

The Brunswik Society

Newsletter

Vol. 24, Nov. 2009

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The contributions to this year's Brunswik Newsletter cover a wide range of research topics from Clinical Judgement of Quality of Life to Cognitive Engineering and Improving Human–Automation Systems, just to mention some examples.

Ken Hammond looks back on the history of the Brunswik Society since it was organized 25 years ago in Boston and gives a compressed reminder of Brunswik's 5 key-concepts, which are the cornerstones in his theoretical stand on organism-environmental interaction. These concepts are so broadly defined that they, like open doors, still invite researchers to new content- and meaning-specifications.

I would like to say thank you to all authors for their contributions.

Grateful thanks to my wife, Gillian, for language checking and support and to Esther Kaufmann, University of Mannheim, for professional help with proofreading, the layout and downloading the contributions.

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Evaluation of Advanced Automated Geospatial Tools and Imagery

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I have continued working with Dr. Kathryn Laskey and students at George Mason University to conduct experiments assessing the value of geospatial tools and imagery to military decision-making. The tools and imagery are being developed by the U.S. Army's Topographic Engineering Center (now called the Army Geospatial Center) to support soldiers' understanding and utilization of terrain and weather information. Our experiments use active-duty military personnel and problem scenarios representative of actual planning environments. The following papers describe the two most recently conducted experiments. In addition, we are beginning to conduct formative evaluations using an array of representative scenarios to obtain military personnel's judgment about the potential value of geospatial tools early in their development to help guide development decisions.

References:

- Powell, W. A., Laskey, K. B., Adelman, L., Johnson, R., Dorgan, S., Klementowski, C., Goldstein, A., Yost, R., Visone, D., & Braswell, K. (2009). Results of an experimental exploration of advanced automated geospatial tools: Agility in complex planning. Presented at *14th International Command and Control Research and Technology Symposium*, 15-17 June 2009, Washington, DC. [Nominated for Best Student Paper award].
- Powell, W. A., Laskey, K. B., Adelman, L., Johnson, R., Klementowski, C., Altenau, M., Goldstein, A., Visone, D., & Braswell, K. (2009). Evaluation of high resolution imagery and elevation data. Presented at *14th International Command and Control Research and Technology Symposium*, 15-17 June 2009, Washington, DC.

Integrating Information in a Clinical Judgement of Quality of Life: A Case Study

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My program of research continues to examine the links between probability of responding and the conceptual framework of Egon Brunswik. A case study has been submitted recently for publication. This case study analysed repeated clinical judgements.

Imagine that for one moment you were asked to decide how someone perceived their quality of life, that is, whether it in simple terms it was poor or good. To help you in your judgement you are given their responses to the World Health Organisation's *EUROHIS Quality of Life Scale*. The person says that they are dissatisfied with their health and their ability to perform their daily living activities; they are dissatisfied with themselves and their personal relationships; they are also dissatisfied with their conditions of living; they have moderately enough energy for everyday life and moderately enough money to meet their needs. Would you think that their quality of life was poor or good? This is an archetype of a clinical judgement on the basis of six pieces of evidence (albeit subjective but psychometrically derived). The reader probably would have little difficulty in deciding that the quality of life in this instance was poor and this was the correct answer.

Now imagine that a clinical psychologist is called upon routinely to make 37 such judgements with varying combinations of evidence. How correct would they be across the 37 cases? How long would it take for their decision or accuracy to stabilise? How reliable would they be in their judgements? Which factors would most influence their decision? The answers to these and some other questions are the topic of this case study, which focuses upon the theoretical issues raised by Bell and Mellor (2009) in their review of clinical judgement and applies them to actual clinical judgements. (Incidentally they manage to spell "Brunswik" incorrectly, so one doubts that they ever read the cited material or giving them the benefit of the doubt it could be a spell check-error).

In any event, the test-retest reliability of the psychologist's judgements was .87. The overall correlation of judgements with the criterion was .28 and the judge made a correct estimate in 64.8% of cases. Accuracy did not stabilise until after 15 judgements. The multiple correlation of the seven cues with the criterion was .59 and the multiple correlation of the same cues with the expert's judgement was .86. The judge relied on self-esteem as a basis for deciding but confounded this with other factors. The results showed that judgements took time to stabilise; that they imposed a substantial cognitive load; that they may well be correct but for the wrong reasons

since the expert failed to use the statistical properties of information to their maximum advantage. The advantage of a fast-and-frugal heuristic for clinical judgement was also supported.

The next stage of this research will examine similar judgements under conditions of incomplete information.

Reference:

Bell, I., & Mellor, D. (2009). Clinical judgments: Research and practice. *Australian Psychologist*, 44, 112-121.

**Can Nonverbal Cues be Used to Make Meaningful
Personality Attributions in Employment Interviews?**

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This study examines the role of personality attributions in understanding the relationships between nonverbal cues and interview performance ratings.

A structured behavioral interview was developed for identifying management potential in a large, national company. Using a concurrent design to validate the interview, managers were interviewed and the interviews were videotaped (n = 110). These videotapes were used as stimuli for raters in this study.

Results indicate that raters can make personality attributions using only one channel of information and these attributions partly explain the relationships between nonverbal cues and performance measures. Furthermore, conscientiousness attributions explain the relationship between visual cues and interview ratings, extraversion attributions mediated the relationship between vocal cues and interview ratings. Neuroticism attributions had a suppressing effect for both visual and vocal cues.

No matter how much an interview is structured, nonverbal cues cause interviewers to make attributions about candidates. If we face this fact, rather than consider information from cues as bias that should be ignored, interviewers can do a better job of focusing on job-related behavior and information in the interview, while realizing that the cues are providing information that must be attended to.

This study isolated the sources of information provided to raters to either the vocal or the visual channel to examine their impact individually. A Brunswick lens model shows the potential impact of personality attributions predicting both job and interview performance ratings when both channels of information are used.

Reference:

DeGroot, T., & Gooty, J. (2009). Can nonverbal cues be used to make meaningful personality attributions in employment interviews? *Journal of Business and Psychology, 24*, 179-192.

Coherence and Correspondence

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Following a symposium on coherence and correspondence at the 2007 meeting of the Brunswick society, I was asked to guest-edit a special issue of Judgment and Decision Making on this topic. I was fortunate to have the assistance of Robin Hogarth and Jonathan Baron in putting together this special issue and it was published in March of 2009. The issue can be found at the following link and should be interesting to all Brunswikian (perhaps all JDM) researchers: <http://journal.sjdm.org/vol4.2.html>.

Bellow is the table of content for this special issue:

- Introduction to the special issue: Coherence and correspondence in judgment and decision making, pp. 113-115. Philip T. Dunwoody.
- Theories of truth as assessment criteria in judgment and decision making, pp. 116-125. Philip T. Dunwoody.
- Correspondence and coherence in science: A brief historical perspective, pp. 126-133. Neal V. Dawson and Frederick Gregory.
- Coherence and correspondence in medicine, pp. 134-140. Thomas G. Tape.
- Are patient decision aids effective? Insight from revisiting the debate between correspondence and coherence theories of judgment, pp. 141-146. Victoria A. Shaffer and Lukas Hulsey.
- Coherence and correspondence in engineering design: Informing the conversation and connecting with judgment and decision-making research, pp. 147-153. Konstantinos V. Katsikopoulos.
- Searching for coherence in a correspondence world, pp. 154-163. Kathleen L. Mosier.
- Criteria for performance evaluation, pp. 164-174. David J. Weiss, Kristin Brennan, Rick Thomas, Alex Kirlik and Sarah M. Miller.
- Coherence and correspondence in the psychological analysis of numerical predictions: How error-prone heuristics are replaced by ecologically valid heuristics, pp. 175-185. Yoav Ganzach.

**Gresham's Law of Judgment:
Fancy, Invalid Information Drives out Plain, Valid Information?**

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Rory Ramsey, Neal Dawson, and I are analyzing an existing data set and have identified an intriguing finding: it seems that when physicians are provided with the results of an elaborate diagnostic procedure, for a patient they are already familiar with and have already made a predictive judgment about, their judgment may get worse.

I'll not give complete details of the prognostic task, as not all authors and data owners have been fully informed about the finding. The task is to predict how well an elaborate, lifestyle changing treatment will work for a chronic condition. Each patient's physician made judgments for the patient. There were a couple of hundred patients, and eight physicians. The physician made two prognostications for each patient, once based on all available clinical data, and then after the patient had undergone the diagnostic procedure all the data from the procedure were supplied to the physician and a second prediction was made about how well the coming treatment would work. Then the patient underwent a month or so of treatment, and there were measures of quality of life before and after this treatment. The physician prognostication was, "What is the probability the patient will improve at least a certain amount, on the quality of life measure?"

The linear regression lens models for the prediction about the future improvement due to treatment, made before (Prediction 1) and after (Prediction 2) receiving the results of the elaborate diagnostic study, are:

| | r_a | G | R_s | R_e | C | $\text{Sqrt}(1-R_s^2)$ | $\text{Sqrt}(1 - R_e^2)$ |
|--------------|-------|------|-------|-------|------|------------------------|--------------------------|
| Prediction 1 | .361 | .772 | .524 | .352 | .275 | .851 | .936 |
| Prediction 2 | .337 | .680 | .771 | .385 | .229 | .637 | .923 |

Both of those models have the same environmental criterion – the patients' improvement given treatment. The achievement accuracy r_a , the correlation between the physician's prediction of improvement and the patient's actual improvement, was

worse when the physician had been given the additional information (.337 versus .361: a lower number; probably not statistically significantly worse, but certainly not statistically significantly better!). The relation between the predictable parts of the judgment and of the actual improvement, G , shows an even larger difference (.680 versus .772) in favor of the physician's judgment without the aid of the diagnostic procedure. On the other hand, the predictability of the physician's judgment is much higher when the diagnostic information was made available (.771 versus .524). The cue with the largest weight in the judgment model of Prediction 2 was the added result of the diagnostic procedure. Its standardized regression weight in the model of the physician's judgments was .633, compared to .187 in the model of the patients' actual improvements.

Thus, when additional information was provided – based on an elaborate, time consuming, expensive diagnostic procedure in which both the patient and the physician had a large investment – the physician naturally enough used it. In this situation, where the patient's actual improvement was quite hard to predict (R_{cs} of .352 without, and .385 with, the results of the diagnostic procedure), even though the diagnostic procedure had some cue validity, some relation with the outcome, the physician relied so much on it (paying less attention to other valid cues that the physician knew how to make use of) that the judgment got less accurate.

We plan to do this analysis six other ways but this general conclusion will probably still hold. We'd be happy to hear if it is similar to results that others have found.

