

Psychology Divided

Review of *Mind and Brain Sciences in the 21st Century*

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1. Introduction

The book is the second in a three-volume series (the first "volume", *The Science of Mind: 2001 and Beyond*, edited by Solso and Dominic Massaro, was published by Oxford University Press in 1995). It is a collection of papers written by distinguished cognitive psychologists and neuroscientists on the future of their disciplines. The papers are clearly genuine reflections on the fate of psychology and neuroscience by professionals embedded in their research programs. And they are valuable for what they are to contemporary and future psychologists, to philosophers, especially those interested in psychology and its current state as a science, and to anyone interested in the sciences of the mind.

As one might predict, the book is relatively short on bold predictions. Many authors provide historical overviews of their fields. Most make the safe though noteworthy prediction that neuroscience will continue its rapid progress--in particular, that new inventions will allow still better access to the structures and workings of the brain. Accordingly, perhaps the central issue of the book concerns the question of whether

psychology (in particular cognitive psychology) will be reduced to (or at least grow still closer to) neuroscience. Some authors explicitly give a positive answer to the question (Thompson, Smith, Gazzaniga, Roediger), while others imply it (Tulving, Posner & Levitin, Gevins). Kagan and Snodgrass are among those who do not foresee a reduction. With few exceptions, the reflections on the issue of reductionism in psychology tend to be statements of faith (frequently constitutive of the author's research program).<1>

The collection begins with a Foreword by Ernest R. Hilgard and ends with a (somewhat unbalanced) summary essay by the editor. Brief biographical notes on the contributors (together with photographs) follow. (One wishes that they contained more information about the field of study or achievements worthy of mention in Plato's world rather than being a compendium of the awards and distinctions in the social structure of this one). Hilgard's Foreword is a brief overview of the history of contemporary psychology. He voices the expectation that the future of psychology will be witness to a plurality of diverse theories since the discipline is still in a preparadigmatic stage.

In what follows, I will briefly state the main theses of the more interesting papers in the collection. Toward the end, I will try to offer my own speculation concerning the developments in psychology, which in a way synthesizes some of the predictions offered by the authors. The book is divided into three parts and my brief discussion of the essays will follow this organization.

2. Consciousness and the 21st Century

Although the papers are grouped under a single heading they disagree about the meaning of the term. It is taken to encompass concepts like sentience, self-awareness, personal experience, private world, inner speech, mind understood as an "intervening variable," and so on.

Bernard J. Baars ("Psychology in a World of Sentient, Self-Knowing Beings") takes the question of the future to be *how* rather than *whether* to study consciousness. Aside from the usual cognitive pay-offs that such a study would have, he believes that the study of consciousness can humanize science, which notoriously depersonalizes its objects of study. Carl Sagan and Ann Druyan ("What Thin Partitions...") focus on the question whether animals other than humans possess consciousness and they claim a positive answer to the question as consciousness admits of degrees.

Richard F. Thompson ("Will the Mind Become the Brain in the 21st Century?") appears to hold an eliminativist version of the identity theory in prophesying that we will be able to dispense with the talk of the mind or consciousness altogether as we learn more about brain processes and the neurophysiological bases of behavior. Somewhat interestingly, he travels the road to reductionism via behaviorism (but the sort of behaviorism that centers around the claim that thought is inner speech--in Thompson's rendition, thoughts are the neural processes underlying inner speech). Although he declares himself as believing that

thoughts *are* neural processes, toward the end of the paper he appears to uphold a functionalist position, on which "true Turing machines" (p. 47) will have mind and consciousness since "the hardwares may differ but the principles need not" (p. 48). So, we might need to talk about the mind after all--at least in the form of such principles.

Endel Tulving's paper ("FACT: The First Axiom of Consciousness and Thought"), a science fiction story and a satire, is a real treat--it is both wise and entertaining. As Tulving is about to write the paper for the collection he is visited by a traveler from the year 2096 who, happily, is engaged in the study of the history of consciousness. Tulving offers some words of wisdom about our social lives, in particular the lives of the scientists (imagine a congress of scientists in a world of postmodern values, for example). As to the fate of the problem of consciousness, it is gradually (and imperceptibly) displaced with another problem "What is the matter with people who are interested in a scientific study of consciousness?" (He stresses the enormous ambiguity of the term itself, the disparate roles the concept of consciousness is thought to play in empirical studies, and the extraordinarily large number of studies devoted to it.) One of the central problems is that the concept is insufficiently determinate, which has permitted an unfruitful debate about machine consciousness to develop. Tulving hypothesizes that major breakthroughs will occur only when scientific minds are freed of this burden and when it is simply decided that machines do not think. The paper contains many interpretative layers. It is more than commended to the reader's attention.

