

language (Habermas, 1981, pp. 162–63). Therefore, explaining actions requires a double interpretation: interpreting what the agent means when he says that his actions are based on certain beliefs, desires, reasons and intentions; and interpreting these interpretations with the help of theoretical concepts and a theoretical scheme. Enç has no eye for this double interpretation problem and does not give it a place in his discussions. Now, I do not want to deny that an investigator can ascribe to an agent hidden, unconscious, motives that this agent does not know but that can make him act and that the investigator can describe in an objective, theoretical, way. But then it becomes unclear whether there is a difference between explaining what an agent does from such hidden, unconscious, motives or from his subjective explicit, conscious reasons. Does Enç's causal model apply in both cases?

Despite this issue, the model is a good step toward integrating the interpretive approach with—rather than reducing it to—naturalism, as so often is done; it also does not lead to the interpretive approach's rejection of naturalism, but rather does justice to both sides. Questions about meaning or double hermeneutics are then to be seen as questions about how to integrate meaning and double hermeneutics in the model, and not as questions that serve to cast doubt on it.

References

- Dretske, F. (1988). *Explaining behavior: Reasons in a world of causes*. Cambridge, MA: MIT Press.
- Habermas, J. (1981). *Theorie des kommunikativen Handelns, Band I. Handlungsrationalität und gesellschaftliche Rationalisierung*. Frankfurt am Main, Germany: Suhrkamp Verlag.
- Schütz, A. (■■■■).

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HENK BIJ DE WEG
Willem Coxlaan 3
3734 BV Den Dolder
The Netherlands
Email: henk@bijdeweg.nl

Essential Sources in the Scientific Study of Consciousness

BERNARD J. BAARS, WILLIAM P. BANKS, & JAMES B. NEWMAN (Eds.)
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At a recent workshop on “The Concepts of Consciousness,” Bernard Baars (2004) gave the initiating keynote address. At the podium, he had a copy of the present volume, which he brought to give to Scott Jordan, one of the conference organizers. However, he found a second use for the volume. As part of his address, Baars pointed out that he had often been asked, over the many years that he has been trying to initiate a science of consciousness, “But is a science of consciousness possible?” Now, he announced, he has an answer. As he slammed the book on the podium,

he said: "It is not only possible, but here is evidence that it exists." With over 1200 pages, and 68 readings dated from 1949 to 2003, this anthology indeed presents not only an impressive volume, but an intimidating one as well. Yet we must ask, are there really that many essential readings in the scientific study of consciousness from the past 50 years? And, in spite of the formidable impression given by the volume, has the science of consciousness really come of age? Or, are we still in a pre-scientific or philosophical era with respect to a science of consciousness?

There are a number of recent anthologies on consciousness, most of which present a philosophical or interdisciplinary perspective. This retrospective anthology may be the first that focuses entirely on works by cognitive scientists and neuroscientists with no philosophers in their midst. Does this mean that we are at last developing a real science of consciousness, or is it an illusion? Will this "new" science of consciousness once again get replaced, like the science of consciousness of the 19th century, by a more behavioristic alternative entirely opposed to any taint of introspection as a methodology?

After scientific interest in consciousness was suppressed by behaviorism for roughly 50 years, from 1910 to 1960, it has had a slow but increasingly speedy reemergence during the last half-century. However, before the study of consciousness could reach its heyday (the past 15 years or so), consciousness had to be rediscovered as a necessary concept in the emerging disciplines of cognitive science and neuroscience, which initially avoided the concept that had gone into disrepute. Now, it has had a rebirth practically in full bloom, as the methods of cognitive science and neuroscience have come together in the emerging subfield of cognitive neuroscience. As the initial introductory paper by Baars makes clear, consciousness can now be studied as a variable, something with degrees that can be manipulated or observed, in the manner of other essential scientific entities like gravity.

