

dust are consistent with the observations in many cases, the time scale of flux variations rules them out in others. M. S. Longair's "An outsider's view of extragalactic infrared astronomy" provides a stimulating summary and points the way for many developments in the near future.

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## The Effects of Persuasion

**Cognitive Responses in Persuasion.** RICHARD E. PETTY, THOMAS M. OSTROM, and TIMOTHY C. BROCK, Eds. Erlbaum, Hillsdale, N.J., 1981. xviii, 476 pp. \$29.95.

Communication and persuasion—the processes underlying our ability to change the attitudes and beliefs of others—have concerned social psychologists for years. Indeed, when Hovland, Janis, and Kelley's landmark volume, *Communication and Persuasion*, appeared in 1953, these topics were perhaps the central focus of social-psychological research. In their classic monograph series, Hovland's group at Yale presented an appealing model for the systematic study of important social questions through laboratory research on attitude change. Controlled experimental investigations of the factors that determine attitude change, they suggested, could be used to understand and combat racial prejudice, social stereotypes, and the pernicious effects of propaganda.

As research progressed, however, the study of persuasion fell on harder times. It became clear that the issues were considerably more complex than had first been appreciated. One underlying assumption of Hovland's approach—that one could examine separately the different components of a persuasive attempt (that is, "who says what, how, and to whom") to arrive at general principles specifying the characteristics of an optimal communication—proved largely unfounded. One simply could not say that balanced communications were better, or worse, than one-sided communications or that logical appeals were more, or less, successful than emotional appeals. Instead, the outcome of a communication depended upon the particular setting, communicator, issue, and audience involved: context-bound conclusions were the rule, simple generalizations the exception. Moreover, although it had proved easy to alter subjects'

attitudes in the laboratory, comparable efforts in the "real world" frequently produced minuscule effects.

In response, a subtle, but important, reorientation occurred. The largely passive and rational listener presupposed by Hovland's approach gave way to a more active, dogmatic, and argumentative listener. People do not, the next generation of research suggested, evaluate new evidence and information in coldly rational terms—especially when that evidence contradicts their current beliefs. Instead they may mentally dispute conclusions, present counterarguments, or derogate the communicator. Interest shifted from factors that promote to factors that inhibit persuasion. The effects of persuasive communications were viewed as a joint consequence of factors that affect comprehension of arguments and evidence and factors that affect willingness to yield to those arguments. Both processes, moreover, appeared to depend upon the listener's active cognitive response to the communication.

This approach provided a reasonably compelling interpretation of previous literature. Its basic limitation was that these presumed mediating processes were typically covert and could be used to "explain" virtually any outcome. What was missing was some means of examining more directly people's internal reactions to persuasive communications.

It is this issue that the present volume seeks to address. *Cognitive Responses in Persuasion* presents a collective argument for the utility of an analysis of the processes of persuasion in terms of the active response of the audience.

The first third of the volume presents the basic argument for a cognitive-response analysis. A general historical introduction is followed by a number of empirically based chapters. A wide array of techniques, from protocol analysis to psychophysiological measures, is offered for assessing the listener's active response to a communication. Illustrative experiments, examining the presumed causal significance of such responses in determining the effectiveness of persuasive appeals, are presented. Together, these chapters provide an informative summary, not available elsewhere, of an emerging body of research.

The second third of the book presents a set of applications of a cognitive-response model to various specialized topics in the study of attitude change. These efforts are often fascinating but focus more on potential than on well-documented current applications.

The final section of the book com-

prises general theoretical statements. Except for the final chapter on memory and cognition, these papers present current summaries of widely known positions. The models do not follow directly from the cognitive-response tradition but do provide alternative frameworks potentially compatible with it.

Overall, this volume is likely to serve different functions for different readers. It is partly a review of the field, partly a persuasive appeal and a promissory note. It should have value for anyone seriously interested in the current state of traditional attitude-change research.

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## Oscillatory Populations

**The Population Ecology of Cycles in Small Mammals.** Mathematical Theory and Biological Fact. JAMES PATRICK FINERTY. Yale University Press, New Haven, Conn., 1981. xiv, 234 pp., illus. \$18.50.

