# Society for Judgment and Decision Making

Preliminary Annual Meeting Schedule
November 20-22, 1999
Westin Century Plaza Hotel Los Angeles, CA

## Saturday

Psychonomics Sessions (*Westside Room*), see abstracts on pp. 12-14.
8:00-10:25 Judgment/Decision Making: Probabilistic Judgment
1:30-3:25 Choice, Commitment and Goals
3:35-5:40 Judgment/Decision Making: Expertise and Confidence
3:00-5:00 Registration begins for the JDM conference

## Sunday

9:00-10:00 **Registration** (*California Lounge*)
10:00-12 noon **Poster Session I** (*California Showroom*), abstracts on pp. 21-27

1:00-3:00 abstracts on pp. 14-16.

**Paper Session 1, *Cypress Room* (Chairperson: B. Mellers)**
1:00 C. Hsee: *Rationale-seeking in Decision Making*
1:24 C. Brown: The Effects of Context on Both Choice and Ratings on Joint Probability Estimation
1:48 A. Goodie: *The Bounds of Conditionalizing in Causal Judgment*
2:12 A. Parker & B. Fischhoff: *Individual Differences in Decision-Making Competence*
2:36 N. Brewer & G. Chapman: *Assimilation and Contrast: Anchoring Perceived Risk for Health Hazards*

**Paper Session 2, *Century II Room* (Chairperson: R. Croson)**
1:00 H. Arkes, C. Scanlan, L. Hutzel, & M. Kung: *The Effect of the Duration of the Initial Investment on Escalation of Commitment*
1:24 N. Buchan, R. Croson, & R. Dawes: *Who's With Me? The Role of Group Boundaries on Trust and Reciprocity: A Cross-Cultural Study*
1:48 B. Massey: *Commitment and Learning in Venture Capital*
2:12 I. Yaniv & E. Kleinberger: *Advice Taking in Decision Making: Dissonance, Discounting, and Reputation*
2:36 J. Soll & R. Larrick: *The 80/20 Rule and the Revision of Judgment in Light of Another's Opinion: Why Do We Believe Ourselves So Much?*

**Paper Session 3, *Century I Room* (Chairperson: J. Sniezek)**
1:00 W. Bruine de Bruin & B. Fischhoff: *People's Understanding of Probability: "It's a Fifty-Fifty Chance"*
1:24 J. Doctor & A. Wolfson: *Measuring Subjective Probability Calibration Using a Rasch Model: An Application with Medical Experts in Judging Patient Functional Status*
1:48 P. Windschitl: *The Influence of Comparison Processes on Judgments of Likelihood: The Alternative-Outcomes Effect*
2:12 P. Slovic, J. Monahan, & D. MacGregor: *Assessing and Communicating Risk of Violence: Probabilities Differ from Frequencies*
2:36 M. Schweitzer & C. Hsee: *Stretching the Truth: Elasticity and Motivated Misrepresentation*

3:30-4:30 abstract on p. 16.

**Paper Session 4 in *Century I Room* (Chairperson: E. Weber)**

S. Epstein: *The Nature of Human Irrationality*

4:40-6:20 abstracts on pp. 17-18.

**Paper Session 5, *Cypress Room* (Chairperson: L. Brenner)**

4:40 A. Chernev & G. Carpenter: *The Role of Market Efficiency Intuitions in Consumer Choice: A Case of Compensatory Inferences*

5:05 G. Fischer, J. Jia, & M. Luce: *Preference Uncertainty and the Construction of Multiattribute Judgments*

5:30 Y. Rottenstreich, L. Brenner, & S. Sood: *Comparison, Grouping, and Preference*

5:55 S. Zhang & S. Sood: *Option Information as a Determinant of Choice Deferral*

**Symposium 1, *Century II Room* (Organizer: M. Meloy)**

*The Distortion of Information During Decision Making: The Role of Task Factors, Evaluative Focus, and Expectations*

K. Carlson & J. Russo: *Distorted Evaluation of Evidence in Legal Trials*

M. Meloy & J. Russo: *Selecting and Rejecting: Predecisional Distortion and Evaluative Focus*

K. Carlson: *The Role of Expectations in Predecisional Distortion of Information: an Introduction to Disparity Pursuit*

**Discussant:** O. Svenson

**Symposium 2, *Century I Room* (Organizer: D. Prelec)**

*Judgment and Choice in the Absence of Fundamental Valuation*

D. Ariely, G. Loewenstein, & D. Prelec: Arbitrary Coherence: *Duration-Sensitive Pricing of Hedonic Stimuli Around an Arbitrary Anchor*

N. Novemsky, H. Kunreuther, & D. Kahneman: *Context Effects on the Evaluation of Small Probabilities and Insurance Premiums*

R. Dhar & S. Sherman: *The Effects of Prefactual Thinking on Purchase Likelihood For Hedonic and Utilitarian Products*

6:30-8:00 **Poster Session II** (*California Showroom*), abstracts on pp. 27-33.

## Monday

8:00-9:00 **Breakfast & Business Meeting** (*California Lounge*)

9:00-10:00 abstract on p. 18.

**Paper Session 6, *Century I Room* Presidential Address (Chairperson: T. Wallsten)**

I. Levin: *Why Do You and I Make Different Decisions? Tracking Individual Differences in Decision Making*

10:30-12:30 abstracts on pp. 19-20.

**Paper Session 7, *Cypress Room* (Chairperson: M. Schweitzer)**

10:30 J. Heckhausen & L. Martignon: *A Motivational Approach to Decision Making*

10:54 S. Jeffrey & R. Larrick: *The Effect of Aspiration Levels on Risky Decision Making*

11:18 R. John, R. Brougham, & D. von Winterfeldt: *Hierarchical Linear Modeling of Risk Judgments Predicted by Cognitive and Emotional Attributes of Risk and Gender*

11:42 J. Lerner & D. Keltner: *The Appraisal-Tendency Hypothesis: Systematic Differences Between Fearful and Angry People in Risky Decision Making and Judgments Under Uncertainty*

12:06 R. Coughlan & T. Connolly: *Predicting Affective Responses to Unexpected Outcomes*

**Symposium Session 3, *Century II Room* (Organizer: D. Seale)**

*Coordination and Learning in Interactive Decision Making*

A. Rapoport, D. Seale, & E. Winter: *Coordination and Learning Behavior In Large Groups With Asymmetric Players*

C. Camerer & T. Ho: *Experience-Weighted Attraction Learning in Entry Games*

D. Seale & A. Rapoport: *Elicitation of Strategy Profiles in Large Group Coordination Games*

R. Zwick & A. King Chung Lo: *Group Coordination In Choosing Lotteries Under The Joint Effect Of Strategic And Outcome Uncertainties*

**Symposium 4, *Century I Room* (Orgs: S. Schneider & J. Shanteau)**

*Emerging Perspectives on JDM Research*

W. Edwards: *Nineteen Steps Toward a Positive Behavioral Decision Theory*

R. Luce: *Rationality in Choice Under Certainty and Uncertainty*

A. Isen: *The Role of Positive Affect in Facilitating Decision Making and Judgment*

A. Wearing & Omodei, M.: *Decision Making in Complex Environments: Psychological Processes and Individual Differences*

**Discussant:** I. Levin

# Psychonomic Society Meeting Abstracts

JUDGMENT/DECISION MAKING: PROBABILISTIC JUDGMENT
Westside, Saturday Morning, 8:00-10:25
*Chaired by William M. Petrusic, Carleton University*

8:00-8:20 (362)
**On the Perception of Variability.** YAAKOV KAREEV, SHARON ARNON, & REUT ZELIGER, *Hebrew University of Jerusalem*–Ever since the days of Francis Bacon, it has been claimed that people perceive the world as more regular (or less variable) than it actually is. Such misperception could explain a host of vexing behaviors; however, evidence in support of this claim has been indirect, and an explanation of its causes lacking. We first suggest that working-memory capacity, limiting the size of the sample people can consider, could serve as such a mechanism. This is so since the sampling distribution of sample variance is downward attenuated, and the more so the smaller the size of the sample. The results of four experiments show that people are sensitive to variability, use sample variance, uncorrected, where estimates of population variance are required, and indeed perceive variability to be smaller than it actually is. Surprisingly, such biased perception can be shown to improve performance in a number of important situations.

8:25-8:45 (363)
**Averaging Dependent and Independent Probability Judgments.** DAVID V. BUDESCU & TIMOTHY R. JOHNSON, *University of Illinois*, & THOMAS S. WALLSTEN, *University of North Carolina* --Wallsten, Budescu, Erev, and Diederich (1997) developed a general framework for assessing the quality of aggregated probability judgments. One of the most powerful predictions that can be derived from their model is that, under some reasonable conditions, the average of conditionally pairwise independent judgments grows increasingly diagnostic of the true event state as the number of judgments being averaged increases, and becomes perfectly diagnostic in the limit. We report results of simulations and reanalyses of some empirical data sets pertaining to this prediction. The results document, under a variety of conditions, the diagnostic value of the average judgment for a finite number of;judgments, their rate of convergence to perfect diagnostic value, and the detrimental effect of conditional dependence among individual judges on the diagnostic value of the average judgment. Implications of these results are discussed.

8:50-9:10 (364)
**Intuitive Bayesian Updating.** X. T. WANG, *University of South Dakota*–In a series of experiments, Bayesian updating was examined using a new empirical paradigm that allows a participant to update Bayesian probability through multiple trials and to stop sampling whenever she/he is ready to make a judgment. The variables in the experiments included problem domains (detecting a fake coin vs. detecting a criminal), real-time constraints (hands-on vs. imaginary), and the base rate of a target in a population. The results showed that the use or disuse of base rate information, indicated by the number of self-determined sampling trials, was a nonlinear and categorical function of base rate with different threshold points for different tasks. Social variables affected the response criterion of the participants but had little effect on their sensitivity to the base rate information. These findings suggest that humans possess a rich array of intuitive and satisficing heuristics to make judgments under uncertainty.

9:15-9:35 (365)
**On the Use of Inconclusive Information in the Generation of Subjective Probabilities.** JOSEPH V. BARANSKI, *Defence and Civil Institute of Environmental Medicine, Toronto*, & WILLIAM M. PETRUSIC, *Carleton University*–This study examined how people use inconclusive information when forming subjective probability (SP) assessments using a medium-fidelity naval threat assessment simulation. In the present context, inconclusive information refers to data that are relevant but do not clearly support a decision alternative. On each of 36 trials, subjects interrogated 10 pieces of information (e.g., speed, direction, bearing) about "targets" in a radar space. The amount of hostile [n(H)], peaceful [n(P)], and "inconclusive" [n(I)] information was factorially varied across targets. The best empirical fit to the data was provided by a variant of support theory,

$$SP(H) = \frac{n(H)'}{n(H)'+n(P)'}, with \quad n(H)' = n(H) + \frac{1}{2}n(I), \; and$$

$$n(P)' = n(P) + \frac{1}{2}n(I),$$

where SP(H) denotes the subjective probability that a given target is hostile. Importantly, systematic deviations from the model's predictions imply that inconclusive information "dilutes" subjective probabilities. We compare this "dilution effect" with related phenomena in the social cognition and judgment/decision making literatures.

9:40-10:00 (366)
**Ending the Tyranny of the Point-Null Hypothesis.** LESTER E. KRUEGER, *Ohio State University*--Few believe the point-null hypothesis is ever true, which makes its acceptance very problematic. To solve that problem, it is proposed that we (1) shift from the point null to a null range (bounded by a just nontrivial difference, or jnd); (2) base the alternative hypothesis likewise on the jnd; (3) properly define (and thereby control!) beta (by distinguishing it from the true "region of doubt" in the rejection region); and (4) set beta at .05 (just like alpha), so that, with the proper data, the null-range hypothesis could be accepted (i.e., alternative hypothesis rejected) at the .05 level even when power is low (< .80). Plausibility measures would still be available in the form of exact probability values (p, q). Limitations (e.g., the lack of error terms, alpha and beta) in other plausibility measures (e.g., 95% confidence intervals; likelihood ratios) will be discussed.

10:05-10:20 (367)
**When Data Are Manipulated: The Traces Left by Naive Statistical Expectations.** GIL KALAI & MAYA BAR-HILLEL, *Hebrew University*, & BRENDAN McKAY, *Australian National University* (read by Maya Bar-Hillel)–In 1994, *Statistical Science* published the results of experiments that purported to offer extremely strong statistical evidence proving the existence of a secret code in the Book of Genesis. This alleged code became known as The Bible Code, made famous by a 1997 bestseller by that name. McKay, Bar-Natan, Bar-Hillel, and Kalai (1998, 1999) offered their own statistical–and other–evidence that The Bible Code is just the cleverly disguised result of data tuning. We show how taking into account the psychology of the code researchers explains some surprising statistical features of their reported experimental results (surprising even assuming a genuine code). Using the notion of naive statistical expectations (e.g., Tversky & Kahneman, 1971), we show how results that are surprising from the statistical viewpoint may be just what one expects if the erroneous but common statistical intuitions of the data tuners is taken into account.

