitely crafted, and include ways of learning from the *body* itself what it is doing (sometimes known as proprioception or introception), ways of establishing authorship by examining how the *mind* may have contributed to the action, and ways of incorporating external information about the *social circumstance* of the action—in particular, the presence and potential contribution of other agents. These systems typically operate together to produce one's sense of authorship. The sources of information they provide are independent, so they may add or subtract from each other, but they come together to produce the experience of consciously willing the action. The experience of conscious will, in this sense, is the final common pathway served by multiple indicators of authorship. These indicators are integrated to produce the sense that "I did it," that "I didn't do it," or any of the gradations in between.

Body Information

The body learns what it is doing through several sensory channels. Proprioception or introception of own movement involves systems sensitive to information fed back from the muscles to the brain (Georgieff and Jeannerod 1998), sensory information from joints, tendons, and skin (Gandevia and Burke 1992; Matthews 1982), visual information encountered as the eyes watch the body in motion (Daprati et al. 1997; Nielson 1963), and information fed forward by the brain to the muscles (Frith, Blakemore, and Wolpert 2000).

The nature of feedback from body to brain has been studied at length. The history of psychology and physiology feature classic works by Sherrington (1906), von Holst and Mittelstaedt (1950), Sperry (1950), and others investigating the role of efference (brain to body pathways) and afference (body to brain) in the production of action (Scheerer 1987). This research shows that people are able to sense joint positions and muscle movements directly. Still the sense of our own bodies can be remarkably weak when inconsistent visual information is encountered (Graziano 1999). People who are shown mirror or video representations of others' limbs in place of their own, for instance, can develop illusions that they are authors of the others' action (Nielson 1963), and this illusion is particularly compelling in people with schizophrenia (Franck et al. 2001; Daprati et al. 1997), movement disorders (Sirigu et al. 1999), and phantom limb experiences (Ramachandran and Rogers-Ramachandran 1996). The experience of bodily feedback can also be overridden by feed-forward processes. The brain produces sensory images of completed action, a kind of movement plan or template, and authorship experiences are attenuated when these expectations are not met (e.g., Blakemore and Decety 2001; Blakemore, Wolpert, and Frith 2000). The interplay between feed-forward and feedback is responsible, for example, for the fact that one cannot tickle oneself, in that knowledge of the feed-forward plan apparently leads to the cancellation of the feedback of the sensation (Blakemore, Wolpert, and Frith 1998, 2000).

Studies of proprioception only tell part of the story of authorship processing, for two reasons. First, research on the body does not explicate how we come to experience authorship for actions that seem to take place inside the mind (e.g., adding up numbers in your head). How do you know that you did that? Research on the body also does not encompass the key role of perceptions of intention, planning, and premeditation in the attribution of authorship.

Mind Information

The assessment of one's authorship is not just a polling of the body. It also takes into account information about one's thoughts, favoring actions as authored by self when thoughts occur prior to the action and are consistent with the action. The *theory of apparent mental causation* proposes that the self-perception of the relationship between conscious thoughts and consciously cognized actions underlies the experience of consciously willing the action (Wegner 2002; Wegner and Wheatley 1999). Normally, of course, we experience our actions as being caused by our intentions, and we interpret the intention–action sequence as evidence in favor of the efficacy of our conscious will; philosophers have often taken this personal observation as the basis for theories of human action (Bratman 1987; Searle 1983), and there is continued debate on the validity of this interpretation (Pockett, Banks, and Gallagher 2006). If mental causation is only apparent, however, we should expect that experiences of conscious will might be enhanced or undermined as a result of experimental manipulations of the apparent co-occurrence of thought and action.

A number of studies reveal that the experience of conscious will is susceptible to just such manipulation. Research testing this theory has found that when people are primed to think about actions just prior to their occurrence, they experience an enhanced sense of authorship for those actions—even when the actions are not their own. One set of studies explored whether people might come to experience the actions of others as under their control—when they are watching in a mirror as the other person standing close behind them extends arms on each side and makes a series of gestures (in a pantomime known as "Helping Hands"). These studies revealed that people report an enhanced sense of control over the other's arm motions when they hear the instructions for movement that the other is following—as compared to when the instructions are not heard (Wegner, Sparrow, and Winerman 2004). Simply knowing the actions in advance seems to yield an enhanced sense of authorship for them. Moreover this enhanced control was accompanied by an experience of empathy for the other's hands as well; participants who had heard the hand movement instructions were particularly likely to show emotional reactions (skin conductance responses) when they watched while one of the hands snapped a rubber band on the other's wrist.

