



# THE BRUNSWIK SOCIETY

## NEWSLETTER

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First Issue

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### BIG ISSUES

Researchers invited to the second annual meeting of the Brunswik Society were asked to name the BIG ISSUES in current Brunswikian research. Although many believe that the accomplishments of Brunswikian research have received insufficient acknowledgment, they name a host of practical and methodological problems that still need to be confronted and solved. The following list will be a point of departure for discussion at the meeting:

#### PERPLEXITIES AND CHALLENGES

- \* What do the POLICY models actually represent? --Chaput de Saintonge
- \* Are the expressed policies really so "bad," or are there situations where their ecological (or other) validity outweighs that of the modelled policy? --Chaput de Saintonge
- \* Exactly what is learned in multiple cue probability learning? This question has been addressed in different ways, but I think it needs to be looked at again. Is a judge learning relationships, conditional probabilities, or simple associations? --Holzworth
- \* What is the advantage of Brunswikian-related research compared with other models such as "Heuristics?" --Fisch
- \* And, in what I would guess is just one more vote: What is Brunswikian research, really? Does it matter? --Klayman

#### THE DOMAIN OF BRUNSWIKIAN RESEARCH

- \* Both the concepts of Brunswikian research (e.g., cue redundancy) and the methodologies (e.g., the lens model) should be used as tools to investigate a broader set of issues relevant to psychology. Almost all the Brunswik-related research has been restricted to bootstrapping in multiple-cue tasks, multiple cue probability learning tasks, and a little research in interpersonal relations. In my own work, I have found it useful for analyzing problem solving and deductive reasoning behavior and more recently modeling interpersonal perceptions and predictions. --Hoch

- \* How can the Brunswikian approach to human judgment be better applied to complexities associated with dynamic systems and dynamic decision making? --Mumpower, Rohrbaugh, Stewart
- \* How can we handle discriminant tasks--they dominate life? --Chaput de Saintonge
- \* What is the place of the Brunswikian system in the resolution of conflict? How can its applicability be improved and expanded? --Chaput de Saintonge, Fisch
- \* Judges of different ages may choose from a set of different cognitive strategies or processes. To my knowledge, no one has done any developmental studies of multiple cue probability learning. --Holzworth
- \* What is the relationship between social judgment theory/Brunswikian thought and artificial intelligence/expert systems? How can variations in expert judgment be reconciled with knowledge-based approaches to artificial intelligence--how do we choose from which experts to derive the knowledge for knowledge-based systems, and do the AI people realize there is a problem here? --Mumpower, Kirwan, Joyce
- \* We need to develop a social judgment theory/Brunswikian theory of values. --Mumpower
- \* We need to integrate Brunswikian-based psychological theories with theories of social welfare and social choice. --Mumpower
- \* What theoretical framework exists that tells us how a person ought to make a judgment? Linear vs. nonlinear; if nonlinear, what? What are the implications of our research for teaching and improving judgment? --Rothert
- \* Increase Brunswikian research in medical contexts. Use the lens model and its derivatives for conflict generation and conflict resolution in 1) allocating medical care; 2) demonstrating to medical students how cognitive conflicts can be generated and resolved. Use Brunswik's concepts for assessing pharmacological and other therapeutic interventions in the quality of life of chronically ill patients (c.f. Dick Joyce). --Fisch

#### METHODOLOGICAL PROBLEMS

- \* Conflict/Consensus/Aggregation--Once the reasons for conflict have been discovered, what is the best way to achieve consensus? When (if ever) is statistical aggregation of judges permissible? Do answers to the above depend on the nature of the tasks? --Stewart
- \* I believe we need to explore additional methods of measuring cue utilization. Although I am an advocate of collecting lots of data from each judge, I always feel uneasy about asking one to make 50 or more judgments in one sitting. --Holzworth



- \* Do judges vary their utilization of cues from trial to trial? Rob Hamm has asked this question, and so has Berndt Brehmer. I want to know if a judge is using just one policy to make a series of judgments, or switching among several. I am not satisfied with R-squared as a measure of consistency. --Holzworth
- \* Does policy feedback produce different results than any other method of feedback in getting different judges to converge in their judgments? --Kirwan
- \* Can we provide a statistically valid framework in which to test the significance of policy model results and of the differences between models? --Kirwan
- \* Of what practical use is policy modelling if there is no gold standard with which to compare judgment policies? Of what use is it if there is a gold standard, for surely we can then just apply the model equation to the problem and obtain the (analytical) answer without using any judgment at all? --Kirwan
- \* What are the parameters to be considered if one is comparing results from different perspectives, for example, field study, laboratory, orthogonal and representative design? --Rothert
- \* What is the relation between social judgment theory and other approaches? Even after Herculean efforts in Hammond's later judgment conferences and in the Hammond, McClelland and Mumpower book, the issue is still important. --Doherty
- \* In real world situations, what is the relation of Brunswikian research, information processing studies, and work with subjective expected utility theory in understanding judgments? --Rothert
- \* A troubling methodological issue--What is the generalizability of policies based on numerous judgments made in a concentrated period when the judgments of interest in the world are made once in a while? This leads some to dismiss the research as irrelevant. --Doherty
- \* Are "policies" created "on the spot?" Are there many situations for which we might use social judgment theory but for which the target population does not really have an articulated policy until they sit down and make a large number of judgments? --Doherty
- \* Another big issue is generalization over conditions, which Hammond discusses in his recent Psychological Bulletin article." --Waller
- \* We need to develop and elaborate lens model techniques based on probability rather than correlational metrics. --Mumpower
- \* We need methods that are appropriate for situations in which cues are hierarchically intersubstitutable. --Mumpower