CHOICE, COMMITMENT, AND GOALS
Westside, Saturday Afternoon, 1:30-3:25
*Chaired by David V. Budescu, University of Illinois*

1:30-1:50 (529)
**Violations of Stochastic Dominance and Coalescing by Financially Motivated People.** MICHAEL H. BIRNBAUM & TERESA MARTIN, *California State University. Fullerton*–Students made choices between pairs of gambles, knowing that some people would play one of their chosen gambles for real monetary payoffs. Violations of stochastic dominance were observed in three studies, replicating previous studies without payoffs and with other procedures for displaying the choices. Significantly more than half of participants in two studies chose a dominated gamble over the dominant gamble. Systematic event-splitting effects were also observed, as significantly more than half of the participants reversed preferences when choosing between the split versions of the same choices. The third experiment found that the incidence of violations depends on the probability distribution. Results are not consistent with rank-and-sign-dependent utility theories, including cumulative prospect theory, which imply stochastic dominance and coalescing.

1:55-2:15 (530)
**The Impact of Time and Time Framing on Gains and Losses.** MARY KAY STEVENSON & KATHLEEN LAGRAVE, *California State University, Hayward*--The effect of temporal discounting on the evaluation of outcomes has been shown to be influenced by the magnitude of the outcome, the sign of the outcome (gain or loss), and the frame or temporal reference point. The current study was designed to estimate discount rates within a neutral frame, expedited frame, and delayed frame for both gains and losses. Unlike previous studies, the focus was on individual differences and the format of the framing manipulation. The results indicated that individuals differ in the way that they deal with gains and losses that are evaluated in expedited and delayed frames. Furthermore, the response scale also influenced the results. Participants who were asked to express their evaluations in dollar amounts had different relative discount rates than participants who were asked to express their evaluations in new temporal deadlines. These results were summarized in a general theory of temporal discounting.

2:20-2:35 (531)
**Emerging Coherence Drives Decision Making.** DAN SIMON, *University of Southern California*, & LIEU B. PHAM, QUANG A. LE, & KEITH J. HOLYOAK, *UCLA* (read by Keith J. Holyoak)–Previous research indicates decision making is accompanied by an increase in the coherence of assessments of individual arguments related to the decision alternatives. We investigated whether this coherence shift is obtained before a decision is made (or even before people know they will have to reach a decision). College students were presented with a complex legal case involving multiple conflicting arguments. Participants rated agreement with the individual arguments in isolation before seeing the case, after processing it under various initial sets, and again after reaching a verdict. The results demonstrate that a coherence shift can be triggered before making a decision one expects to make later, by a set to memorize the case, and by sets to receive additional information or to communicate information about the case to someone else. Emerging coherence appears to drive decisions, rather than merely rationalizing decisions that have already been made .

2:40-2:55 (532)
**The Roles of Choice and Feedback in Escalation of Commitment Research.** HAL R. ARKES, *Ohio University*–Most escalation of commitment experiments use the same design: Experimental group participants select the option in which to invest, experience failure, and then choose how many resources to invest in the floundering original choice versus an alternative. Control group participants are given the second investment opportunity but neither the original choice among options nor any outcome feedback. Although escalation of commitment has generally been attributed to the negative outcome feedback, the results of this experiment instead implicate being given the original choice of options. When control group participants were allowed to choose one of the stocks to be included in the Trial 2 choice, just as experimental group participants were allowed to do, the remaining factor that differentiated the two groups–the receipt versus nonreceipt of outcome feedback–did not result in significantly different escalation. Also, positive Trial 1 investment outcome led to more escalation than did negative.

3:00-3:20 (533)
**Too Many Goals, Too Little (or Too Much) Time.** SANDRA L. SCHNEIDER & FORREST A. W. SAMNIK, *University of South Florida*–The goals to which people aspire influence the decisions they make both in the short and the long run. We collected descriptive data to explore the types and frequency of commonly sought-after goals. We examined three different time horizons: goals for the next week, the next 3 to 5 years, and an entire lifetime. The sample of 260 females and 170 males was divided into four age groups: 18-29, 30~4, 45-59, and 60-95. Although there was substantial agreement about many aspects of the reported goals in all conditions, there were also large differences as a function of time horizon, gender, and age group. The data highlight the need to understand decision making within the larger context of the goals that the decisions are intended to support. Issues include how people prioritize their goals, to what extent they consider goals before acting, and how well they integrate short-term and long-term goals.

JUDGMENT/DECISION MAKING: EXPERTISE AND CONFIDENCE
Westside, Saturday Afternoon, 3:35-5:40
*Chaired by Joseph V. Baranski, Defence and Civil Institute of Environmental Medicine*

3:35-3:45 (558)
**Analysis of Judgment Confidence Using Item-Response Theory.** LAURA T. FLANNELLY, *University of Hawaii*, & KEVIN J. FLANNELLY, *Center for Psychosocial Research* (read by Kevin J. Flannelly)–Two studies were conducted to examine subjects' calibration of judgment in terms of their actual performance and their expected performance on test questions. Expected performance was estimated for each item using subjects' ability level and item difficulty, according to item-response theory. The one-parameter Rasch model was used. Both methods of scoring judgment bias (or calibration) yielded the commonly reported hard-easy effect, with subjects being overconfident that they correctly answered hard test questions and underconfident that they correctly answered easy questions. A closer examination of this effect in Study 1 revealed that subjects were overconfident on the questions they answered wrong and underconfident on the ones they answered right. Study 2 confirmed that overconfidence was highest on questions that were answered incorrectly, and also showed that subjects who performed poorly were more overconfident of their answers than were subjects who performed well.

3:50-4:10 (559)
**Comparing Cross-Cultural Confidence: Contingent Conclusions.** HONGBIN GU & THOMAS S. WALLSTEN, *University of North Carolina, Chapel Hill* (read by Thomas S. Wallsten)–Yates, Lee, Shinotsuka, Patalano, and Sieck (1998) found Chinese respondents to be more overconfident, less discriminating, and more variable than Japanese or American respondents in a hypothetical medical diagnosis task involving asymmetric prior probabilities and six binary symptoms. We reanalyzed their data to (1) separate group effects on choice from those on confidence estimates and (2) determine the consequences of analyzing the data conditioned on responses versus conditioned on objective probabilities (Erev, Wallsten, & Budescu, 1994). Group differences appeared in response distributions (Chinese having the most extreme estimates), percent correct choices (Chinese having most errors), and within- and between-subjects variability (Chinese being the most variable). Japanese were least sensitive to base rates and Chinese least responsive to symptom patterns. Whether the Chinese were the most over- or underconfident depended on the method of analysis.

4:15-4:25 (560)
**Judging Confidence Influences Decision Processing in Sensory Detection.** WILLIAM M. PETRUSIC, *Carleton University*, & JOSEPH V. BARANSKI, *DCIEM*—To examine the effects of confidence on the properties of the decision process, we used a visual detection task with four levels of signal strength. All observers worked for three blocks without rendering confidence judgments. For the subsequent three blocks, a control group continued to not provide confidence judgments and three experimental groups provided confidence judgments with two ("certain" or "not certain"), four ("guess," "low," "moderate," "certain"), or six ("50," "60," "70," "80," "90," "100") confidence categories. Rendering confidence increased decisional RTs on noise and all signal trials, with the increase varying with the number of confidence categories. The two-category–"certain" or "not certain" condition–altered the speed-accuracy tradeoff, with decreases in detective sensitivity occurring along with a speeding of responses over blocks. Thus, the effects of confidence judgment on the primary decision depended on both the number of confidence categories and the content of the categories.

4:30-4:50 (561)
**Psychological Science and Managed Care: Origins of Practice Variation in Medicine.** VALERIE F. REYNA, FARRELL J. LLOYD, & RONALD WOODARD, *University ofArizona*–The aims of this research were to determine whether medical judgments for patients with chest pain deviate from recommendations in a national guideline and to test predictions about the psychological sources of such deviations and their implications for clinical training and managed care. Physicians in cardiology, internal medicine, family practice, and emergency medicine were presented nine patient scenarios (three each at three levels of risk) and asked to make probability judgments and admission decisions. Decisions deviated significantly from those recommended in the guideline and from an expert-defined standard, and were associated with level of cardiovascular training. Physicians with less training processed more information, consistent with fuzzy-trace theory. Contrary to assumptions of managed care, primary care physicians had lower decision thresholds and were more likely to admit patients, compared with specialists. Results also confirmed that physicians' disjunctive probability judgments–required by the guideline–were subject to biases predicted by fuzzy-trace theory.

4:55-5:10 (562)
**Mental Representations and the Design of Future Naval Decision Support Systems.** MICHAEL L. MATTHEWS & ROBERT D. G. WEBB, *Humansystems Incorporated*, CAROL McCANN, *Defence & Civil Institute of Environmental Medicine*, & DAVID J. BRYANT, *Humansystems Incorporated* (read by David J. Bryant)–This talk highlights some implications of a cognitive task analysis (CTA) of a naval frigate operations room officer (ORO) position. Four pairs of experienced OROs talked through an operational scenario and described their cognitive activities based on their operational experience. Results suggest that OROs employ both analytic and intuitive (or naturalistic) decision-making approaches, based on the time available. The analysis points to the generation, maintenance, and use of a variety of forms of more-or-less abstract mental representations (pictures, models, or schemata) to acquire and maintain situation awareness and make decisions. Experienced OROs appear to rely heavily on such mental representations (generated during training and refined with experience and during mission planning) to rapidly categorize situations and make decisions. Current work further explores the role of mission planning in generating and using mental representations.

5:15-5:35 (563)
**Decision Making by Experts: Effects of Task Characteristics on Expertise.** JAMES SHANTEAU, *Kansas State University*–The purpose of this research is to propose and test a new model of how task characteristics influence performance of experts. Previous efforts to characterize the behavior of domain experts from a judgment/decision making perspective are reviewed. Several unexplained anomalies are considered (e.g., the nearly perfect calibration of weather forecasters in some tasks and the poor calibration in others). To account for both traditional results and anomalies, a four-category (left to right) taxonomy of tasks is proposed: aided tasks (such as forecasting weather), competent tasks (such as judging livestock), restricted tasks (such as clinical psychology), and quasi-random tasks (such as stockbrokers). Data from previous studies of experts were reanalyzed according to this taxonomy. The results are consistent: The more structured (further to the left) the stimulus environment, the better the performance measures. The implications of these results for selection, training, and evaluation of experts are considered.

# JDM Paper and Symposium Abstracts

## Paper Session 1

**Rationale-seeking in Decision Making**
*Hsee, C. (University of Chicago)*
When making a choice between alternatives, people do not always think about which option will deliver the highest consumption utility but tend to choose the option most consistent with rationales -- beliefs about how they should make decisions. In other words, one's choice depends not only on the predicted consumption utility of the options, but also on their "rationale utility." A series of studies, tapping a wide range of contexts, show that consumers may forego the option they themselves predict to have the highest consumption utility in order to choose the option that is most rationale-consistent.

**The Effects of Context on Both Choice and Ratings**
*Brown, C. L. (University of Michigan)*
In this paper, I demonstrate that non-chosen alternatives have a substantial impact on subjective "experienced" utility of alternatives actually consumed, while controlling for the effects of the choice set composition on the likelihood of choice itself. These results are confirmed in both a simulation and in an experiment involving the actual consumption of a hedonic product (candy bars). Using this method, I am able to identify several important effects of set contrast and variety on experienced utility which previous researchers have had difficulty confirming.

**The Bounds of Conditionalizing in Causal Judgment**
*Goodie, A. S. (University of Georgia)*
In making causal judgments, it is sometimes necessary to conditionalize on a third variable. For example, if assessing whether drinking coffee causes lung cancer, one would need to take into account the covariation between coffee drinking and smoking. It is impossible to condition on all possible third variables, however, making the question of the selection of conditionalizing variables an important one. The salience and causal relevance of a third variable was manipulated, and causal evaluations of an invariant target variable measured, to test the hypothesis that people conditionalize more on those third variables which are themselves already known to be causal.

**Individual Differences in Decision-Making Competence**
*Parker, A. M., Fischhoff, B. (Carnegie Mellon University)*
Research into the quality of people's decision making has typically focused on general cognitive processes, rather than on individual differences. Nonetheless, these tasks show considerable response variability, with some people doing better than others. Here we ask whether there are consistent individual differences in such performance. If so, we can then ask how else these decision makers differ. We adapted six conventional tasks, tapping different decision-making skills. They were administered to subjects from a longitudinal study. Results suggest that decision-making competence can be thought of as a unified construct. Validity is evaluated by correlations between decision-making competence and historical variables.

**Predicting assimilation and contrast: Anchoring perceived risk for health hazards**
*Brewer, N., Chapman, G. (Rutgers University)*
Until the early 1970's, anchoring-as-contrast was a robust finding. With the publication of Kahneman & Tversky's (1974) much cited paper, anchoring-as-assimilation proliferated. One explanation is that the widespread adoption of a two-step method in anchoring studies caused the switch from contrast to assimilation effects. Two studies are presented that test an alternative explanation, that the match between anchor, target and target rating scale determines the presence of assimilation or contrast. This account represents an improvement in predictive accuracy over current theories of when contrast or assimilation obtain.

## Paper Session 2

**The Effect of the Duration of the Initial Investment on Escalation of Commitment**
*Arkes, H. R. (Ohio University), Scanlan, C. R. (Ohio University), Hutzel, L. (Appalachia Educational laboratory), Kung, M. (Griggs-Anderson Research)*
After finding out that their initial marketing strategy had either failed or succeeded after either a short (5 month) or long (5 year) period of time, subjects had to decide how much to invest in their initial marketing strategy versus a new strategy. Escalation of commitment to the old strategy was manifested only among people whose failing investment had been in place for a short period of time. This result plus an analysis of the independent variables used in previous studies helps to resolve some contradictory findings in the escalation of commitment literature.