In other studies, research participants have been led to think incidentally about some item—say, a frog or a deer—and then were asked to "type randomly" at a computer keyboard for several minutes and subsequently rate

the likelihood that they typed a number of different words. These participants rate their likelihood of typing "frog" or "deer" more highly than the likelihood of typing comparable words, and are particularly likely to report such authorship if they had encountered the primed word just prior to the random typing task (Gibson and Wegner 2003). Similarly, when people are asked to discern which of two moving blocks on a computer screen they are controlling, they are inclined to select the one whose eventual resting place they were primed to think about by a prior presentation of a block on screen (Aarts, Custers, and Wegner 2004). Reduced levels of thought relevant to an action have the expected complementary effect: when people doing a series of simple tasks (e.g., winding thread on a spool) are asked to try not to think about what they are doing during a task, they become less likely to report intending to perform that task (Wegner and Erksine 2003). These findings all involve people performing actions alone, but similar observations have been made in cases of coaction.

Individuals placed in hand-to-hand contact at a computer keyboard and asked to "read the muscle movements" of another person, for example, have been found to report being influenced by that person in their keyboard responses. They answer a series of questions correctly at the keyboard even though the person whose muscles they are ostensibly reading never hears the questions and was instructed to remain inert. The participants were entirely responsible for the communications and yet experienced their own actions as being performed by the other (Wegner, Fuller, and Sparrow 2003). This failure to recognize self as the source of coaction is the basis of the discredited technique of "facilitated communication," the practice of holding the hand of an autistic or otherwise communication-impaired person in the attempt to help that person type at a keyboard. Messages "facilitated" in this way are typically produced by the facilitator—who nonetheless experiences the messages as issuing from the autistic client (Jacobson, Mulick, and Schwartz 1995).

Coaction that occurs when people operate a ouija board together is open to a similar analysis. People moving a computer mouse together in an experiment simulating the ouija board report greater intention to stop an onscreen cursor on a particular item when they have been prompted to think about that item and know that the other person has not experienced this prompt (Wegner and Wheatley 1999). And when people are given to believe that their actions have helped or hurt another, they become prone to report that they intended and caused such a result when they are led to have thoughts relevant to the action before its apparent occurrence (Pronin et al. 2006). It seems there are many instances in which people take their

own thoughts into account on the way to inferring their intention and developing an experience of will for an action—even when those thoughts have no authentic causal relation to their action. These illusions of conscious will suggest that the experience of will is not an authentic indicator of how action is caused (Wegner 2002, 2003, 2004).

Social Information

In addition to information from the body and mind, information gleaned from the social circumstances in which an action is performed has a remarkably strong effect on the experience of conscious will for the action. A renowned instance of this effect occurred in the obedience studies conducted by Stanley Milgram (1963). Research participants were led to believe that they were teaching another participant in an experiment by applying electrical shocks whenever he performed incorrectly, and many were found to apply such shocks willingly—to the point of apparently placing him in grave danger and possibly causing his death. Yet these people were only willing to accept a modicum of responsibility for this action. Participants obeying the experimenter reported what Milgram called an *agentic shift*: "the person entering an authority system no longer views himself as acting out of his own purposes but rather comes to see himself as an agent for executing the wishes of another person" (Milgram 1974, p. 133).

The Milgram experiment represents an unusually powerful psychological situation (Ross and Nisbett 1991). When people are pressed by strong social circumstances into doing things they would not otherwise do, it makes sense that they would recognize these circumstances and view their own authorship as reduced. The experimental literature on causal attribution in social psychology reveals that people are indeed influenced by the presence of external forces and agents to attribute less causality to self (Gilbert 1998; Heider 1958; Jones et al. 1972; Kelley 1967). What this literature also shows is that social circumstances often do not need to be very powerful to undermine the experience of authorship. Human sensitivity to the influence of social circumstances on authorship is highly acute, as people respond to subtle cues that can rapidly and radically alter perceptions of who is in charge.

