

stimulation was followed by varying explanations sounding like confabulations. From this meager observation Wegner concludes that the experience of will “may not be very firmly connected to the processes that produce action.” That is about the extent of his discussion of brain except for three pages (182–84) on the split-brain, to which I will return; the remaining 95% of the book concerns psychological observations and arguments.

Wegner does take note of Libet’s classic experiments with the readiness potential (Libet et al. 1983; cf. Libet 2003). It is quite clear that an action plan develops for some 300 milliseconds before the subject (S) is aware of the development, leaving 150 msec for the S to either abort the process or let it run to completion. At issue is not whether S’s choice is determined (either materialistically or theologically); what concerns us here is whether S’s choice affects the outcome. Wegner argues that 150 msec is not enough time for a choice to have an effect and that the experience of will “might just be a loose end” (p. 55). Wegner seems to consider consciousness, including will, to be epiphenomenal; for example, “the real causal mechanisms underlying behavior are never present in consciousness” (p. 97). Epiphenomenality is quite explicit in Figure 3.1 (p. 68 in the book), which shows that the train of causation of an action develops in parallel to the train of causation for awareness of the action; there is no contact between the two paths. This figure allows for no awareness of the developing action plan, contra Libet, and therefore no possibility of awareness affecting the outcome. Note that this figure is intended to describe the normal process, not the result of a lesion-induced disconnection as occurs with the alien hand (see below).

As disturbing as Wegner’s dismissal of will in the Libet experiment and his equal weighting of Penfield’s large data corpus with Delgado’s single case, are his muddling references to the split brain. He describes Sperry’s (1961) review as showing that the split-brain animal has “a capacity to do something with one side of the body but not the other” (p. 182). *Any* normal animal can do that! This is a remarkable bowdlerizing of Sperry’s view of the duality of intention in the split-brain. Regarding humans, Sperry (1974) wrote: “The minor hemisphere [is] thinking, remembering, reasoning, *willing*, and emoting, all at a characteristically human level” (emphasis added).

Regarding the split-brain human, Wegner looks for support in Gazzaniga’s description of an “interpreter” in the left hemisphere that rationalizes right hemisphere actions based on information unavailable to the left hemisphere. Wegner asserts that, “This theory locates the invention of intention on the left side of the brain.” Wegner’s partisanship leads him to misinterpret Gazzaniga, who long ago (Gazzaniga 1967) noted the disconnected right hemisphere’s capacity for independent action. Although Gazzaniga has described the disconnected human right hemisphere as having less cognitive ability than a chimpanzee or even a monkey (Nass & Gazzaniga 1987), he nonetheless has consistently described its capacity for independent action (Baynes et al. 1997; Gazzaniga 1995). A capacity for intention in each hemisphere has long been recognized by split-brain animal experimenters of many nationalities and ideologies (Bogen 1977), as well as current human researchers (Zaidel & Iacoboni 2003).

Wegner’s misunderstanding of the split brain is reflected in his discussion of the alien hand (AH). This term was introduced (Bogen 1979) specifically to describe the phenomenon of disclaimed but well-coordinated, apparently purposeful behavior of the left hand in right-handed split-brain patients. Thus, the AH has been ascribed to hemispheric independence due to callosal injury. The AH has also been attributed to an intrahemispheric frontal lesion disconnecting speech generation from the cortex producing the action. (A well-informed, brief word on the AH is an editorial by Goldberg [2000].)

That there is a *reality*, significantly ordered although often random, and that we can come progressively, bit by bit, to comprehend that order are basic assumptions not only of science. Much of life is our attempt to determine what is *true* or *real*. A crucial aspect of this search for truth is a better understanding of our own

behavior. Wegner has amassed a wealth of examples to show how easily our cognizing can be misled. But it does not follow that our direct experiences of will are typically illusory. Indeed, Wegner ultimately reverts in his final chapter to considering will as an emotion and he allows as how “our experiences of will . . . often do correspond correctly with . . . the actual causal connection between our thought and action” (p. 327).

## Calling in the Cartesian loans

Daniel C. Dennett

Center for Cognitive Studies, Tufts University, Medford, MA 02155.  
ddennett@tufts.edu <http://ase.tufts.edu/cogstud/~ddennett.htm>

**Abstract:** Wegner’s tactic of describing the conscious mind as if it inhabited a Cartesian Theater in the brain is a stopgap solution that needs to be redeemed by paying off these loans of comprehension. Just how does Wegner propose to recast his points?

