



THE BRUNSWIK SOCIETY

Newsletter

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Bowling Green Researchers Identify CFB Components

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Recent reviews (Balzer, Doherty, & O'Connor; Doherty & Balzer, 1988) of the cognitive feedback (CFB) literature have identified three distinct components of CFB: task information (TI; information about relations in the environment), cognitive information (CI; information relations perceived by the person), and functional validity information (FVI; information about relations between the environment and the person's perception of the environment). These reviews have suggested that TI appears to be the component that influences performance on MCPL tasks. Undergraduate subjects ($N = 133$) participated in a MCPL task that had them predict the number of games a major league baseball team had won based on five team statistics (e.g., team batting average). The type of CFB provided (TI only, CI only, TI+CI, TI+CI+FVI, and No Feedback) was manipulated, and a measure of task knowledge (familiarity with baseball) was also collected. Traditional measures of performance (e.g., r_p) as well as self-report measures of perceptions of CFB were collected. Preliminary results indicate that TI appears to be the component of CFB that influences task performance. In addition, a number of CFB x task knowledge interactions were found. Implications for theory, as well as for the practical application of CFB procedures, will be discussed.

Editor's Note. Mike Doherty is spending the year in Dublin, Ireland spreading the word among other Irishmen.

FIFTH ANNUAL INTERNATIONAL INVITATIONAL MEETING OF THE BRUNSWIK SOCIETY

Saturday, November 18, 1989

Austrian Room

Hyatt Regency, Atlanta, GA

- | | | | |
|-------|---|-------|--|
| 8:00 | - | 8:30 | Continental Breakfast |
| 8:30 | - | 10:00 | Feedback/Insight/Negotiation

William Balzer, Barbara Reilly,
Jeryl Mumpower

C. R. B. Joyce, Hans-Ueli Fisch,
Beat Hiltbrunner |
| 10:00 | - | 10:30 | Break |
| 10:30 | - | 12:00 | Learning

Robin Hogarth, Terry Connolly,
Ray O'Connor, Berndt Brehmer,
Alex Wearing |
| 12:00 | - | 1:30 | LUNCH (on your own) |
| 1:30 | - | 3:00 | Medicine

Roy Poses, Thomas Tape,
Robert Wigton, Marilyn Rothert,
Paula Horvatich, Ted Speroff |
| 3:00 | - | 3:30 | Break |
| 3:30 | - | 5:00 | Forecasting

Tom Stewart, Cynthia Lusk,
Len Adelman, Martha Neal,
Kenneth Hammond, John Rohrbaugh |
| 5:00 | | | Adjourn |

Due to the large attendance this year, participants must (regrettably) limit their presentations so that all may have an opportunity to speak.

Brehmer Experiments with Fire Fighting, Emergency and Patient Management

Berndt Brehmer, Department of Psychology, University of Uppsala

This is what we have been up to in Uppsala.

1 Further experimentation with the DESSY fire fighting simulation. These experiments have been concerned with the effects of feedback delays, such as whether it matters where the delay is located in the feedback loop, and whether subjects can develop better strategies to cope with delays when they are informed about the delays.

2 Experimentation with some of Broadbent's systems, trying to replicate his results on when subjects will be aware of their control strategies and when they will not be aware of these strategies. This work has some relation to Cognitive Continuum Theory.

3 Experimentation with MORO, a new dynamic system that we have received from Dietrich Doerner in Bamberg. It requires subjects to act as advisors to a government in a developing country, suggesting various kinds of measures for improving conditions in that country. It is a very complex simulation, but it works very well for experiments. Our first experiments have been concerned with the problem of goal specificity and its effects on control.

4 We have continued our analyses of distributed decision making and we are now ready to start experimentation in that area. Some of the preliminary work that provides the ground for this experimentation will be published in a book edited by Jens Rasmussen, myself, and Jaques Leplat.

5 We have performed two experiments to evaluate information systems for emergency management, one for on-site management of nuclear emergencies and one for off-site

management of such emergencies. These evaluations have been performed as experiments in dynamic decision making, using real time scenarios of emergencies and "real" decision makers. We have learned a lot from these experiments, not only about the information systems.