- \* We need clear developments in methods and techniques for addressing dynamic decision making within the Brunswikian context, for example, a version of social judgment theory that can cope with dynamic ecologies that change in real-time and perhaps even with evolving cue structures where the same cues don't always have ecological validity at a particular time. A major criticism of social judgment theory is that it formalizes the decision too much and is insensitive to moment-by-moment fluctuations in emphasis. --Cooksey
- \* Do regression models adequately represent the complexity of environmental systems? When are they appropriate or inappropriate? Do regression models adequately represent the complexity of organismic systems? When are they appropriate or inappropriate? Should we distinguish between "models of the mind" and "models of the mind's models of the environment?" This may be key in clarifying the usefulness of Brunswikian theory for the development of expert systems. --Rohrbaugh
- \* We need to investigate the utility of alternative methodologies for implementing social judgment theory beyond the current multiple regression paradigm. We should make clear progress in areas such as protocol analysis, knowledge representation from a Brunswikian perspective, new methods for feedback, and ways of focusing on individual judgment cases as opposed to the averaged view that regression and social judgment theory provide. --Cooksey

#### THE BURDEN OF REPRESENTATIVE DESIGN

- \* We need further progress in the construction and execution of substantive representative designs. By finding ways to make this research more practical and feasible we would overcome the main hindrance to Brunswik's ideas' gaining wide acceptance. --Cooksey
- \* In association with representative design, we need some progress in the analysis of idiographic data: methods and techniques that can streamline the analysis and presentation of idiographic information. --Cooksey
- \* We must struggle to make the cognitive conflict paradigm more representative of conflict situations outside the psychology laboratory or else, I'm afraid, it will become an Edsel. --Holzworth
- \* A major problem in many accounting and auditing applications of the lens model is the absence of an objectively measurable distal variable. For example, auditors make judgments about the "materiality" of possible misstatements in financial statements, but we have no clear method for measuring materiality. Surely similar problems occur in other domains. --Waller
- \* In formulating a representative design in real world settings, such as medical decision making, how do you identify the cue correlations? How do you determine the optimal number of cases and what is the appropriate use of a fractional factorial design? --Rothert



- \* When attempting to identify the policy of a group of individuals, how do you identify appropriate individuals to put in the group, especially when you are aware of individual differences? --Rothert

#### TECHNOLOGY

- \* I'd nominate group decision making on computer networks, with or without sophisticated group decision aids; though I have made little progress towards developing a Brunswikian framework for this, it's obviously a hugely important problem in a practical sense. --Connolly
- \* The development of new micro-computer based methods (analogous to the new methods for monitoring TV viewing behavior) for the study of everyday thinking and decision making as it occurs. I would expect various technical means for such studies to be available within the next decade. Implementing the technology in sensible and sensitive ways constitute big Brunswikian challenges. --Earle
- \* More of us need to compare perceptual and cognitive processes in our investigations. Interactive video techniques offer tremendous opportunities. --Holzworth

#### COMMUNICATING THE RESULTS OF BRUNSWIKIAN RESEARCH

- \* Why is Brunswikian Research less widely known than other approaches? --Fisch
- \* How can we "sell" judgment analysis? --Joyce
- \* How can we show the circumstances in which judgment analysis does the judgment job better than its alternatives? --Joyce
- \* How should Brunswikian research integrate and be integrated into mainstream research in cognition and judgment/decision making? --Klayman
- \* How can we better communicate the need for the empirical study of judgmental behavior to those whose methods imply that individuals "know their minds?" In multiattribute utility analysis, for example, it is assumed that decision makers can give a direct accounting of their value tradeoffs merely by a direct specification of relative weights and utility functions. In expert systems, individuals provide the rules that they believe they use in acting on their own expertise. --Rohrbaugh
- \* How do we get people to use decision aids? --Doherty

