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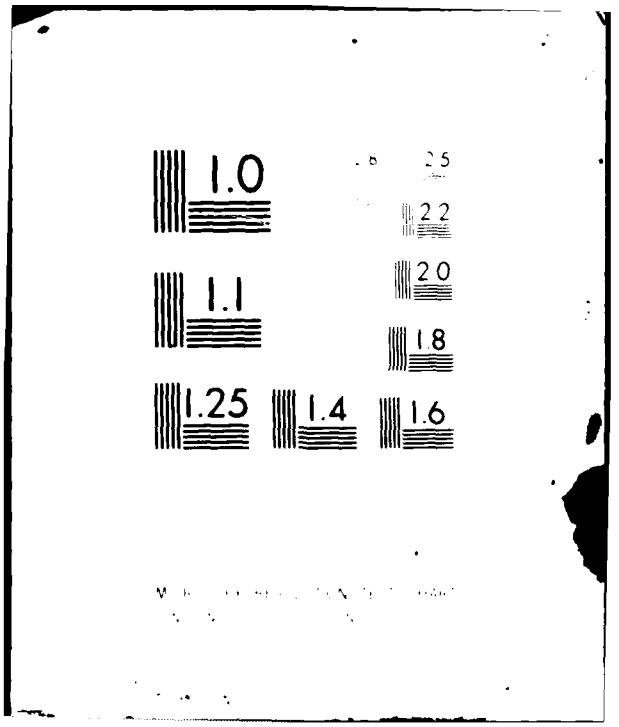
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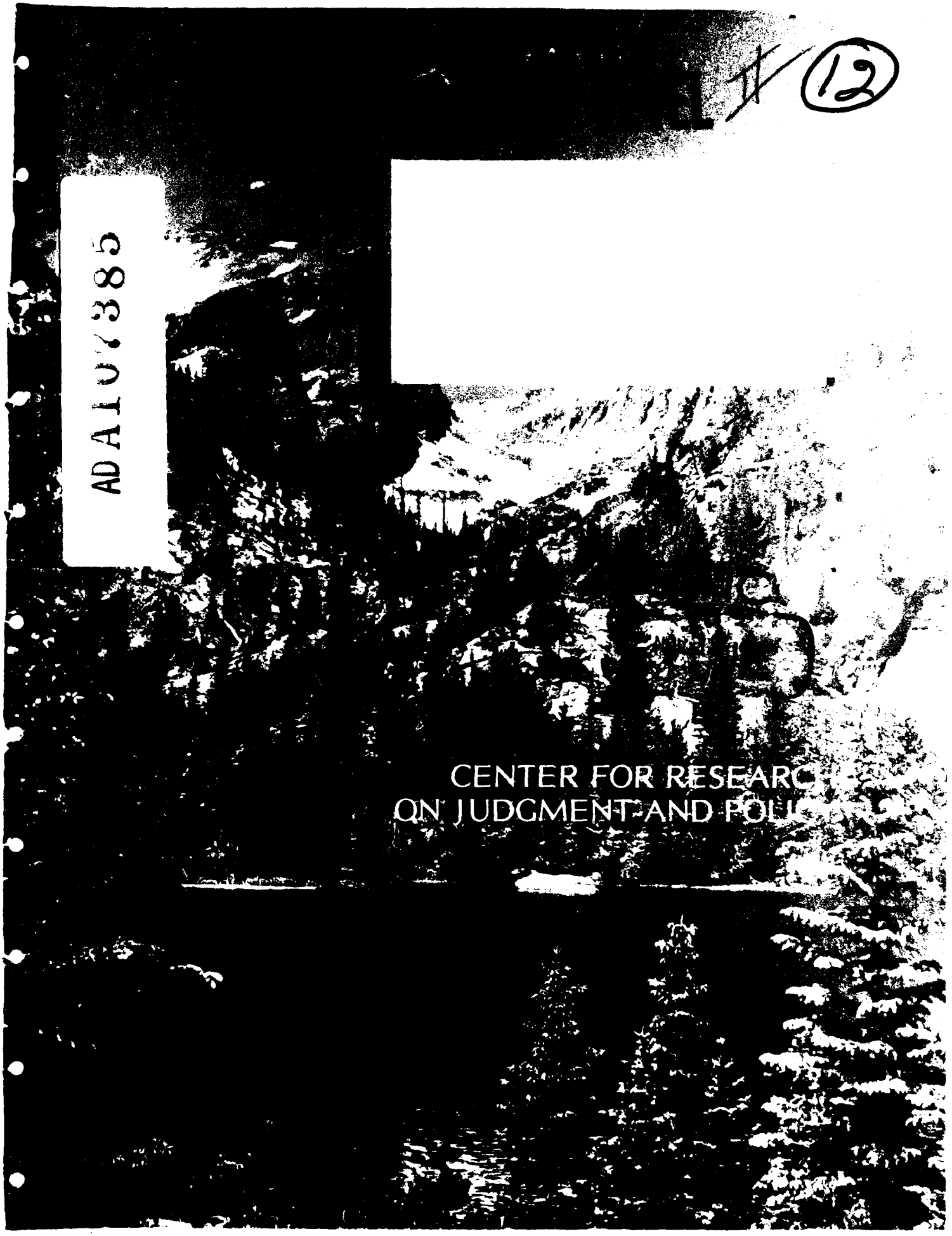