**Who's With Me? The Role of Group Boundaries on Trust and Reciprocity: A Cross-Cultural Study**
*Buchan, N. R. (University of Wisconsin, Madison), Croson, R. T. A. (University of Pennsylvania), Dawes, R. M. (Carnegie Mellon University)*
In this research we examine the extent to which people extend trust as the potential for direct reciprocation diminishes. In a trust experiment run in China, Japan, Korea, and the United States, we manipulate the group boundaries such that reciprocation occurs directly, from someone within the "group," or from a random person in "society". Results demonstrate that the extent of trusting and reciprocation varies across cultures, and that surprisingly, people will cooperate even in the absence of communication between them. Finally, we find that while people do trust for reasons other than purely self-interest (the anticipation of reciprocation) and extend trust to benefit the collective, the amount they trust decreases as the distance to the reciprocator grows.

**Commitment and Learning in Venture Capital**
*Massey, B. C. (University of Chicago)*
This research investigates the role of previous commitments on investment decisions by venture capital firms. Building on research on sunk costs and "cognitive repairs", the present research proposes two hypotheses for the relationship between previous commitments and venture capital decisions. These hypotheses are tested in a large-scale archival study of the venture capital industry. Results support both hypotheses: previous commitments are positively correlated with subsequent reinvestment decisions, and this relationship is weaker for experienced firms than for inexperienced ones.

**Advice Taking in Decision Making: Dissonance, Discounting, and Reputation**
*Yaniv, I., Kleinberger, E. (Hebrew University of Jerusalem)*
A fundamental question in behavioral research is, what do decision makers do with the information available to them? Whereas in most behavioral research, decision problems are presented to respondents with the information as "givens," in realistic situations, the informational basis of the decision problem often is assembled or constructed by the decision maker. The decision maker thus engages social-cognitive processes, such as soliciting advice, combining opinions, and reconciling inconsistencies. We suggest a framework for understanding decision makers' use of advice as a function of its quality and its distance from own opinion. Several theoretical concepts explain the findings: (a) "egocentric discounting" of other's opinion, (b) "reputation formation" for advisors, (c) "dissonance" caused by being exposed to advice that is similar or different from own opinion.

**The 80/20 Rule and the Revision of Judgment in Light of Another's Opinion: Why do We Believe Ourselves so Much?**
*Soll, J. (INSEAD), Larrick, R. (University of Chicago)*
People collect advice frequently, but what do they do with it? This paper examines how people revise predictive judgment in light of a peer's opinion. On average, final judgments can be quantified as 80% own initial judgment, 20% peer. Anchoring on own initial judgment, differential access to reasons, and overconfidence cannot fully explain this "80/20" rule. This talk will examine several alternative explanations. Which one(s) turn out to be right may have prescriptive implications for both advice givers and receivers.

## Paper Session 3

**People's Understanding of Probability: "It's a *fifty-fifty* chance"**

*Bruine de Bruin, W. (Eindhoven University of Technology), Fischhoff, B. (Carnegie Mellon University)*

A basic understanding of probabilities is essential if people are to communicate their risk perceptions. Miscommunications may arise when they use of "50" as a proxy for "fifty-fifty chance," without intending the associated number. This tendency leads to seeming overestimations of small probabilities. We identify several determinants of saying "50," including conditions evoking (a) verbal (rather than numeric) thinking, and (b) epistemic uncertainty. Our results provide insight into the fundamental cognitive processes involved in assessing probabilities. We suggests ways to reduce unwarranted 50s, to diagnose their frequency in existing data sets, and to "correct" for their excessive use.

**Measuring Subjective Probability Calibration Using a Rasch Model: An Application with Medical Experts in Judging Patient Functional Status**

*Doctor, J. N., Wolfson, A. (University of Washington School of Medicine)*

In this study we show that the Rasch model is a useful tool for ruling out dependence between item difficulty (i.e., hard/easy items) and subject knowledge (i.e., expert/novice probability judges). Fifty professionals in medical rehabilitation trained in the judgment of patient functional outcomes, completed a 60 item two alternative forced choice questionnaire of knowledge of standardized functional outcomes. Subjective Probability Estimates were obtained for each item using a half-range scale. The dichotomous Rasch model was used to test for the separability of item difficulty from subject knowledge. Calibration curves and probability scoring indices for the group and individual subjects were estimated using Rasch accuracy estimates.

**The Influence of Comparison Processes on Judgments of Likelihood: The Alternative-Outcomes Effect**

*Windschitl, P. D. (University of Iowa)*

Research on the alternative-outcomes effect suggests that a pairwise comparison between the support for a focal event and support for the strongest alternative event plays a special role in the perceived likelihood of the focal event. This comparison process can result in likelihood estimates that violate clear normative standards. However, the comparison process provides a useful and generally accurate heuristic for guiding assessments of certainty regarding the focal event. Experiments testing the strength and generalizability of the alternative-outcomes effect will be presented, and the relationship between this effect and support theory will be discussed.

**Assessing and Communicating Risk of Violence: Probabilities Differ from Frequencies**

*Slovic, P. (University of Oregon), Monahan, J. (University of Virginia School of Law), MacGregor, D. G. (Decision Research)*

number of studies have concluded that biases and errors in probabilistic judgments are reduced or even eliminated when likelihood is assessed as a relative frequency rather than a probability. We therefore expected that forensic psychologists and psychiatrists would perform better using frequency response scales rather than probability scales to judge the likelihood that a mental patient would become violent. This superior performance was not evident in three studies that we conducted. We found dramatic differences between judgments of the probability of violence and judgments of the relative frequency. However, both modes of response exhibited serious deficiencies.

**Stretching the Truth: Elasticity and Motivated Misrepresentation**

*Schweitzer, M. E. (University of Pennsylvania), Hsee, C. (University of Chicago)*

A substantial literature has investigated the communication of uncertain information (see Budescu & Wallsten, 1995 and Fox & Irwin, 1998 for reviews.). Most of this work has focused on cognitive limitations, though in many cases decision makers are likely to be influenced by motivational factors in the way they communicate uncertainty or elasticity. In this paper, we describe the relationship between elasticity and motivated misrepresentation. We demonstrate that the magnitude of motivated misrepresentation is directly related to elasticity even when the costs and benefits of misrepresenting information are held constant.

## Paper Session 4 – Plenary Speaker

**The Nature of Human Irrationality**

*Epstein, S. (University of Massachusetts at Amherst)*

One of the greatest enigmas of human existence is why a creature that has the intelligence to solve the most difficult problems in science and technology is unable to solve the simplest problems in human relations. Yet, these latter problems affect not only individual happiness, but may well determine the fate of the species. The explanation of this anomaly, according to Freud, is that people's rational thinking is subverted by their unconscious thinking, the principles of which he believed could be determined from a study of his own and his patients' dreams. The difficulty with the Freudian solution is that he had the wrong unconscious, one that is essentially maladaptive, which makes no sense from an evolutionary perspective. I describe a different form of unconscious thinking that, although essentially adaptive, hais some serious limitations. This adaptive unconscious is consistent with principles of evolution and modern cognitive science, and it can account for almost everything that Freudian theory can and much that it cannot.

## Paper Session 5

**The Role of Market Efficiency Intuitions in Consumer Choice: A Case of Compensatory Inferences**

*Chernev, A., Carpenter, G. (Northwestern University)*

In this paper, we advance the notion of *market efficiency inferences* as an alternative inference strategy based on consumers' perceptions of the pattern of dispersion of value across the brands in the marketplace. We propose that, based on their prior experience, consumers form expectations about the pattern of dispersion of value across the alternatives in the choice set and use these expectations to infer the unobservable attribute information. In a series of four studies we document the existence of market efficiency inferences and examine their impact on consumer choice.

**Preference Uncertainty and the Construction of Multiattribute Judgments**

*Fischer, G. W. (Duke University), Jia, J. (Chinese University of Hong Kong), Luce, M. F. (University of Pennsylvania)*

Just as people are uncertain about the occurrence of events in the external world, they are also uncertain about the subjective value or utility of decision outcomes. In our research, we investigate some of the consequences of preference uncertainty about how to value outcome attributes and make tradeoffs among them. We present empirical data regarding three manifestations of preference uncertainty: longer response times, larger response errors (differences in expressed preferences at times 1 and 2), and wider subjective confidence intervals for judgments. We investigate two hypotheses regarding stimulus-based causes of preference uncertainty. As predicted by our attribute conflict hypothesis, greater within-alternative conflict (discrepancy among the attributes of an evaluative alternative) leads to greater preference uncertainty. As predicted by our attribute extremity hypothesis, greater attribute extremity (very high or low attribute values) leads to less preference uncertainty. We also show that the item level, preference uncertainty effects proposed here operate in parallel with strategy-level, effort-accuracy tradeoffs observable across participants. Finally, we show that these findings are consistent with RandMAU, a family of random-coefficients, multiattribute utility models that we recently proposed. The parameters of the model correspond to degree of diminishing (or increasing) sensitivity to levels of a single attribute, rates of substitution between pairs of attributes, and the degree of complementarity or substitutability among attributes. Preference uncertainty occurs with respect to the properties represented by these parameters. Our analysis shows that non-linearity in single-attribute value functions and multiattribute composition rules plays an important role in modeling the degree of preference uncertainty about different types of alternatives.

**Comparison, Grouping, and Preference**

*Rottenstreich, Y. (University of Chicago), Brenner, L. (University of Florida), Sood, S. (Rice University)*

How does the attractiveness of an option depend on comparisons drawn between it and other alternatives? We suggest that comparison between options highlights each option's relative advantages and disadvantages. To the extent that disadvantages are weighed more heavily than comparable advantages, comparisons between options should make each option less attractive. Indeed, we find that circumstances encouraging inter-item comparisons yield lower reservation prices than circumstances discouraging inter-item comparisons. Furthermore, the way in which options are grouped in a choice problem may influence which comparisons are likely to be made. In particular, we propose that grouping focuses comparisons, making within-group comparisons more likely than between-group comparisons. If grouping focuses comparison, and comparisons hurt the attractiveness of options, then grouping should reduce the attractiveness of grouped options. Consistent with this prediction we observe that an option is more likely to be chosen when alone than when part of a group.

**Option Information as a Determinant of Choice Deferral**

*Zhang, S. (University of California, Los Angeles), Sood, S. (Rice University)*

We propose that comparison processes affect subjective experience regarding the amount of information perceived in the choice set. Attribute information that is comparable between alternatives in a choice set gives rise to more perceived amount of information about the choice set relevant for decision making relative to information that is not comparable. Additionally, attribute information that is comparable is easier to process than attribute information that is not comparable. The authors provide data that suggests that although comparable information may facilitate ease of comparison, this may not be accompanied by a similar increase in the perceived amount of information about the choice set. Hence, there is a complex relationship between comparability of attributes, perceived amount of information about the choice set, and choice deferral.

## Symposium Session 1

**Distorted Evaluation of Evidence in Legal Trials.**

*Carlson, K. A., Russo, J. E. (Cornell University)*

Juror decision making is examined for evidence of predecisional distortion of information (witness affidavits) in a legal case. Two experiments were conducted using students (Experiment 1) and prospective jurors (Experiment 2). Results reveal that both students and jurors exhibit predecisional distortion while making case decisions, but that prospective jurors' distortion levels are twice those of students. Results also reveal that students reduce distortion when a new witness' testimony reverses the currently leading verdict, but jurors' distortion levels are maintained even under new leadership. Distortion and initial leanings (based on the case introduction) are predictive of both students' and jurors' decisions, but prior beliefs are only predictive of jurors' decisions. Implications for these findings and possible causes of predecisional distortion of legal case information are discussed.

**Selecting and Rejecting: Predecisional Distortion and Evaluative Focus.**
*Meloy, M. G., Russo, J. E. (Cornell University)*
This paper uses two studies to examine the impact of instructions to select versus reject on predecisional distortion processes in an attempt to understand the impact of evaluative focus as an underlying causal mechanism for the phenomenon. In the first study (binary choice), subjects in the reject paradigm engaged in half as much predecisional distortion as their select counterparts. Although the reduction was substantial, a significant amount of distortion was still present. To discover the differences in process that led to this reduction in distortion, a second study involving verbal protocols was conducted. The focus of the thoughts generated under select mode was substantially more positive than those generated in a reject mode. Under select mode, the vast majority of thoughts were positive and linked to the "leader". In contrast, rejection mode led to more thoughts about negative dimensions of both the leader and trailing alternative, and more balanced processing of information overall.

**The Role of Expectations in Predecisional Distortion of Information: an Introduction to Disparity Pursuit.**
*Carlson, K. A. (Cornell University)*
This paper introduces disparity expectations as an explanation of predecisional information distortion. A disparity expectation is the expected difference between the values of the alternatives under consideration. According to disparity pursuit theory (Carlson 1999), consumers attempt to achieve coherence between the expected disparity and the achieved separation between alternatives during product choice. As the expected disparity increases, so should the need for separation between the alternatives and, driven by that need, the amount of information distortion. Evidence from three experiments is presented. The first two experiments reveal that expectations set either externally or internally (by key attributes) have predicted impacts on information distortion. A final experiment demonstrates that the expected disparity, when manipulated by presenting the price first, can be used to influence product choice.