- \* Many areas in psychology would gain complete view of various problems if there were a more explicit and frequent recognition that performance/achievement is a function not only of internal psychological processes but also of characteristics of the external decision environment. Even more important would be a recognition that a complete understanding of performance requires an investigation of the interaction of the internal and external halves. Alloy and Tabachnik (Psychology Review, 1984) made a reasonable attempt in their work on the illusion of control and illusory correlation. --Hoch
- \* How about an introductory psychology from the Brunswikian perspective? Or an undergraduate research methodology text with lab manual? A lab manual could complement POLICY-PC. --Holzworth
- \* We need to maintain an international forum within which the Brunswikian perspective can be promoted. I think Brunswik's ideas need stronger promotion as a general psychological theory (it could use updating as well). One way to work toward this is to maintain good communication lines among us. Perhaps even a periodic newsletter could be started with international contributions toward raising and solving problems in the Brunswikian context. --Cooksey
- \* How is the Brunswikian Society planning to finance its third international meeting? The future of the group is a serious question. Activities? Content? Membership? Funds? It should be discussed. --Joyce



BRUNSWIKIAN RESEARCH REPRESENTED AT THE 2ND ANNUAL MEETING  
OF THE BRUNSWIK SOCIETY

The research interests of participants in the second annual meeting of the Brunswik Society are listed alphabetically by participant.

BERNDT BREHMER, Department of Psychology, University of Uppsala, Sweden

Brunswikian Projects in Uppsala

1. Dynamic decision making. These experiments utilize DESSY, a general computer-based paradigm for the study of dynamic decision making. Current experiments are concerned with subjects' ability to use detailed information about delays in the system to improve their performance. In an applied project we are trying to put what we have learned from our work with DESSY so far to use in an attempt to create expert systems for emergency management.
2. Staff decision making. A general paradigm, based on the lens model, has been developed for the study of staff work. The paradigm involves a decision maker, a complex task, and a staff of experts to help the decision maker. Experiments so far have been concerned with the problem of whether the decision maker can learn to give the appropriate weights to the experts in the staff, and whether he/she can learn to distinguish different reasons why the experts should receive different weights, viz. differences in competence and differences in the relative importance of their subtasks to the total task.
3. Learning and hypothesis testing. We have studied subjects' hypotheses in single-cue probability learning tasks that differ in predictability and in multiple-cue probability learning tasks that vary with the respect to the number of cues and function forms. In progress are experiments involving a detailed, trial-by-trial study of how subjects modify their hypotheses as a function of the data they are receiving from the task.
4. Policy construction. Presumably, few policies are learned from direct experience with a task. Instead, they are learned from communication from other people. The question, then, is how people understand linguistic communication relevant to policies, and how they construct policies on the basis of such communication. We have developed an experimental paradigm for studying this problem, and the first experiments, which are concerned with the problem of how people understand and use information relevant to selection of weights for a policy, are being written up.
5. Methodological factors in policy capturing. This project is concerned with the effects of the method used for selecting the cues for a policy-capturing study, with subjects' ability to describe their policies, with the effects of experience on the structure of policies, and with validation of the results of policy capturing. The purpose of the review is to try to ascertain what, if anything, has been learned about human judgment from thirty years of policy capturing.



6. Cognitive conflict. Current studies involve an evaluation of the effects of cognitive feedback, the effects of justification when the subjects are required to give an explicit justification for their judgment on every trial (this factor has been shown to increase consistency in ordinary inference tasks), and the effects of case-by-case discussion versus discussion about principles.
7. Memory. The purpose of this project is to develop a methodology for studying ordinary, everyday memory (as opposed to the kind of memory studied in the psychology laboratories and tested by clinicians by means of memory tests) based upon Brunswik's methodological principle of behavior-research isomorphy. Current studies involve a comparison of three age groups studied by means of questionnaires which ask subjects to describe memory tasks they encounter in their everyday life. Memory tasks are being constructed for each person based on his or her answers to the questionnaire, and the performance on these tasks is then related to the frequency and importance of the memory tasks in the subjects' everyday lives. The memory aids used by people in their everyday life are also assessed.

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MARK CHAPUT DE SAINTONGE, Department of Pharmacology and Therapeutics, The London Hospital Medical College, University of London, London, England

1. Validity of clinical trials. We are comparing diagnostic criteria for admission to clinical trials with the operational diagnostic criteria described by doctors' POLICY models. The results cast doubt on the applicability of the outcomes of trials to real-life situations. They also confirm the usefulness of the POLICY-style model as a taxonomic tool.
2. Reaching a rational consensus among doctors. (with John Kirwan). Models of doctors' definitions of a treatment success were constructed. These models should allow design of trials with realistic goals. The variety of models emphasizes the need for resolving conflicts of judgment and modeling consensus. This problem recurs in small group work with primary care physicians trying to reach agreements over therapeutic and diagnostic policies. From the students' point of view, the problem is learning expertise in an environment dominated by tasks of discrimination. The possibility of conflict between knowledge-based and statistically based (Brunswikian-POLICY) systems has so far inhibited action.