Small mammals (especially lemmings and voles but also foxes and lynxes) have long been known for their occasional density irruptions (particularly in arctic, subarctic, and temperate regions). Thus, a Norwegian translator of the Bible in the latter part of the 13th century is known to have likened the lemming irruptions to the Biblical locust plagues in Egypt. The scientific investigation of these irruptions was started by the Norwegian naturalist Robert Collett more than 100 years ago. However, it was not until the 1920's when Charles Elton realized the periodic nature of these irruptions (and hence called them cycles) that ecologists all over the Northern Hemisphere (that is, in the United States, Canada, Northern Europe, and the Soviet Union) began intensive research on these cycles: Do cycles exist? What causes them? How do they influence the ecosystem? Why are not all small mammals in a given region cyclic? Why are not all populations of a given species cyclic throughout its range? These and similar questions have stimulated much thinking among ecologists, and an array of hypotheses concerning population regulation has resulted. Hence, small mammal cycles have had a significant impact on ecological theory as we know it today. Unfortunately, we cannot yet explain why cycles occur even though we are fairly certain of their existence.

Finerty aims in his book to answer some of the questions cycles present.

More specifically, he aims at bringing together theory and facts relating to these cycles. Unfortunately, the sections on theoretical ecology are fairly weak (or, rather, superficial). Therefore, even though Finerty provides some bridges, he does not close the increasing gap between theory and facts.

In my opinion, the importance of the book lies in chapter 3, entitled "Do cycles exist?"; this constitutes approximately one-third of the book. Finerty answers this question with a definite yes. And more important, he does this by applying refined statistical techniques such as spectral analysis and autocorrelation. In this chapter he succeeds, I believe, in showing how field ecologists can apply some of the statisticians' powerful techniques in analyzing their data.

Nevertheless, I was a bit disappointed to see that lemmings and voles are so superficially treated; after all, these are the species that come to mind on seeing the words "cycles in small mammals." It would have been valuable if Finerty had analyzed the *Lemmus sibiricus* (= *trimuncronatus*) data for Barrow, Alaska, from 1946 until the mid-1970's (Pitelka, Schultz, and others) and likewise the *Lemmus lemmus* data for northern Finland from 1946 until the present (Kalela and others), the *Microtus arvalis* data for continental Europe from at least 1950 until now, and the *Clethrionomys rufocanus* data for Siberia from 1935 to 1965 (Koshkina). Certainly these data are in quality comparable to the Canadian fur statistics on lynxes from the latter half of the last century. I am sure, however, that the book will stimulate other mammalogists to carry out such analyses; it does indeed provide a valuable start.

The next chapter, "Causal factors: theories and facts," is disappointing. Finerty is unable to bridge the gap between data and mathematical models; much of the discussion is well-known material that belongs in a standard ecology textbook rather than a monograph. One important conclusion emerges, however, from this chapter: dispersal and the spatial structure of the habitat are likely to play essential roles in the occurrence of cycles. This emerges convincingly both from Finerty's data analysis and from his theoretical arguments.

The last chapter, largely devoted to loop analysis, is an interesting one. The author does a splendid job of explaining the essence of the method; this presentation will certainly stimulate more ecologists to apply it. As a good theoretician, Finerty then goes on to ask what kind of system might produce a stable, oscillatory situation. Unfortunately, some of

the models are based on very implausible assumptions. I find it hard to accept a model (such as model 1, pp. 184-185) in which the individuals are assumed to be able to conceive what conditions are like in another area to which they may disperse (that is, a dispersal sink); how can a lemming detect an "invitation" from a dispersal sink? Basically, I think there is too much hand waving in parts of this chapter. Further, in this section (and in others) I find several group-selectionist arguments such as have plagued much of the study of cyclic small mammals.

In summary, I think Finerty has succeeded in presenting the mathematical and statistical techniques necessary for a detailed analysis of small mammal cycles; he is less successful at interpreting and applying the biological theories. I recommend that scientists and students working with cyclic small mammals read this book. It makes one think about the problem in new and (I believe) profitable ways. In short, it is a stimulating book, which obviously has been written by a culturally well-oriented person; it is clear that Evelyn Hutchinson (to whom the book is dedicated) has been the author's supervisor. However, I shall tell my students to read additional literature on cyclic small mammals (even though a comparable synoptic account admittedly is difficult to find).

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