3. Brain and Mind in the 21st Century

Edward E. Smith ("Infusing Cognitive Neuroscience into Cognitive Psychology") elaborates and illustrates the claim that cognitive psychology will abandon its high-level functionalism in favor of a neurophysiologically informed categorization of cognition. Michael I. Posner's and Daniel J. Levitin's "Imaging the Future" is perhaps a paradigm of the kind of paper that the collection was to contain. It has a number of relatively concrete predictions some of which are likely to have the specialist and nonspecialist readers raise their eyebrows (e.g. that the advances in cognitive neuroscience will have an impact on education, in particular on the way in which various subjects are taught, or that genetic bases of personality differences will be discovered). Alan Gevins gives a couple of suggestions of what to do with one's own personal brain scanner.

Karl H. Pribram's "The Deep and Surface Structure of Memory and Conscious Learning" "ruminates" on two topics: the deep and surface structure of memory and conscious learning as self-organization. In an uneven style (inserted is a long quotation from his letter to J. McClelland and B. McNaughton, which itself contains two other longish quotations, this time from printed sources), he briefly summarizes some of the problems and received positions, and goes on to suggest a preferred way of thinking about them. He ends with some broadly understood philosophical speculations concerning the relation between the mind and the brain. The position Pribram prefers seems to be that of

functionalism (structural identity), though he weaves in elements of Platonism, Aristotelianism (search for final causes) and Pythagorean pragmatism.

Michael S. Gazzaniga asks "What Are Brains For?" His immediate one-word answer ("Sex") is reminiscent of the deplored exaggerations common in the popular press. He really means reproductive success, of course (so, the frigid wife devoted to her children is evolutionarily correct). Provocative language aside, the paper advances the view that the brain is a system of complex adaptations and takes their discovery (in particular the question of exactly how they are instantiated in the nervous system) to be the principal task of neuroscience. Gazzaniga makes the provocative suggestion (on the basis of two rather quick examples of the innate capacity for language and drug abuse) that psychological theories are "only superficial analyses that explain the noise in the biological system rather than how the system actually works..." (p. 159).

4. Psychology (Memory, Theory, and Cognition) in the 21st Century

Henry L. Roediger III ("The Future of Cognitive Psychology?") begins with a surprisingly insightful reminder of how unlikely it would be for anyone to successfully predict the future of a discipline. Aside from the obvious difficulties associated with the task, there are those connected with a researcher's being embedded within a particular research program, where the salience of the work of some casts long shadows over the potentially fruitful ideas of others, where prospering approaches tire despite (or perhaps because of) their enormous popularity, and where old rejected ideas revive in new climates. He gives five examples from his own area of research (learning and memory), the development of which could not have been predicted by either himself or his contemporaries 25 years ago. He then ventures to make some safer predictions (e.g., that few of the predictions in the volume will come true) and some more specific ones concerning the development of cognitive psychology. The latter fall into two categories. First, he hopes that future research on memory will be less "episodic" and less tied to the narrow context of a laboratory, that researchers will turn to the study of life-span memory informed by the "everyday memory movement," and that memory research will be even more interdisciplinary than it is now. Second, he foresees that cognitive psychology in general will deepen its association with neuroscience and even begin pursuing a reductionist approach. Aware of the anti-reductionist atmosphere, he usefully reminds the reader that reduction can give a discipline a firmer foundation.

Gay Snodgrass' "The Memory Trainers" is written in the form of an 2050 address by the memory researcher Joy Smoothlawn. She predicts that the funding for cognitive science will be drastically cut. This together with the social demand (created by increased life expectancy and the legalization of doctor-assisted suicide) for techniques to test and improve memory will transform the area of memory research into a practical field (the last theoretical advance is reported to have occurred in the 1990s--the address includes a

long historical overview of memory research). One interesting "hindsight" observation Smoothlawn makes is that the brain imaging techniques (such as PET, MRI or ERP) that appeared to hold so much promise at the end of the 20th century have all been abandoned. This is because memory assessment is based solely on behavioral rather than physiological measures.

Jerome Kagan's "On the Future of Psychological Categories" contains a number of predictions. Aside from venturing the relatively safe prediction that technical advances will allow psychologists to study phenomena that are now largely inferred, he prophesies the end of infant determinism. In particular, Kagan believes that developmental psychology will pay more attention to later experiences and to temperamental factors. Moreover, he predicts that the classification of psychological phenomena will substantially differ from the ones we know. Psychologists will begin using multiple criteria for the construction of concepts. Interestingly, Kagan believes that the division between neuroscience and psychology will grow rather than diminish. This is because the disciplines have different classification schemes: "the [neuroscientists] wish to explain contemporary brain states while the [psychologists] remain preoccupied with future behavioral and emotional states of the individual" (p. 247). Thus despite the predicted and predictable advances in neuroscience, psychology will not be reduced. It will develop its own independent conceptual framework.

