

questions that intersected with the confusions and ambiguities of children's thought. What has survived and endured from those early revelations, however, are the dense, and not entirely illuminating, theoretical interpretations of what had been observed. The ring and texture of children's thought seem to have disappeared as psychologists press to learn exactly what the child really knows. The accoutrements of precise, thorough-going research—standardized data-gathering procedures, apparatus, the need to gather data in great numbers—have produced a juggernaut of in-

vestigation that has all but lost sight of the child. It may be all right for a dentist, replete with mirrors, probing instruments, suction tubes, and assorted clamps, to lose sight of whose mouth it is in which he or she is working, but it has not been very productive for psychologists to adopt so narrow a focus or to rely on instrumentation that is so ungainly and overbearing. The delicate elusiveness of children's thinking may well be the object, rather than the barrier to be overcome, in the quest to understand how the mind develops. ■

guation. For example, Granger, Eiselt, and Holbrook, using both data and arguments from parsimony, sculpt a convincing view of linguistic inference. Not coincidentally, the article by Granger and colleagues on maze learning is another oasis of empirical evidence, in this case neurobiological. Most of the rest of the book, however, consists of appeals to intuitive plausibility and of anecdotal protocols obtained from mysterious subjects using undisclosed elicitation methods. For example, although Schank is among the most forthcoming in providing at least some evidence for his theoretical ideas, his 21 examples of explanations seem amazingly unrepresentative of everyday thinking. These subjects live truly examined lives; they seem hilariously out of synch with the real world. These are people who wonder why a friend holds a pillow at a certain angle or how the laws of physics might account for swirls in the snow. This virtuoso exhibition of explanation is fascinating because the subjects are so insightful and thoughtful. However, are they representative, and is this depth of explanation representative even for this rarefied breed? Some hint that methodology might help answer such questions.

Both Schank's ruminations on reminding and Kolodner and Simpson's anecdotes on analogies seem to fly in the face of results from many experiments indicating that people are obtusely impervious to helpful analogies in problem solving, even when the experimenter provides the analogies. The issue is not who is right, but rather that it behooves a theory of similarity-based reasoning to address such results. The insularity of the majority of articles in the volume from any kind of experimental data, external or internal, along with the fact that many of the intuitions are not as universal or self-evident as the theorist supposes, undermines what are otherwise interesting speculations.

The collective reluctance to refer to those beyond a small circle of investigators using very similar paradigms and the unwillingness to submit ideas to rigorous tests raise the possibility that these theories are precariously balanced on a common foundation of false premises. The crucial presumptions are that human reasoning is basically a rational, mindful, hypothetico-deductive, actively inferential enterprise. This generous view of the human reasoner is contradicted by the work of Langer, by numerous challengers to the Piagetian approach, and, most significantly, by the empirically

I Think, Therefore It Is

Janet L. Kolodner and
Christopher K. Riesbeck (Eds.)
Experience, Memory, and Reasoning
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Review by
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On reading *Experience, Memory, and Reasoning*, one senses that this field is taking its first steps in a journey that promises to last well into the next century. In this atmosphere of discovery, the authors take on challenging and profound questions that concern knowledge, language, and hypothesis formation. The problems are important, and their theoretical treatment is commensurate with their complexity. This richness, however, costs dearly in parsimony. Indeed, except for two instances, concern for adequacy so overwhelms parsimony that it seems to no longer exist as a consideration. Moreover, the authors generally eschew the coin of the realm, systematically obtained data, bartering instead with anecdotes and intuitions. Still, I would recommend this book as a source of provocative ideas by intelligent observers, with the proviso that those ideas be kept on hold until they are substantiated scientifically.

The array of topics is impressively diverse, ranging from understanding the workings of a toy tank to the uses of hy-

potheticals in legal reasoning. In several cases, the domain is overtly generic (i.e., Wilensky's article on the representation of conceptual knowledge). Whether the theorizing is aimed at a particular real-world context, the emphasis throughout inclines toward generalizable theoretical explanations for intelligent thinking.