## Symposium Session 2

**Arbitrary Coherence: Duration-Sensitive Pricing of Hedonic Stimuli Around an Arbitrary Anchor**
*Dan Ariely (MIT), George Loewenstein(Carnegie-Mellon University), & Drazen Prelec (MIT)*
In three studies we show that people display a peculiar combination of arbitrariness and coherence when they specify the minimum compensation required to be exposed to an unpleasant hedonic stimulus (an unpleasant noise). Subjects were exposed to a sample noise then stated their willingness, hypothetically, to listen to the noise for 30 seconds for either a large or small payment. Subsequently, their actual WTA was elicited to listen to the noise for different intervals (10, 30 and 60 seconds in the first experiment). Prices exhibited 'arbitrary coherence,' in that they were systematically related to noise duration but also powerfully influenced by the arbitrary high/low anchor. The first study documented the effect at the individual level, the second in experimental markets. The third examined whether the anchor only influenced monetary valuations or more fundamentally influenced perceptions of noise aversiveness.

**Context effects on the evaluation of small probabilities and insurance premiums**
*Nathan Novemsky (Princeton University), Howard Kunreuther (University of Pennsylvania), & Danial Kahneman (Princeton University)*
The present studies investigate people's responses to two variables as signals to risk: probabilities and insurance premiums. Several experiments elicit judgments of the risk for a hypothetical chemical plant. Each scenario includes either probability or premium information associated with the possibility of death from an accident. Since the findings for both scales are similar, we will refer only to probabilities. Respondents that read about a single plant do not differ in their perceived risk for the plant despite variations of several orders of magnitude in the probability. Respondents who are told the probability for the risk associated with car travel, are no better at evaluating the risk for the plant. We have identified two ways to induce respondents to use the probability for the chemical plant when evaluating its risk: 1) give each respondent several chemical plants that vary only on probability 2) give each respondent two reference values from a familiar risk (e.g. car travel) to give them a feel for how a ratio of probabilities translates into different levels of risk. These results suggest that people do not have a well-defined notion of what is a high or low probability or insurance premium independent of context. For people to give meaning to these values requires enough information in the context for them to map their feelings of risk onto the probability and premium scales.

**The Effects of Prefactual Thinking on Purchase Likelihood For Hedonic and Utilitarian Products**
*Ravi Dhar (Yale University) & Steven "Jim" Sherman (Indiana University)*
The current research examines how the generation of alternatives prior to purchase influences purchase intent. Across three studies we test whether purchase intent differs systematically for hedonic and utilitarian products when consumers are allowed to generate alternative outcomes (prefactuals). The results of the first study show that purchase intent was more likely to increase after listing prefactuals when the good described was hedonic and was likely to decrease when the item was functional. We propose that asking subjects to generate alternatives increases purchase intent for hedonic products by creating a contrast effect (since people tend to generate utilitarian uses for money) but decreases purchase intent for utilitarian products (by increasing accessibility for other uses). A second experiment examines cases where the prefactuals are domain specific: fun versus utilitarian uses for the money. The third study determines whether the results are caused by differences between the two types of goods or more generally, by how and when consumers think about them.

## Paper Session 6 – Presidential Address

**Why do You and I Make Different Decisions? Tracking Individual Differences in Decision Making**
*Levin, I. (University of Iowa)*
Models of decision making increasingly call for explanations at the level of the individual decision maker. In this paper I will consider how individual difference factors, measured independently of task outcomes, moderate performance on judgment and decision making tasks. Both of the following are required: (1) having a priori measures of individual difference characteristics, and (2) including task performance measures that provide insight into the process by which a decision is made, not just the final outcome. I will describe the results of a literature review that identifies gaps in research on individual differences in decision making, and I will describe new techniques for uncovering decision processes. Finally, I will describe recent research in our laboratory that links individual differences characteristics to decision processes. For example, I will show how the "need for cognition" scale predicts measures of effort, strategy use and decision quality in a multiattribute-multioption decision task.

## Symposium Session 3

**Coordination and Learning Behavior In Large Groups With Asymmetric Players**

*Rapoport, A. (University of Arizona), Seale, D. A. (University of Nevada – Las Vegas), & Winter E. (Hebrew University)*

This paper examines coordination in a 20-person, iterated market entry game in which the market capacity is changed randomly from trial to trial and the incentive to enter the market decreases linearly in the number of entrants. Asymmetry between DMs is achieved by charging them differential entry costs which are private knowledge. Our results obtained under the decision method show remarkable coordination on the aggregate level, which is accounted for surprisingly well by the Nash equilibrium solution. However, at the individual level the Nash equilibrium solution does not account for differences between players with different entry costs, or among players with the same entry cost. The observed behavioral regularities are accounted for by individual cutoff decision rules in which the cutoff point changes across trials.

**Experience-Weighted Attraction Learning in Entry Games**

*Camerer, C. F. (California Institute of Technology) & Ho, T. (University of Pennsylvania)*

Experience-weighted attraction (EWA) learning is a hybrid model which combines features of reinforcement and belief learning ("weighted fictitious play") into a general model. The key idea is that players choose strategies and reinforce chosen strategies according to their payoffs, but also reinforce unchosen strategies according to what they would have gotten (if they know what that is). Under some conditions, reinforcing unchosen and chosen strategies equally strongly leads to behavior which is, surprisingly, exactly the same as if players formed beliefs by extrapolating from past observations of what other players did, and choosing strategies with high expected payoffs given those beliefs. In studies on six pervious data sets, EWA almost always improves on either choice reinforcement models or belief models by combining the best-fitting features of both approaches (adjusting for the fact that EWA has more parameters in six different ways). This talk reports the results of applying the EWA model to data from the market entry game in which payoffs to entrants are stochastic, with the chance of a high payoff decreasing in the number of other players who enter. We also discuss applications of the learning model to decision making, including consumers choosing among product brands.

**Elicitation of Strategy Profiles in Large Group Coordination Games**

*Seale, D. A. (University of Nevada – Las Vegas), & Rapoport, A. (University of Arizona)*

The strategy method is an experimental procedure for eliciting a complete individual decision profile for all possible alternatives, not only the ones that happen to be reached during the course of play of a game. We use it to elicit individual decision profiles in a symmetric market entry game experiment in which the subjects have to decide whether or not to enter several alternative markets *before* some market capacity value is randomly selected to determine their payoffs. Our results show that the number of entrants across a large set of market capacity values is organized quite well by the Nash equilibrium solution. These aggregate results do not differ from previous results obtained under the more common decision method. In contrast, the decision individual profiles do not support equilibrium play, and exhibit a variety of patterns that defy any classification. In particular, we find no evidence in support of cutoff decision rules with a changing cutoff point that seem to be elicited under the decision method.

**Group Coordination In Choosing Lotteries Under The Joint Effect Of Strategic And Outcome Uncertainties**

*Zwick, R. (Hong Kong University of Science and Technology) & King Chung Lo, A (Hong Kong University of Science and Technology)*

We consider interactive decision making situations in which each DM must choose to participate in one of several independent lotteries with different prizes that are commonly known. In contrast to the typical individual decision making task under risk, the probability of winning a prize, given that a particular lottery is chosen, is not exogenous. Rather, it decreases in the number of DMs registering to play this lottery. We derive the Nash equilibrium solution to this n-person noncooperative coordination game and then test it experimentally with several groups of 18 subjects each. The aggregate, but not the individual, results support the mixed strategy equilibrium solution once we assume common risk aversion.

## Symposium Session 4

**Nineteen Steps Toward a Positive Behavioral Decision Theory**

*Edwards, W. (Wise Decisions Inc.)*

Decision theory at its core consists of three linked models: MAU, Bayes, and SEU. If one spells out how the process of decision making works, taking all three models as elements of that process, one gets 19 steps. Of these, three are subject to specification by normative calculations; the rest are not. So much of behavioral decision theory research has focused on error, in the sense of discrepancy between a formal calculation and some bit of behavior, that most of the 19 steps have not had much experimental attention. Until we pay more attention to the whole process, rather than just to the normatively specified subprocesses, we will continue to be seen, correctly, as hobbyists playing in our sandboxes. And the real world of real decisions will continue to pass us by.

**Rationality in Choice Under Certainty and Uncertainty**

*Luce, R. D. (University of California – Irvine)*

Since Savage (1954) it has been accepted that subjective expected utility (SEU) embodies the concept of rational individual behavior under uncertainty. If, however, one alters the domain formulation in two ways, by distinguishing gains from losses and adding a binary operation of joint receipt, then equally rational arguments lead in the case of binary mixed gambles to predictions quite different from SEU. A question, raised but not really answered, is whether there is a rational argument for choosing one domain formulation over the other.

**The Role of Positive Affect in Facilitating Decision Making and Judgment**
*Isen, A. M. (Cornell University)*
Affect is a regular part of decision making. It is time to incorporate affect, especially the facilitative effects of positive affect, directly into models of decision making. In this talk, I will provide a brief overview of both behavioral and neurological evidence documenting how positive affect influences the decision making process. In doing so, I will also provide suggestions for how affect may be incorporated into decision making models.

**Decision Making in Complex Environments: Psychological Processes and Individual Differences**
*Wearing, A. J. (University of Melbourne) & Omodei, M. M. (Latrobe University)*
There has been relatively little systematic investigation of the psychological processes and individual differences underlying human decision making in complex dynamic environments. We suggest that understanding such decision making tasks requires an adaptive control model, which assumes that a person is motivated to regulate actions in order to adapt to and control the environment. We provide an overview of experimental studies of complex tasks using micro-worlds. Micro-worlds simulate a complex dynamic environment and offer a balance between the contradictory criteria of simplicity and complexity. We show how this type of approach can help us understand not only decision behavior and performance, but also appraisals, affective reactions, and personal characteristics related to mastery.

## Paper Session 7

**A Motivational Approach to Decision Making**
*Heckhausen, J., Martignon, L. (Max Planck Institute for Human Development)*
We propose a motivational approach to decision making. We claim hat an individual's motivational state, such as a need state or a goal, determines which cues are attended when making a decision. The cue with the highest relevance for the individual's goal or need can be expected to be treated as decisive (the most valid) for a Take The Best kind of strategy. Moreover, we argue that models of information process are adapted to the phase action in which they occur, which can be predecisional, during action, and after success or failure (postaction). Individuals tend to search for and integrate more information when facing a novel and complex decision task. However, once a decision is made, and the individual has passed the Rubicon.

**The Effect of Aspiration Levels on Risky Decision Making**
*Jeffrey, S., Larrick, R. (University of Chicago)*
This paper studies a "goal effect" that is observed when decision makers decide between a sure thing and a lottery of equal expected value. When all outcomes of both options are above a goal, risk aversion disappears. A regret theory explanation similar to a reverse outcome bias is provided. It is proposed that decision makers call upon the goal as a reference points for evaluating outcomes. This allows predicted positive evaluation of the lottery regardless of what obtains. This leads more people to choose the lottery than would in the absence of the goal.

**Hierarchical Linear Modeling of Risk Judgments Predicted by Cognitive and Emotional Attributes of Risk and Gender**
*John, R. S., Brougham, R., von Winterfeldt, D. (University of Southern California)*
Hierarchical linear models (HLMs) are used to simultaneously predict risk judgments from individual cognitive and emotional risk attributes and from the gender of the participants. Random coefficient regression models demonstrated that cognitive and emotional attributes of risk were about equally predictive of risk judgments. An intercepts-as-outcomes model supported the finding that females give higher risk judgments overall than males. No evidence was found in the estimated slopes-as-outcomes model that participant gender moderates the relationship between risk judgments and any of the cognitive or emotional risk attributes. Results of mixed model ANOVAs suggested that gender differences in risk ratings are not robust across risk domains or across specific risks within some domains. The HLM approach allowed us to address a broad range of interesting theoretical questions, while overcoming many of the methodological pitfalls inherent in traditional approaches.

**The Appraisal-Tendency Hypothesis: Systematic Differences Between Fearful and Angry People in Risky Decision Making and Judgments Under Uncertainty**
*Lerner, J. S. (Carnegie Mellon University), Keltner, D. (University of California, Berkeley)*
Four studies tested Lerner and Keltner's (in press) appraisal-tendency model, which specifies the influences of incidental emotions upon judgment and choice. In support of the model, angry individuals held optimistic perceptions of public risk whereas fearful individuals held pessimistic perceptions of public risk (Study 1). Angry individuals also favored risk-seeking options whereas fearful individuals favored risk-averse options, regardless of whether choices were framed as gains or losses (Study 2). Finally, whereas happy and angry individuals held optimistic perceptions of personal risk, fearful individuals held pessimistic perceptions (Studies 3 and 4). Our discussion addresses conceptual benefits of an appraisal-tendency approach.

**Predicting Affective Responses to Unexpected Outcomes**
*Coughlan, R. (University of Richmond), Connolly, T. (University of Arizona)*
The studies reported here examine the accuracy of individuals in predicting affective responses to unexpected outcomes. In the first study, variables thought to affect satisfaction with outcomes were manipulated in a scenario study with undergraduate subjects. A follow-up study involved the expectations of real-life bowlers about their scores in an upcoming game and their reactions to unexpected outcomes. Results show that bowlers did very well at predicting affective reactions. Together, these studies show strong support for the role of expectations in shaping affective responses to unexpected outcomes. In both studies, predicted and actual satisfaction ratings show support for prospect theory principles.