Perceivers' attributions of authorship are influenced, for example, by very small perturbations in the relative salience of individuals' contributions to coaction. A person wearing a brightly colored shirt is more likely to be held responsible for the direction of a group discussion than someone dressed so as to blend in, even when contributions are the same (McArthur and Post 1977). A person looking into a mirror is more inclined to rate self as

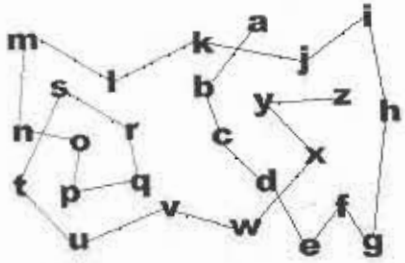

Figure 2.1
The alphabet maze.

responsible for hypothetical actions than someone without a mirror (Duval and Wicklund 1972, 1973), apparently because of increased salience of self as a causal agent. And such salience also operates when people are viewed from different physical perspectives. Perceivers looking at someone face-on, rather than over the person's shoulder, are more inclined to hold the person responsible for action (Taylor and Fiske 1978).

Subtle variations in the timing of contributions to coaction also appear to influence authorship judgments. When two people are walking along the sidewalk hand in hand, for example, and they take the opportunity of a break in traffic to cross to the other side of the street, they have engaged in a coaction. The question of which one decided to make the crossing just then is likely to be determined by what could be very small differences in the timing of their actions. The one who is perceived to have made the move first—even by a matter of a split second—will tend to be seen as the leader of this particular segment of their walk. A mere glance at one's co-walker might be enough to signify that the move is to be made, and people often seem aware of such subtleties as they maneuver on walks together. On occasion the walkers may discover that neither was really leading and they've become lost, but the far more common pattern is for both to know at each turn who is author of their coaction.

The influence of such fine differences in the timing of action and gaze on the experience of authorship for coaction was examined in a series of studies recently conducted in our laboratory (Sparrow and Wegner 2006). For these studies a participant was asked to perform the action of tapping out the letters of the alphabet in order with a conductor's baton by following a line connecting letters on a maze (see figure 2.1). The task involved tapping the letters on the click of a metronome set to click once per second. The participant and experimenter sat on either side of a Plexiglas

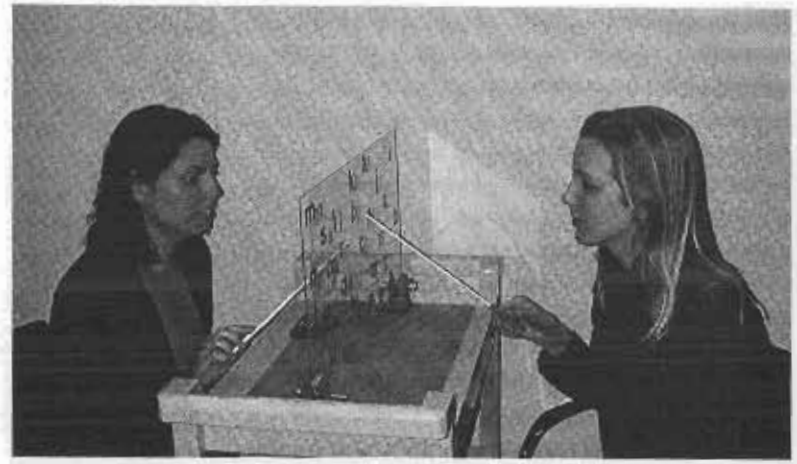

Figure 2.2
Experimenter (*left*) and participant (*right*) coaching.

sheet showing the maze (see figure 2.2), with the participant facing the letters. The participant completed the maze several times.

This task was entirely straightforward for participants, as all were happily quite familiar with the alphabet. After each completion of the maze, participants took a minute to rate the action on a set of scales measuring their experience of authorship. The scales included measures of the degree to which they felt responsible for the action, felt in control of the action, performed the action deliberately, performed the action voluntarily, and caused the action. Ratings on these scales were highly correlated, and were summed to yield an overall measure of authorship. The basic idea of the studies was to examine how various activities performed by the experimenter during the maze task might impinge on the participant's sense of authorship for this simple movement.

In a first experiment, participants completed the maze three times. For half of these participants, the experimenter also had a pointer and pointed at letters in time with the participant and metronome. For the other participants, the experimenter directed her gaze letter by letter through the maze in time with the participant. Perceivers are typically able to read the eye movements of a person to infer what is intended (Bekkering and Neggers 2002), so this study examined whether the gaze of the experimenter might be read and understood as might the experimenter's pointer movement.