Although many of the contributions seem like reports on work in progress rather than finished pieces, clusters of articles do conjoin into reasonably coherent statements. The articles on language are especially cohesive, virtually every one pointing to a large and interactive role for encyclopedic knowledge, in addition to dictionary-like information, in understanding language. The contributions on language are also essentially unanimous in continuing the trend away from the traditional psycholinguistic segregation of syntax and semantics, allowing elements of both types of knowledge to interact dynamically.

The articles on language also benefit from being grounded to some extent in empirical evidence regarding disambi-

well-armed battalions of investigators in the fields of judgment and decision making. Particularly in the latter case, the theoretical and topical questions being addressed are strikingly similar, yet the image of thinking is radically different. Again, it is incumbent on these theorists to comment on a chasm of such enormity.

The general approach taken in this volume is not explicitly justified here. Abelson's preface to Schank's (1982) *Dynamic Memory*, however, is an excellent apologia for this constellation of methodological and metatheoretical choices. Abelson closes the preface with, of course, an explanatory anecdote, the upshot of which is that being persnickety about empirical facts is for the hopelessly earthbound. He recounts the story of poor, dull Steven at summer camp who is taken to watch the sunrise. When the teacher rapturously exclaims that the sun is rising, poor, dull Steven corrects her by saying that the earth revolves around the sun. Who among us would not feel small-minded for insisting on the prosaic pursuit of data after such a devastating pursuit-down?

The analogy does not stand up under closer scrutiny, however. If theories should soar without constraints, and if data are for the small-minded, then we have theology rather than science. Theories should be more than articles of faith, with the congregation swayed by the most evocative rhetoric. If the teacher had said "Look! You can all see that the earth is flat!" our sympathies would quickly shift to Steven. Beguiling visions can be truth or lies, and it matters which.

The implicit trade-offs being made here are familiar. Data collection is difficult, its tedious details rob time from theorizing, computers are more accessible than human subjects, experiments are for people who lack ideas, experimental contexts are artificial, people are always more astute in real-world situations than in the laboratory, theories of complex phenomena require dispensation from parsimony, the assumptions are so obvious they do not need to be proved, one must always go beyond the data, and so on. These purported trade-offs lead inevitably to the theoretical cul-de-sac that whatever seems to be true actually is true, an often falsified conviction. The best theories do not settle for such Hobson's choices. We must aspire to both complexity and elegance, to expansiveness in substance but incisiveness in methodology, to risk taking in hypothesizing but rigorousness in observation, and to theorizing that leans to imagina-

tion but theories that bow to reality. This book rises above most in accomplishing half of these. It is, therefore, an ambitious and significant venture.

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Delusions in Depth

Thomas F. Oltmanns and
Brendan A. Maher (Eds.)

Delusional Beliefs

New York: Wiley, 1988. 352 pp.
ISBN 0-471-83653-4. \$37.95

Review by
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The persistent utterance of propositions that appear to clinicians and to nearly all other members of their culture to be manifestly absurd is undoubtedly one of the most general and critical signs meriting an attribution of serious disorder in the entire domain of psychopathology. It is somewhat puzzling, therefore, that so little attention has been devoted to defining such phenomena in precise terms or to examining their fundamental nature in ways that might shed light on the more primary aberrancies (e.g., schizophrenia, major mood disorder, intoxication, organic brain disease) usually presumed to underlie their occurrence. This book, largely the product of a conference held at Indiana University in April 1985, takes an important step toward exposing both the many conceptual anomalies remaining unsolved and the vastness of our ignorance concerning the antecedents of delusion formation.

The classical definition of delusion as a "false belief" is of course readily challenged by reference to any of a host of historical, cross-cultural, or religious, faith-based counters, according to which whole populations would have to be considered deluded—including many past generations of scientists. Contemporary definitions are therefore careful—as in *DSM-III-R*—to include some sort of constraint about the unusualness of the belief within the person's own cultural context. But that leaves us with the problem of the person who has an unusual idea that happens to be right, as with Columbus's

notion regarding the shape of Earth. Issues such as this one are thoroughly explored in various chapters of the book, and probably none of the authors would disagree with David Heise's (Chapter 12) explicit statement that truth value cannot reasonably serve as a criterion in defining "delusion." For Heise, interestingly, the critical issue is the person's maintenance of social commitment by thinking in a way that others can share.