# JDM Poster Abstracts

Poster Session I: Sunday, November 21, 10-12 noon

**Managerial Use of Market Response Models**
*Charles Abramson (California State University, Long Beach)*
An investigation is undertaken to understand how managers' competitive marketing decisions and outcomes are influenced by a number of industry and information conditions, including whether they have access to a market response model. Second, a number of constructs and functional form, are analyzed to determine which representation best explains how managers make such competitive pricing decisions across industry and information availability conditions. Both objectives are pursued via two experiments in the context of a pricing game in a health care setting. In this environment, managers of each of five hypothetical firms make pricing decisions over an 8 period time horizon.

**A Test of a Taxonomy of Natural Decision Making Approaches**
*Bernard Goitein (Bradley University)*
Kinston's seven managerial decision making approaches correspond to distinct organizational cultures. The approaches emphases are: articulating common goals; modeling organizational effectiveness; sensing and seizing opportunities; developing evidence-based solutions; negotiating agreements; fostering creativity; and assigning decisions to appropriate functional areas for disposition. Convenience samples of managers and undergraduate students read brief descriptions of the approaches. Managers and students readily rated each approach's appeal and descriptiveness of their decision making. Factor analyses revealed the seven hypothesized factors in each group, although relative preferences varied significantly between groups. The seven types appear to be meaningful, distinct decision approaches to these samples.

**Inclusion and Exclusion in Prescreening Options for a Positive and Negative Decision Task**
*Caryn M. Prosansky, Irwin P. Levin (University of Iowa)*
Previous research has compared inclusion and exclusion processes in narrowing choice options in a "positive" task such as hiring decisions. The present study is the first to expand this analysis to "negative" (firing) decisions. Results from the firing task were similar to those for hiring, showing that exclusion instructions led to less narrowing of choice options than did inclusion instructions. However, by including control subjects who were not explicitly instructed to include or exclude, we determined that exclusion was the "natural" process for hiring decisions, whereas inclusion was the "natural" process for firing decisions.

**The Gambler's Fallacy versus the Hot Hand: Empirical Data from Casinos**
*Jim Sundali (University of Nevada, Reno), Rachel Croson (University of Pennsylvania), Eric Gold (Gold Objects, Inc.)*
The gambler's fallacy is a mistaken belief in negative serial autocorrelation of a non correlated process. In contrast, the hot hand is a mistaken belief in positive serial autocorrelation. This study presents results from videotapes of patrons gambling at a roulette table in a casino (roulette is a good game to use because the outcome is indeed serially uncorrelated). We examine the extent to which individuals bet in a way which is consistent with the gambler's fallacy or with the hot hand.

**Is the Gambler's Fallacy a Fallacy?**
*Christopher T. Ball (College of William and Mary)*
After repeated occurrences of the same outcome for independent events the gambler's fallacy is that an alternative outcome is now more likely to result. This biased reasoning should lead to an increase in risk associated with predicting the next outcome. However, the current experiment found individuals varied considerably in their responses to a 'run' of outcomes involving gains or losses with some participants decreasing their level of risk. The present paper reports methods for predicting these individual differences.

**Contrasting Stochastic and Support Theory Explanations of Subadditivity**
*J. Neil Bearden (University of North Carolina at Chapel Hill), Thomas S. Wallsten (University of North Carolina at Chapel Hill), Craig R. Fox (Duke University), Hongbin Gu (University of North Carolina at Chapel Hill).*
The sum of judged probabilities of disjoint events generally exceed the judged probability of the union of those events. Support theory (Tversky & Koehler, 1994) attributes this subadditivity to more inclusive events providing more effective retrieval cues. However, it also follows from a model of probability estimates perturbed by regressive stochastic error. Three experiments in which subjects studied repeated events and later estimated their frequency suggest that both processes contribute to subadditivity. Likewise, respondents accurately judged their mean and median estimates as too high/low, but inaccurately judged true values, suggesting that stochastic error is sufficient but not necessary for subadditivity.

**Avoiding the "Ellsberg Bag" as Avoiding a "Stacked Deck" Possibility, Rather than Avoiding Ambiguity**
*Robyn Dawes (Carnegie Mellon University), Gunne Grankvist (Goteborg University), Jonathan Leland (IBM)*
Offered a prize for drawing a chip of one of two colors, people prefer drawing from a bag containing half of each color to a bag with unknown proportions. This preference may reflect differential sensitivity to the possibility that the unknown proportion is "stacked" against as opposed to for the chooser. Tossing a coin before drawing to determine the winning color favors choice from a 50-50 bag for 100kr (in gift certificates) rather than from an unknown proportion bag for 150kr. Tossing afterward, when the draw cannot be made in an unfavorable situation, significantly reduces choice from the 50-50 bag.

**A Comparative Strength Model for Judgment**
*Alan Sanfey, Reid Hastie (University of Colorado)*
In this series of experiments, we seek to validate a general model of choice under uncertainty based on the central equation proposed by Tversky and Koehler (1994) in their Support Theory of subjective probability. Specifically we are interested in judgments of outcomes of pairwise and multiple candidate political elections, where the inputs to the model are based on actual observed stimuli, as opposed to subjective ratings of strength. The studies indicate that a model of this nature can do an excellent job at modeling predicting judgments, and also provides quantitative tests of whether probability or frequency is guiding judgment.

**Proximity, Compatibility, and Intuitive Probability Judgments**
*Kimihiko Yamagishi (Shukutoku University)*
Conjunction Fallacy occurs because people substitute similarity assessment to probability judgment. In turn, human similarity space has been shown to possess a non-Euclidean property. Hence two objects may be similar and dissimilar to each other. Based on these findings, regarding Category C and example X, I argue that judgments of non-membership is guided by assessment of dissimilarity, and that judgments of p(X belongs to C) and of p(X does not belong to C) show contradictions that their sum exceeds unity. Such judgments are predictable from the compatibility principle. (Japan Ministry of Education Grant-in Aid for Encouragement of Young Scientists 10710032)

**Why the Ratio-Bias May Have More to Do With Randomness Than Ratios**
*Dean A. Yoshizumi, Irwin P. Levin (University of Iowa)*
In a two-option task with equal probabilities, individuals prefer the option having the greatest absolute number of winning chances. That is, individuals prefer the option with 10 winning chances in 100, versus 1 winning chance in 10. The effect reverses for a choice between losing options. This effect is known as the ratio-bias, and has been examined extensively by S. Epstein and colleagues. We tested an alternative interpretation for the ratio-bias effect: subjective randomness. The distributions of win/loss chances were manipulated to coincide with expectations of random and non-random distributions. Conditions under which the ratio-bias will and will not be observed were as predicted.

**When Yankees Go South: How Attribute-Level Preferences Adapt to a Changing Environment**
*Christina L. Brown (University of Michigan), Patricia M. West (Ohio State University)*
We show that a changing environment can unbalance attribute-level preferences. We suggest that the cognitive challenges of a new environment draw attention to attributes whose incidence or underlying meaning differs between locations. A corollary is that less salient, "quieter" attributes will be (perhaps unintentionally) de-emphasized in this new environment, although they might initially have been quite important. We confirm these expectations in an experiment assessing the apartment preferences of MBA students in Texas and New York City. Finally, we demonstrate that, because of non-conforming and partial adaptation, newcomers choose different apartments than natives, and their search processes are less effective.

**Choosing Among Multiple Attribute Alternatives as a Function of Age, Problem Content and Complexity**
*Yoella Bereby-Meyer, Idit Katz, Avi Assor (Ben Gurion University of the Negev, Israel)*
Decision making is a crucial skill in modern society. Many programs have been developed to improve children's decision making. However, little is known about children's decision processes. Our study aimed to analyze how children choose between multiple attribute alternatives. It analyzes a choice task, which varied in complexity and content and was performed by two age groups. It was found that performance is influenced by the content and does improve as a function of age. The main strategy that children use is emphasizing one attribute and choosing accordingly. This tendency increases as a function of the problem's complexity.

**Weight Approximations in Multiattribute Decision Models**
*Ron Roberts (University of the West of England)*
Simulations show the best approximation weights for multiattribute analysis depend on the method used to normalise the ranked swing weights. If weights are initially constrained to sum to 1 then Rank Order Centroid (ROC) weights are the best approximations. However if ranked swing weights are determined without initial restrictions, as in SMARTS analysis, and are then normalised, the distributions of the ranked weights are different. This paper sets out formula for these distributions and tables new approximation weights for between 2 and 10 ranked attributes. Trials show the new weights are more efficacious to SMARTS than ROC weights.

**Predicting the Prominent Attribute: The Role of Negative Features in Matching and Choice**
*Martijn Willemsen (Eindhoven University of Technology, The Netherlands), Gideon Keren (Eindhoven University of Technology), Huib de Ridder (Delft University of Technology, The Netherlands)*
A matching-choice procedure has been applied to options with one positive and one negative dimension. Participants matched two options to make them equally attractive and later, after some unrelated tasks, chose between the two options. The results show that the negative dimension became the prominent dimension under two different cover stories. When matching the negative dimension, participants hesitated to provide strong negative values thus reducing the prominence effect for that matching condition. The prominence effect of the negative dimension was shown to lead to non-compensatory choice behavior and was also observed in a direct choice task without a matching task.

**An Additive Model of Conjunctive, Disjunctive, and Linear-Compensatory Decision Strategies**
*Terry Elrod, Richard D. Johnson, Joan White (University of Alberta)*
We propose a non-linear estimation procedure for identifying whether a decision maker used a conjunctive or disjunctive decision strategy with either crisp or fuzzy cutoffs, a compensatory model, or a two-stage combination of these. Our model offers several advantages over previous procedures for identifying decision strategies. First, it allows for fuzzy thresholds in non-compensatory decisions. Second, it accommodates different processing strategies for each attribute. Finally, it enables the researcher to identify decision strategies from observed choices in a natural setting. The model is tested on MBA admissions data and on a set of simulated decisions. Results support the hypotheses.

**The Influence of Frame, Format, and Domain on Children's Decision Making**
*M. Elizabeth Burns, H. David Smith (Middlebury College)*
The effects of frame, format (frequency information vs. probability information), and domain (object gains and losses vs. time gains and losses) were investigated with two-hundred-three children in grades 2, 4, and 6. Results suggested that frame did not significantly influence children's decisions. However, children who considered frequency information were more
likely to choose less risky options across all domains. In addition, when considering a total count of risky choices, sixth graders chose significantly more risky options than both fourth graders and second graders. Results will be discussed in the context of research in decision making and cognitive development.

**Heuristics and Biases in Children: A Review of the Literature**
*Patrice D. Tremoulet (Rutgers University), Pamela A. Polizzi (Lucent Technologies, Holmdel, NJ), Gretchen B. Chapman (Rutgers University)*
We review developmental studies of reasoning which employed adaptations of the following: a) conjunction problems, b) base rate problems, c) numerical estimations, d) framing problems, and e) the Wason selection task. Based upon these studies, we evaluate three hypotheses about children's reasoning: 1) reasoning heuristics and biases are innate (Smith, 1993; Davidson et al., 1995), 2) the use of reasoning heuristics increases during development (Reyna, 1994; Jacobs et al., 1991; Krouse, 1986), and 3) the use of reasoning heuristics decreases during development (Agnoli, 1991). We conclude that, although young children do have some reasoning biases, the use of heuristics increases during development.

**A Motivational Explanation for Bias in Expert Witness Testimony**
*Lisa M. Sedor (University of Washington)*
This study examines how preferences influence the extent of information search, the amounts of effort expended, and the loss estimates calculated by students acting as expert witnesses. I link the motivated reasoning literature with that documenting client advocacy in expert witness judgments to explain how CPAs, as objective experts, can reach judgments biased toward the retaining party's legal position. I find that participants who personally prefer to see the retaining party win the lawsuit engage in less extensive information searches, expend less effort on the task, and calculate more biased loss estimates than participants who personally prefer the opposing party.

**Probabilistic Reasoning by Army Intelligence Experts: Psychological Evaluations for Co-RAVEN Technology for Battlefield Decision-Making**
*Oleksandr S. Chernyshenko, Janet A. Sniezek, Gunnar Schrah (University of Illinois at Urbana-Champain)*
Twenty seven Army Intelligence officers participated in three experimental studies conducted to assess different aspects of battlefield probabilistic reasoning. All studies were administered via computer and were designed to assist in the development of Co-RAVEN, the intelligent reasoning technology designed to help reduce the cognitive load faced by military intelligence analysts. Experiment 1 investigated the affect of priming for expertise on overconfidence phenomenon. Experiment 2 provided empirical findings concerning expert agreement and reliability when estimating the likelihood of battlefield events. Experiment 3 studied how experts update event likelihood, as more information becomes available. Results and practical implications of the findings are discussed.