In these between-subject sets of pointer and gaze trials, the experimenter carried out three different coactions (counterbalanced in order across participants). For one trial (with pointer or gaze), the experimenter pointed or looked at exactly the same letter as the participant. On this *simultaneous* trial, each person started on "A" and proceeded through the alphabet. For another trial, the participant started on "B" and the experimenter started on "A"—for this *leading* trial, then, the participant was always one step ahead of the experimenter. For a third trial, the participant started on "A" and the experimenter started on "B"—for this *following* trial, the participant was always one step behind the experimenter. This variation in the sequence of their activities was the only indication to participants of what was different across the three trials. At no point in the introduction of the tasks did the experimenter ever mention the terms "leading" or "following" or explicitly direct the participant's attention to the experimenter's gaze. All the tasks were introduced solely by reference to the details of the participant's required movement.

The results revealed that participants' reports of their experience of authorship were remarkably sensitive to the experimenter's coaction. Participants reported experiencing greater authorship for action during leading than during following, with simultaneous trials between these extremes. This was true whether the experimenter used the pointer or gaze to trace the alphabet. So, as in the case of the walkers stepping off the curb to cross the street, the one who does so first experiences greater authorship for the action, and the one who does so second experiences less authorship for the action—even though both are performing a coordinated coaction and their individual movements are indistinguishable. These findings also indicate that the experimenter's timed gaze placement has the same effect. Perhaps this is why it feels annoying to have someone read over your shoulder or watch as you work on a puzzle; their gaze exerts a kind of pressure that makes it less clear that you are the boss.

In this series of studies a second experiment arranged for participants to complete the same alphabet trials, but the experimenter always used a pointer, while some participants moved a pointer and others moved their own gaze. As in the initial study, leading produced greater authorship than following, and this was no different for participants using pointers or gaze. Apparently the person who is leading or following another's pointer movement with his or her own gaze experiences the same relative changes in authorship as the person leading or following with the pointer; watching ahead of someone's action makes you feel more the author of your eye movements than watching behind it.

We also wondered whether these effects were due to the participant's awareness that the experimenter could perceive their relative position—or if this effect might also occur in participants who were working with an experimenter who could not see their relative position. In a third experiment, then, participant and experimenter were placed in separate rooms with an embedded one-way mirror between them. Participants could see the experimenter, but knew the experimenter could not see them. Under these conditions, leading again induced greater authorship than following, so it appears that having one's coaction monitored by the experimenter was not essential to the influence of asynchronous action on authorship attributions. There need not be mutual knowledge of the relative timing of coaction to produce these social effects of relative timing.

Finally, we were curious about the degree to which these effects might be general across people, or whether they might be limited to people who are particularly attuned to the perception of other agents. Perhaps people who are "mindblind" (Baron-Cohen 1995) might not have the same acute sensitivity to the relative position of the experimenter's movement. Their experience of authorship might be determined more by their body and mind inputs and less by perceptions of the social circumstances of action. To assess this possibility, we had participants in a fourth experiment complete a pretest questionnaire to assess their autism-quotient (AQ) (Baron-Cohen et al. 2001), a self-report measure of individual differences in the sensitivity to social cues and other autism-relevant characteristics. The study revealed that participants who scored high on autism-like traits reported authorship that was unaffected by their position relative to the experimenter, whereas participants with higher levels of social sensitivity showed the effects of experimenter position as in the prior studies. The participants with autism-like traits had reduced authorship levels for coaction regardless of position.

These experiments, taken together, suggest that the authorship experience of normal adults is highly sensitive to relatively minor variations in the social context of a simple action. The alphabet maze presented no challenge to any of the participants, so it is unlikely that any real leading or following was taking place. Yet participants reported a reduced sense of authorship when their action occurred after that of the experimenter, and an enhanced sense of authorship when it occurred before. Apparently it doesn't take much in the way of social circumstances to override the multiple sources of authorship information in body and mind and produce an alteration in overall authorship experience. Someone else doing an action just before or after we do it makes us feel differently about whether we did it.

The susceptibility to social information in the experience of authorship is reflected in unique patterns of brain activation that occur during actual leading and following. PET scans were made for participants in one experiment while they imitated an experimenter's actions, were imitated by an experimenter, produced actions without imitation, or produced actions while the experimenter performed other actions (Decety et al. 2002). The same brain area was found to be activated both when one was imitated and when one imitated the other (left superior temporal sulcus, STS). Meanwhile there were also differential activations in these circumstances (the right or left parietal area, respectively). This pattern suggests that the STS is involved in understanding both one's own and another's actions, whereas the parietal area helps to differentiate which actions originate with the self and which originate with the other. The sensitivity to social circumstances in experiencing authorship is subserved by an intricate neural architecture that operates to incorporate this information into one's overall experience of authorship of action.