No Brunswick Meeting this Year

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Dear Participants in the Brunswick Society

Egon Brunswik's theoretical and conceptual framework has been applied to an impressive range of subject-matter fields, for example personality psychology, medical diagnostics, weather forecasting, employment judgment, business science, etc. This research has demonstrated the suitability of the lens model design for giving interesting, useful empirical results within a wide area of different research fields. However, less attention has been devoted to the key concepts, for example uncertainty, representative design etc., that are the cornerstones (building blocks) in his theory about organism-environment interaction. Before exploring the five fundamental key-concepts of Brunswik's psychology a short introduction to the history of Brunswick Society is presented.

The Brunswick Society was organized 25 years ago in Boston during a discussion with several colleagues in which we expressed our dissatisfaction with the absence of Brunswikian concepts and research (about which more below) in the Judgment and Decision Making Society meetings. It may be worthwhile to remind readers that the J/DM Society that exists today emerged from two separate meetings; (a) the ones that had taken place to encourage further work on the Bayesian approach that had been developed by Ward Edwards and colleagues and (b) the meetings that had taken place in Boulder, Colorado that included Bayesian work and Brunswikian work developed by me and my students as well as other colleagues. Ward's meetings continue (despite his death), but the meetings in Boulder were discontinued many years ago. Fortunately, Jim Shanteau, Gary McClelland, John Castellan (dec) and others took up the task and formed the current J/DM Society. It was the absence of Brunswikian discussion in the J/DM meetings that led to the formation of the Brunswick Society 25 years ago. The meetings were generally considered successful in that the attendance grew so much that it became necessary to expand the meetings to one and onehalf days; this was astonishing to me. In view of this apparent success, why has the 2009 meeting been cancelled?

A little more history; when the Society was formed I made all the arrangements and set up the one day program. Initially, about 10 people attended, and attendance gradually grew to about 45 participants, literally, from all over the world. As the Society grew, Tom Stewart set up a web page, a newsletter was created, and other attributes of a successful scientific Society appeared. After about 10 years of

organizing meetings I asked Tom to take over this task, which he did very successfully (the attendance grew). Tom asked Jim Holzworth to organize the meetings after about eight years or so and Jim has been doing so. I feel now it is time to bring in new enthusiasts to take over the organization of our Brunswik meetings: Elke Kurz-Milcke has agreed to do this. As the take-over has occurred rather late in the year, time has been too short to organize a meeting for 2009.

Topics

a. *Uncertainty*. Despite the central place of this concept there has been little or no discussion of uncertainty in the last 20 years of Brunswikian meetings. This despite the disputes between Gigerenzer and Kahneman and their followers, each of whom has based an entire research program on different ideas about uncertainty. "Probability" is now prominent in the theories of a few cognitive psychologists (e.g., Anderson, 1991) but has yet to achieve a prominent place in the modern neuroscience.

b. *Compromise*. Compromise is one of the most important, yet least recognized and least employed, concepts introduced by Brunswik. It is at the root of his theory of cognition. He gave it considerable prominence in his 1956 book when he contrasted the two "intentions" of perception, namely, "proximal" (retinal) size and "distal" (object) size. Actual judgments were found to be located on a continuum between these two poles of intention, and thus represented a "compromise" between the two poles (its specific location depending on conditions), although generally approaching the distal pole. When discussing the intellect, compromises were located between intuition (perception) and analysis (thinking), and the process was termed "quasirationality", the specific form of which was also dependent on conditions. This term – quasirationality – was chosen because it indicates approximation to, but not full achievement of, rationality. "Compromise" runs through all of Brunswik's theorizing and can be brought to bear on modern theories of judgment as well as decision making. It is most apparent when theories such as TTB that entail "maximizing" are contrasted to "matching" behavior. In this situation matching behavior would represent the compromise between (a) maximizing (TTB) that marks the analytical pole of cognition and (b) dividing weights equally among all cues as the most "thoughtless" method of judging that would mark the intuitive pole of cognition. Yet I have never heard a discussion of this concept in any Brunswikian meeting.

c. *Achievement*. I believe we need a richer, more inclusive, concept than mere "accuracy", I prefer to speak now in terms of correspondence *competence*, and coherence *competence* (see, Dunwoody, et al., 2009, for a discussion of these terms). "Accuracy" simply means correspondence of the judgment or decision with an empirically correct criterion, and that, of course, is of high significance. Coherence could mean the same, but the *derivation* of the "answer" would in general require the competence – explicit or implicit – to include other aspects of the task or process of judgment – as the Gestaltists first showed us with their concept of the gestalt. That is, a judgment – reached intuitively or analytically – based on the coherence all the elements – and their relationships – of the judgment should match all the elements – and their relationships – of the task. Correspondence theorists for their part, could and should enrich their conception of correspondence competence to include error distributions, as I describe elsewhere.

d. *Intersubstitutability*. The terms “vicarious functioning” and “vicarious mediation” were central to Brunswik’s emphasis on the uncertainty in the environment; they served to remove the ambiguity introduced by the broad concept of uncertainty; they specified exactly where both subjective and environmental uncertainty arises, how uncertainty in the environment causes uncertainty in the subject, why some environments are more uncertain than others, and many other features of our relation to our ecology. Brunswik was very specific about both matters, particularly in the field of visual perception. He denoted the uncertainty in the environment by pointing to the differences in validity and reliability (the latter often neglected) in various indicators or cues in the environment to object size – none are fully dependable – and also denoted their intersubstitutability (their intercorrelations with other cues indicate how often substitution can be used). This intersubstitutability is one reason why our visual perception and that of other mammals is so good. Fortunately for students of judgment and decision making, all these concepts carry direct implications from perception to the study of human judgment. But they are seldom examined in empirical detail. I have never seen such an examination at the Brunswick meetings.

e. *Representative design*. We are gradually making progress with the recognition of the sensibility of Brunswik’s suggestions regarding experimental design. The current Editor of the *Journal of Experimental Psychology: Applied* has declared that she will no longer accept mss that claim that their work applies to the “real world”, and instead will require demonstration of representativeness. Most important, however, in order for the phenomena that give rise to the requirement of representativeness, the organism must be given a multi-cue environment in which to behave. Unfortunately, however, even in Gigerenzer’s demonstrations of the ubiquity of heuristics, multi-cue environments are generally avoided in favor of binary presentations (Gigerenzer, 2009, and earlier). But if multi-cue tasks are used, the organism will also have a chance to engage in vicarious functioning in response to the vicarious mediation of information. Whether it will, and under which circumstances, has become a research issue of considerable interest (see Gigerenzer & Brighton, 2009; Hogarth & Narelaia, 2007). It has become clear, however, that answering this question does require the researcher to provide an environment representative of a wide range of conditions, that is, an environment that includes *causal texture* (cf. Tolman & Brunswik, 1935).

These five concepts (uncertainty, compromise, achievement, intersubstitutability, representative design) are the backbone of Brunswik’s probabilistic functionalism and marked the presentation of a new kind of experimental psychology. But they seldom make their appearance at meetings of the Brunswick Society.

Of course, I strongly hope for the long life of a Brunswick Society that discusses the ideas put forward by Egon Brunswik in a fashion that is congruent with his aims for the development of a scientific discipline.

Kenneth Hammond

Brunswikian Research at the University of Connecticut

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Research in the Brunswikian tradition continues at the University of Connecticut. We are still working with Tom Stewart (University at Albany) and Jeryl Mumpower (Texas A&M University) on a project concerning how people learn to make decisions when feedback is limited. We are framing our work at UConn within the context of personnel selection. Other projects have been completed, or are well underway.

In his doctoral dissertation, Dennis Thomas attempted to assess whether judgment analysis and individual difference measures can be useful tools for the identification of at-risk drivers, and whether computer-based training can have an impact on how drivers use various cues when making judgments of crash risk. In one study, a judgment task focusing on perceptions of crash risk in various driving scenarios was developed and administered to younger (under 21 years of age) and older drivers (over 25 years of age). Analysis of participants' responses to the judgment task showed that differences among younger and older drivers existed for the weight assigned to the presence of passengers, road type being driven on, and distraction from the forward roadway. Most notably, significantly more young drivers (82.4% of those sampled) were likely to have driver distraction as a significant predictor of crash risk judgments than were drivers in the older age group (56.9%). This finding suggests that younger drivers are aware of the risks associated with looking away from the roadway, yet crash statistics suggests they are still overrepresented in crashes where distraction was a primary cause of the crash. Results of a second study showed some indications that the weight assigned to driver distraction in the judgment task could be potentially useful for predicting extended glances away from the forward roadway on a simulated driving task in a full-size driving simulator. Although weight assigned to the distraction crash risk factor was not a statistically significant predictor of any of the glance duration measures, the results showed the relationship was in the predicted direction (negative correlation). Drivers who gave more weight to distraction tended to take fewer glances away from the road, spend less overall time with eyes off the road, have shorter mean glance duration, have shorter maximum glances, show smaller percentages of glances over 2.0 and 2.5 seconds, and have smaller percentages of tasks with eyes off the road for more than 2.0 or 2.5 seconds. A third study did not find any changes in crash risk factor weights after exposure to a hazard anticipation training program, but a number of relationships were found among individual difference measures and baseline performance on a computer-based attention maintenance assessment program. The findings suggest that driver distraction may require special training above and beyond that in the hazard anticipation training program used here. Given the lack of a training effect, it was not possible to determine to what extent judgment analysis would be useful for assessing the impact

of driver training. The judgment task developed for this study proved to be an easy-to-use and reliable instrument. The instrument had the ability to discriminate among various groups of users and showed the potential to predict safety related driving behaviors in a simulated driving environment. Although the results pertaining to judgment analysis' usefulness as a tool to evaluate the effectiveness of a pc-based driver training program were inconclusive, future research can follow the research design employed here in forthcoming attempts to make a determination as to judgment analysis' efficacy as a training program assessment tool.