**Probability Judgments Based on Nondiagnostic Evidence**
*Carla Colle, Derek Koehler (University of Waterloo)*
We investigated how individuals evaluate two types of nondiagnostic evidence (irrelevant and mixed), using two variants of the book bags-and-poker-chips task. In Experiment 1, nondiagnostic information followed a piece of diagnostic data in a belief-revision task. We found that irrelevant evidence was ignored, but mixed evidence produced more extreme judgments. In Experiment 2, the diagnostic and nondiagnostic components of the evidence were aggregated and assessed as a single body of evidence. These judgments were compared to responses from a separate block of trials based on the diagnostic information alone. Using this latter procedure, both types of nondiagnostic evidence produced dilution.

**Anchoring Effects: Single vs. Multiple Anchors**
*Ju-Whei Lee, Hsiang Ju Hsiao (Chung Yuan University)*
Anchoring effects refer to the phenomenon that if an individual receives a number before making a quantitative judgment, his judgment would be biased by the value of that number. Previous researchers usually presented an anchor (i.e., a number) to the subject. The present study investigated the effects of the number of anchors and anchor-consistency on quantitative judgments. The results showed that anchoring effects appear in both single- and multiple-anchor conditions. The anchoring effect is stronger in the multiple- than in the single-anchor condition. With multiple anchors, the anchoring effect is stronger in the high-consistent condition than in the low-consistent condition.

**The Effects of Available Information on Judgments-of-Knowing**
*Wendy Shields (University of Montana), J. David Smith (State University of New York at Buffalo), David Washburn (University of Georgia)*
The ability to make judgments-of-knowing--to assess how well one knows something and, therefore, how well one will perform on a future test--has been considered a sophisticated metacognitive capacity confined primarily to cognitively-mature humans. However, young children and even nonhuman animals may exhibit at least some ability in this area. We present data that suggest that the amount and type of information made available to participants at the time of judgment influence rhesus monkeys' ability to make judgments-of-knowing. This line of research could lead to improved methods of aiding the metacognitively-challenged.

**The Effects of Choice and Ego-Involvement on Confidence Judgments**
*Jonathan H. Chow, Lisa Scherer (University of Nebraska at Omaha)*
The purpose of the study was to investigate whether ego-involvement moderated the effect of choice versus arbitrary cue on accuracy and confidence judgment on a general knowledge task. Ego-involvement was manipulated through the information provided about the task. High ego-involved participants were informed that the task is highly predictive of success in life. Results indicated that arbitrary cue participants were more overconfident than choice participants were. Ego-involvement moderated the effect of choice on confidence judgments. In the high ego-involvement condition, arbitrary cue participants exhibited higher overconfidence than choice participants did. No significant difference was found in the low ego-involvement condition.

**Exploring Automation Bias in Multiple Environments**
*Kathleen L. Mosier (San Francisco State University), Linda J. Skitka (University of Illinois at Chicago)*
In a research program on "automation bias," the tendency to use automated aids as a heuristic replacement for vigilant information seeking and processing, we have identified several factors associated with this bias. Our strategy was to utilize both student and professional pilot samples in parallel to obtain converging evidence on the phenomenon. We found comparable automation error rates across populations. Professional pilots were sensitive to the criticality of flight tasks. Training for automation bias reduced commission errors for students, suggesting the importance of early intervention. We also found superior performance in a non-automated condition, and evidence of a preference for action over inaction, whatever the supporting information source.

**"I've Heard That Before, Therefore I Know It": The Validity Effect in the Classroom**
*Victoria Shaffer, Catherine Hackett Renner (West Chester University)*
Familiarity of terms and performance on course tests was examined. Experiment 1 compared test performance on common versus uncommon concepts in psychology (Boneau, 1996). On classroom examinations, students performed significantly higher on uncommon concepts (answered more questions correctly) than common concepts. In Experiment 2 students were given a term list on the first day of class and asked to indicate if they heard the term before and their confidence that they would answer a test question about the term correctly. Students performed significantly higher on terms they had not heard before. Relevance to the validity effect will be discussed.

**Controlling for Competing Causes Requires Attention at Encoding**
*Kelly Goedert-Eschmann, Barbara A. Spellman (University of Virginia)*
Previous research has shown that people control for alternative causes when evaluating the strength of a target cause (Spellman, 1996). We investigated whether this process is strategic and attention demanding. Participants saw combinations of fertilizers poured onto a plant and made predictions as to whether the plant would bloom under varying amounts of cognitive load. Participants under no load and speeded conditions conditionalized their causal judgments on competing causes. However, under divided attention, participants failed to conditionalize and instead appeared to discount a weaker cause when presented with a strong alternative cause.

**Real-World Covariation Assessment: A Preventive Health Example**
*Elliot J. Coups, Gretchen B. Chapman (Rutgers University)*
We are all regularly faced with situations in which we must judge the relationship between events. We examined such covariation assessments in relation to an important preventive health behavior: receiving a flu shot. 477 participants indicated their personal and vicarious experience with the flu shot and the flu. We examined the extent to which each of a number of strategies for combining this experience information was associated with judgments and decisions related to the flu shot. Our results indicated that people did not integrate their experience information in a normative fashion, but instead tended to follow simpler intuitive strategies.

**Legal Decision-Making: Are there Substantial Grounds for Disagreement?**
*Mandeep K Dhami, Peter Ayton (City University, London)*
Legislation guides legal decision-making, but also affords discretion, which may lead to disagreement in decisions on similar cases. This has been observed for example, when English magistrates make bail or jail decisions (e.g. Hucklesby, 1996). In the present study, sixty-one magistrates made risk judgements and bail decisions on a set of hypothetical cases comprising an orthogonal combination of case information. We argue that differences at stages of the decision process, namely in selecting and processing information; making risk judgements; and quantifying the "substantial grounds" for a decision, as specified by legislation, may account for the disagreement found in magistrates' decisions.

**The Influence of Four Mood States on Both Social and Non-Social Decisions**
*A. K. Ganzel (Cornell College), Laura Finken (Creighton University)*
We investigated the impact of angry, happy, sad and neutral moods on both objective (gambling) and social (dating) hypothetical decisions. Approximately 40 subjects were assigned to each mood condition (170 total); moods were induced via videotapes and a pre-engineered computer failure. A mood checklist confirmed the manipulation. There were no mood differences for the objective decision. However, sad and neutral subjects were more likely, and angry subjects less likely, to take a social risk than would be expected by chance. Findings are discussed in terms of cognitive, motivational, and methodological explanations, and follow-up studies outlined.

**When Cue Levels Can't Be Manipulated in Judgment Analysis: Determining Cue Levels Concerning Sexual Harassment Court Cases**
*Lisa M. Kath, Carrie A. Bulger, R. James Holzworth (University of Connecticut)*
Our research compares court rulings with lay persons' judgments of sexual harassment. We identified important facts (cues) from actual court cases, and asked raters to judge impact levels (scale values) of each cue. Achieving consensus on cue level ratings proved difficult, so cues were coded dichotomously by two subject matter experts. We conducted judgment analyses to
capture individual policies concerning severity and pervasiveness of harassment cases, and compared three methods of determining cue values (personal scale values, group mean scale values, and dichotomous). We accounted for significant judgment variance, and the three methods of cue scaling produced roughly equivalent results.

**How Often Depends on What is Being Asked: Effects of Response Alternatives and Privacy Guarantees on Frequency Reports of Sensitive and Non-Sensitive Behaviors**
*Anthony Ong, Ana Archaval, Christina Lamas, Nicole Steen (University of Southern California)*
The present study explored the decision-making processes involved in computing behavioral frequencies on self-administered questionnaires. Specifically, comparisons of the impact of precoded response alternatives and privacy guarantees on reports of a common, non-sensitive behavior (i.e., TV viewing) and an infrequent, sensitive behavior (i.e., shoplifting) were examined. The results extend previous findings (e.g., Schwarz, 1990, 1998); respondents use the frequency range suggested by the response alternatives as a frame of reference in computing the frequency of TV viewing. In comparison, frequency reports of shoplifting were affected by self-presentation concerns. Implications for improving the quality of information obtained from surveys are discussed.

**Perceived Reliability of Consumer Information on the Internet: Race and Gender Differences in Propensity to Trust**
*Marlene D. Morris (Georgetown University)*
The current research examines a specific instance of risk assessment/trust in consumer settings – perceptions of the reliability of information provided in Internet environments. Within studies of contextual factors influencing consumers' assessments of the reliability of information (information accuracy, process transparency) significant race and gender differences are noted in judgements of information. Contrary to related findings by Slovic and others, non-whites judged product information in an Internet setting as more reliable, accurate, and complete, were more likely to purchase from the sites and use sites again, and felt less need for additional search than whites. Race by gender interactions show that this difference exists primarily between white and non-white males, while females responded similarly across ethnicities.

**Tracing Decision Processes on the Web**
*Barbara Fasolo, Gary H. McClelland (University of Colorado at Boulder)*
Are webpages valid decision making tools? Forty participants chose among different computers on the basis of information displayed in a matrix on a specially designed webpage. Participants were more accurate when they had fewer computer options to choose from and when computers were described by more attributes. With more time available, the decision process was more attribute-based than option-based. The results are discussed within Payne, Bettman, and Johnson's (1993) adaptive decision maker framework and compared to previous non-web-based process tracing methods. Implications are discussed for improving information display on webpages to support multi-attribute decision making.

**Developing an Internet-based Decision Research System**
*Robert Mauro (University of Oregon)*
Decision researchers are frequently deterred by logistical difficulties from working with people of varying experience, expertise, age, culture, etc. Recent technological developments may provide a partial solution to these problems. Participants can be reached at home or work through the Internet using aesthetically enticing materials. An Internet-based Decision Research System (IDRS) that can reproduce simulated decision environments and conduct research using other typical laboratory procedures is described. The IDRS can gather many of the measures obtained in the laboratory (e.g., time spent accessing information, order of access, self-reports of confidence, subjective probability estimates). Preliminary results from this system are described.

**Accountability and Experience in Decisions Involving Sunk Costs**
*M.G. Fennema (Florida State University)*
Studies of decisions involving sunk costs have documented that some individuals consider sunk costs in their decisions and some do not. Accountability studies have shown that individuals who are accountable use more information. In the context of decisions involving sunk costs, this would suggest that sunk cost information would be used more often. However, due to strategy differences between novices and more experienced decision makers, I predict that the former will use sunk cost information in such a way that non-normative decisions will result and the latter will use it in a way that would result in more correct decisions.

**The Effect of Feedback on Sunk-Cost Decisions in the Classroom**
*Elmer Anita Thames (John Carroll University)*
This study investigated the tendency to invest additional time, money, or effort once an irretrievable investment has been made, i.e., the sunk-cost effect. University students imagined taking a required course in their last semester before graduation. During the 5th or 8th week of the semester, they received either a "D+" or an "F+" on one of the two exams for the course. They also received an estimate from their instructor of their chance of passing the class. This was either a 50% or 75% chance. Participants showed a strong tendency to continue in the course, regardless of the number of weeks they had been in the course. The type of score and estimate of success significantly influenced their tendency to continue in the course.

**Naive Investors, Sophisticated Risk Preferences**
*Daniel G. Goldstein and Philip Blythe (Max Planck Institute, Germany), William F. Sharpe (Standford University)*
Are your retirement investments overly cautious? Though many naïve investment decisions seem risk averse, this may stem more from measures of risk attitude than with the actual risks lay investors want to take. We have developed a tool called The Distribution Builder which allows investors to specify the exact distribution of income levels they would like to achieve and reports what the requisite investment would cost. We analyze lay investors' distributions of wealth in terms of risk attitude, efficiency, and the extent to which they can be realized through traditional investment strategies.

**Magnitude versus All-or-None Violation in Image Theory's Compatibility Test**
*Lee Roy Beach (University of Arizona), Lehman Benson III (University of Arizona), John W. Payne (Duke University)*
Seidl and Traub (1998) proposed a version of the compatibility test (Beach, 1990) that treats violations as magnitudes rather than in the all-or-none manner required by Image Theory. The present work empirically examined these two ways of treating violations. Results showed that low levels of required travel were generally not regarded as violations, but high levels were, and all higher levels counted roughly the same in the decision to reject the job. That is, the relationship between rejection and weeks of travel was a step function rather than a continuous function, supporting the all-or-none hypothesis.

**Strategies People Use for Limiting Hypotheses**
*Alexandra Kincannon, Michael Hertz, Barbara A. Spellman (University of Virginia)*
What evidence do people gather when trying to limit a hypothesis? We asked participants, "Suppose you know that all birds have a condyloid canal. What animal(s) would you test to determine whether ONLY birds have a condyloid canal?" Participants saw 12 response choices and could make up to 5 tests before making a determination. We propose that more similar non-bird evidence (e.g., bat) provides stronger confirmation because expected information gain (EIG) is greater than for dissimilar non-bird evidence (e.g., gorilla). Our results show that people select evidence with greater EIG and modify strategies from feedback when they conduct multiple tests.

**Knowledge of Category Attributes Determines Whether People Search for Diagnostic Comparisons**
*Carla C. Chandler (Washington State University), Patricia Cheng and Keith Holyoak (University of California, Los Angeles)*
Problems of diagnosis are best solved by comparing the attributes of two categories and emphasizing diagnostic attributes that occur only in one of the categories. We examined the conditions that promote/hinder comparisons by using two versions of the classic Glom-Fizo problem. In each version, the ambassador's attributes matched the Gloms, and we asked participants to convince colleagues that the ambassador is a Glom by referring to facts known about Gloms-Fizos in general. More participants made comparisons if facts about Gloms and Fizos were all known (45%) than if some facts were unknown (17%) but could have proved informative.