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JAY CHRISTENSEN-SZALANSKI, Department of Management Sciences, College of Business Administration, University of Iowa, Iowa City, Iowa

Because the outcome of a decision is important to the information processor, I'm currently examining how people judge the quality and the value of an outcome. Specifically, I am looking at the temporal, emotional, and ethical effect upon the information processor's judgment.



TERRY CONNOLLY, College of Business and Public Administration,  
Department of Management and Policy, University of Arizona, Tucson,  
Arizona

My current interests in all the following areas are pursued within a broadly Brunswikian, lens-model (but nonrepresentative design) framework.

1. Empirical and simulation work on predecisional purchase of information to guide decisions.
2. Decision processes in computer networks.
3. Conceptual work on cyclical processes in decision making.
4. Straight empirical work on evaluation of decision aids.

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MICHAEL DOHERTY, Department of Psychology, Bowling Green University,  
Bowling Green, Ohio

1. Determining the effects of identifying error. I am currently working on a series of studies aimed at determining the effects, if any, of identifying for the subjects whether error in a system occurs in the input or in the feedback. In a traditional MCPL study, the locus of the error is typically unspecified. It is said to be in "the relationship between the cues and criterion" and is normally operationalized by making  $Y_{\text{sub-e}}$  a linear composite of  $n$  cues, but letting the subject see only  $n-1$  cues. In our MCPL experiments, we make it clear to subjects that the error is measurement error in the cues, in one case, and in the feedback in another. The effects of identifying error are being explored across tasks, which include two artificial universes, Wason's 2-4-6 task, and our own pseudodiagnosticity task. The nature of the error distribution is also being manipulated.
2. "Expert judge" policy-capturing studies. Several of these are in various stages of completion by students. One dissertation, just completed, studies university EEO officers judging whether simulated interactions constitute sexual harassment. Another dissertation just completed investigates clinicians' judgments of vignettes of suicide threats.

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TIMOTHY C. EARLE, Research Scientist, Battelle, Human Affairs Research  
Centers, Seattle, Washington

1. Natural hazard studies. We are currently engaged in two NSF-funded natural/technological hazard research projects that are fundamentally informed by Brunswikian insights. The first project is a longitudinal field study of the effects of information about hazards on judgment of risk and on hazard-related behavior. This project has focused on two hazards, of water-supply contamination and earthquake, both in Whatcom County, Washington. Three waves of data were collected by telephone interviewers over a three-month



period. The panel of respondents consisted of approximately 150 individuals. Data analyses use confirmatory factor analysis and structural modeling techniques (LISREL) to assess models of the effects (both cognitive and emotional aspects) of hazard information on hazard-related behavior and judgments of risks, benefits, and costs.

The second project is a laboratory study of the cognitive structure (schemas) and cognitive processes associated with hazard-related decisions. The study compares the task content of experts' and novices' hazard-related schemas. The hazard task is based on the process of assessing the environmental impact of disposing of defense-related radioactive wastes at Hanford, Washington. The expert subjects are scientists working on projects related to radioactive waste in Richland, Washington. The novices are graduate students at a university in Western Washington and have no training in nuclear topics. A new methodology, based on information acquisition processes, permits a relatively unobtrusive view of how individuals both structure hazard decision problems and how they process information about hazards over time.

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HILLEL J. EINHORN, Professor of Behavioral Science, Center for Decision Research, Graduate School of Business, University of Chicago, Chicago, Illinois

1. The role of causal inference in diagnostic reasoning. This work investigates the concept of "cues-to-causality," and the rules that people use to combine the cues into judgments of probable cause. The cues are multiple, redundant, probabilistic indicators of causality and specifically follow the Brunswikian concept.
  2. Ambiguity and a contextual model of risk. This work attempts to model how factors such as the uncertainty of probabilities (including linguistic phrases), the sign and size of payoffs, and the framing of problems influence the choice process. Although not specifically Brunswikian, the work clearly shows that people are using many more cues in choosing than are considered in current normative and descriptive models.
  3. A model of updating beliefs. This work models the updating process by a sequential anchoring-and-adjustment process that captures two opposing forces: contrast/surprise and inertia. The model shows that the combination of simple psychological processes and complex environments makes for highly contingent judgments and choices.
  4. Expression theory and preference reversals. The preference reversal phenomenon is shown to be only one of six possible reversals. Expression theory accounts for all six reversals as well as violations of dominance, CE-PE utility elicitation biases, and several other decision anomalies. The model of the process is quite simple; the resulting behavior is not.
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HANS-UELI FISCH, Psychiatrische Universitaetspoliklinik, University of Bern, Switzerland