George Sperling's "The Goal of Theory in Experimental Psychology" offers, broadly speaking, a methodological perspective on theories in psychology. He contrasts theorizing in psychology and physics and argues that it is in principle impossible for psychology to strive to achieve simple and general theories of the sort available in physics. He gives two reasons for this. First, psychological systems are products of evolution, where the various psychological adaptations accrue one on top of others. Second, psychological systems are capable of learning, as a result of which the output at any given point in time is a function of a very complex past. Neal E. Miller's paper is also short on predictions. Rather he conveys what he takes to be the most important lesson of the history of psychology. The future students of psychology need to be prepared for a lifetime of learning not only of psychology, its methodology, data and principles, but of other areas especially those where psychology can be of some use.

Hans J. Eysenck's primary concern is for psychology to become a real science ("The Future of Psychology"). He believes that psychology can have a real practical impact. For example, psychology has very good prospects of helping to *prevent* cancer or coronary disease, perhaps far better than medicine has of curing them. And yet, psychology has remained largely underfunded, while enormous funds flow to the medical profession. The problem is that psychology needs to cure itself by becoming a respectable science. In order to do this, it must cut itself off from the two movements that shaped and dominated much of its 20th century history: psychoanalysis and behaviorism. On one hand, psychology must fight the anti-scientific "quackery" of a variety of movements associated with applied psychology: psychoanalysis, humanistic psychology, existentialism, hermeneutics, etc. On the other hand, psychology must turn to the investigation of biological bases of behavior, thus ending the behaviorist dogma

(supported by the atmosphere of political correctness) that psychological phenomena are determined by environmental factors. Eysenck cites a number of studies which he either authored or co-authored that undercut the adequacy of the two troublemakers. Toward the end, Eysenck gives some examples of the kind of research he thinks would be most fruitful. He wishes, among others, to dispel common (politically correct) misconceptions about what the investigation of biological factors of behavior would entail.

5. Psychology (...) in the 21st Century

The perhaps outstanding prediction about the development of psychology missing from the book's pages is contained in its omissions. While the collection encompasses articles by known cognitive psychologists (many specializing in memory research), whole areas of psychology are simply unrepresented.<2> I probably should not even mention clinical psychology as this is likely to ignite some of the authors of the book even through the thick covers of a review. Still, clinical psychology is closest to people's lay understanding of what psychology is. And there are other seemingly more established areas that do not have their representatives. Social psychology stands out most profoundly.

If I were to venture a prediction it would be that psychology is going to face a schism in its foundations: cognitive psychology will separate off from the remainder of the field. To some extent this has already happened. Cognitive psychology has changed character by moving closer toward the neurosciences. In fact, because the field is undergoing such a rapid development, fostered by a rather amazing development of a variety of techniques to study brain functions, it tends to cast a cognitive shadow over the whole of psychology. The areas in its light seem all too prominent, while the remaining ones are overshadowed.

But the *raison d'être* of the schism is by no means a matter of technology. Technological advances have merely made the opposition more obvious. There is a more important conceptual reason concerning the distinction between two very different levels of description: the personal and the subpersonal (e.g., Dennett, 1987). Cognitive psychology, if not from the beginning then some time down its developmental path, has become focused on the subpersonal.<3> This is close to obvious nowadays largely because of the proliferation and success of neural network models. The psychological lies in the way that brain activity influences various kinds of cognitive functions of a person. The person is the end-point of the inquiry which does not figure in the inquiry itself (save for being the border beyond which the disciplinary interests do not reach). By contrast, disciplines like social psychology or (a part of) clinical psychology (the outstanding example here is object-relations theory) still understand the person as a whole and investigate his/her relations with the environment. The psychological concern is precisely with the form of the relations of the person with (most significantly) other people and other aspects of social reality. (The category of the person is, as it were, the starting point, whose interior is reminiscent of the behaviorist's "black box"-- unanalyzable save for the analysis offered in terms of the relations.)

It should be obvious to any reader that the contrast is overdrawn. Cognitive psychology has gone beyond the person's border and social psychology has looked beneath the skin. I believe that our increasing understanding of the importance of the contrast between the personal and the subpersonal, and the giving up of the too literal rendition of the metaphor of inner space (McDowell, 1986, 1994), will lead to a separation in the domain of psychology that is long overdue. This separation is only to be expected for conceptual reasons. It would resolve some of the internal tensions within the discipline (see in particular Eysenck's paper in the collection). What is less clear is that there would be the right kind of social infrastructure to support it. The rapid developments in the brain research have definitely given great grant opportunities for cognitive science. It is unclear that social psychology or theoretical clinical psychology could bear the financial burden of a discipline. If they could, the 21st century would see a separation of the sciences of the brain from the sciences of the mind (or better, self).

Notes

<1> A reader with a philosophical background should not expect to find arguments taking into account such classics as Dennett (1971), Davidson (1970) or Putnam (1967).

<2> Perhaps other areas of psychology are represented in the other volumes. There is no editorial comment to that effect in the book.

<3> This is not uncontestable. J. Fodor's (1975) program, for instance, is to insist on finding the personal in the domain of the subpersonal. Indeed, such temptation stems from the fact that we desire to but do not know how to make the transition between the subpersonal and personal. However, our only hope is to get a good and firm idea about the two separately first, rather than trying to force the understanding too quickly.

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