6 We are continuing our studies on control room operators. We have finished two more descriptive studies, and we are now planning studies that will develop decision aids for control operators that are built upon different forms of simulation.

7 We have finished a first study of the management of patients with large burns to test our hypothesis that the patient management system can be seen as a hierarchically organized control system where different categories of personnel work in different time scales, and where the view of the patient as a whole is in the management system as a whole, rather than in any individual person.

Funder Examines Relationship Between Personality, Behavior, Personality Judgment

*David C. Funder
Department of Psychology
University of California, Riverside*

During the past year I have been gathering and analyzing more data concerning the relationship between peers' judgments of personality and the actual behaviors of the individuals judged. In particular, I have examined links between peers' judgments of Q-sort items based on their acquaintance with the target in daily life, and behaviors of the target we have observed (and videotaped) in three laboratory situations. We are excited by the

Adelman Studies Expert Judgment

*Leonard Adelman
Dept. of Information Systems
and Systems Engineering
George Mason University*

My principal application of judgment analysis this year occurred as a consultant on a subcontract. Specifically, researchers for the prime contractor used an ANOVA to test whether different levels of two external factors affected experts' relative weights for different cues. They found no statistical differences in the means of the Z-transforms for the correlations. However, this approach was basically equivalent to examining the convergent validity measures in a convergent-discriminant validity analysis. By extending the analysis to include discriminant validity measures, we showed that certain levels of the factors did in fact significantly affect the experts' judgments.

MEDICAL NEWS

Horvatic Develops Course on Prescribing Dependence Liability Drugs

*Paula Horvatic
Center for Educational Development
and Faculty Resources
Medical College of Virginia*

Editor's Note. Paula Horvatic currently directs the education and training efforts for the Division of Substance Abuse Medicine and tells an interesting story.

Dr. Sidney Schnoll (Chief, Division of Substance Abuse Medicine) and I were approached by the Executive Director of the Board of Medicine for the State of Virginia. He explained to us that the Board of Medicine was monitoring the prescribing (for controlled substances) practices of approximately 400 physicians in Virginia. His concern was that there were no programs that he could send these physicians to for remediation. (Virginia has no more nor any less physicians in trouble for their prescribing habits than any other state.) A little later we learned that there are only a few courses on prescribing drugs with dependence liability that are available and that these are offered on a somewhat random schedule on a regional basis. This was confirmed by the Department of Substance Abuse of the American Medical Association (AMA) who in turn encouraged us to consider developing a continuing medical education program that could be offered nationally. The AMA representative said that the right program could be sponsored by the AMA and distributed regularly in all of the AMA regions. We decided to accept the challenge if we could obtain the funding to develop and pilot test the program.

In less than a year, after a preliminary proposal, a full-blown proposal and back and forth visits, the UpJohn Company awarded us a large grant to develop and

pilot test a continuing medical education course on prescribing drugs with dependence liability. I wanted this two-day course to have a variety of learning experiences one of which was computerized clinical case simulation. I planned on contracting their development out to the National Board of Medicine (NBME), but while I was at the NBME working out the deal, I was introduced to clinical judgment analy-

sis by one of their staff members. Sid and I were sold immediately on its potential for our program and I budgeted enough to develop two judgment simulations in addition to the clinical case simulations. Then I met Roy Poses here at MCV and invited him to join us to provide us with some of his knowledge about clinical decision making. I believe the project (which I'll discuss in Atlanta) has enormous potential.

Poses Models Physicians' Judgments

Roy Poses, Division of General Medicine, Medical College of Virginia

I have continued to work on a multivariable model of physicians' judgments of the probability of sepsis (severe bacterial infections of the blood) for real patients. Several plausible clinical variables carried substantial amounts of weight. A variable meant to reflect the influence of the availability heuristic also had a significant weight. This suggests that this heuristic may inappropriately affect physicians' diagnostic judgments for actual patients, and that, at least in this instance, it is not a laboratory curiosity as some would contend.