1. Previous Brunswik-related research

- a) Effects of various antidepressive drugs on multiple cue probability learning and retention. Antidepressant drugs administered to depressed hospitalized patients differentially influenced the parameters of the lens model.
- b) The clinical judgment of general physicians and psychiatrists in evaluating and prescribing for depression. The physicians were given profiles of depressed patients with combinations of symptoms. They were asked to judge the severity of the disorder and to prescribe. In a first phase, the physicians based their judgments only on the cues of a depression rating scale; in a second, each physician defined his own cues. Agreement between judges was low. Psychiatrists were somewhat more consistent than general physicians, particularly when they selected their own cues.
- c) Transcultural differences of drug treatment decisions in psychiatry. Hypothetical patients were given to psychiatrists in Switzerland and Texas. The psychiatrists recommended the appropriate chemotherapeutic regimen. The study found large cross-national differences, particularly in dose prescribed. These differences corresponded well to clinical observation.

2. Research Interests

- a) Application of social judgment theory in medical examination and to the assessment of patients' quality of life
- b) Clinical pharmacology of psychotropic drugs
- c) Effects of drugs on visual perception
- d) Treatment of alcoholic patients and of chronically depressed patients

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JOHN S. GILLIS, Department of Psychology, Oregon State University, Corvallis, Oregon

1. Cognitive deficits in depression. (with Patricia Post) This study examined two forms of cognitive deficit believed to characterize depression: problems in dealing with uncertainty and cognitive inflexibility or the inability to shift set. Eighty college students were classified as mild to moderately depressed or as nondepressed on the basis of their scores on the Beck Depression Inventory.

Cognitive performance was assessed on a series of multiple-cue probability learning tasks. These techniques provide a unique means of examining both flexibility and effectiveness of performance under uncertain conditions. Two forms of the tasks were constructed, one (high certainty) in which the criterion was highly predictable ( $R\text{-squared}=.90$ ) on the basis of the three cues which a subject had available and another (low certainty) in which the cue-criterion relationship was much less predictable ( $R\text{-squared} = .75$ ). Tasks further required that subjects change set in order to perform effectively. After the first block of 40 trials in which they learned a specific pattern of cue dependencies (i.e., cue B was highly correlated with the criterion although cues A and C were irrelevant) cue validities were changed. The second block of 40 trials required subjects to depend upon a previously invalid cue and ignore the earlier valid one. A shift in set or strategy was thus required for continued successful performance.

Although depressed subjects learned the tasks as well as nondepressed individuals during the initial block of trials, they were significantly impaired in adapting to the shift in cue validities. Levels of uncertainty did not differentially affect the depressed group, however, all subjects performing best in the high certainty conditions.

2. The Personality Components of Adjustment: A Cross-Cultural Comparison. This study used the methods and analytical procedures of social judgment research to assess the relative importance of various traits in the perception of an individual's personal adjustment. Subjects from India and the United States judged how well adjusted certain individuals might be expected to be given their personality characteristics. Multiple regression techniques were used to assess the extent to which various traits described by the 16 PF were taken into account in making such judgments. Although coming from markedly different cultural backgrounds, both groups of judges based their assessments on similar dimensions. Ratings of adjustment were significantly related to intelligence, emotional stability, and the extent to which an individual was "experimenting" or "free-thinking." No other traits were given significant weight and there were no differences between the Indians and Americans.

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STEPHEN J. HOCH, Center for Decision Research, Graduate School of Business, University of Chicago, Chicago, Illinois

1. Deductive reasoning studies. I have used the concept of cue redundancy to investigate deductive reasoning performance. In two recent papers in Memory & Cognition (Hoch & Tschirgi, 1983, 1985), we have shown that performance improves dramatically when reasoning problems are structured so that they provide cues that are redundant with the logical structure of the task. We started off trying to understand why people do better on problems based on concrete or realistic content but were also able to demonstrate that cue redundancy operates even in strictly abstract environments, at least when subjects can draw on partial knowledge of logical (i.e., truth table) constraints.



2. Predicting the behavior and attitudes of other people. We (Davis, Hoch, & Ragsdale, Journal of Consumer Research, 1986) investigated the spousal prediction process first by building a psychological model of the prediction process. Most husbands and wives used anchoring and adjustment, first anchoring on their own position and then adjusting for ways in which they believed they differed from their spouses. We also examined the influence of this anchoring and adjustment strategy on predictive accuracy and found that subjects' own position provided the most valid component of their judgment policies; similar to much of the bootstrapping research, subjects had difficulty identifying and correctly weighting other linear or nonlinear cues besides their own positions.