As this volume makes clear, the world of ideas cannot in fact be neatly divided into the dichotomy of delusional versus nondelusional, a point well made by Oltmanns in an introductory overview chapter; as with the fate of most proposed dichotomies in psychology, this one turns out to be a continuum. The absence of a sharp line of demarcation enhances the likelihood that much of what is involved in what is called *delusional thinking* is in fact normal, if not routine—a once quite radical idea whose time may have arrived with the publication of this work. Many of the contributors, for example, grapple with the application of knowledge concerning "normal" cognitive processes to the understanding of delusional phenomena. The results are often intriguing.

This is probably not a book for the casual reader. The contributions are generally presented in a lucid manner, but the level of discourse is high and assumes a sophisticated readership. On the other hand, the book deserves to be on the essential reading list for every serious psychopathologist. ■

morality to women and men? What social relations are legitimated by such gendered constructions of reality, and whose needs do they serve? (cf. Mednick, 1989).

In emphasizing the value of love, care, and responsibility to others, Gilligan and her colleagues restore a central dimension to the study of morality. But linking moral modes only to gender serves to essentialize gender, "removing it from the context of relationships, discourse, culture, societal structure, and processes of historical formulation" (Broughton, 1983, p. 635). Searching for differences between women and men without fully conceiving of gender as a social category helps to create an ahistorical, global, and mythical Woman.

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Decisions and Revisions

David E. Bell, Howard Raiffa, and Amos Tversky (Eds.)

Decision Making: Descriptive, Normative, and Prescriptive Interactions

Cambridge, England: Cambridge University Press, 1988. 623 pp. ISBN 0-521-35149-9 (hardcover); 0-521-36851-0 (paperback). \$65.00 hardcover; \$29.95 paperback

Review by
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Do I dare
Disturb the universe?
In a minute there is time
For decisions and revisions which a minute
will reverse.

T. S. Eliot

Can there be a calculus of regret and disappointment? Is decision making

propelled primarily by calculated self-interest or by inchoate emotion, and is either the product or the process rational? Among goals, tastes, values, and desires, where is the actual preference, and which should we act on? And, most fundamentally, are such concepts as preference, value, belief, uncertainty, and utility real or constructed? These are

the sort of questions that suffuse the contributions to this volume, and that, more generally, drive contemporary research on decision making.

Such questions are addressed in 27 chapters, 20 of which are theoretical and 7 applied, and the theoretical papers are divided into three sections: conceptions of choice, beliefs and judgments about uncertainties, and values and utilities. The areas of application include decision making in medicine, in organizations, in competitive markets, by senior managers, and about public policy. The chapters are flanked on one side by an introduction-overview, and on the other by a transcription of the closing discussion of the conference on decision making held at the Harvard Business School in 1983, from which many of the papers derive.

Other papers are reprinted from research journals, a feature that makes the collection dated for researchers well versed in these areas. However, most readers will not be equally acquainted with research inside and outside of their discipline, and, therefore, the book should be very useful in bridging the interdisciplinary gap. Moreover, the problems discussed here are by no means resolved in current research and remain at the forefront of theoretical development. In particular, many of the papers are meticulous in laying out the historical and theoretical context of the research, various disciplines and perspectives are represented, and the quality of the contributions is, on the whole, superb. I should think that this volume will assume the status of a handbook for many and will be required reading in most courses on decision making. The addition of prescription to normative and descriptive considerations that two of the editors strongly propound has already begun to be adopted in textbooks (e.g., Baron, 1988).

The authors' answers to the questions posed above vary, although the trichotomy of descriptive, prescriptive, and normative goals allows for much smoothing over of differences. For example, if a theorist concedes that decision making as actually performed is irrational (descriptively) but that Subjective Expected Utility is a laudable model (normatively), then the decision analyst can continue to prescribe the SEU model as a palliative for the decision maker's deficiencies. However, decision makers are sometimes reported to be uncomfortable after taking the cure, and this is where theorists part company. Some argue that theories must encompass such notions as regret, self-

deception, or moral repugnance. Is there an irreducible modicum of discomfort and dissatisfaction inherent in making difficult decisions that need not be directly modeled, or do these social and psychological considerations constitute more than mere elaborations on the basic SEU model? In the latter case, as the editors point out, modelers must "sort out what is fundamental from what is derivative" and must be prepared "to grapple with deep problems of the 'divided self'" (p. 29).