**Exploring Cognitive Skills of Leaders**
*Shawn A. Noble (Kansas State University/Army Research Institute-Fort Leavenworth),Jon J. Fallesen (Army Research Institute-Fort Leavenworth), James Shanteau (Kansas State University)*
Researchers have been interested in identifying a set of cognitive characteristics for those in leadership roles. This research is important because factors such as downsizing, multiple tasks, and digitization make the decision making environment more cognitively complex than ever before. Previously, researchers and military personnel have laid the groundwork by providing "skills" that are important for leader development. To further exploration, this research has been conducted to better identify, organize, clarify, and humanize relevant cognitive skills. In addition, this research has led to the development of a model that may enhance thinking in a VUCA (Volatile, Uncertain, Complex, Ambiguous) environment.

**Estimation in a J-Shaped World**
*Ralph Hertwig (Max Planck Institute for Human Development)*
For many evolutionarily important tasks, from choosing where to forage to deciding whether to fight, adaptive behavior hinges partly the ability to estimate quantities. Such decisions often have to be made quickly and on the basis of incomplete information. I present a heuristic, QuickEst, that exploits a particular environmental structure, namely, J-shaped distributions. I demonstrate by simulation that where knowledge is scarce QuickEst outperforms or at least matches the performance of more computationally expensive methods such as multiple regression and estimation trees. QuickEst is an ecologically rational strategy whose success highlights the importance of studying environmental structures.

**Enviroment Structures That Influence Heuristic Performance**
*Laura Martignon, Ulrich Hoffrage, Daniel Goldstein (Max Planck Institute for Human Development)*
We identify seven features of the environment that have an influence on the performance of heuristics for choice tasks using binary cues: 1. Inter-cue correlations; 2. Center of gravity of cues; 3. Number of cues (scarce/abundant information); 4. Discrimination rate (combined with validity); 5. Compensatory structure; 6. Conditional dependencies between cues; 7. Training set size. For each feature we present analytical or simulation demonstrations of its effects on the performance of decision mechanisms. For instance, abundant information favors simple unit-linear models, while the simple Take The Best heuristic can exploit environments with scarce and non-compensatory information to make accurate choices.

**Tailoring Heuristics to Frequent Events**
*Peter M. Todd (Max Planck Institute for Human Development), Seth Bullock (University of Leeds, UK)*
Real-word decision problems are not like exams where each question appears only once and contributes equally to an overall score. Rather, some natural problems may occur more frequently, and some may carry more weight. This has often been ignored when assessing the performance of cognitive mechanisms, including simple heuristics. The frequency and significance structure of environments can impact decision performance, and assessing a heuristic tailored to one environment with the distribution of decisions from another environment can make the decision maker appear poorly calibrated and irrational. Here we explore the effects of frequency structure on the performance of decision mechanisms.

**Effects of Analogical Message on Risk Perception-Attitudes Toward the Risks and Benefits of Nuclear Power Plants**
*Takashi Kusumi (Kyoto University)*
This study examined the effects of using analogical comparisons with past accidents on the perception of risks in nuclear power plant. Japanese undergraduates (N=115) rated the perceived risks, benefits, and acceptability of nuclear power plant construction in their neighborhoods. One week later, the participants were given either an analogical or a non-analogical message comparing the Chernobyl plant to a Japanese plant, and then answered the same questionnaire again. The analogical message promoted the perceived risk and changed the participants' attitudes to negative toward the plant. The non-analogical message decreased perceived risk and changed their attitudes to positive towards the plant.

**Age Differences in Observed Risk Attitude: Preliminary Results from a Sample of Italians 20-to-80 Years Old**
*Marco Lauriola (Univ. of Rome)*
Individually administered a 60-item Risk Attitude Survey (RAS) to a sample of 76 Italians 20-to-80 years old. All the subjects completed 13 years of education. On each trial, subjects' task was making a decision between two prospects having the same expected value. One of them offered sure gain or loss, the other offered a risky alternative. Preliminary results provided evidences for RAS construct validity, since the overall pattern of preferences is consistent with major findings in risky decision making. Moreover, age differences were found: older adults were more apt to be risk taking than younger adults, but only in the domain of avoiding losses.

**The Better-Than-Average Effect: A Cognitive or Self-Enhancement Bias?**
*Michael R. Baumann, Janet A. Sniezek (University of Illinois at Urbana-Champaign)*
A number of studies in self-evaluation suggest that people have a general need for self-enhancement (e.g., Kunda, 1987, 1990). Several studies have suggested that the better-than-average effect (BTA) is a specific instance of this general need. However, recent work suggests this may not be the case. The current paper develops and tests a dual-process explanation of the BTA (the singular vs distributional race model; SVDR) against such self-enhancement explanations. Results favored the SVDR over self-enhancement explanations. Methodological concerns with the study of the BTA are also discussed.

**A Restraint on People's Pursuit of Environmental Zero Risk**
*Kazuya Nakayachi (University of Shizuoka, Japan)*
This study compared participants' willingness to pay (WTP) for a hypothetical risk reduction in two conditions: one was an incremental condition in which risk reduction occurred in a step-by-step fashion requiring cost for each step, the other was a one step condition in which risk was reduced by a single step measure. The results suggest that people are willing to pay for an initial reduction in risk, but become averse to doing so for subsequent reductions when zero risk was achieved incrementally. By contrast, they put more value on the risk-free state when it is achieved in a single step.

**Mental Representation and Reciprocal Thinking: Another Perspective on Decision Framing**
*David A. Rettinger (Middlebury College), Reid Hastie and Walter Kintsch (University of Colorado, Boulder)*
Decision framing effects result from processing that emphasizes frame-congruent information. Providing a rationale for one's options reduces framing by eliminating this bias (Jou, et al., 1996). Subjects read the Asian Disease problem either with or without a rationale. Using identical materials, Jou found more reciprocal thinking and less framing with rationales. We found that adding a rationale did not increase reciprocal thinking or mitigate framing effects. Computer simulations of both our subjects and Jou's indicate that changes in mental representations due to frame may explain both the earlier results and our failure to replicate them.

**Getting Advice Versus Knowing Your Options: The Influence of Advice on Information Seeking and Retention**
*Frank A. Drews, Katrin Fischer (Technical University of Berlin)*
When people have to decide in a complex domain they often prefer to receive advice from an expert. Independent of the advice they may collect further information about the options. How advice affects a person's information seeking and retention with respect to available options is not known. In two studies we examined the influence of advice on information search and memory. Subjects who received advice looked for more information about a recommended option and recalled more information about the recommended option than about alternatives. Subjects without advice gathered information by using a within-attributes strategy.

**Choice Over Time: The Perpetuated Impact of Search Costs on Decision Processes in Information Abundant Environments.**
*Gal Zauberman (Duke University)*
This work focuses on the effect of the information environment on search patterns, consideration sets and choices over time. The information environment is conceptualized in terms of two temporally distinct search-cost categories that are traded off: initial set-up costs and on-going evaluation costs. The relationship between these two search-cost categories affects initial selections as well as the propensity to search for, discover and adopt new options. This "lock-in" effect occurs in two stages. First, due to intertemporal discounting, the lower set-up and higher evaluation cost option is selected. Second, once the set-up cost has been incurred, it is less likely to consider and switch to a (superior) new alternative.

**Biodata Related to Styles of Inductive Reasoning**
*R. James Holzworth (University of Connecticut)*
A biographical (biodata) questionnaire has been developed for assessing demographic and biographical variables potentially related to analytical and intuitive styles of cognition. The 195 items assess individual differences concerning exposure to science, math, and fine arts, tolerance for uncertainty, tolerance for ambiguity, and decision style. Biodata questionnaires were completed by 378 students representing more than 34 majors within several colleges. Four criterion measures (essay items) known to induce different modes of cognition were also completed. Results indicate individual differences in styles of cognition for the study participants. These individual differences were related to biodata variables.

**The Use of Cognitive Stopping Rules in Information Systems Analysis**
*Mitzi G. Pitts (University of Memphis), Glenn J. Browne (Texas Tech University)*
Information requirements determination is the task performed by systems analysts to understand user needs for computer information systems. A two-part study was conducted in which 54 practicing systems analysts participated in a requirements determination task. First, the cognitive stopping rules used by analysts were identified. Second, two prompting tools were used to attempt to mitigate the consequences of stopping rule use. Results showed that the use of additional prompts reduced the undesired effects of stopping rules for all subjects, and that the treatment group utilizing a theory-based strategic prompting tool generated a significantly greater quantity and quality of system requirements.

**Content Dependencies in Decision Strategy Selection**
*Yuri Tada (The Ohio State University), Elke U. Weber (Columbia University)*
To test the hypothesis that certain decision strategies are more suitable for some decisions than others, participants were randomly assigned to one of the eight strategies to use in making ten decisions, varying in content. When people are asked to use an unsuitable decision strategy, it is believed that their choice and the most desirable option according to the strategy will be inconsistent. Results showed that the amount of inconsistencies for these decisions was statistically different. For instance, people were less likely choose a utility maximized option in decisions that do not render themselves well to logical calculations (e.g., which religion to embrace).

**Measuring Academic Productivity**
*Dewey C. Scheid, Robert M. Hamm, Steven A. Crawford (University of Oklahoma Health Sciences Center)*
A system was developed to measure productivity for an academic family medicine department. Faculty members rated the relative value of a comprehensive list of 96 academic activities, and indicated how many times a year they did each activity. Then they participated in a role playing exercise in which each player was arbitrarily assigned a portfolio of academic activities (all portfolios had approximately equal), and they traded activities until satisfied with their assignments. Scale incompatibility problem solution is given. Results (e.g., being PI of a funded grant is 67 times more valuable than attending a research presentation) and process are critiqued.

**Evaluation of a Performance-Based Measure of Expert Performance in an Air Traffic Control Microworld Environment**
*Rickey Thomas (Kansas State University)*
CWS methodology has been used to measure competent performance in CTEAM, an air traffic control microworld environment. Results from laboratory studies indicate that CWS is sensitive to task complexity, and that higher CWS indices do in fact correspond to better performance. The CWS methodology has been extended to measure the performance of teams as well as individuals. CWS is also being used to track the development of expertise.

**MouseTrace: A Better Mousetrap for Catching Decision Processes**
*JD Jasper (University of Toronto)*
In their review of process tracing methods, Ford et al. (1989) argued that researchers had neglected two factors that may influence decision processes and strategies: individual characteristics and features of the environment. Taking this into consideration, we report a compilation of work that is centered around two themes. First, the development and use of a new (and we believe improved) variation of MouseLab, called MouseTrace. Second, the investigation of decision making variables with known (but not entirely understood) effects including: choosing vs rejecting, missing information, and attribute framing.

**Using Multiple Judgments and Process Tracing Techniques to Examine Cognitive Models of Decoy Effects**
*Jonathan C. Pettibone, Douglas H. Wedell (University of South Carolina)*
Decoy effects occur when the addition of a seemingly irrelevant alternative shifts preferences among the other alternatives in the choice set. We used two techniques to provide a richer database for testing cognitive explanations of these effects than choice data alone provides. First, we used process tracing to explore patterns of information acquisition. Second, we used a judgment-based approach, in which participants evaluate different aspects of the alternatives in a choice set. We discuss the contributions of both approaches and demonstrate convergent evidence for a two component model of choice behavior. These components are based on traditional weighting and valuing processes and on added values from relational information.

**Taking the "Easy" Way Out: Trade-Off Avoidance in the Attraction Effect**
*Janet A. Schwartz, Gretchen B. Chapman (Rutgers University)*
Using a within-subjects design to study decoy effects, we compared process measures when people did and did not show biases like the attraction effect. Two key findings will be discussed. First, the attraction effect was mediated by a process measure associated with trade-off avoidant processing. Second, comparisons across different decoy conditions revealed that different information processing patterns were associated with different choice biases. Consistent with reason-based choice, these results indicate that many choice biases may result from the same initial trade-off avoidant heuristic, but will also depend on the type of decoy present, as that will determine to what extent trade-offs can be reduced or avoided.

**What Processes are we Tracing? The Role of Memory Representation in Online Decision Behavior**
*Stuart M. Senter, Douglas H. Wedell (University of South Carolina)*
In a series of experiments, we inferred strategy from choice patterns so that links between process measures and strategies could be explored. Although strong links have been established, we have also demonstrated that strategies can often be flexibly implemented so that this linkage breaks down. Our experimental evidence implicates the role of information acquisition pattern in developing the memory representation on which choice processes operate. The results showed that recall accuracy for processed information depends on two things: 1) the manner in which information is presented and, 2) the type of information that is probed. This work represents a broadening approach to the study of judgment and decision making that directly incorporates memory processes.

## Poster Session II: Sunday, November 21, 6:30-8:00 pm

**Guessing in Multiple-Choice Tests as a Judgment and Choice Problem**
*Yigal Attali (National Institute for Testing and Evaluations, Jerusalem, Israel)*
The problem of guessing in multiple-choice tests is considered as a judgment and choice problem. It is proposed that both examinees and examiners will not select the alternatives with equal probability, because their intuitive judgments of randomness are systematically biased. Specifically, both examinees and examiners will favor the choice of middle (as opposed to extreme) alternatives, and they will favor alternatives that are under-represented in the previous choices. Evidence supporting these propositions is presented, including from actual choices of examinees and examiners in high-stake tests, and the psychometric implications of these results, in terms of the difficulty and discrimination of items, is considered.