Surprisingly, a variable meant to reflect value-induced bias (the log of the physicians' estimate of the relative risk of death due to sepsis) had a negative weight associated with it. Thus the physicians tended to give lower assessments of the likelihood of potentially treatable blood infections to those patients most at risk of dying from them. This suggests that the physicians employed wishful thinking, that they overestimated the probability of a good outcome (no sepsis) for those most at risk if they were to have the bad outcome. Such a bias may have a strong adverse effect on the duality of medical care.

Brunswikian analysis may be a powerful tool to discover judgmental heuristics used in real-life settings.

With Bob Wigton and Paula Horvatic, I am attempting to develop a model of physicians' judgments of the likelihood of addiction to and of favorable results from anti-anxiety drugs given to individual patients. Our ultimate goal will be to develop computerized cognitive feedback programs to improve these judgments, and hopefully the resulting decisions.

*Trio from Switzerland
To Attend Atlanta Meeting*

Dick Joyce (founder/member of the Brunswick Society) and two of his colleagues (Beat Hiltbrunner from Ciba-Geigy in Basle and Hans-Ueli Fisch from the University of Bern) will attend the meetings in Atlanta this year and present their research on applying judgment analysis to the medical field.

Lens Model Analysis Presented in Medical Decision Making Journal

Theodore Speroff
MetroHealth Medical Center
Case Western Reserve University

The paper using multiple outcome lens analysis has been accepted for publication: "Lens Model Analysis of Hemodynamic Status in the Critically Ill" will be printed in the Fall issue—vol 9(4)—of the *Journal for the Society for Medical Decision Making*. The article will be accompanied by an invited editorial by George Diamond, MD, titled, "Through a Lens, Darkly." Hopefully, a rejoinder "The Lens Model: A Gem of a Method of

Judgment Analysis or Just a Diamond in the Rough?" will be published back-to-back in the same issue. Since the annual MDM meeting will be held in October, I will be able to report on the reception of MDM members to the lens model at the Brunswickian meeting.

I will also be able to report on one or more of the following activities:

- The extension of lens modeling to logistic regression.
- A cross-validation of the multiple outcome lens analysis of hemodynamic status in the critically ill.
- The examination of reliability among raters conducting a methodologic review of observational studies using lens analysis.

Rothert Analyzes Womens' Judgments

Marilyn Rothert, College of Nursing, Michigan State University

Women's Judgments Regarding Estrogen Replacement Therapy. We are currently completing this grant, and awaiting word on a proposal for continuation. Cluster analysis was used to identify three major clusters of policies held by subgroups of women. The three groups differ widely in their use of risk information. Group 1 focused on hot flashes primarily, Group 2 on osteoporosis and hot flashes, and Group 3 focused on the potential negative side effects of therapy. A related policy capturing study was done to assess nurses' policies and similar clusters reappeared suggesting the groups are stable. We did a follow-up study using protocol analysis on a subset of 3 women from each of three clusters to ask:

- What is the relationship between the interview data and our interpretation of the quantitative data?
- How do the various analyses converge or differ?
- Can women's descriptions convey their judgment policies?

In general, findings indicated a strong relationship between the interview data and the quantitative data. Women were able to articulate their policies descriptively and understood the information presented, although some women had difficulty combining the population data with their own risk factors and values. The research team includes David Rovner, Margaret Holmes, Neal Schmitt, and Geraldine Talarczyk.

Decision Support Intervention. The proposed research will develop and test a "decision support intervention" to aid women in becoming better decision makers concerning estrogen replacement therapy (ERT). Using an experimental design, we will test the decision support intervention against written information only and lectures/discussion. Measures will be assessed at completion of the three-week intervention, six-month and one-year postintervention. We hypothesize the decision support intervention will improve knowledge retention, satisfaction with personal decisions, compliance, and satisfaction with health care provider interaction. Findings from this study may have implications for the class of health care problems requiring communication of risks and benefits. In addition to the research team above, George Cvetkovich and Annette O'Connor will serve as consultants.