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INTEGRATION OF THEORY AND RESEARCH IN JUDGMENT AND DECISION MAKING: FINAL REPORT

Kenneth R. Hammond and Gary H. McClelland

UNIVERSITY OF COLORADO

INSTITUTE OF BEHAVIORAL SCIENCE

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Center for Research on Judgment and Policy

Report No. 236

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This is the final report on the project aimed at the integration of theory and research on judgment and decision making. The specific goals, methods, and results are briefly indicated. The principal results of the project include the publication of two books and six technical reports.

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Integration of Theory and Research in Judgment and Decision Making:

Final Report

(1977-1981)

Kenneth R. Hammond and Gary H. McClelland

Purposes and Objectives

Our purpose was "to study a variety of independent approaches to the analysis of human judgment and decision making with the aim of integrating these approaches into a coherent body of knowledge" (p. 2, CU Proposal No. 0277.8.091B, June, 1977). There seemed little doubt about the need for such an attempt in view of the readily-documented fact that the "current literature bearing on judgment and decision making contains thousands of entries produced by professionals in such different disciplines as psychology, management science, operations research, planning and policy sciences, sociology, statistics, systems analysis and others" (p. 2, Proposal). Moreover, the proposal asserted, "the authors of these articles seldom acknowledge the presence of studies outside their own discipline," and therefore, these isolated research efforts have resulted in uneven development, and a discipline that "continues on an unpredictable course . . . characterized by redundancy of effort on one hand and numerous unexplored problems on the other". We found nothing in the four-year pursuit of our topic that is inconsistent with the views expressed above. Nor did we find any effort other than our own to remedy what virtually everyone will acknowledge to be an unsatisfactory state of affairs.

Because the main substance of our work is fully described in two reports, both of which have been published in book form and already distributed to those receiving this Final Report, in what follows we briefly indicate the methods employed, and the principal results of our work, rather than presenting details.

Methods

Our first step was to cut our ambitions to fit our professional and budgetary resources. Rather than including in our study work from all of the disciplines mentioned above, we focused our efforts on six major approaches, anchored at one end by the largely analytical, mathematically-oriented approach taken by Keeney and Raiffa and at the other by the largely psychological (nonmathematical), empirically-oriented approach taken by Jones, Kelley and others, known as attribution theory. We also included in our study the approaches taken by Ward Edwards, Daniel Kahneman and Amos Tversky, Kenneth Hammond, and Norman Anderson.

We chose to focus our work on approaches to theory and research rather than on the description of the judgment and decision process, for the reason stated at the outset: There is no general agreement on what form such a description should take. For us to have selected one among the many possible descriptions of the judgment and decision process that have been put forward would have put us in a position of advocacy, and would, therefore, have compromised our efforts to achieve a descriptive framework that was theoretically-neutral. The first year of the project was, therefore, devoted to constructing a theoretically-neutral descriptive framework and applying it to the six major approaches indicated above.

Results

Year I: (1977-78)

A comparative study of the theory, methods employed and procedures used by six major approaches was undertaken. The results of the study were described in a report mailed to twenty-seven established researchers in the field who were then invited to participate in a conference, the purpose of which was to criticize and improve the report. At least two persons who were representative of each of the six major approaches were present. A critique, prepared prior to the conference, was presented by one person representing each approach. Others presented critiques as well. The principal outcome of the conference was the recommendation that, because of its potential usefulness, the report be published in book form. This step was, therefore, undertaken in Year II.

Year II: (1978-79)

Three main steps toward integration were taken in this period: (a) the report written during the first year was reviewed, revised and sent to the publisher; (b) representatives of the six approaches studied in Year I were presented with the same two practical problems and comparisons were made of the methods employed by them to cope with the problems; (c) a detailed analysis of differences between theory, method and procedures of two of the six approaches was made.

As in the first year, reports regarding the latter two projects were mailed to established researchers who were then invited to a conference to criticize and improve the work. The general reaction to these reports ran from "indifferent" to "negative". The second conference failed in the sense that the reports that were presented were judged as not having served the purposes of integration well. One constructive conclusion was reached, however, when

several members of the conference concluded that lack of a common language was a barrier to integration. They contended that a glossary was needed and that it should be constructed by this research group since a glossary was needed to further the aims of integration. The investigators decided that this conclusion was correct: The major concepts in the field should be listed, authoritative definitions provided, their origins should be found, noted and, comments provided when appropriate. As a result, this project was undertaken in the fall of 1979.

Year III: (1979-80)

During this period the report described above was published in book form under the title "Human Judgment and Decision Making: Theories, Methods and Procedures". (The report on which the book was based had already been sent to each person whose name was on the ONR distribution list.)