In her doctoral dissertation, Amy (Reese) D'Agostino set out to accomplish two goals: to extend the work examining the relationship between individual differences and performance on dynamic decision making tasks and to use this knowledge to inform the design of a decision aid. Specifically, this research focused on individual differences in cognitive style. Study 1 examined the impact of three dimensions of cognitive style, *effort*, *structure*, and *decisiveness*, on performance in a firefighting microworld. A sample of 85 undergraduate psychology students completed a cognitive ability test, three measures of cognitive style (need for cognition, personal need for structure, and personal fear of invalidity scales), a short demographic questionnaire, along with six simulated firefighting tasks. Participants learned across tasks. Need for structure predicted overall performance along with several aspects of situation awareness. Interactions between decisiveness and effort, and between decisiveness and cognitive ability, predicted overall performance and situational awareness. Structure was determined to be the dominant predictor; those with high need for structure performed worse than those with low need for structure. Study 2 used knowledge gained about structure in Study 1 to inform the design of a decision aid targeted at those with a high need for structure. The aid consisted of strategy recommendations based on feedback from top performers in Study 1 and behaviors related to performance in previous research (Elliott et al., 2007). Eighty-six undergraduate psychology students were assigned to an aid or no aid condition. The same measures and tasks were used as in Study 1; the only difference in procedure in Study 2 was the aid group received a written document with strategy recommendations. The decision aid did not enhance performance in general, nor did it specifically help those with a high need for structure. This research demonstrates the importance of exploring individual differences to identify those best suited to dynamic decision making environments. It is important to continue to explore how the decision maker, the task, and the external environment influence one another to truly understand how the decision making process unfolds and how those who struggle in these environments can be helped.

In his doctoral dissertation, Kris Korbela is investigating relationships between stress, coping behavior, and judgment. Specifically, this research investigates the contribution of coping behaviors to understanding judgment in stressful contexts, combining Brunswick's lens model paradigm with the cognitive-phenomenological model of stress developed by Lazarus and colleagues. Coping has been conceptualized as effortful thought and behavior that occurs to manage the effects of a stressor within the environment (Lazarus & Folkman, 1984). Judgment and coping are being studied in a stressor-strain framework via the use of a longitudinal judgment task adapted from the work of Stewart, Mumpower, and Holzworth (2008). Undergraduate students ($N = 192$) assume the roles of Transportation Security Agency officers, screening passengers at a "checkpoint" for drugs and other illegal or

dangerous material. Study participants judge each passenger on “suspiciousness” based on informational cues provided during the task. Participants make judgments about five groups of 30 passengers. Stress is manipulated by varying task predictability (R_e). Results indicate that stress level affects judgment achievement (r_a), consistency (R_s), and matching (G), even when task predictability is taken into account. Participants in the lower stress conditions achieve higher levels of r_a and R_s . The relationship between stress level and G is less clear; participants in the medium stress level achieve higher levels of G than those in the high stress condition. Apparently, coping behavior [assessed subjectively with selected items of the Brief COPE scale (Carver, 1997)] reliably predicts r_a , but does not moderate the relationship between a state-based measure of stress [Stress in General (SIG) scale; Stanton, Balzer, Smith, Parra, & Ironson, 2001] and r_a .

Kathlea Vaughn continues her doctoral dissertation research, examining the role of individual differences in justice orientation in personnel decision making. Effects of these individual differences are being analyzed within the context of organizational motivations, expressed through experiment instructions and pay-off matrices. The potential interaction between individual differences and organizational motivations are being examined within the context of two different personnel decision tasks: one in which the decision is whether to hire an applicant, and another in which the decision is whether to lay-off an employee.

A Reply to Hammond

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We take issue with Ken Hammond's harsh assessment of recent *Brunswick Society* meetings (http://www.brunswick.org/annualmeetings/Brunswick_2009_meeting_posting.pdf). At his SJDm presidential address in 1988, Ken proudly showed a list of many different professional journals that are publishing Brunswikian articles. He was delighted that many of us were considering Brunswikian ideas in our varied areas of theoretical and applied research. People came to Brunswick meetings to learn more and share their own research ideas, hoping for encouragement, guidance, and constructive feedback. They always received it. A look at the agendas of recent meetings will show such support, with a large number of participants being graduate students. The feedback that we received about the meetings was that they were stimulating and useful in many ways.

There is always room for improvement and we hope that future committees will organize even better meetings. They will have to consider a number of financial and logistic issues as well as what constitutes Brunswikian research. People will have to step forward and help to maintain the Brunswick website, Brunswick list, and the wonderful newsletter, as well as take responsibility for ordering services, collecting registration fees, and paying bills at future *Brunswick Society* meetings.

It is time to make some serious decisions about the future of our society. We don't have society officers, elected or volunteer. Should we choose/elect any officers? How about term limits? To whom can we pass the torch? How can we function in a financially responsible way? There are, undoubtedly, other questions that we should be asking about the future of our *Brunswick Society*. We need some answers very soon.

Sincerely,

Jim Holzworth
Tom Stewart

**The Application of the Brunswikian Lens Model for Automating
the Diagnostic Process for Improved Human-Automation System Interaction**

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Within the last year at the University of Heidelberg and Mannheim we have been working on reducing at least a theoretical asymmetry which is still apparent today when humans interact with highly complex technical systems. The background for this research has its origins in the Brunswikian lens model, which is why, it might be of general interest for the readers of this year's newsletter.

Our demonstration platform is an electrically powered wheelchair, which can be operated on different levels of assistance: It can offer its user a collision avoidance behaviour, which prevents the wheelchair from colliding with static and moving obstacles/humans in the environment. In addition, it can offer an autonomous navigation mode, which, when active, allows the wheelchair user entering a desired goal position via a touchscreen and it, then, drives the user autonomously and safely to it. On the highest level of assistive functionality, the wheelchair system can use an eye- and head-tracking system and analyze the gaze patterns of the user to distinguish movement-relevant and movement-irrelevant gaze patterns (e.g., searching for an object in the environment). On the basis of this gaze analysis the wheelchair offers a two-level intention estimation behaviour: On the lower level, it predicts the movement direction (right/left/straight) and drives in this predicted direction, which significantly reduces the number of input commands required from the user. On a higher level, the wheelchair even judges on the goal object, which the user wants to go to and if the user accepts this goal, the wheelchair can, again, drive the user autonomously to it (for a description of the system, see e.g. Bartolein, Wagner, Jipp, & Badreddin, 2007). Such systems with different levels of automation have, in the human-automation interaction research field, been treated as systems with different levels of automation (see e.g. Endsley, & Kaber, 1997; Parasuraman, Sheridan, & Wickens, 2000) and there has been a huge amount of research going on regarding when which level of automation should be active (see e.g. Parasuraman, Bahri, Deaton, Morrison, & Barnes, 1990; Prinzl, Freeman, Scerbo, Mikulka, & Pope, 2000) and this is, where in our research, the Brunswikian lens model comes in.

When a human interacts with a technical system, the system has the potential to collect many behavioural cues on the human being. These "information windows" depend on the interaction method: Research has, for example, demonstrated that the

gaze behavior (gaze patterns, gaze durations) correlates with intelligence (see e.g. Jipp, Bartolein, & Badreddin, 2008). In addition, the way how a wheelchair user controls the joystick gives valuable input on the user's fine motor abilities and more specifically on his/her precision and wrist-finger speed (Jipp, Bartolein, & Badreddin, 2009). As this short overview already shows, there is a broad information basis, which has, at least in the field of assistive technology, not been considered sufficiently. That it is, however, important, has been shown in a study during which especially the fine motor abilities have successfully been linked to accidents with objects, which occur while driving a wheelchair through a realistic environment (Jipp, Bartolein, Wagner, & Badreddin, 2009).

In order to make optimal use of these information windows and link the resulting behavioural cues with the distant variables (abilities), we developed a model on the basis of a Bayesian Network, which enables the computer system to reason on the fine motor abilities of the technical system. In order to do so, the model uses cues (e.g. the variance which is in the joystick input signal) which can be assessed automatically (Jipp, Bartolein, Badreddin, Abkai, & Hesser, 2009). The first validation experiments were quite successful: The model enables the computer system to use these information windows, to automatically collect behavioural cues about the user and to reason about a relevant distant variable on the basis of these cues. Hence, on the basis of a Brunswikian lens model and an implementation with Bayesian Networks we successfully automated the psychological diagnostic process. In order to further automate the intervention, we are currently working on defining the optimal level of assistance depending on a given ability level, such that the wheelchair system can adapt its level of assistance automatically depending on the ability level of its user. Herewith, each user would get a - for him/her - optimal level of support without risking skill degradation.

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Two Examples for the Relevance of Brunswik-Symmetry

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In my study I discussed the importance of Brunswik-Symmetry in the context of implicit leadership theories (see f.ex. Lord, 1985), especially for the fit between actual leader and employees' implicit leadership theories (implicit-explicit fit). A former study by Epitropaki and Martin (2005) failed to show an important effect of the implicit-explicit fit on job satisfaction ($r = .19$). As they used a criterium that consisted of items that could not be influenced by the direct supervisor like satisfaction with the working conditions or the salary but a leader-specific predictor, I supposed that the small effect was due to a narrower lower level predictor and a broad higher level criterium (see also Wittmann, 2007). I conducted a study in which I compared the correlations between implicit-explicit fit and job satisfaction on the one hand and satisfaction with the direct supervisor on the other using Steiger's Z-test (see f.ex. Wuensch, 2007). Results strongly supported my hypothesis, as a strong effect was found for the correlation with satisfaction with the direct supervisor compared to a medium sized effect for the correlation with job satisfaction.

Additionally, I wanted to know how the increase of symmetry between predictor and criterium influences mediation effects. Baron and Kenny (1986) say that you need a zero-correlation between predictor and criterium if the mediator is accounted for to speak of a full mediation. Based on this commendation I proved theoretically that an increase in symmetry between predictor and criterium leads to an increase in the influence of the predictor on the criterium and so to a remaining direct effect for the cases that the predictor-criterium-relationship and the mediator-criterium-relationship profit a) absolutely or b) relatively the same. This assumption was empirically confirmed as well (see Junker, forthcoming).

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**Ambulatory Assessment:
A Modern Version of Brunswik's Representative Design Approach**

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In the following contribution I will highlight that the ambulatory assessment approach is traced to Brunswik's representative design (1955). In the first well known representative design study, Brunswik himself followed his student and asked her to judge different object sizes. The goal was to reveal the object consistency of a person under real world conditions. Since then, with the electronic revolution a modern version of this the ambulatory assessment approach has been evolving. Ambulatory assessment is defined as "the use of computer assisted methodology for self reports, behaviour records or physiological measurements, while the participant undergoes normal daily activities" (Fahrenberg, Myrtek, Pawlik, & Perrez, 2009, p. 206). Different terms have been used for this kind of data collecting, e.g. ecological momentary assessment, the experience sampling method and real time data capture (see Fahrenberg & Myrtek, 2001). In line with Brunswik's research idea, real life assessment is one of the most obvious advantages of the ambulatory assessment approach.

Anyway, I also want to highlight an advancement of the ambulatory assessment approach to the representative design approach, with the "experience in multimodal methodology, i.e. with control procedures and parallel registration of subjective, behavioural and physiological changes in daily life" (Fahrenberg, Myrtek, Pawlik & Perrez, 2009, p. 210).