Coaction and Conscious Will

So why all this fuss about social effects on authorship? In one sense these effects are fascinating in themselves. It is interesting to observe that you can be driving merrily along the freeway, notice a car in a lane next to you pull slightly ahead and stay there—and get the odd sense that you've been bested somehow. Seemingly minute social maneuvers affect our inner sense of what we're doing, and this strange power is disconcerting. But there is another reason to be thinking about social effects on authorship feelings, a reason that turns us toward the more general issue of why we have authorship feelings at all. Think of it this way: if the experience of conscious will is a veridical reflection of the inner causal processes whereby action is produced, why is this experience so radically sensitive to the presence of external social pressures that may in fact be *irrelevant* to the production of the action? Another driver's position has nothing to do with your travel down this road at this moment. You were going there anyway. Why does this position impinge at all on your experience of authorship for driving?

The Official Doctrine

One clear implication of the influence of social irrelevancies on our experience of authorship is to undermine any wish we might have to accept what Ryle (1949) called the "official doctrine" of the mind—the idea that we know what we are doing. In a well-crafted critique Ryle wondered at the widespread assumption that the mind is "self-luminous"—knowing all that it does, including its causation of action. Ryle swept such ideas into a pile he called the "official doctrine." He produced a series of arguments suggesting that the person is not intrinsically informed of the mind's workings in this way, and instead is merely in a good position to observe the mind and draw inferences about its operation. In philosophy, Dennett (1984, 1987, 1991, 1996, 2003) drew from this observation the general insight that mind is in the eye of the beholder (his conception of the "intentional stance"). And in psychology, Bem (1967, 1972), and then Nisbett and Wilson (1977), offered a range of research findings consistent with Ryle's critique. These various themes all center on the notion that the person is a self-perceiver rather than a self-knower—particularly when it comes to authorship.

If the official doctrine were correct, the mind would always know what it does. After all, if the experience we have of consciously causing an action were a valid reflection of the entire causal enterprise producing our action, it should never be mistaken. The mind should be able to sort out and discount irrelevant circumstances such as the presence of another person performing the action before or after our own performance. At best, reports of the feeling of conscious will should reflect *only* the authorship information arising from the body—the proprioceptive or introceptive information noted earlier. The experience of conscious will shouldn't be fooled by experiments that introduce extraneous information about the state of the mind before the action, and it *certainly* shouldn't be pushed around by information indicating that another person is in the area and might be doing something similar! If the experience of conscious will is a conduit into the soul of our actions, an indicator of the very wellsprings of what we do, immaterial facts should not perturb it. But they do.

We've all had the experience of deciding to order something in a restaurant, only to find that someone dining with us orders this item from the server before we've had a chance to speak up. At this moment, although we usually don't mention it to anyone, we would like to be able to take the server aside and note that we had already thought of this dish and are not slavishly copying the other diner. The other diner's actions do not have any sensible bearing on the authorship we should feel for our selection—but we find our authorship feelings are warped nonetheless. This kind of thing suggests that the official doctrine simply can't be right. If the mind knows what it is doing as it causes its action, it can't be swayed at every turn by inconsequential matters such as who ordered first. The social

sources of authorship feelings in coaction, then, help us to realize that the experience of conscious will is a feeling our minds construct to reflect where they think authorship lies—not a feeling that radiates from a self-luminous mind as it reports its own causal power.

Authorship and Social Accounting

As this chapter is being written, there are several controversies in the news about claims of plagiarism. A Harvard undergraduate, Kaavya Viswanathan, has been accused of plagiarizing segments of her novel and the novel has been retracted by the publisher. The chairman of Raytheon Co., William Swanson, stands accused as well, in his case for parts of his *Unwritten Rules of Management* that were found to have indeed been written, but by someone else. The chairman took an immediate cut in pay. Claiming authorship for items that are not one's own is a risky business, bringing social opprobrium or worse when it is discovered. And these examples are just today's top stories.

The fact is that the accounting of who has done what is a central task of every human system, the foundation of justice and morality. Our tendency even to name or think about actions seems to arise from our need to figure out who did what (Feinberg 1970). The elements of social exchange that allow us to function as a society would be upended immediately if we weren't all keeping track at all times, at least at some level, of who does *everything*. Slips in accounting can destroy our system of interaction; we become concerned when authorship is confused. It bothers us when a person with schizophrenia claims to hear inner "voices" from others, as we know there is a lapse in appreciating authorship (Graham and Stephens 1994; Hoffmann 1986). We find ourselves getting nervous when someone such as President George W. Bush claims that God is the author of his actions (Suskind 2004). People who claim too little authorship for self, like the plagiarists who claim too much, upset our sense of justice and threaten to undo our society (Homans 1961). As a result we will forever be worrying about who called the cab, who burned the turkey, who left the cat out overnight, who clicked the remote, who lost the twist tie to the ginger snaps... and on and on.