In continuing this research, I have developed a lens-like model for investigating the influence of social projection (anchoring on one's own position) on predictive accuracy. Although it has long been thought that the projection tendency reduces predictive accuracy because people assume more similarity with the target than actually exists, I show that the direct impact of projection on accuracy can be either positive or negative. In a large study of interpersonal prediction using a representative design, I show that in many cases projection has great heuristic value, and that in a majority of cases subjects actually would have been more accurate if they had projected more rather than less.

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JAMES HOLZWORTH, Associate Professor, Department of Psychology,  
University of Connecticut at Avery Point, Groton, Connecticut

1. Police officers' judgments of when to draw a weapon. Last September, my policy-capturing study of police judgments was published. A month later, five of the officers were involved in a SWAT action that resulted in a suspect being killed. Each of the five officers who fired weapons, and some others who did not, agreed to participate in a follow-up study. I presented officers the original task (concerning drawing a weapon) and then a second, modified task to determine possible effects of the shooting incident upon policies. The second task, with a modified cue set and a slightly different response measure, investigated the generality of policies across tasks.
  2. Utilization of ridge regression in policy capturing. I am concerned about the problem of the instability of regression coefficients across different cue sets. A combination of ridge regression and subjective weighting has been found to successfully increase cross-validated R-squareds and to reduce sums of squared errors of prediction.
  3. Detection of correlation. I am investigating the extent to which judgments of relatedness are data-driven or theory-driven in different contexts, using several measures of subjective correlation.
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C. R. B. JOYCE, Medical Division, CIBA-GEIGY Ltd., Basel, Switzerland

1. Evaluation of clinical trials (with P. Bech, A. Haaber, and the Danish University antidepressant group; to appear in Psychological Medicine, November 1986). This study demonstrated that application of an inconsistency-free judgment policy to experimental results (a clinical trial of 2 antidepressive treatments) does in practice what it must do in theory--reduce commission of Type II error.
2. Assessment of managerial performance. Managers are becoming increasingly aware of individual differences in judgment and the need to explore them and do something about them. At CIBA-GEIGY this problem arose in the selection of drugs for development, as well as in the selection of methods for developing them, with a view to future personal developments. I am particularly interested in developing ways of deciding in what circumstances judgment analysis can best be applied.

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JOHN KIRWAN, Bone and Joint Research Unit, London Hospital Medical College, London, England

1. clinical judgment in rheumatoid arthritis
2. the use of lens model feedback as a cognitive aid in patient management
3. policy modelling as an aid in clinical trial design
4. distinguishing between doctor, nurse, and patient
5. judgments of disease severity and response to treatment
6. establishing the ecological validity of local cues for disease assessment and of local means for achieving the distal goal of improving patients' health

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JOSHUA KLAYMAN, Center for Decision Research, Graduate School of Business, University of Chicago, Chicago, Illinois

Learning in probabilistic environments. Recently we've been focusing on diagnostic rather than predictive judgment, using medical scenarios. In one study now underway, we examine how judgment is affected by the structure of prior knowledge. Cue-probability information is provided either in a disease-by-disease format or in a symptom-by-symptom format. We find that the different information formats lead the subjects to encode the information differently, and thus to make different judgments. In another study, we examine the effects of prior knowledge and prior hypotheses on subsequent learning from feedback. We present new fictitious diseases that fit well-known schemata (e.g., a mononucleosis-like ailment), and see how well people learn cues that are congruent with or contrary to expectations, or that initially might be thought irrelevant. Comparison is also made to an equivalent task with no relevant schemata.



ANTHONY LADUCA, National Board of Medical Examiners, Philadelphia, Pennsylvania

Clinical Judgment in Management of Chronic Illness (with John D. Engel). Responsibility for the licensing of physicians in the United States resides with the civil law authority of the several states, usually operating through individual state medical boards. Obtaining academic credentials, therefore, is independent of securing the license to practice, and the requirements for the latter may vary among the 54 licensing jurisdictions. Nevertheless, all jurisdictions require that physician candidates pass written examinations prepared by the National Board of Medical Examiners (NBME). In 1985 the NBME provided nearly 170,000 examinations to medical schools, licensing boards and selected medical specialty boards, and other client organizations.

In 1986 the NBME provided support for a research and development project aimed at investigating computer-based assessment of physicians' clinical judgment. This project is part of a larger effort to establish the feasibility and validity of computer-based assessments of physicians' clinical knowledge and skill. The Clinical Judgment Analysis (CJA) project is being guided by Brunswikian principles through application of social judgment theory (SJT). Following the pattern established by other researchers who have applied SJT to physicians' clinical judgment, the NBME team has developed a prototype version of an assessment of clinical judgment in management of patients with congestive heart failure. This prototype operates on an IBM personal computer. The test consists of descriptions of 30 patients with previously diagnosed congestive heart failure seen in the physician's office. Each description consists of five clinical cues (e.g., dyspnea and rales), and for each patient a judgment of severity is made. A regression routine computes the examinee's judgment policy. Provision for feedback is not made because the prototype is a test. However, the use of this arrangement for clinical instruction has not been ruled out.