CJA Used to Model Outcome Criteria

D. Mark Chaput de Saintonge
Therapeutics Section
The London Hospital Medical College

We continue to use Clinical Judgment Analysis (CJA) to model outcome criteria for use in clinical trials and the audit of medical practice. Studies underway will test the acceptability of these methods to trial producers and consumers. New work explores the contribution of policy models to the construction of medical expert systems where the model of the domain is not well developed and external criteria are not available. The growing need for some homogeneity of medical standards within the European Economic Community has encouraged us to develop the use of CJA as a taxonomic tool which may also encourage consensus development.

Tom Tape and Bob Wigton (University of Nebraska Medical Center) have been using the lens model to gain insight into regional variation in medical practice. They have conducted a three-site study of physician estimates on the likelihood of pneumonia based on patients' presenting symptoms and signs.

Mumpower's Research Focuses on Negotiation, Public Policy

Jeryl Mumpower
Center for Policy Research
State University
of New York at Albany

My Brunswickian research is focused on negotiation. I have recently finished two papers on this topic.

The first is entitled "The Cognitive Characteristics of Negotiators and the Structure of Negotiations." It concludes that the underlying structure of negotiation tasks is critically influenced by negotiators' cognitive characteristics. Relatively slight differences in how negotiators evaluate the utility of potential settlements result in distinctly different settlement spaces and efficient frontiers. The analysis reveals the high degree of cognitive complexity that typically faces negotiators, even for simple negotiation tasks.

The second is entitled "Cognitive Influence on the Dynamics of Negotiations." A series of simulation-based analyses demonstrate that the dynamics of the process are critically affected by three cognitive factors. The first is the underlying structure of the negotiation task,

which is determined by the value structure of the negotiators. The second is the parties' strategic negotiating orientations, that is, the manner in which their individual evaluations of overall utility are influenced by concern for the other negotiator's welfare. The third is the tactical rules that guide the choice of concessionary offers that negotiators make during the bargaining process.

We are currently initiating a series of empirical studies to investigate some of the hypotheses generated by our theoretical and simulations analyses.

Much of my time remains devoted to public policy research. We just completed a major study on medical waste, with reports released in June and July.

Hogarth Studies Risk, Monetary Incentives

Robin M. Hogarth, Center for Decision Research, University of Chicago

My work during the past year has included:

1 *Further development on a theory of risk and ambiguity.* Important experimental result: Attitudes toward risk and ambiguity for losses were qualitatively different for real as opposed to hypothetical payoffs.

2 *When do monetary incentives help or hinder performance in learning a decision-making task?* Experimental results indicate conditions that help, hinder, or make no effect. These lead to theoretical speculations about more general conditions.

3 *From risk to ambiguity to ignorance:* We are starting to study how people make risky decisions (involving the purchase and sale of insurance and warranties) under conditions of ignorance, that is, with only vague ideas about possible costs and relevant probabilities. For example, consider buying a warranty for a new electronic device for which there is very little past history. We are exploring the "arguments" people use in discussing these decisions with themselves to try to understand both their content and structure.

Editor's Note. Robin Hogarth's work is closely related to that of Terry Connolly (University of Arizona). Hogarth and Connolly will make a joint presentation at the meeting.

Effects of Alcohol Warning Labels Studied

George Cvetkovich, Department of Psychology, Western Washington University

Warning label laws assume that consumers are "simple reactors" (learning about an action's risk directly reduces the frequency of the action). Studies of consumers, however, suggest that warning labels function in more complicated ways. For example, consumers are unlikely to read warnings on products not considered to be hazardous, or they may consider products with warning labels safer than ones without a warning. Our research on risk communication suggests three factors that influence the processing of

hazard information: (a) involvement (the amount of personal investment in a hazard issue); (b) personal relevance (the extent that a hazard can affect the individual); and (c) ability (the individual's capacity to process the hazard information). Consideration of these factors has led us to identify three paths by which warning labels may have an effect. We plan to examine these paths by studying the effects of the newly mandated alcohol warning labels that will be placed on all beverage containers beginning November 18, 1989.