Following Baars's introduction, about which I will speak below, the anthology is organized into ten sections, each preceded by an overview of the readings in that section. The sections are well organized with the introductions providing useful frameworks to view the readings. The first section, "Overview," has only two readings, one by George Mandler from 1975 in which he encourages cognitive scientists to take seriously the concept of consciousness; and the other by Francis Crick and Christof Koch from 1998, who give neuroscientists the same message. The second section has ten articles on consciousness in vision—an area in which a great deal of the relevant research has been conducted, showing progressive developments from cognitive science and neuroscience considered separately, to more recent studies in cognitive neuroscience. The third and fourth sections contain eight and seven articles, on attention and immediate memory, respectively. These sections are also successful in showing progressive developments on two crucial concepts related to immediate consciousness. The fifth section on internal sources contains five articles on visual imagery and inner speech. The sixth section, on below the threshold of consciousness, has important articles by Cheesman and Merikle, Shevrin and Dickman, and Libet. The seventh section, with nine articles on consciousness and memory, contrasts a variety of memorial processes where conscious vs. nonconscious

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processing makes a difference. The eighth section has six articles on unconscious and fringe conscious processes, while the ninth section's nine articles focus more widely on states of consciousness: waking, deep sleep, coma, anesthesia and dreaming. The final section presents a fascinating array of nine theoretical articles from the 1990s, whose diverse integrative frameworks, which often complement each other, show just how far we have come in the study of consciousness.

Taken as a whole, the anthology is a veritable smorgasbord of material to reflect upon attempts to understand consciousness as a functional activity of the brain and to distinguish it from nonconscious brain activity. With its vast array of captivating articles in diverse research areas, it is less to be faulted for what it includes, than for what, of practical necessity, it has left out. In my own case, I was disappointed that the editors chose to exclude research related to the role of self in consciousness, since it is central to understanding consciousness as a subjective phenomenon, and readings more directly on this topic might have contributed to the overall value of the volume. On the other hand, I took great pleasure in tracking, across several sections of the anthology, the development of research on neural correlates of consciousness that used binocular rivalry and other methods to distinguish between conscious and unconscious neural activity.

In his introduction (see also Baars, 1988, 2002), Baars argues that it may be essential to any science to turn what was once considered an all or nothing phenomenon into a variable with degrees. He applies this notion to consciousness, in particular to psychological phenomena where conscious as opposed to unconscious processing makes a difference in performance. He believes that a long tradition of contrasts between attended vs. unattended information, immediate vs. long-term memory, strategic vs. automatic control, and other psychological variables that overlap with consciousness, feed directly into the recent work on consciousness as an objective variable that can be investigated. It is here that we see why earlier work on other psychological concepts is presented in this volume along with more recent work that is explicitly on consciousness. The newer work is seen as continuous with the older work and both are presented here as essential works in a progressive development from cognitive science and neuroscience to the science of consciousness.

But why should we shift from the traditional terms that have become part of our scientific vocabulary in favor of consciousness as a variable? Many "information processing" psychologists balk at adopting the new terminology (e.g., Durgin, 2002; for a reply, see Christie & Barresi, 2002). Indeed, many of the papers presented in this anthology do not mention consciousness at all, and though some of their authors are now comfortable with the term, in these earlier papers they seem steadfastly to avoid it. So how does Baars justify using consciousness as a variable in addition to these other terms, and how does he operationalize the concept so as to distinguish it from other concepts?

Baars's main claim in the introduction and in earlier work about why consciousness should receive independent treatment is that it is an important variable in its own right and that it has wide ranging impact on psychological function. One example he gives is the difference in activity of an organism that is awake vs.

asleep. This obvious difference in degree of consciousness is associated with all sorts of adaptive phenomena which depend on an organism being alert, awake, responsive to stimuli, and goal directed in its activities. However, Baars does not restrict his attention to states of consciousness. He is more interested in the contrasts that occur between conscious and nonconscious processing in a normal, awake organism. He thus focuses on how we can operationally distinguish conscious from nonconscious processing in an ongoing state of consciousness, and uses self-report as the main basis for this distinction. In other words, we should accept as conscious what an individual claims to know by way of conscious experience, and accept as nonconscious what cannot be reported. This distinction is taken as a tentative operational definition of consciousness as a theoretical concept, and as such can be supported or defeated by other convergent operations. From a methodological point of view, what Baars stresses is that consciousness is not to be thought of as a private affair immune to public investigation, but one to be studied through empirical investigations involving self-report along with other measures of performance, or their neurological correlates. Furthermore, the interpretation of any of these measures must be theory-driven, and hence can be reinterpreted in light of further developments in theory and in empirical methods. Thus, introspective report does not stand alone as an infeasible methodology for the new science of consciousness as it may have for some introspectionists of the nineteenth century.