At present, a team of five clinicians is working with NBME staff on development of judgment tasks for patients with: (1) chronic obstructive pulmonary disease; (2) diabetes mellitus Type II; (3) depression; (4) peptic ulcer disease; (5) hypertension; and (6) rheumatoid arthritis. Plans call for pilot testing of a preliminary battery in early 1987.

Although this project emphasizes development of tests, research questions are not being ignored. Priority is being given to issues of (1) the development of meaningful criterial models to provide judgment ecology; (2) the properties of the lens model equation; (3) alternative methods of obtaining consensus among clinical experts; and (4) the feasibility of applying SJT to the ethical analysis of medical moral dilemmas.

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JERYL MUMPOWER, Rockefeller College of Public Affairs & Policy, State University of New York at Albany, Albany, New York

1. Labor-management negotiations. I have recently completed a second study using social judgment analysis techniques to facilitate mediation and conflict resolution in labor-management negotiations.



Judgment analysis appeared helpful both in (a) improving interpersonal communication and understanding within and among negotiation teams and (b) providing input to analytical attempts, based on integer linear programming, to identify optimal settlements.

2. Political riskiness. I have recently completed a study of expert judgment of political riskiness, based on a social judgment analysis approach. This study has prompted me to give considerable thought to the nature of expert judgment and especially to the implications of the psychology of expert judgment for artificial intelligence and expert systems.

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JOHN ROHRBAUGH, Rockefeller College of Public Affairs & Policy, State University of New York at Albany, Albany, New York

1. Integrating managerial judgment with dynamic models of social systems. David Andersen and I are preparing our final report to the National Science Foundation's Decision and Management Science Program on this project. We have been continuing to use judgment analysis and system dynamics models during decision conferences, a form of group decision support system (GDSS) provided for executive teams that are on the brink of making crucial organizational policy choices.
2. POLICY PC. This special software has been developed to provide easy and efficient access to judgment analytic techniques. POLICY PC has been used this year to develop a statewide service delivery plan for the New York State Division of Alcoholism and Alcohol Abuse and an alternative approach for the New York State Public Employment Relations Board to mediate labor-management disputes.
3. Judgment models in teleconferencing. A collaborative study of judgment models in teleconferencing (with Joel Harmon of Rutgers) is being summarized for publication.

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MARILYN L. ROTHERT, Office of Medical Education Research and Development, College of Nursing, Michigan State University, Lansing, Michigan

1. Validity of structured case vignettes. My colleagues David Rovner, M.D., Margaret Holmes, Ph.D., Neal Schmidt, Ph.D., and I have just completed a study examining the external validity of structured case vignettes as a method for studying the clinical behavior of physicians. Our validation measure was the test-ordering behavior of family practice physicians in cases of urinary tract infection and newly discovered cases of hypertension. Cases were developed using orthogonal design on one set and representative design on a second. However, in this situation the correlation among cues actually changed the design matrix very little because correlations among cues were very low. As a criterion we calculated a regression equation from data obtained by chart review of patient cases. In general, we showed a high correlation between predicted physician test ordering and actual test ordering on paper cases, at



least for urinary tract infection, an acute disease. Paper cases therefore can be effectively used for the prediction of clinical performance. In a more chronic disease, chart review at one point in time may underestimate the true workup of the disease, which may take place incrementally over some time. In this situation, paper cases may give a better prediction of the overall complete workup with the time frame condensed. Differences in test ordering between the orthogonal and representative sets appeared to be related to cue percentage, and the policies were very similar.

2. Judgments of estrogen replacement therapy. We will soon begin a study of womens' judgments about estrogen replacement therapy. Our aim is to identify and systematically assess the factors that influence women's judgments about estrogen replacement therapy for menopausal symptoms. We hypothesize that these factors are a woman's perceptions, experiences, and expectations of menopause, and such sociodemographic characteristics as previous health care behaviors and experiences, and knowledge of menopause. This study will identify the relation of these variables to the judgment. Multivariate analyses will be used to define women's policies in using information to judge estrogen replacement therapy. Written instruments will also assess the related factors. We will use cluster analysis to identify groups with similar sets of rating policies and multiple discriminant analyses to determine sociodemographic and health correlates of womens' judgment strategies. Thinking aloud protocols from a subsample of women from the largest clusters will complement the statistical analyses and assist with the interpretation of data.