Alex Wearing (University of Melbourne) is just completing a fire-fighting program in the Brehmer tradition for looking at the interaction on affect and cognition in dynamic decision making, and the first lot of results will be reported at Psychonomics. He is part way through a project on cognitive models of the economy with a view to reaching a better understanding of economic decision making, and has completed a small project (part of which he mentioned two years ago) on decision making by General Practitioners.

Weather Forecasting in Colorado Focus of Research

Center for Research on Judgment and Policy University of Colorado

Cynthia Lusk

This year I have been working on three weather forecasting projects, two of which concern judgment and decision making in dynamic tasks under stress.

The first project, in collaboration with Ken Hammond, is being conducted with NOAA meteorologists producing a forecast under representative conditions. Forecasters observe data (workstation "products") in whatever order and form they wish, and we collect data regarding the products selected, their rationale for product selection, and forecasts and confidence judgments after viewing each product. We plan to code each workstation product regarding the degree to which it should induce pattern matching (PM) or functional analysis (FA; similar to Hammond et al.'s coding of analysis versus intuition). Utilizing this code, we will assess the relationship between the relative use of, and alternation between PM and FA products over time, interforecaster agreement, and accuracy. These data may also be used as a baseline for comparison to NWS forecasters in a stressful operational setting.

The second project, also in collaboration with Ken Hammond, emphasizes the effects of stress on judgment and decision making. Several subprojects are involved here. One completed project indicates that meteorologists make superior forecasts when the weather is more active (making the forecast situation more stressful) than on less active (less stress-

ful) days. We are following up this project with two other studies. The first will use archived product usage logs from the NWS meteorologists, and our product coding (see above) to assess the extent to which the relative use or pattern of alternation between PM and FA inducing products differs when the weather is more or less active/severe/stress-inducing. The second study involves NCAR meteorologists forecasting severe weather for Stapleton International Airport. We are hoping to obtain precursor judgments in order to build models comparing low and high activity/stress days to ascertain differences in judgment of environmental models.

The final project, in collaboration with Tom Stewart, concerns an expert system comparison ("SHOOTOUT-89"), which took place this summer at NOAA. Our simple linear model was one of six systems to compete. This exercise provided an excellent opportunity to compare a wide variety of approaches to expert systems. (I will talk about the latter at the Brunswick meeting).

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Kenneth Hammond

I have been working on the expansion of the Cognitive Continuum Theory to include concepts other than intuition and analysis. (I deny that this step was taken only to satisfy Mike Doherty!) The new material includes pattern recognition (in relation to functional relations), specification of different templates for both patterns and functions, depth versus surface conditions in relation to direct and inverse probabilities, and the role of oscillation and alternation in cognitive activity. I will diagram these concepts at the meeting.

Center for Policy Research State University of New York at Albany

Thomas Stewart

I have been working on an experiment designed to evaluate the effects of additional information on the judgmental skill of experts. Experienced meteorologists at NOAA in Boulder have been making severe weather forecasts using weather information recorded during the summer of 1987 and displayed on an advanced interactive computer graphics workstation. During the fall and winter, some of the same forecasters will make the same forecasts using different displays and limited information sets. I have also been involved in an expert systems "shootout" during the summer. Cindy Lusk and I entered a simple linear model in competition with several expert systems for predicting severe weather along the Colorado Front range.

Martha Neal, formerly an undergraduate student at the University of Colorado and now a graduate student at the University of North Carolina, writes to say that when she found herself in a seminar at Duke in which the new rage "connectionism" was being explained she was immediately struck with the implicit connection with lens model theory. She will explain why in Atlanta.

New Articles

Barbara A. Reilly
Department of Psychology
Clemson University

Reilly, B. A., & Doherty, M. E. (1989). A note on the assessment of self-insight in judgment research. Organizational Behavior and Human Decision Processes, 44, 123-131.