The importance of authorship accounting in social life makes the role of social cues in authorship judgments far more understandable. It's not just that other people might blur for us what we think we did—it's that everyone is continually trying to keep clear on what everyone is doing. There is a great social task at hand, the maintenance of society. With this in mind, the finding that people are influenced by who goes first in the alphabet

task begins to take on some meaning. In essence, this realization suggests that authorship judgments have evolved in humans not merely as a way of keeping track of personal causation as compared with the forces of physics in the world, but additionally, and more profoundly, as a way of accounting for own agency in a social world where agency in coaction is the measure of all things. The experience of willing an action is enhanced when others follow, and is reduced when others lead, even when the leading and following are causally irrelevant, because the experience is produced as a *reportable measure* of one's potential claim to causal influence.

Conscious will is an experiential indicator that lends a sense of "me-ness" to some portion of the maelstrom of coaction in which the self is involved. And this feeling produces something more than a rational judgment of authorship. It also yields a kind of authenticity, a sort of embodiment (Niedenthal et al. 2005) to the judgment that gives it much the same punch as an emotion. Like a feeling of joy or fear or anger, a feeling of doing marks an action as one's own in a way that is easily perceived and highly memorable.

Imagine that a toddler is tugging to get your attention and you push her away, perhaps with a bit too much vigor. She falls back on her bottom and begins to cry. Yes, you feel bad because she's crying. You feel worse because you were partly the author of that coaction, and you are responsible for what happened. The feeling that is produced in this setting, a sense of willfulness about the action, along with guilt and embarrassment for doing it, makes your authorship all too clear to you. You experience a sense of first-person responsibility for this event that is more telling about your reactions and subsequent feelings than any amount of third-person responsibility (responsibility attributed to you by others) that might be allocated in the court of toddler justice downtown (Wegner 2004).

The maintenance of social justice and the fabric of society, as well as the continued operation of morality in human affairs—these are all things that some commentators would have us believe are lost if there arises widespread belief in a deterministic model of human action (e.g., Nahmias 2002). The implosion of these social necessities does not hinge, however, on the existence of *real* responsibility. Thoughts do not have to cause actions for morality and human value to continue. Rather, there must be a personal perception of own responsibility. The real linchpin holding together society is *first*-person responsibility, the kind of thing that happens in your head and your heart when you nudge that toddler and know you did it. We could have a world of legal systems and punishment machinery

in place to hold people responsible for what society thinks they did, but if people never had any deep inner sense that they authored their actions, all of this would be for naught. Many prisoners may believe they don't deserve to be in prison—but what if nobody believed they ever had done something to deserve what they got? The experience of conscious will, along with its attendant moral emotions, is what gives us each an inner sense of our part in the grand scheme of coaction and allows us to accept graciously the deserts that society, by its own calculations, thinks we should get for our authorship.

Conclusion

The experience of consciously willing an action has long been understood as an expression of the true source of action: Actions we consciously will are those that indeed were caused intentionally by us. This is what Ryle called the "official doctrine," and it is an intuition that continues to be espoused by a number of psychologists and philosophers. It turns out, though, that people in psychological experiments are remarkably open to illusions of their own authorship, coming to conclude they have done things they did not, or to believe that they have not done things they actually did do, as a result of the introduction of misleading information about the relationship that exists between their own thoughts and actions, or about the relationship between their own actions and the actions of others.

In particular, the experience of coaction can be difficult to read properly. It is easy to become convinced that the irrelevant actions of others have implications for one's own authorship. When another person mimics your action before you do it, it seems that you are less responsible for your own action; when the other mimics it afterward, in turn, you feel an enhanced sense of responsibility for the same motions. These feelings reflect erroneous authorship judgments, and so indicate that the experience of consciously willing an action is only a fallible estimate of authorship—not a direct expression of the operation of personal causation. Human sensitivity to social cues in judging personal authorship in coaction also points to a useful observation about why such authorship feelings have evolved at all. The experience of authorship seems to have developed in humans as a building block toward the creation of social exchange systems. Knowing who does what may keep society together. Fred Astaire and Ginger Rogers must have had views of who was doing what in their dance team that led

to similar cohesion—a solution to the puzzle of coaction that kept them dancing cheek to cheek.

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