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THOMAS STEWART, National Center for Atmospheric Research, Boulder, Colorado

1. Expert judgment in weather forecasting (with William Moninger of the National Oceanic and Atmospheric Administration). We are studying the judgment processes of weather forecasters making severe weather predictions. The study involves an experimental weather forecasting workstation that uses interactive computer graphics to display weather information and includes the capability for animation and for overlaying information from different sources. The workstation can be used to replay weather from past days in "displaced real time," making it possible to observe different forecasters in identical, highly realistic forecasting situations.
  2. Methodological issues in judgment analysis. In work supported in part by CIBA-GEIGY, I am reviewing experience with judgment analysis (the regression approach to modelling human judgment). The goal is to prepare a paper that will summarize the methodological issues involved in applying judgment analysis and that will provide a reference for researchers who are interested in using the technique in a specific application but are not judgment and decision researchers.
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WILLIAM S. WALLER, Associate Professor of Accounting, College of Business and Public Administration, University of Arizona, Tucson

Judgment and decision making in accounting and auditing contexts is my general research interest. More specifically, I am interested in how auditors acquire, represent, and use their expert knowledge about relationships among environmental variables. For example, a paper forthcoming in The Accounting Review reports two experiments on auditors' covariation judgments and the effects thereon of context and substantive experience. Also, I am presently writing a paper that summarizes and critiques the voluminous Brunswikian research in accounting and auditing.



## BRUNSWIKIAN RESEARCH IN AUSTRALIA

--Ray W. Cooksey

The following consists of the current work of four of the five people I've been able to contact who I know are engaged in Brunswikian research in Australia.

Dr. Len Dalgleish, Department of Social Work, University of Queensland, St. Lucia, QLD. 4067 Australia

Len is currently involved in the application of social judgment theory procedures to the training of social workers in the diagnosis of child abuse cases. He is negotiating with both the police department and the state social work system to use his training system to help improve diagnostic judgments. His biggest problem is that he has found he must use a large number of cues relative to the feasible number of cases being judged, so he is looking for alternative ways of representing relative weights, which are very unstable in small blocks of cases. He is using a version of POLICY that he's written for the APPLE computer.

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Professor Alan Lonsdale, Head, Educational Development Unit, Western Australian Institute of Technology, Kent Street, Bentley, W.A. 6102 Australia

Alan is currently on study leave in the U.S. and U.K. so I was unable to contact him directly. However, his recent work has involved the application of social judgment theory procedures to the study of promotion policies at his institution. He has derived four promotion criteria that are now used as cues in promotion decisions. Social judgment theory is used to capture policies for individual promotions committee members, and then to achieve a group-compromise policy, which can then be used in the decision process. Alan has expressed an interest in a microcomputer version of POLICY (John Rohrbaugh, please note) as he is currently forced to use SPSS!

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Professor Alex Wearing, Head, Department of Psychology, University of Melbourne, Parkville, VIC. 3052 Australia

Dr. Shane Thomas, Lincoln Institute of Health Sciences, 625 Swanston Street, Carlton, VIC. 3053 Australia

Alex and Shane have been working together on some investigations of the methodology of social judgment theory. In particular, they were interested in the effects of order of stimulus presentation on the stability of regression weights. They find the social

judgment theory procedure very sensitive to order effects. All this was part of Shane's Ph.D. thesis with Alex as a prelude to some further investigations in the area of medical diagnosis. In addition, Alex has been working in the area of dynamic decision making, looking at how people manage and control systems of varying complexity.

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Dr. Dan Milech, Department of Psychology, University of Western Australia, Nedlands, W.A. 6009 Australia

I have been unable to contact Dan or his student (former student?) Lauren Shiels, but I understand that one of his interests is cognitive feedback and its facilitative effect on learning.

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Dr. Ray W. Cooksey, Centre for Behavioural Studies in Education, University of New England, Armidale, N.S.W. 2351 Australia

I'm currently doing two separate studies with social judgment theory. The first applies social judgment theory to high school students "diagnosed" as poor spellers. Specific interest is in what it is about words that makes them easy or difficult to spell from the student's perspective. Students judge the spelling difficulty of 100 words and are asked why they rated each word as they did. Cue structure will be recovered post hoc after analysis of the student interviews. The criterion in the study is whether or not they can in fact spell the word correctly. The unique feature of the study is an intervention program designed to improve spelling. The lens model procedure is done before and after intervention for both a treated and untreated group to look for policy changes.

The second project is a study of teacher expectations (beginning-of-year judgments about students' problems and potentials) in multicultural classrooms. Specific interest is in the relative emphasis on cues for cultural background versus cues for cognitive ability. The teachers make multiple judgments per student, so the multivariate lens model will be used. Both white Australian and Aboriginal Australian teachers are participating. The study is being conducted in Darwin in the Northern Territory of Australia.