Recently, a special issue on ambulatory assessment was published in the European Psychologist, including studies, for example in clinical psychology (Ebner-Primer & Trull, 2009) and industrial/organizational psychology (Klumb, Elfering & Herre, 2009). These approaches are also highly useful in developmental psychology (see Hoppmann & Riediger, 2009). Development is defined as "a dynamic process of selective adaptation of changing circumstances that extends across the entire lifespan from conception to death" (Bales, Lindenberger, & Staudinger, 2006). This echoes Brunswik's basic idea of adaption leading to favour, a data gathering approach also based on Brunswik's idea as the ambulatory assessment approach. The methodological association between Brunswik's research and data gathering methods is outlined in depth by Fahrenberg (2005).

For researchers interested in further information I refer you to the European Network for Ambulatory Assessment. This approach may open new windows for studying experiences and behaviours under daily life conditions, i.e. a modern version of Brunswik's representative design.

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**Flesh on the Bones:
A Critical Meta-Analytical Perspective of Achievement
Lens Studies**

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Daily we make decisions and often we are highly dependent on the expert's judgment achievement, such as a medical diagnosis, or a weather forecast. Consequently, the judgment accuracy is important in our daily life. Hence, the main aim of our project was to find out how well people judge in lens model studies (see Kaufmann, Sjö Dahl, Athanasou & Wittmann, 2007, 2008). Our project reveals the adjusted judgment achievement values (i.e. Lens Model components, see Tucker, 1964) corrected with a psychometric meta-analysis (Hunter & Schmidt, 2004). We are not aware of any earlier psychometric meta-analysis applied to lens model studies. Generally, simple, so-called bare-bones meta-analyses, have been used to achieve a meta perspective of the field. Recently, Karelaia and Hogarth (2008) published a comprehensive bare-bones meta-analysis.

In our study we present an example showing the advantages of a psychometric approach (analysis) and further explaining its characteristics. Before focusing on the analysis in more detail, we described the compared data bases. From our meta-analyses of 31 studies 19 overlap with Karelaia and Hogarth's data base (see Kaufmann, 2009, for details). Eighteen of these 19 studies are all coded by Karelaia and Hogarth (2008) as one-shot learning tasks (i.e. achievement studies) and 16 of the 19 as field studies. According to these authors, these field studies "were representative of the natural ecology of the task that is, sampled from real stimuli" (2008, p. 409). Hence, our data base is narrowed down to achievement studies which stressed to sample real stimuli or daily life situations. In the following, our complementary points to Karelaia and Hogarth's analysis (2008) are outlined:

Firstly, our psychometric analysis is unique, in that our data is corrected for different artifacts (e.g. measurement error, dichotomization). In this context, it is important to mention the linkage between the Tucker's Lens Model Equation (1964) and the psychometric meta-analytic approach according to Hunter and Schmidt (2004), although these latter authors do not refer to Tucker (see part: $R_s R_e G$).

However, there is a historical connection as Tucker was the supervisor of Schmidt's thesis. Empirically, the corrected judgment achievement values in our example can be estimated according to Hunter and Schmidt (see Wittmann, 1988) as follows:

$$r_{a, \text{ true value}} = S \sqrt{r_{tt}^{Rs} r_{tt}^{Re}} + e \tag{1}$$

S

Selection effects due to restriction (enhancement) of range

1 Danger to overestimate

1 Danger to underestimate

$r_{tt}^{Rs} r_{tt}^{Re}$

Psychometric reliability of judgment and criterion

2 Dangers to underestimate

$G R_s R_e$

Environmental validity and consistency (Construct reliability)

2 Dangers to underestimate (lack of symmetry)

e

Sampling error

1 Danger to overestimate (positive error)

1 Danger to underestimate (negative error)

From this Equation 1, showing results from our psychometric analysis, we conclude that there is a danger of 6 to 2 to underestimate the judgment achievement values (r_a) with only a bare-bones meta-analysis. This fact is, however, too often neglected.

In the following Figure 1 our three different correction strategies, conservative, averaged and liberal, are compared with a bare-bones meta-analysis (for details see below, or Kaufmann, 2009). This comparison reveals that: 1) without a psychometric meta-analysis the "true" judgment achievement is clearly underestimated and 2) the variation in the data is overestimated. Hence, with a liberal correction strategy our moderate judgment achievement value (.39) increases to a high level (.55).

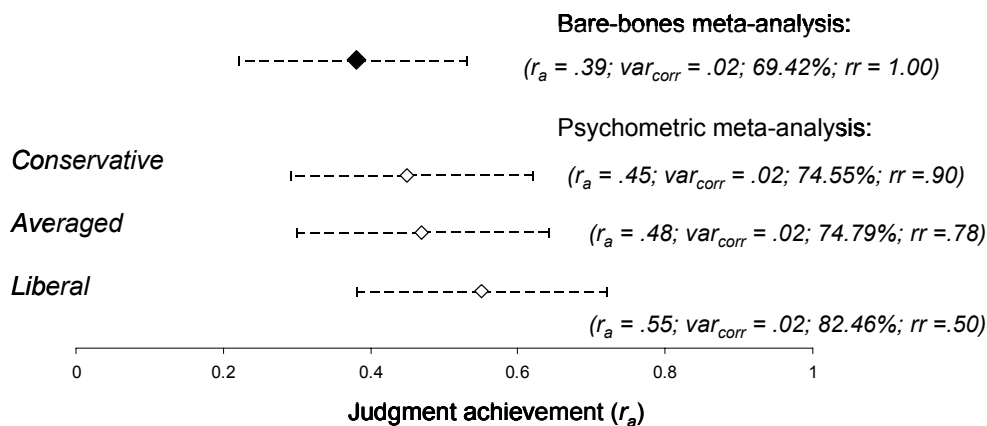


Figure 1. Comparison of our bare-bones meta-analysis with our psychometric analysis.

In addition, at a liberal correction level there are no moderator variables (75% Rule = 82.46%) indicated.

Secondly, in contrast to Karelaiia and Hogarth (2008), we are also interested in judgment accuracy differences between areas of medicine, business, education,

psychology and others, using lens model studies. It is necessary to add that in our project it was only possible to correct medicine and business science data with area specific information. Hence, we restricted our artifact corrections, with different levels, (conservative: $rr = .90$, averaged: $rr = .78$, liberal: $rr = .50$) to the remaining areas.

Thirdly, we also analyzed data on individuals to prevent any ecological fallacy (Robinson, 1950) and to complement them with judgment achievement data aggregated across people, to prevent any individualistic fallacy. This presentation of our analysis, including the check of the type of correlation in our data base, is published 2009 in the Swiss Journal of Psychology (see Kaufmann & Athanasou).

Fourthly, we also recorded variations in the experience level within the different areas. Surprisingly, it was the psychology experts who presented with low judgment achievement.

Finally, the different sensitivity analysis supported the robustness of our results.

Revealing the “true” value of judgment achievement together with Lens Model components, increases the possibility of improving the validity of applied experts’ models. Although different analyses (Camerer, 1981; Karelaia & Hogarth, 2008) showed the success of expert models compared with human judgments, we highlight that all previous analyses clearly underestimated this success as they ignored artifacts, that can be corrected with the Hunter and Schmidt psychometric meta-analysis approach (2004). It is therefore likely that the success of the expert model can be additionally increased by artifact corrections, in contrast to human judgments. We see such a psychometric approach or artifact correction as the privilege of expert models (see Kaufmann & Wittmann, 2009).

In summarizing our project, we want to emphasize the importance of finding “true” judgment achievement values (i.e. Lens Model components). Although we started with a bare-bones meta-analysis, finally we found the fruitfulness of a psychometric meta-analytic approach. By reducing the heterogeneity in our data, we were able to present adjusted lens model values which we regard as closer to the “true” values than uncorrected bare-bones data, in other words, our project shows that flesh is needed on the bones.

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Brunswikian Research at Illinois

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My colleagues, students and I have written some papers this year of possible interest to Brunswikians. They range from already in print, to in-press, to submitted. Titles and abstracts follow. We also have a less explicitly Brunswikian "An Overview of Human Factors Psychology" chapter in-press for the *Oxford Handbook of I/O Psychology* that could be of interest to some. Feel free to let me know if you would like more information on any of these.

Decision making under pressure and constraints: Bounded rationality
(Alex Kirlik and Sven Bertel)

The origins of bounded rationality in the pioneering research of Herbert A. Simon are presented, and the influence of these original ideas are traced forward to examine how they have influenced a wide variety of contemporary lines of psychological research on both the capabilities and mechanisms of human judgment and decision making.

The robust beauty of linear knowledge in a nonlinear judgment task
(Jennifer Tsai and Alex Kirlik)

Fifty years of research on human judgment has demonstrated that people are quite capable of learning to make accurate judgments in tasks where the criterion to be judged can be predicted by a linear-additive cue combination. Learning in nonlinear tasks, however, has rarely if ever been observed. We report the results of a study in which 12 knowledgeable baseball observers performed the nonlinear task of judging which of two baseball scenarios would result in a greater expected number of runs scored (criterion), given the presence and placement of any base runners and the number of outs (cues). Our findings indicate that these baseball experts were able to excel in this nonlinear task using dominance principles to effectively linearize what remained, at an overall level, a strictly nonlinear task. Expert judgment can transcend task linearity by decomposing the global task ecology into locales in which locally linear rules are sufficient.

Fast and frugal heuristics (Sven Bertel and Alex Kirlik)

Cognitive heuristics are fundamental to human judgment and decision making. Often described as rules of thumb that are used in lieu of optimal procedures (e.g., when resources are limited or knowledge is incomplete), cognitive heuristics may also be understood as essential mechanisms that guide information search and produce decisions by effectively and efficiently exploiting information structures in the environment. This article describes a selection of simple but powerful, task-specific, *fast and frugal heuristics* (FFHs) as suggested by Gigerenzer, Todd and the ABC Research Group (1999). Underlying assumptions related to concepts of ecological rationality are presented, as are basic mechanisms of, and research into the validity of FFHs.

Relevance versus generalization in cognitive engineering (Alex Kirlik)

The purpose of this article is to describe how research at the intersection of cognition, technology and work can be generalized beyond the source context of scientific inquiry and confirmation. Special emphasis is given to clarifying much existing confusion accompanying the use of terms such as 'ecological validity,' 'representativeness,' and the 'real world.' The ultimate goal is to foster a more productive dialog on the relative merits of where and how research on important cognitive engineering topics, such as cognitive adaptation to change and uncertainty, should be conducted.