"A widely accepted finding in research on human judgment is that people have relatively poor insight into the weighting schemes they use when they make holistic judgments. The empirical research supporting this generalization rests on indices of self-insight produced directly by subjects. This note replicates the usual finding, but reports an alternative method of assessing self-insight, i.e., the proportion of subjects who recognize their own policies when those policies are represented in terms of Usefulness Indices. Forty college senior accounting majors made holistic judgments of 160 hypothetical job offers, each offer being composed of 19 attributes. For all 40 students, predicted judgments using regression weights correlated more highly with actual judgments than did the predicted judgments using subjective weights, i.e., the direct ratings of the importance of the attributes. Eleven of the students subsequently attempted to identify their own policies. The probability of a correct identification was .025, yet 7 of the 11 students selected their own policies (p = 1.84 x 10^-9). This suggests that people have far better self-insight than hitherto believed, but that they cannot adequately express that insight by the subjective weighting procedures that have been commonly used." ©1989 Academic Press, Inc.

In Atlanta, I will discuss my dissertation, "The Effect of Foreign Ownership on Initial Job Choice Decisions and Subsequent Self-Insight into the Job Choice Process" and cover the basic progression of my research from the initial findings using the recognition method to the replications and extensions.



Raymond M. O'Connor, Jr.
Department of Psychology
Indiana University-
Purdue University at Indianapolis

O'Connor, R. M., Jr., Doherty, M. E., & Tweney, R. D. (1989). The effects of system failure error on predictions. Organizational Behavior and Human Decision Processes, 44, 1-11.

"While Brunswick's conception of ecological validity has been widely discussed, his conception of ecological unreliability, or error in the data on which inferences or predictions are based, has been largely ignored. Further, when psychologists discuss error in continuous data, that error has, perhaps because of the impact of classical psychometric theory, been thought of as Gaussian, and labeled measurement error. The present paper reports a two-cue MCPL experiment in which there are multiple observations of each cue on each trial; these observations make the data error, or ecological unreliability, highly salient. In one condition both cues were degraded only by measurement error, i.e., the five observations varied randomly around the true cue value. In the second condition both cues were degraded by measurement error, while one of the two cues was also degraded by a form of error we call System Failure (SF) error on 30% of the trials. SF error refers to the form of error which we associate with technological rather than biological systems, in that any given observation may be irrelevant to what is supposed to be measured. The SF condition was significantly more predictable than the measurement error only condition, yet subjects had significantly lower achievement." © 1989 Academic Press, Inc.

I am currently developing a study to follow up the OBHDP paper. Given that we found disruptions caused by SF error, I am now considering a study looking at what exactly is causing these disruptions.

My most recent judgment research project is my dissertation in which I at-

tempted to do a partial replication of Steinmann's (1976) paper looking at the role of task complexity in determining the effectiveness of feedforward and cognitive feedback. I modified Steinmann's research to include more subjects, more trials on which to base cognitive feedback, and a slightly different manipulation of task complexity. In addition to manipulating function forms (as Steinmann did), I also manipulated the number of cues subjects used (two versus four). I found a main effect for complexity and blocks, but no differences between feedforward and cognitive feedback groups.



Jay Christensen-Szalanski
Management Sciences
University of Iowa

Christensen-Szalanski, J. J. J., & Fobian, C. S. (in press). The hindsight bias: A meta-analysis. Organizational Behavior and Human Decision Processes.

"The hindsight bias in probability assessments is one of the most frequently cited judgment biases. A meta-analysis of 122 studies revealed evidence that the bias occurs under some conditions and that its effect can be moderated by a subject's familiarity with the task and by the type of outcome information presented. The data also suggest that the use of "almanac" questions can generate an unusually large hindsight effect. An observed asymmetry in the effect of the hindsight bias suggests that cognitive, and not motivational factors may be the main cause of the bias. Finally, the overall magnitude of the effect of the hindsight bias was found to be small (r = .17) while these results suggest that the bias may not be as worrisome as commonly assumed in the literature, we discuss some situations when an effect this small may be of importance to practitioners. We also show that depending upon the familiarity of the task and type of outcome information presented, anywhere from a minimum of 0% to a maximum of 7-27% of the population may make different decisions because of the hindsight bias."

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