Three quotations from Wegner’s (2002) book, each not just defensible but, I think, importantly insightful, take out Cartesian loans that are now overdue.

“*We can’t possibly know (let alone keep track of) the tremendous number of mechanical influences on our behavior because we inhabit an extraordinarily complicated machine*” (p. 27). These machines “we inhabit” simplify things for our benefit. Who or what is this “we” that inhabits the brain? A Cartesian ghost in the machine? Surely not, in spite of first appearances.

“*Conscious will is particularly useful, then, as a guide to ourselves*” (p. 328). Again, who or what uses this handy guide? Does one part of the brain use another part? Is it as simple as that?

“*Illusory or not, conscious will is the person’s guide to his or her own moral responsibility for action*” (p. 341). My body is causally responsible for whatever effects emanate from it, whether it is falling down a flight of stairs, or pulling the trigger of a gun, but I, the person “inhabiting” this body, am morally responsible only for my actions. Again, who is this person and what is he doing in my body?

I have defended Wegner’s tactic of temporarily indulging in these ways of speaking, and sketched a way for him to recast his points without relying on the ominous image of a Cartesian Theater in which the Self sits as Witness and Decision-Maker (Dennett 2003a; 2003b; 2003c). But I would like to see how he himself proposes to pay off these comprehension-loans, since he may have some other tricks up his sleeve.

## We believe in freedom of the will so that we can learn

Clark Glymour

Department of Philosophy, Carnegie Mellon University, Pittsburgh, PA 15213,  
and Institute for Human and Machine Cognition, University of West Florida,  
Pensacola, FL 32507. [cg09@andrew.cmu.edu](mailto:cg09@andrew.cmu.edu)

**Abstract:** The central theoretical issue of Wegner’s book is: *Why do we have the illusion of conscious will?* I suggest that learning requires belief in the autonomy of action.

*You should believe in freedom of the will because if you have it you’re right, and if you don’t have it you couldn’t have done otherwise anyway.*

—Sam Buss (Lecture at University of California, San Diego, 2000)

Wegner’s (2002) fascinating book argues that conscious will is like the existence of God: most everyone believes it most of the time, but it isn’t so. (The simile is mine, not Wegner’s.) Hence, what I take to be the central theoretical issue of the book: *Why do we*

have the illusion of conscious will so systematically and so pervasively? Perceptual illusions are explicable as unusual violations of the conditions under which our sensory processing are veridical, but attributions of free will are scarcely unusual, and an explanation is required. It is hard to resist attributing autonomy to others, even when we see the mechanics of reason come apart before our eyes. Anyone who has had day-to-day encounters with someone suffering from obsessive/compulsive disorder will have had the impulse to blame the sufferer for irrational actions committed in the course of their otherwise normal conduct and discourse. If we have no Cartesian freedom of the will, why do we have so fierce an inclination to attribute autonomy to ourselves and others? What function, what cognitive causal role, do such beliefs have that might help to explain their emergence and retention in the human psyche, and why do we have them *consciously*? Wegner offers an answer to the first of these twinned questions. I will offer another.

Wegner sketches this answer: Our conscious illusions of autonomous action inform us about ourselves and prompt feelings of moral responsibility and guilt, which influence our subsequent actions. That answer seems correct so far as it goes, but inadequate to the question. One could conceivably be perfectly aware of one's own actions without having the sense that one does them autonomously. Wegner's proposal does not explain why we attribute others' actions to their autonomous intentions with nearly the same force and immediacy of our self-attributions; nor does it explain why knowledge of action need be conscious – but neither will I.

Rather, here is another conjecture: *The implicit assumption of freedom of the will is essential to learning. If we did not at least unconsciously assume our own actions to be autonomous, we could not learn the effects of our own actions; and if we did not assume the same of others, we could not learn the effects of our own actions by observing theirs. If, in action taken or observed, the application of that assumption is conscious, we must have the illusion of conscious will.*

Consider scientific inference from observational, non-experimental, data. There are several possible explanations for a correlation observed among two kinds of events for which instances of one kind precede those of the other: Events of the first kind may cause the second; or some third factor or factors may influence both kinds of events; and there are still other possibilities. For concreteness, consider an association between smoking and lung disease, which could be explained by at least two different causal structures:

1. *Smoking* → *Lung Disease*
2. *Smoking* ← *Unknown* → *Lung Disease*

To make a reasonable causal inference, one must have grounds to exclude the second explanation. One rarely does, and that is why observational science is hard. Experimentation tends to eliminate alternative explanations of data. What makes an experiment an experiment is that acting from outside the system under study, the experimenter determines the value of the causal variable, or determines its probability distribution. If the experimenter fixes or randomizes the value of the causal variable in each case, and does so by a method not influenced by other features not under the experimenter's control, then there is no confounding. If we force someone – or an entire population – not to smoke, then we eliminate confounding, and, if smoking does not cause lung disease then these two variables are uncorrelated in the experimental results. (For mathematical details, see Pearl 2000; Spirtes et al. 2001; and for a philosophical exposition, see Woodward 2003.)

Independent manipulation does not make causal learning possible, but it makes it enormously easier to make accurate causal inferences. Whatever the circumstances, if one does not impose the premise – warranted or not – that the association of putative cause and effect is not produced by other common causes of both, the inference to causation is wanton.

For our inner workings – the unconscious, biological algorithms of thought – to allow that actions have unknown causes would be precisely for them to allow that those unknowns might also cause the immediate and slightly more remote events that we take to be

effects of actions; action and event would be potentially confounded and no causal inference would be possible in everyday life, just as no causal conclusions are possible in ill-designed, confounded, scientific experiments or in poorly designed observational studies. So, unconsciously at least, to be intelligent in the way we are, we *must* presuppose autonomous actions – and to make correct causal inferences, actions and their effects must for the most part actually be unconfounded by common causes. An organism that did not so assume might learn by association, but its ability to plan and foresee the effects of interventions in the world would be severely limited. Daniel Povinelli (2000) and Tomasello and Call (1997) give evidence that our nearest biological neighbors are limited in these respects, while Gopnik et al. (2004) give evidence that even quite young children make comparatively sophisticated causal inferences from data in which passive correlations and effects of interventions are combined. If, from whatever causes, the assumptions of our inner processes that lead to action are consciously manifested in the very instance of action or in the perception of action in others, we will have the conscious sense of autonomous agency, of freedom of the will. And we do. We think immediately that our actions cause the observed effects, and nothing else causes both our actions and the observed effects. Usually, we assume the same of others, and if we did not then we could not learn causal relations from their actions and the events that follow them.

#### ACKNOWLEDGMENTS

Thanks to Alison Gopnik for helpful discussions, to Sam Buss for the best argument, and to the Office of Naval Research for support of research.

## The elusive illusion of sensation

Valerie Gray Hardcastle

Department of Science and Technology in Society, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0247. [valerie@vt.edu](mailto:valerie@vt.edu)  
<http://www.mind.vt.edu/>

**Abstract:** The sensation of will is not the same thing as the will itself any more than the sensation of hunger is the same thing as being devoid of nutrients. This is not a really surprising claim, but it is the only claim to which Wegner is entitled in his book.

When I feel hunger pangs, am I feeling genuine hunger, or am I feeling “merely” the sensation that accompanies real hunger, a purely physiological state? If the latter, then hunger pangs must be some sort of illusion, a stand-in for states we cannot access consciously. When our bodies infer that they need more nutrients, we feel hungry. However, as the popular press makes very clear, we are often wrong about this inference and consequently feel hungry when we aren't really.

This meditation on hunger parallels what Wegner (2002) says about our sensations of willing an action. The sensation of willing isn't actually doing anything; it certainly isn't causing our bodies to behave in any particular way. Instead, the sensation is “merely” telling us that (we think) our own psychological states are driving our bodies.

Is this conclusion so surprising? I grant that we generally talk and think about the will in very sloppy terms, but when we get right down to it, do we really believe that the sensation of willing just is the will itself? I submit that we do not; we believe, if we have ever even thought about these matters before, that the sensation informs us about the sort of actions we are performing. If we feel the force of our will, then we believe that we, in some important and fundamental sense, are the causal agents responsible for what we are doing. The sensation of will isn't the will itself any more than the sensation of hunger is the same thing as being devoid of nutrients, or the sensation of warmth is heat itself, or the smell of a rose is the rose itself. In each case, our sensations tell us something about the world out there (or in here); they indicate or represent to us the way the world is (or we take it to be).