Brunswikian resources for event perception research (Alex Kirlik)

Recent psychological research determining whether dynamic event perception is direct or instead mediated by cue-based inference convincingly demonstrates evidence of both modes of perception or apprehension. This work also shows that noise is involved in attaining any perceptual variable, whether it perfectly (invariantly specifies) or imperfectly (fallibly indicates) the value of a target or criterion variable. As such, event perception researchers encounter both internal, sensory or inferential, and external, ecological sources of noise or uncertainty, due to the organism's possible use of imperfect or "nonspecifying" variables (or cues) and cue-based inference. Because both sources play central roles in Egon's Brunswik's theory of probabilistic functionalism and methodology of representative design, event perception research will benefit by explicitly leveraging original Brunswikian, and more recent, neo-Brunswikian, scientific resources. Doing so will result in a more coherent and powerful approach to perceptual and cognitive psychology than is currently displayed in the scientific literature.

Can the Expert Outperform Mechanical Data Combination?

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Paul Meehl (1954), Kuncel, Klieger, Connelly and Ones (under review), and others have demonstrated the superior predictive validity of mechanical over expert data combination to predict various types of human behavioral outcomes, but they have left open the possibility that under certain circumstances the expert could outperform the mechanical approach. With the guidance of his faculty advisor, Nathan Kuncel, David Klieger is in the process of planning and writing a doctoral thesis that uses the mathematics of the Lens Model (Hursch, Hammond, & Hursch, 1964; Tucker, 1964) and other approaches (a) to review past research and existing data relevant to this proposition and (b) to test this proposition. This research has important implications for applied psychology. Many practitioners continue to use expert data combination instead of a mechanical method to make predictions (as discussed by Highhouse, 2008; Jeanneret & Silzer, 1998). If mechanical validity is greater than that of expert validity, then the utility of mechanical approach will exceed that of expert data combination, all other things being equal (Brogden, 1949; Cronbach & Gleser, 1965; Hunter & Hunter, 1984; Naylor & Shine, 1965; Taylor & Russell, 1939). Due to its effect on utility, improvement in expert validity is important if expert data combination is going to be used even in the face of superior mechanical validity.

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Improving Estimation Accuracy through Sequential Adjustment

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In line with Brunswik's double system-design (see Hammond & Stewart, 2001) estimating a criterion variable's value based on multiple cues can be a challenging task. In this study, we propose a simple way to improve estimation accuracy: Instead of seeing all cues' values at once before coming up with one single estimate, view each of them piecemeal and estimate at every step. The efficacy of this method was tested in two real-world tasks, one about estimating prices of diamonds and the other fuel efficiency of cars; and in both novices and experts. Compared with the "all-at-once" method, we found that the sequential one could improve both groups' estimating accuracy significantly (see Luan, 2009).

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- Luan, S. (2009). *Improving estimation accuracy through sequential adjustment*. Poster presented at the Society for Judgment and Decision Making (SJDM), Boston (MA), November, 22.

Calibration Heuristics and Performance Prediction

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This year we developed two brunswikian lines of research. One of them is concerned with calibration heuristics in deductive reasoning tasks, and the other is related to the selective use of cues for predicting outcomes in specific domains.

1) Calibration phenomena are sensitive to the structure of deductive reasoning tasks. When the expected inferences have a structure compatible with realistic environmental tasks, a calibration without biases was obtained. When the tasks are unusual, the hard-easy-effect was found. Additionally, a monotony effect for compound propositions was observed. When both propositions included in an implication presented the same value, i.e. positive or negative, the underconfidence bias was found. Some adaptive heuristics approach was proposed to explain these calibration phenomena.

2) We are also conducting a collection of experiments about the selective use of cues for predicting performance in experts and non-experts in several domains. Our partial results are coherent with a brunswikian interpretation related to environmental conditions.

Some results related to these research projects are published in Macbeth (2009a), Macbeth (2009b), Macbeth and Fernández (2008), Macbeth and Morán (2009). Additional information about our brunswikian activities are available online in the new website of our institute (<http://iipus.webs.com>).

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Ecologically Valid Cues in Social Interaction

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Brunswik's lens model provides a useful conceptual framework to study how people come to know their environments accurately. The model assumes that people infer their environmental state from cues, which differ in their ecological validity. The cue validity may be determined by stochastic processes when we perceive physical environments. In the interpersonal context, however, the cues are under the target's strategic control. Taking this difference into account, my colleagues and I recently tested and confirmed a prediction regarding the accuracy of social inference: Interpersonal inferences will be more accurate between partners who like each other than between partners who do not, or where only one partner likes the other (Ohtsubo, Takezawa, & Fukuno, 2009). This prediction was derived from the following reasoning: The greater the number of valid cues available to the perceiver, the more accurate the perceiver's social inferences will be. The number of valid cues, in turn, may be determined by the target's intention to disclose his/her internal state. Self-disclosure tends to be facilitated by liking for the partner. Therefore, the target's liking for the perceiver is a determinant of accuracy (i.e., the number of valid cues perceived). At the same time, the perceiver may be more strongly motivated to accurately infer the target's internal state when the perceiver likes the target. Therefore, the perceiver's liking for the target and the target's liking for the perceiver will jointly determine the accuracy of social inference.

The above argument is associated with an implicit boundary condition: It applies only to close relationships within which partners generally like each other. Valid social cues, however, may also be available between rivals whose interests are in conflict. A useful analytical framework, the signaling game, was developed in economics and biology. Valid signals (i.e., cues) may evolve even between preys and predators. For example, faced with chasing predators like hyenas, Thomson's gazelles tend to engage in stotting (i.e., leaping repetitively with all four legs kept straight). By doing this, gazelles can accurately communicate their stamina (i.e., the probability that they will successfully escape from the predators). With such a credible signal, the predators can avoid a foreseeable failure in hunting, and consequently save their stamina. My student and I have recently applied the signaling game to a social interaction context (i.e., the context of apology making; Ohtsubo & Watanabe, 2009). I believe this approach is useful in studying a wider range of social interactions. Although we did not explicitly refer to the lens model in our signaling paper, the signaling game would appear to be a useful analytical tool in coming to understand which cues are valid, and why.

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The Journal of Experimental Psychology: Applied

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Although you may be familiar already with the *Journal of Experimental Psychology: Applied*, I would like to remind you that this may be an appropriate outlet for your research. The mission of the *Journal of Experimental Psychology: Applied* is to publish original empirical investigations in experimental psychology that bridge practically oriented problems and psychological theory. The journal also publishes research aimed at developing and testing of models of cognitive processing or behavior in applied situations, including laboratory and field settings. Occasionally, review articles are considered for publication if they contribute significantly to important topics within applied experimental psychology. Areas of interest include applications of perception, attention, memory, decision making, reasoning, information processing, problem solving, learning, and skill acquisition.

The general criteria that I use to determine the suitability for a research project for this journal rests on three criteria:

- 1) Does the work advance theory?
- 2) Is an experimental approach used?
- 3) Do the results have clear practical implications?

With respect to question 1, the research should be presented in the context of extant theories and it should be clear what the implications are of your results for theory development and advancement. For question 2, I include quasi-experimental designs as well. Less frequent but still acceptable are papers that provide models, reviews, or meta-analyses of topics that are relevant to applied experimental psychology. For question 3, the research should have potential practical relevance; that is, it should be grounded in a problem space and the implications of the results for that domain should be clear.

Perhaps of most interest to the readership of this newsletter, I have been greatly influenced by the Brunswikian perspective in the philosophy that guides my stewardship of this journal. Below I quote from my inaugural editorial (Rogers, 2008, pp. 1-2):

Hallmarks of any good research are internal and external validity, and this may be especially important to consider in the context of applied research (see Shadish, Cook, & Campbell, 2002). One issue that is particularly important to the concept of external validity is representative design. Egon Brunswik is credited with delineating the

importance of representative design for psychological research and developing the concept of ecological validity to describe the “trustworthiness” or predictive validity of environmental cues (for a review see Hammond & Stewart, 2001, The Essential Brunswik). Unfortunately, since the original work was published (e.g., Brunswik, 1949) those terms have somehow become merged in the psychologist’s lexicon. In the interest of historical purity, if authors mean that their experimental context resembles the situation to which they wish to generalize, they should use the term “representative.”

A disturbingly frequent phrase that I have observed in submissions to JEP: Applied is “the real world” or “in real life.” These expressions are empty. Hammond and Stewart (2001) said it best: “The real trouble with introducing the terms real world or real life and the reason that they should be abandoned is that they are simply low-grade escape mechanisms; their use makes it unnecessary to define the conditions toward which the generalization is intended. One need only assume (without evidence) that everyone knows what these terms entail” (pp. 7–8). Instead, authors should be specific about the situations to which they expect their results to generalize.

In sum, I believe that you will find that the goals of the editorial staff of the *Journal of Experimental Psychology: Applied* match well with the views of the members of the Brunswik Society. I invite you to consider our journal as an outlet for your research.

We look forward to receiving your manuscripts for consideration in our journal (www.apa.org/journals/xap). Please do not hesitate to contact me (wendy@gatech.edu) or the Associate Editors Frank Durso (frank.durso@psych.gatech.edu) and Dan Morrow (dgm@uiuc.edu) if you have any questions about the journal in general or the suitability of a particular manuscript you are considering submitting.

Reference:

Rogers, W. (2008). Editorial. *Journal of Experimental Psychology: Applied*, 14, 1-4.

**Egon Brunswik and Contemporary Psychology:
From Probabilistic Functionalism to Judgment under Uncertainty**

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This thesis is about the influence of the theory and thoughts of Egon Brunswik (1903-1955) in contemporary psychology. The introduction of this work is important for a deliberation of his central ideas as they apply to probability in the history of man. By looking at this background, we can obtain a deeper understanding of the criticism of modern theories of judgment under uncertainty proposed by Kahneman and Tversky created by Brunswikian followers. The proposal of representative research design, the formation of the lens model, and the notion of ecological validity of cues and vicarious functioning are Brunswik's biggest contributions in psychology. With regard to the origin of this thesis, I was delighted to find information about the attempt to replicate Brunswik's experiments with perceptual constancy by a member of the Prague Psychology Department, Jaromir Kasperek, PhD, in the 1950's. Brunswik was a real inspiration for a number of contemporary psychological and other theories, from Hammond's theory of social judgment and the theory of cognitive continuum to Funder's innovative approach in personality judgment and the theory of probabilistic mental models and fast and frugal heuristics of G. Gigerenzer and the multiple cue learning theory.