The consensus that emerges in this volume seems to be that, whatever the origins of some apparently irrational behavioral anomalies, these are sufficiently robust that they should be addressed in theory. One approach is to relax some of the axioms of the canonical SEU model and see if these irregularities can be brought under a less restrictive umbrella. Another approach is to retain the overall SEU framework by modifying the model (e.g., by introducing reference points) or by supplementing it (e.g., by incorporating qualitative values). Interestingly, the book is a faithful reflection of the field of decision making in this regard, illustrating how theoretical change in recent history has been gradual and evolutionary, rather than abrupt or discontinuous. The SEU framework has been preserved in that decision making continues to be analyzed in terms of assessing probabilities and determining utilities, and the process of choice is seen as essentially computational. This is not to say that radical changes have not been proposed, most notably regarding the conception of human rationality (Shafer and Tversky, Tversky and Kahneman), but even this conception has evolved progressively with Simon's pathbreaking work comprising an intermediate step (as his chapter makes abundantly clear).

Thus, the history of decision making from Savage and Simon to the present compendium has not been characterized by paradigm shifts, but "behavioral and normative theories have developed as a dialectic" (March, p. 34), with the outlines of the SEU model discernible in both the descriptive and normative descendants. The trend for future research forecast by this collection is increasing emphasis on inherent subjectivity, relativity, and variability in decision making. The last point, that preferences are intrinsically variable and, perhaps, non-existent in an a priori sense, is capable of touching off revolutionary change in decision making theory, and its adherents present this as a fundamental qualitative

shift away from prior conceptions (e.g., Fischhoff, Slovic, and Lichtenstein; Shafer; Tversky and Kahneman). But even those who detect enormous variability in responses (in contradiction to the SEU model) do not necessarily take the step of abandoning that perspective entirely, deciding instead that "traditional EU theory may have to be modified" (Hershey, Kunreuther, and Schoemaker, p. 422).

The range of approaches in this volume can be arrayed from Bell and Raiffa's "Risky Choice Revisited" to Schelling's "The Mind as a Consuming Organ." Schelling's, and perhaps March's chapter, represents the most significant departure from the traditional method, erecting an almost poetic sensibility against precise quantitative analysis. Similarly, Argyris reminds us that a human mind, as opposed to a computer, operates in a vague, intuitive way that he calls "rigorous sloppiness" (p. 607). These theorists do not offer a coherent alternative to the SEU metaphor, and as Russell and Thaler note, "the neoclassical theory will not be abandoned until an acceptable (superior) alternative is available," and such variations as prospect theory or self-control

theory are "still basically maximizing" (p. 522). Yet, we marvel at that human mind that is "an embarrassment to certain disciplines, notably economics, decision theory, and others" (p. 353), whose enjoyment of a meal is "as much in the telling as in the eating" and whose ecstasy comes from an estranged child's arrival "at a parent's bedside in time to become reconciled just before the parent dies" (p. 354), an entirely mental consumption. The poignancy of choice exhibited in these examples is the subtext of the contributions on medical decision making, is salient in the discussion chapter on medical choices, and is acknowledged in one way or another by most of the contributors. It would be difficult indeed to point to any topic in psychology that both inspired such intellectually exciting theoretical work and that addressed problems of such immediate and profound concern. I would be surprised if any student exposed to this book did not, at least momentarily, consider joining the ranks of those who study decision making.

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Issues About Developmental Research Methods

K. Warner Schaie,
Richard T. Campbell,
William Meredith,
and Samuel C. Rawlings (Eds.)
Methodological Issues in Aging Research

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260 pp. ISBN 0-8261-5400-X. \$29.95

Review by
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Research on adult development and aging arguably requires careful understanding of issues associated with de-

sign and inference when the primary variables of interest are characteristics of individuals that are inherently not under