I believe that the historical content presented in this volume as well as very recent developments in cognitive neuroscience of consciousness provide strong support for Baars's position. Not only is there a progressive development of research in particular areas that use the concept of consciousness, but also there seems to be a developing theoretical convergence in accounts of how the brain supports diverse conscious activities. Variations on Baars's own "global workspace model" seem to be at the center of this theoretical convergence. The basic idea is that devoted and mainly unconscious parallel processing activities compete for representation in the limited global workspace which *is* consciousness. To become represented there, the processing activity must be mutually supportive and integrated with other processing activities also currently in consciousness or be strong enough, with the aid of its own compatriots, to overthrow the current dominant regime. Both theory and research is converging to indicate that there is a thalamic-cortical loop which controls both states of consciousness and shifting content of consciousness. Moreover, research on brain activities is beginning to combine with purely psychological studies in identifying waves of cortical activity involving primary sensory areas, parietal association areas, and prefrontal cortex as integrated in a bottom-up and top-down loop of conscious activity. Indeed, recent developments in cognitive neuroscience of consciousness indicate that the present anthology is already "old news" with respect to this exciting recent research (Baars, *et al.*, 2003; Dehaene, 2001; Laureys, *et al.*, 2004). But that is what we should expect from any new science that begins to outstrip its historical origins. Fortunately, we can thank the editors of the present volume for not losing sight of these origins, and for showing how they lay the groundwork for this new science, just as it emerges with the birth of a new century.

References

- Baars, B. J. (1988). *A cognitive theory of consciousness*. Cambridge, England: Cambridge University Press.
- Baars, B. J. (2002). The conscious access hypothesis: Origins and recent evidence. *Trends in Cognitive Sciences*, 6, 47–52.
- Baars, B. J. (2004, November 15). Treating consciousness like any scientific construct. Keynote address given at *The concepts of consciousness: Integrating an emergent science*. An international interdisciplinary workshop at Illinois State University, Normal, IL.
- Baars, B. J., Ramsøy, T., & Laureys, S. (2003). Brain, conscious experience, and the observing self. *Trends in Neurosciences*, 26, 671–675.
- Christie, J., & Barresi, J. (2002). Consciousness and information processing: A reply to Durgin. *Consciousness & Cognition: An International Journal*, 2, 372–374.
- Dehaene, S. (Ed.) (2001). *The cognitive neuroscience of consciousness*. Cambridge, MA: MIT Press.
- Durgin, F. H. (2002). An ostrich on a rock: Commentary on Christie & Barresi. *Consciousness and Cognition: An International Journal*, 2, 366–371.
- Laureys, S., Owen, A. M., & Schiff, N. D. (2004). Brain function in coma, vegetative state, and related disorders. *Lancet Neurology*, 3, 537–546.

JOHN BARRESI
Department of Psychology
Dalhousie University
Halifax, Nova Scotia B3H 4J1, Canada
Email: jbarresi@dal.ca

Thinking Without Words

JOSÉ LUIS BERMÚDEZ
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Nonlinguistic animals can be very clever. Daniel Dennett (1976) recounts a proud pet owner's anecdote of a dog quite possessive of a particular chair: on one notable occasion, the owner was sitting in the only chair that the dog is permitted to sleep in. The dog went to the door, ostensibly wanting to go out, but—as soon as the owner followed—the dog hurried back and climbed into her now-empty chair. And however compelling pet stories (and however sincere their owners) are, empirical research into infant and animal cognition proves even more suggestive; for example, chimpanzees display complex social behaviors that seem to include dissembling to secure food and mates. And many developmental psychologists assure us that we have little scientists hypothesizing in our cribs.

Suggestiveness does not pass for theory, but instead calls out for it. How should we account for such behavior? Upon hearing the story above, we might be tempted to ascribe to the dog the intention to trick her owner into believing that she wanted to go out. As Dennett points out, doing so means that we treat the dog as a higher-order intentional system—one capable of harboring beliefs about beliefs. And since we construe the dog as succeeding to deceive her owner, she causes him to believe