Brunswik's Lens Model Adapted to Aspect Representation

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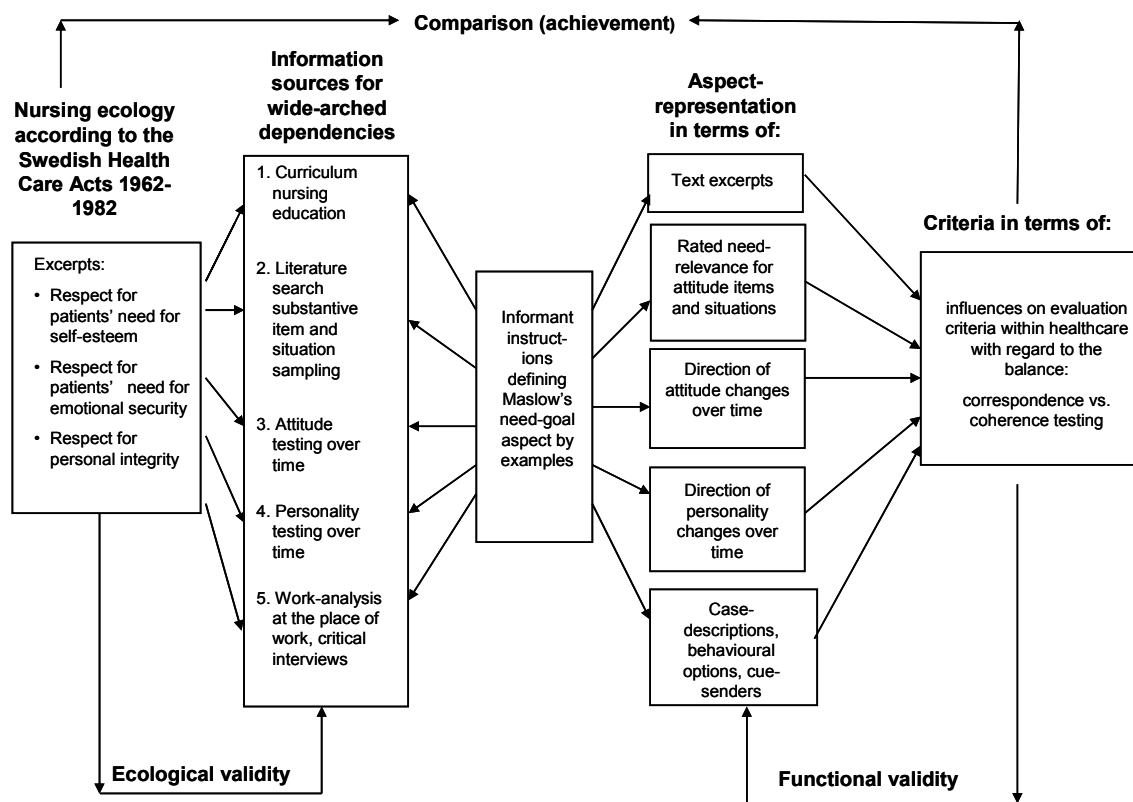
The concept bounded rationality was proposed by Herbert Simon (1956) to substitute the classical rationality concepts, which on the whole overlooked common constraints of the judgement and decision process. Simon's use of the word *satisfice* in contrast to *optimize* postulates that there are always constraints of some kind, for example, time limits or individual aspiration levels, that ought to be taken into account to understand the decision process. Gigerenzer and Goldstein (1996, p. 651) summarize Simon's approach as follows: "*Let us stress that Simon's notion of bounded rationality has two sides, one cognitive and one ecological*". This is true, but isn't it a rather muted interpretation of the human decision process? Can anybody think about "aspiration level" and "satisfice" without associating emotive, motivational factors such as goal-sets or attitudes, which all can function as well as restraints as individual assets during human information processing? The adaptation of aspiration level and goal variables as a function of success or failure has been studied by Selten (1998). The impact of success or failure on the individual's aspiration level is well known by parents and teachers who want their children or students to grow with success. It is also inherent in Maslow's concept "growth motivation" (Maddi, 1980, pp. 107-108). If these emotive factors were included in the definition of the human decision process, we could perhaps expect an increased focus on idiographic aspects and on situational, contextual information when studying interpersonal relations applying Brunswik's conceptual framework. It seems quite natural to include the single individual's levels of aspiration into a more general and comprehensive decision theory.

In Hammond (1966, pp. 21-22) we find Brunswik's research approach described as follows: "*...that central states such as motivation, set, attitude, or personality characteristics should be varied, and that distal effects such as goal achievement should be observed. And here at last, we find those wide-arched dependencies which Brunswik found to be the ultimate source of problems for psychology ...the dependencies between distal causes and distal effects.*"

The following 5 studies listed under "information sources for wide-arched dependencies", all deal with one and the same *distal goal-aspect* on human, social interaction, namely Maslow's psychosocial needs (1970), defined by examples in the same way to all our informants (nurses or student nurses). This Newsletter contribution is confined to studies 3 and 4. The remaining studies are briefly presented in earlier Brunswik Newsletters (Sjö Dahl, 2005, 2006, 2007, 2008). In Figure 1, a Brunswikian lens model diagram, the 5 studies are seen as information-

sources, mediating the impact of the Swedish Health Care Acts on society's evaluation-criteria, applied to social policy-decisions.

Figure 1. Brunswik's lens model adapted to aspect-representation.



Each need-for-specification (see examples below) constitutes an “*or-assemblage (Oder-Verbindung)*” (Brunswik, 1952, p. 19) mediating situational circumstances, which refer to the single individual's social ecology. Maslow's psychosocial needs are hierarchically organized, indicating a certain dependency between different need-families, but there is not much specification. Our need definitions are seen as distal goal-descriptions, which in the single case may be modified, or “*compromised*” in Brunswik's terminology, by varying proximal, situational constraints. It is a plausible assumption that a wide-spread neglect of situational contexts and idiographic information could promote an aspect-blindness (*a philosophy of avoidance*) for the social, psychological and physical consequences, which correspond to our judgements, decisions and choice of measures. It is an open question how such an aspect-blindness over time may influence the balance between coherence and correspondence criteria within our society, when we evaluate single individuals' or groups' decision making. The importance of not neglecting idiographic aspects in research on judgement and decision making has been pointed out by Kaufmann (2007) and Kaufmann, Sjö Dahl and Mutz (2007). To illustrate our need descriptions the following examples are given.

The need for achievement

1. *increase personal pride by achieving something*
2. *conquer obstacles*
3. *exceed present achievement level*
4. *master or manage tasks satisfactorily*
5. *work with something giving result*

The need for emotional security

1. *have a positive relation with people you are dependent on or are emotionally attached to*
2. *be able to predict or know what is going to happen in the near future*
3. *be cared for, supported, protected, guided, consoled*

Our choice of a psychosocial need-goal aspect within the nursing field is based on the conviction that clients in medical, institutional care are often *deprived of* psycho-social need satisfaction, which in turn might reduce their chances for rehabilitation and returning to an acceptable quality of life.

The social ecology of our patient-nurse relation is represented by a content analysis of a nursing curriculum and a relevant literature search, resulting in an attitude item pool together with a situation sample, and finally critical incident cases from interviews with nurses at their places of work. In brief, an effort is made to apply “...a *substantive situational sampling*” (Hammond, 1966, pp. 68-70) biased towards the concept “*ecological relevance*” (Björkman, 1969, p. 146) i.e. being important to humans’ adaptation to what we call the “real life”.

Attitude changes

Based on a descriptive factor analysis, five separate Likert scales each consisting of 36 items were constructed, see Table 1.

Table 1
The five scales

| Scales | Description | Highest, absolute factor loading | α_c |
|--------|---|----------------------------------|------------|
| R | Formal, instrumental or rational attitude | .68 | .85 |
| K | Avoidance attitude | .63 | .79 |
| P | Problem-smoothing, belittling attitude | .67 | .75 |
| RF | Tendency for rule-dependency | .64 | .80 |
| E | Extrovert, dutiful attitude | .58 | .69 |

Note. α_c = Reliability estimated as Cronbach’s alpha coefficients.

The five attitude scales had the same maximum raw scores and balance between their positively and negatively scaled 36 items. Attitude development during nurses’ 5-term professional education was studied with a sample of 290 nurses, distributed over terms 1, 3 and 5. For the Cronbach’s alpha coefficients for the 5 attitude scales, see Table 1.

As the variance-covariance matrixes for the groups are equal, tested with Box's test (Cooley & Lohnes, 1971, pp. 228-229), and the probability, that the groups' population centroids are equal, is 1 per cent or less, tested with Wilk's Lambda test and Rao's F-approximation, (ibid. pp. 226-227) it seems meaningful to go on with studying eventual group differences with discriminant analyses.

The factor pattern for the two discriminant functions, canonical correlations between the five attitude tests and the term variable are given, together with communality-values, in Table 2.

As the first function is clearly significant on the .05 level, while the second function does not reach this significance request, the interpretation is confined to the former one. The group centroids in the discriminant space show that the first discriminant function differentiates between the term-1 group and on the other hand the term-3 and term-5 groups, the first having a less concrete, rational attitude than the latter two groups. Further, term-1 group has a less problem-smoothing and belittling attitude than the other two term groups. According to our results, student nurses in term 1 appear to have a greater preparedness to mentally share their patients' psychosocial need situation than student nurses who have been professionally trained for a longer time. A one-way analysis of variance of group differences, separate for each scale supports these results.

Table 2
Discriminant analysis on the scales

| Test | Function | | H ² |
|-------|----------|------|----------------|
| | 1 | 2 | |
| R | .44 | -.44 | .39 |
| K | .61 | .14 | .39 |
| P | .35 | -.49 | .36 |
| RF | -.13 | -.03 | .02 |
| E | .29 | -.12 | .10 |
| Can.R | .32 | .14 | |

Personality changes

Using the same methodology as above, i.e. discriminant analyses, eventual personality changes during nurses' professional 5-term education was studied with the same sample of student nurses as in the attitude study (n = 290). Data was collected for the three term groups by means of Cesarec and Markes' personality scales (CMP), consisting of 165 questions, distributed with 15 questions over 11 need-variables, based on M. A. Murray's need list (Murray, 1966). For the Cronbach alphas in each variable see Table 3.

Table 3
Cronbach alphas of the variables of the CMP

| | Variables of the CMP | | | | | | | | | | |
|------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | ach | aff | agg | dst | gui | dom | exh | aut | nur | ord | suc |
| α_c | .69 | .62 | .78 | .79 | .71 | .83 | .80 | .55 | .58 | .75 | .70 |

Note. *ach* = achievement. *aff* = affiliation. *agg* = aggression. *dst* = defence of status. *gui* = guilt feelings. *dom* = dominance. *exh* = exhibition. *aut* = autonomy. *nur* = nurturance. *ord* = order. *suc* = succourance.