Work continued on the glossary throughout the year. In addition, a subcontract was let to Drexel University to carry out a co-citation analysis of publications in the field in order to test the validity of the manner in which the work of many authors was organized into six approaches in the first book, and to present an empirically-based pictorial structure of research groups in this field.

The following new projects were also undertaken:

1. Hammond developed a general theoretical framework for the purpose of unifying research and theory in the field (see CRJP Report No. 226).

2. McClelland undertook an axiomatic approach to the concept of weight (see CRJP Report No. 227).

3. Shanteau compared the use of the concept of weight in two approaches (see CRJP Report No. 228).

Year IV: (1980-81)

During this period, the glossary was completed in book form and published under the title "Concepts in Judgment and Decision Research: Definitions, Sources, Interrelationships, and Comments". The co-citation study by Drexel University verified the validity of the organization of approaches to research described in the first book and provided a useful pictorial structure of the field. The results of the co-citation study were therefore included in the glossary. The glossary was issued by the publisher on October 15, 1981 and a complimentary copy was sent to all persons whose names appear on the Center for Research on Judgment and Policy's ONR distribution list.

In addition, theoretical efforts toward unification continued during the year. Hammond described the similarities and differences in problem-solving and judgment and decision making research (see CRJP Report No. 231). And the empirical analysis of 100 research articles began to produce useful knowledge. For example, it is clear that researchers show a surprising lack of research concern for variables often mentioned as important in cognitive research. In a report not yet complete, Hammond and Quinn found surprising gaps in the reporting of information regarding the properties of the tasks used in judgment and decision research. After examining 88 articles published within the six major approaches described in Hammond, McClelland, and Mumpower (1980), as well as 12 other papers not included within these six approaches, they found the following omissions regarding task properties: (a) 14% of the articles do not report the number of judgment scale levels; (b) when cues are simultaneously presented, 24% do not report whether or not relevant cues are identified for the subject; (c) 95% do not report the amount of time given to the subject to

respond; and (d) when an outcome criterion is present, 34% do not report the type of relationship between cue and criterion, or the ecological validities (weights) of the cues, or the organizing principle in the task, among other omissions. With regard to results, (a) 20% fail to report the subjects' consistency over time or trials; (b) 90% do not report the distribution of errors; (c) 98% do not report and/or investigate subjects' reports regarding judgment processes; (d) 80% do not report response time; (e) 84% do not investigate or report the subjects' level of confidence; (f) 60% do not report which judgment parameters change over trials; (g) 25% do not report the weights, cue-criterion relationships, or organizing principles used by subjects; and (h) 90% do not inquire into memory processes, among other omissions.

The complete results of this analysis will be distributed in report form during the year 1981-82.

Shanteau used computer simulation techniques to study the conditions under which the synergistic use of information would fail to be detected by the investigator (see CRJP Report No. 235).

Conclusion

It will, of course, be impossible to be certain about the results of these efforts toward integration in the immediate, or even the distant, future. Our books and reports will be more likely to affect the graduate students of the 1980's, rather than present investigators. And, of course, there will be many new research developments in the 1980's aside from our books that will gain the interest of students and thus shape their development; the causes of change will be difficult to determine. It seems unlikely, therefore, that it will be possible to discover a direct, empirical link between the work carried out here and our aim of "integrating these approaches into a coherent body of knowledge".

Therefore, unless and until an evaluation is undertaken by means of a survey of graduate students, say, the books and reports produced by this project will have to be judged on their own merits as contributions to the organization and development of the field of judgment and decision making.

Appendix A

Publications

Books:

Hammond, K. R., McClelland, G. H., & Mumpower, J. Human judgment and decision making: Theories, methods, and procedures. New York: Hemisphere/Praeger, 1980.

Anderson, B. F., Deane, D., Hammond, K. R., McClelland, G. H., & Shanteau, J. Concepts in judgment and decision research: Definitions, sources, interrelationships. New York: Praeger, 1981.

Technical Reports Distributed to Members on ONR Distribution List

McClelland, G. H. Equal versus differential weighting for multiattribute decisions: There are no free lunches. CRJP Report #207, 1978.

Hammond, K. R., McClelland, G. H., & Mumpower, J. The Colorado report on the integration of approaches to judgment and decision making. CRJP Report #213, 1978. (See book published by Hemisphere/Praeger, 1980.)

Hammond, K. R. The integration of research in judgment and decision theory. CRJP Report #226, 1980.

McClelland, G. H. Axioms for the weighted linear model. CRJP Report #227, 1980.

Shanteau, J. The concept of weight in judgment and decision making: A review and some unifying proposals. CRJP Report #228, 1980.

Hammond, K. R. Principles of organization in intuitive and analytical cognition. CRJP Report 231, 1981.

Shanteau, J. Detection of multiplicative synergisms in simulated data for nonorthogonal designs: What lies beyond linearity? CRJP Report #235, 1981.

Appendix B

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