The Cronbach’s alpha varied between the eleven scales from .55 to .83, with seven scales having alpha values $\geq .70$. The first discriminant function is clearly significant on the .05 level, while the second one does not reach this significant request. Interpretation of the factor pattern is therefore confined to the first discriminant function. As before, in the attitude study, only coefficients $\geq .30$ are considered. It is thus primarily the scales Succourance, Autonomy, Exhibition, Nurturance and Achievement that correlate with the first discriminant function. The group centroids in the discriminant space show that the first function differentiates between the term-1 and term-3 groups on the one hand and the term-5 on the other hand. The difference consists of higher values on the autonomy scale for the term-5 group than for the term-1 and term-3 groups. Further, the term-5 group has lower values than term-1 and term-3 groups on the scales succourance, exhibition and nurturance. Even here, results from one-way analyses of variance support our interpretation from the discriminant analysis. Our results seem to indicate that student nurses at the end of their professional education are less exhibitionistic, more self-assertive, less empathetic and less dependent on emotional support from others, than student nurses in the term-1 and term-3 groups. A hypothetical explanation of student nurses’ attitude- and personality changes during their professional education might be that despite the emphasis on value-loaded general goals a corresponding value-focused challenge may be missing in teaching on more concrete subject-matter levels.

Conclusions

The 5 studies mentioned above illustrate an effort to include variations over time and geographical contexts in a comprehensive research project. This covers attitude and personality changes during a 5-term professional education, a substantive item and situation sample related to construction of attitude questionnaires. It also includes a content analysis of curriculum for nursing education and a sampling of nurses’ work ecology, restricted to a defined psychosocial aspect, by means of interviews with nurses at their place of work. This variation over time and geographical contexts allows observation of aspect constancy over a wide range of far-reaching arcs between more or less proximal stimuli and remote distal goals.

Maslow’s 11 psychosocial “needs for” all refer to the interaction between the organism’s goal states and social ecology. In several of our studies the need for achievement presents with very low ranking. This is in full accordance with the ignorance and neglect for rehabilitation measures that society’s officials, on different levels, have demonstrated during a long period of time with serious consequences for the Swedish society’s workforce. Combined with routine, medical practice for prolonging patients’ sick-leave periods without any causal motivations this *laissez*

faire policy has cumulated in an unacceptable proportion of the Swedish workforce on long-term sick-leave or early retirement. The remedy has been a vast series of efficiency-criteria, rules like average, allowed time per telephone call for health guides, regardless of content, maximum time allowed for social insurance officials, specified on different errands. It should be observed that there is a time-dimension involved in these evaluation contexts. Coherence to these normative standards comes before the factual consequences that correspond to the decision taken. Such an evaluation situation might tempt the decision-makers to underrate the consequences of their decisions in interpersonal affairs (see Dunwoody, 2009; Hammond, 2007, p. 98).

The neglect to consider idiographic aspects and contextual information within society's medical care-system may over time influence people's choices of criteria, *coherence or correspondence*, used in different evaluation contexts. We do not suggest any covering laws about this influence, pertaining to decisions dealing with interpersonal affairs. However, there might be mechanisms, working over time, in educational and professional contexts, mechanisms which are causally related to the *tacit philosophy of avoidance* that is so unanimously documented in all our 5 studies. A few examples, all pertaining to the Swedish health care system, will illustrate *how coherence* to efficiency-criteria may tempt decision-makers to overlook or smooth down *consequences*, that correspond to their decisions.

Example 1. In Sweden it not always so easy to get in direct contact with a doctor by telephone. The contact is usually mediated by a nurse functioning as a health-advisor giving advice and deciding about eventual contact with a doctor or a hospital clinic. A mother with a sick 3-year-old boy called the health-advisor twice described the boy's symptoms and got soothing responses – just wait and see. When she called for the third time she was advised to go to the hospital. The boy has died on arrival.

An investigation revealed, that health guides were working against an average "bonus time" of 3.48 minutes per call. Success at the end of the month gave a bonus of 1000 Swedish kronor. This system had been implemented in Stockholm and other places for quite a long time (Folcker, 2009). After being public knowledge this money-spinning criterion was abolished.

Example 2. During this summer the Swedish Social Insurance Offices in Malmö have implemented a comprehensive rule system specifying maximum time for different decision tasks like this:

1. parental allowances, 12 minutes
2. short-term ill persons, recovered, 51 minutes
3. sick people investigation, 92 minutes

Each month the executive officials are contacted by their chiefs who want to know exactly how many decisions had been made during the month. At the end of the year the time used for the decisions in relation to stipulated maximum time is used to adjust the official's salary. This adjustment is done irrespectively of the direction of the decision (granted sick-leave pay or refused). One official reports that he got an email from the boss with congratulations for the great number of refusals. Coherence

to stipulated maximum time was thus rewarded without any qualitative scanning of eventual consequences implied by the decision taken (Mikkelsen, 2009).

Example 3. According to the Swedish National Audit Office (RiR, 2009:07) “information of acceptable quality for decisions about granting or refusal is often lacking” (ibid, p.1). One proposal for improvement is *that the doctor concerned should include a description of the client’s functional (work level) level (capacity). Today this information is not asked for on the form that the doctor has to fill in*” (RiR,2009: 07). As expected without idiographic and contextual information about the patient, there will be difficult for doctors to give causal reasons for their decisions.

Example 4. In a report from the Social Insurance Office in Sweden to the Department of Social Security the motto for their decision strategy is presented as “Simple, Fast and Correct”. The report concludes that during the past year “it has mainly been fast”. An executive official at the Social Insurance Office adds to the reporter “here on the floor we talk mostly about simple and fast” (Lender & Luthander, 2009; Mikkelsen, 2009).

A final question

Do we really want a society where coherence to man-made criteria (rules) may justify neglect of consequences, corresponding to our decisions and actions? This problem might not be solely about truth criteria, but also about freedom to oscillate between different values within certain restraints.

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Patient – Clinician Cooperation in Psychiatry

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Knowledge systems are sometimes referred to as either shallow or deep. The latter are based on knowledge about causal relations while the former, shallow systems, do not refer to causal explanations. Psychiatric criteria manuals, like the widely used DSM-IV criteria-manual are presented as mainly descriptive, i.e. a shallow knowledge system. However, you cannot take it for granted that this manual is applied as such in clinical practice. Diagnosing clinicians may read depth into symptom- and syndrome-descriptions to a degree that varies with the single clinician. In other words, the shallow system may, in a diagnostic dyad (patient – clinician), trigger a combination of mental cue abstraction and the use of exemplar memory.

Recent research by Juslin, Olsson and Olsson (2003) and Ohtsubo, Takezawa and Fukuno (2009) makes it important to formulate the following two questions:

1. To what extent does the single, psychiatric clinician abstract diagnostic information from patients' live history and to what extent does he/she rely on exemplar memory? Diagnostic, psychiatric categorization may also be based on similarity matching against prototypes, which dynamically function as attractors in a Veronoi tessellation plane (Gärdenfors, 2000, p. 88). It is, however, not clear how similarity should be conceptually defined. Is it a set-theoretical concept based on a common core of fixed features, or is it a distance depending on contexts (Gärdenfors, 2000; Tversky, 1977; Tversky & Gati, 1982; Tversky & Hutchinson, 1987)? A comprehensive discussion about the role of similarity and frequency in judgements, satisfying bounded rationality, is presented in Juslin and Persson (2002), together with experimental studies, demonstrating the success of exemplar models. Despite these encouraging results the authors emphasize the need for comparisons between different models and application to more complex real-life environments (ibid. p. 602). The diagnostic dyad in psychiatry is such a more complex situation, involving information search with the following functional purposes:
 - a) *Explanatory function, giving likely causes for patient's dysfunctions*
 - b) *Indicating appropriate treatment*
 - c) *Within limits, predict patient's future development*

- d) *Facilitating professional communication among ward staff*
- e) *Screening off, once diagnosed, less need to interrogate and communicate with the patient*

Today we do not know if the diagnostic process, applied in psychiatric practice, is best described by a “fast and frugal model” or a “lazy algorithm” or a hybrid model, partly intuitive, partly analytical.

2. Does the emotional relationship (liking) between the diagnosing clinician and the patient influence the clinician’s responsiveness to the patient’s expressive behaviour?

Shallow diagnostic systems run the risk of one-sided classification of people in order to indicate some drug treatment. According to Millon and Grossman (2007, pp. 17-18) there is little evidence that the shallow system DSM IV facilitates an optimal choice of psychotherapy: The authors write: *“Therapeutic techniques must be suited to the patient’s problem. Simple and obvious though this statement is, it is repeatedly neglected by therapists who persist in utilizing and argue heatedly in favour of a particular approach to all variants of psychopathology. No school of therapy is exempt from this notorious attitude.”*

The human being’s extraordinary capacity to reach distal ends (goals) by trying out a large repertoire of means-end relations has a central role, called vicarious functioning, in Brunswik’s psychology. It goes without saying that impairment of this mental resource is far from optimal for somebody trying to recover from a severe mental breakdown. In Brunswik (1952, p. 17) we find the following description of the salient difference between a robot and a human being: *“in listing the essential postulates for a human robot, Boring notes, under vicarious response that there is little that will make our robot seem more human than this ability to choose one means after another until the goal is reached”*. Brunswik goes on describing what happens when this ability for vicarious functioning is impaired: *“Impairment of vicarious functioning implies the breakdown of higher functions. Mental disturbances or retardation in natural development has often been described in terms of rigidity, fixation, concretism, etc.”*

This description is very similar to the robot-like mood patients on neuroleptic drugs complain about.

For a long time psychiatrists have been reluctant to regard their patients’ opinions to be of value as relevant information about their internal or external situation. Mental patients sometimes lack insight, talk in a symbolic way that has to be interpreted in analytic sessions. In psychiatric literature they are usually mentioned, referred to, in third person terms (talked about). Very seldom do they appear in the first person, talking with their own voices to the readers. Even when patients seem to convey realistic, sensible ideas, their contributions are often perceived as twisted by their illness and their subjective experiences.

Eberhard (2009, p. 23), in a longitudinal study of 225 patients diagnosed with schizophrenia, underscores that one of the most common and problematic symptoms of psychotic disorders is said to be lack of insight. A common, provocative definition

of lack of insight is, according to Eberhard (ibid. p. 23): *“Clinicians, whose patients disagree with their judgement, denote such patients as lacking in insight”*. A more reasonable approach is suggested by Eberhard, asking the question: *“in which respects do they differ and how much do they differ?”* (ibid. p. 23).

One main purpose with Eberhard's study was to perform parallel ratings by both the clinician and the patient. Was it possible to have psychotic patients rating their own psychotic symptom? To answer this question Eberhard had 151 schizophrenic patients and their clinicians perform parallel ratings during a period of five years.

This longitudinal study (Eberhard, 2009, pp. 30, 42-43) presents parallel ratings about disease severity symptoms and functional capacity, side-effects and cognitive functioning by 151 schizophrenic patients and their clinicians. On the basis of a profound statistical analysis Eberhard concludes: *“we were surprised at how small the discrepancy was between the patients' and the clinicians' ratings. --- consequently we want to argue strongly in favour of including similar ratings as part of current “state of the art” practice guidelines.--- However, we had not expected that the two parties would agree to the extent they did* (ibid. 42-43). In a more qualitative discussion about the parallel ratings the author summarizes as follows: *“Perhaps clinicians should adopt the patient method, i.e. focus on affective indices when rating degree of illness, and use words that reflect that, rather than confronting patients on the reality of their hallucinations and delusions”* (ibid, Paper V, p. 12).

In Wiersma (1996, p. 162) the author criticized the current WHO classification system ICIDH (International Classification of Impairments, Disabilities and Handicaps (1980) for referring to abilities without taking circumstances into consideration and not realizing that assessments were always made against norms and values. In May, 2001, WHO endorsed a second edition of ICIDH, now with the title International Classification of Functioning, Disability and Health, referred to as the ICF. The overall aim of the ICF is to provide a standard language for description of health and health-related states. The domains in ICF *“can therefore be seen as health domains and health-related domains”* (WHO, 2001, p. 3).

The following excerpts from the Introduction chapter of ICF illustrate the emphasis on the single person's ecology and resources for vicarious functioning, two cornerstones in Brunswick's conceptual world, that until today have been severely neglected within psychiatric diagnostics and treatment.

“ICF has moved away from being a “consequences of disease” classification (1980 version) to become a “component of health” classification” (p. 4). ---- *“There is a widely held misunderstanding that ICF is only about people with disabilities; in fact, it is about all people,--- In other words, ICF has universal application”* (p. 7). ---- *“Environmental factors have an impact on all components of functioning and disability and are organized in sequence from the individual's most immediate environment to the general environment”* (p. 8). ---- *“Environmental factors interact with all the components of functioning and disability”* (p. 8). ---- *“It is important to note, therefore, that in ICF persons are not the units of classification; that is, ICF does not classify people, but describes the situation of each person within an array of health or health-related domains. Moreover, the description is always made within the context of environmental and personal factors”* (p. 8).

Egon Brunswik's general advice to psychologists to pay equal attention to environment as to the organism is clearly incorporated in the introductory lines above from WHO's classification system, ICF, 2001. That diagnostic inferences, or labelling, *always should be made within the context of environmental and personal factors* implies that clinicians and patients must find ways to cooperate with the purpose of improving the clinician's feedback situation and at the same time establish a trustful, lasting alliance, making alternative treatments, beside drug prescriptions, possible.

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News from Tom R. Stewart

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With Jeryl Mumpower and Jim Holzworth, I have continued to investigate how people learn to make decisions when feedback is limited because the decision itself eliminates the possibility of feedback (e.g., when the decision is not to hire an applicant, the company will not learn whether the applicant should have been hired). We call this conditional feedback because the presence or absence of feedback is conditional on the decision. Two students are working on projects related to this work. April Roggio has developed a model of decision learning for her dissertation. She has used system dynamics modeling tools to model threshold learning and cue utilization. Navid Ghaffarzadegan presented papers at the Academy of Management and JDM meetings based on his model that was able to replicate two results in threshold learning: conservative threshold placement in full feedback and threshold overestimation in conditional feedback.

Four other students here have projects planned or underway. Lucy Dadayan is investigating the effect of information technology on medical decision making. She is using mammography as a case study and is surveying radiologists about the effects of film vs. digital mammography on their decision making, including cue utilization.

Chris Muller is investigating the use of QALY's (quality adjusted life years) to evaluate health care outcomes. She wants to investigate the circumstances under which individuals feel that maximizing QALY's is an acceptable distributional rule, the circumstances under which individuals adopt a fair innings framework and the characteristics patients and treatment that matter to individuals when making health allocation decisions.

Dosuk Lee is planning to investigate the relation between information displays and performance in judgment and decision making. He will compare cognitive fit theory and cognitive continuum theory.

Andy Whitmore is interested in the implications of incomplete information in product labeling, particularly non-price information such as "organic", "fair trade", and "shade grown." He is developing a system dynamics model that will incorporate the results of judgment analysis representing consumers' use of various subsets of product label information. I am reminded of the "linkage" work of Hammond and Mumpower in the 1970's.

News from Elise A. Weaver

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Nowadays, I'm working at the Human Resources Research Organization (www.humrro.org) as a Senior Scientist in the Modeling and Simulation Program. I'm working with Paul Sticha, who went to graduate school with Gary McClelland and collaborated with Len Adelman early in his career.

Brunswik's ideas continue to influence me in my modeling work, as I look for ways to incorporate concepts from representative design in simulation settings. Models developed for applied situations often require the assignment of values to parameters for which there is little empirical data. We want to ground those values as well as possible, while stating our assumptions. In one Bayesian model, we assigned conditional probabilities based on weights derived from a judgment analysis with a subject matter expert. In a system dynamics model, we will use statistical properties from a limited set of empirical cases to constrain initial conditions in a simulation of a broader set of cases.

I like the opportunities to stretch offered by my new position, working collaboratively in an organization with over 80 Ph.D. psychologists to help address questions in education, defense, and the private sector.

Evaluation Research and Brunswikian Concepts

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Last year two German speaking publications appeared dealing with Brunswikian concepts.

In a book chapter about evaluation models we capitalized on Ken Hammond's contributions to judgment and decision making as a helpful model in tailoring research designs to the problems (see Wittmann, 2009a).

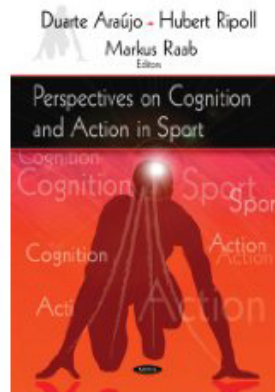
The second publication, as part of a discussion forum we organized with C. Spiel and F. Lösel, is focusing on the transfer of psychology for social issues and policy making. It deals with the possibilities of using the lens model equation to describe how all of us most often underestimate the effect sizes of psychological interventions and how to relate the lens model to cost-benefit analysis in terms of return on investment decisions (see Wittmann, 2009b).

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- Wittmann, W. W. (2009b) Die ökonomische Bedeutung psychologischer Interventionen und warum wir sie alle unterschätzen [The economic impacts of psychological interventions and why we all underestimate them]. *Psychologische Rundschau*, 60, 252-253.

New books

Perspectives on Cognition and Action in Sport



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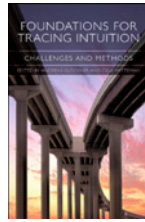
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More information at: http://www.amazon.co.uk/Perspectives-Cognition-Action-Duarte-Araujo/dp/1606923900/ref=sr_1_1?ie=UTF8&s=books&qid=1238341033&sr=1-1

There has been considerable debate on sport psychology about the status and the function of cognition and action in sport. This debate is very relevant since there was a refinement of the different positions, and there were several attempts to integrate apparently contrasting perspectives. A main goal of this book is to put the links between cognition, perception and action into the discussion both oriented towards theory and practice, and thus, cast a new look on cognition and action in sport. The book is organised in three sections. Section I discusses the organisation of action attending to its dynamics and complexity. It shows how multiple levels of complexity are involved in performance and learning. Section II discusses not only what is knowledge, but also how athletes use it during performance. Section III presents different perspectives about judgement and decision-making as well as applications to training.

Foundations for Tracing Intuition: Challenges and Methods



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The study of intuition and its relation to thoughtful reasoning is a burgeoning research topic in psychology and beyond. While the area has the potential to radically transform our conception of the mind and decision making, the procedures used for establishing empirical conclusions have often been vaguely formulated and obscure. This book fills a gap in the field by providing a range of methods for exploring intuition experimentally and thereby enhancing the collection of new data.

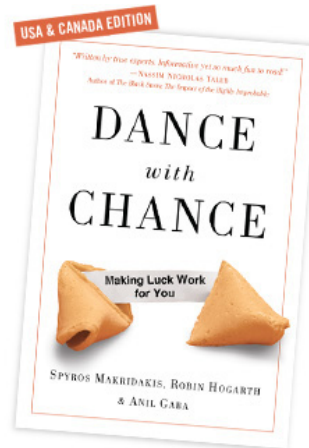
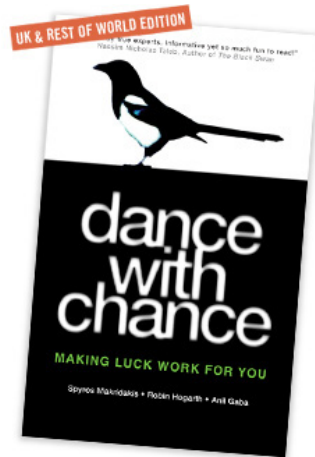
The book begins by summarizing current challenges in the study of intuition and gives a new foundation for intuition research. Going beyond classical dual-process models, a new scheme is introduced to classify the different types of processes usually collected under the label intuition. These new classifications range from learning approaches to complex cue integration models.

The book then goes on to describe the wide variety of behavioural methods available to investigate these processes, including information search tracing, think aloud protocols, maximum likelihood methods, eye-tracking, and physiological and non-physiological measures of affective responses. It also discusses paradigms to investigate implicit associations and causal intuitions, video-based approaches to expert research, methods to induce specific decision modes as well as questionnaires to assess individual preferences for intuition or deliberation.

By uniquely providing the basis for exploring intuition by introducing the different methods and their applications in a step-by-step manner this text is an invaluable reference for individual research projects. It is also very useful as a course book for advanced decision making courses, and could inspire experimental explorations of intuition in psychology, behavioural economics, empirical legal studies and clinical decision making.

More information you will find at: www.cognitivepsychologyarena.com

Dance with Chance: Making Luck Work for You



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Robin Hogarth - together with Spyros Makridakis and Anil Gaba - have published a book aimed for a general audience. Its title is *Dance with Chance: Making Luck Work for You*. The book is inspired by the notion that much of what happens in the social and economic domains is essentially unpredictable and yet we still have to make decisions in life. How best can people deal with this uncertainty and take reasonable decisions. The book looks at decisions in the areas of medicine, investment, and business as well as some comments on happiness.

More details about the book can be had from consulting the website:

<http://www.dancewithchance.com/>

The Brunswik Society

<http://www.brunswik.org/>