**The "Attraction Effect" with a Dominating Alternative**
*Joachim Meyer, Simone Moran (Ben Gurion University of the Negev, Israel)*
Two experiments assessed the effects of asymmetric and inferior decoys on the judged attractiveness of alternatives where one alternative (the target) clearly dominated the other (the competitor). Results show that the attraction effect continues to exist even when an alternative is clearly dominant, and that the effect does not require asymmetrical dominance. An asymmetrical decoy enhances the dominant target's attractiveness, whereas an inferior decoy enhances the competitor's attractiveness. Findings have theoretical implications for several explanations of the "attraction effect."

**Unintended Consequences of Cooperation Inducing Mechanisms**
*Madan Pillutla (London Business School), Xiao-Ping Chen (University of Washington)*
Research suggests that contribution to public goods (i.e., cooperation) will increase when the group uses positive or negative sanctions. We argue that when groups use sanctions and rewards to induce members to cooperate in a social dilemma, individuals' natural propensity to cooperate may be reduced. Results from two studies (a lab experiment and a survey) provide a consistent strong support for our hypothesis. Specifically, we found that cooperation (in groups that adopted sanctioning or reward systems) following the removal of sanctioning or reward systems fell below that of groups that have not adopted the systems in the first place.

**Risk Perception and Risky Choice: What Does the Relationship Look Like?**
*Monica D. Barnes, Sandra L. Schneider (University of South Florida)*
Assumptions about the relationship between risky choice and perceptions of riskiness may be oversimplified. We examined both of these in three different contexts using a variety of multi-outcome lotteries. Participants were presented with one of three sets of 30 lotteries: non-negative expected value (EV) ($0-$60), non-positive EV ($0-$-60), and mixed EV ($-60-$60). Lotteries differed in EV, distribution, and variability. Results were strikingly similar to previous results from a complete set of lotteries with evidence of context effects around $0 EV. Findings show that risky choice patterns are complex and not straightforwardly related to how risky lotteries are perceived to be.

**Evaluating The Simplified Conjoint Expected Risk Model: Comparing the Use of "Objective" and "Subjective" Information**
*Lisa K. Carlstrom, Christina G.S. Palmer, J. Arthur Woodward, (University of California, Los Angeles)*
The Simplified Conjoint Expected Risk model (SCER) posits that risk is a combination of pr(harm), pr(benefit), pr(status quo), expected(harm), and expected(benefit). It has been evaluated using subjective judgments of SCER model variables in domains where objective information regarding harms and benefits is unavailable. However, if individuals cannot disentangle their subjective estimates of pr(harm) etc., from their risk judgments, the model fit may be inflated. We compared the performance of SCER with and without elicitation of estimates of SCER model variables. Results suggest that SCER is robust to the source of model variable information and can be extended into complex domains.

**The Effects of Alcohol and Gender on Decision-making of Sexual Risk-taking**
*Young-Hee Cho (California State University, Long Beach), M. Lynne Cooper and Kenneth J. Sher (University of Missouri, Columbia)*
This study investigates the effects of alcohol and gender on the decision-making of sexual risk-taking using a 3X2, beverage (alcohol, placebo, no-alcohol) by gender factorial design. Men judged that they were more likely to have sex than did women for all beverage conditions. The women in the intoxicated and placebo conditions judged that they were more likely to have sex than did the sober women whereas there was no difference among men's judgments across beverage conditions. Also, women listed more negative outcomes than did men, and participants in both the placebo and sober conditions listed more negative outcomes than did the intoxicated people.

**An Experimental Investigation of Risk Assessments and Choices of Firefighters during Search and Rescue**
*Janet A. Sniezek, Carol L Gohm, Reeshad S. Dalal, Michael R. Baumann (University of Illinois at Urbana-Champaign)*
We examine the risk assessments and choices of 47 firefighters in two search and rescue simulations--one involving smoke, heat, and live fire. They were required to choose between two exit routes under conditions of high uncertainty. Firefighters provided judgments of various factors relevant to the time-pressured risky decisions (e.g., distance and time, victim weight, own heart rate, and air remaining in tank. Participants varied in terms of the actual choice of exit route. The roles of judgment bias, stress, and individual differences are discussed, along with implications for theory and training regarding decision making under uncertainty and acute stress.

**Risk Taking in Relationships: Deciding for Oneself Versus for a Friend**
*Amy H. Beisswanger, Julie M. Hupp, Eric R. Stone (Wake Forest University)*
Two experiments tested how people go about making decisions for themselves versus a close friend concerning relationship issues. The experiments showed that people make more risk-seeking choices when deciding for others. However, these differences only held when the issue did not seriously effect the person's future. When the issue in question would impact the person's future, then the difference between self and others disappeared.

**Gender Differences in Search for and Weighting of Communal Information in Choice Tasks**
*Richard D. Johnson and Jane Saber (University of Alberta), Joffre Swait (University of Florida)*
Men have been widely characterized as heuristic decision makers who focus primarily on self-relevant (agentic) information, in contrast to women who are described as more comprehensive processors of both agentic and other-relevant (communal) information. In two studies, subjects chose among alternatives that were described by agentic and communal attributes and OLS Regression was used to estimate the weights of the attributes for the choices. Information for each choice set was provided to subjects in the form of an information display board and search patterns were recorded. Results indicated several differences between business and psychology students, but no significant gender differences.

**Gender Differences and Domain-Specificity in Risk Perceptions and Perceived-Risk Attitudes**
*Ann-Renée Blais (Ohio State University), Elke U. Weber(Columbia University)*
Perceived-risk attitude, defined as a person's tendency to choose or avoid options perceived to be riskier, appears to be a relatively stable personality trait. What changes, for example, from choices between gains to choices between losses is the perception of the relative riskiness of choice alternatives. An instrument that assesses both conventional risk attitudes and perceived-risk attitudes was developed based on this conceptual framework. We found evidence of domain-specificity (based on five domains of life : ethics, monetary, social, recreational, and health/safety) of risk perceptions but not of perceived-risk attitudes. Gender differences in risk perceptions and risk taking are also discussed.

**Males' and Females' Behavioral and Self-Report Indicators of Certainty**
*Rebecca J. White, Nancy E. Briggs, Ching-Fan Sheu (DePaul University)*
This study examined gender differences in self-report measures of certainty in one's response to trivia questions, when objective chance is controlled. Participants were told they had a 2/7, 4/7 or 6/7 chance of randomly guessing a correct answer. Participants were asked to rate their percent chance of correctly answering the questions, and were also asked to raise their hand as an indication of feeling one had chosen the correct answer. Overall, participants did not base their estimates of certainty on the objective chance with which they were provided. Female participants reported and demonstrated lower certainty in their answers.

**The Role of Ethnicity, Worldview, and Gender in Risk Perception: Determining the Harms and Benefits of an Activity**
*Christina G.S. Palmer, Lisa K. Carlstrom, J. Arthur Woodward (University of California, Los Angeles)*
Evaluation of the Simplified Conjoint Expected Risk model has shown that both the harms and benefits of an activity play a role in risk judgments; and other studies suggest that the outcomes of activities cast as harms and benefits may differ with ethnicity, worldview, and gender. Because ethnicity, worldview, and gender account for differences in risk perception, a deeper understanding of these differences could come from identifying the issues that are framed in terms of harms and benefits. This study analyzes the perceived harms and benefits of 22 financial and health activities across worldview and gender in 4 ethnic/racial groups.

**When Missed Shots Can be Pleasurable: Expectations and Emotions in Basketball**
*A. Peter McGraw, Barbara A. Mellers (The Ohio State University)*
In an ongoing effort to explore connections between emotions and the outcomes of choice, we examined the emotional experiences of basketball players attempting a series of shots. They rated their certainty of success before each shot and their emotional reaction afterward. Results were consistent with decision affect theory; judged pleasure was a function of outcome and strength of belief in expectations. As the surprisingness of the outcome increased, emotional responses were amplified for both successes and failures. Individual differences also emerged. For example, everyone judged successes as pleasurable, but some participants also judged failures as pleasurable, especially for difficult shots.

**Anger and Fear When Bargaining: More than Unpleasant Feelings?**
*Faison P. Gibson (University of Michigan)*
Focusing on how an emotion's pleasantness influences choice suggests that anger and fear similarly affect offers made in a bargaining task. Results from this study indicate that offers made while experiencing non-task-related anger and fear support an aggression-retreat hypothesis. Emotions that are similarly unpleasant may have opposite effects on choice.

**Mood-Congruent Processing as a Cause of Jurors' Outcome Effects in an Audit Negligence Case**
*Kathryn Kadous (University of Washington)*
Jurors evaluating auditors in negligence lawsuits experience outcome effects; i.e., auditors are judged more harshly in light of negative outcomes even when the audit quality is held constant. In order to investigate whether this effect is attributable to mood-congruent processing and negative affect caused by disturbing outcomes, I perform an experiment in which audit quality and outcome information are crossed with a third manipulation attributing affective responses to the difficulties of the juror role. Results confirm that participants find negative outcomes disturbing. Further, the attribution manipulation decreases reliance on the legally irrelevant outcome information and increases reliance on audit quality.

**Do Neutral Ratings Imply Indifference or Ambivalence?**
*Jeff T. Larsen, A. Peter McGraw, and Barbara A. Mellers (The Ohio State University)*
Traditional theories of affect describe emotion as the difference between positive and negative feelings and fail to distinguish between indifference and ambivalence. We argue that the same overall evaluation can arise for different reasons and may be marked by distinct underlying affective experiences. Participants may judge a target person described by good and bad trait adjectives as neutral because they are either indifferent (i.e. they lack positive and negative feelings) or because they are ambivalent (i.e. they simultaneously experience positive and negative feelings). Similar effects are shown with the overall pleasure of wins and losses for gambles.

**What Determines Consumer Sentiment?**
*Fergus Bolger (Bilkent University, Ankara, Turkey), Philip Hans Franses and Gerrit Antonides (Erasmus University Rotterdam, The Netherlands)*
The Index of Consumer Sentiment (ICS) is constructed monthly for many countries as it has been found to predict both consumption and the business cycle. But what determines consumer sentiment? We find seasonal factors and other events significantly predict ICS, probably by influencing public mood. As current mood should not influence economic expectations, such events may bias ICS as an economic predictor. However, we find that correcting for these events does not cause ICS to have more (out-of-sample) predictive value for economic variables like new car sales or consumer credit. The practical and theoretical implications of these findings are discussed.

**Acceptance of a Price Discount: the Role of the Categorical Link Between Purchases and the Comparative Price Format**
*Nicolao Bonini (Univ. of Cagliari), Rino Rumiati (Univ. of Padova)*
Students consider a price reduction. The discounted product has a high vs. low regular price in two versions of the same problem. In both versions, the sum of the regular prices of two planned purchases and the absolute value of the discount are the same. The price reduction is accepted more frequently in the high than in the low relative discount version when the purchases do not belong to the same product category. This pattern disappears when the two purchases belong to the same product category. Also, it disappears when a minimal or a comprehensive comparative price format is used.

**Contextual Effects of Product Line Strategy**
*S. Ramaswami (University of Pennsylvania)*
We report on four experiments that examine the effects of manipulating the end-points of a product line on the perceptions and choice shares of target members of the line. These effects are asymmetric; a low-end product-line member has a negative impact on the other members of the line, but a high-end product-line does not have a correspondingly large positive impact on the other members of the line. We discuss implications for product line managers, and for theoretical research on context effects on choice.

**Resource-Allocation Behavior: Effects of Differing Objective Functions**
*Eric Nolan, Harvey Langholtz, Barron Sopchak (The college of William & Mary)*
The study of resource-allocation behavior has received recent attention as participants' behavior was compared to solutions found with the optimal model, Linear Programming (LP). Several published articles discuss resource-allocation behavior under various conditions and explain some strategies people use when making resource-allocation decisions. Previous studies examined situations where payoff for allocation choices did not differ, always resulting in LP objective functions with slopes of -1. The present study extends the literature by observing behavior when payoffs differ and objective functions vary from -1/3 to -3. Results suggest that as objective functions vary participants make appropriate changes in resource allocation.

**The Effect of Goals and Constraints on the Quantity of Solutions for Ill Defined Problems**
*Roni Reiter-Palmon, Virginia Collins, Lisa L. Scherer (University of Nebraska - Omaha)*
Both goals and constraints have been identified as important components of structuring an ill defined problem (Reitman, 1965). The purpose of this study was to determine the effect of goals and constraints generation on the number of solutions generated to ill-defined problems. Participants were 162 undergraduate students in a 2(goal generation/no goal generation) x2(constraint generation/no constraint generation) design. In addition, each participant completed two different problems. Results indicated a main effect for both goal generation and constraints. The generation of goals or constraints resulted in fewer solutions than no generation prior to problem solving.

**The Influence of Arguments on Degree of Belief**
*Glenn J. Browne (Texas Tech University), Noel E. Wilkin (University of Mississippi)*
Past research has represented uncertainty as qualifications of beliefs that result from reasoned arguments. Missing from this account, however, has been the direct connection between arguments and assessments of likelihood. The present research establishes this connection by demonstrating the influence of arguments on probability judgments. Subjects were presented with arguments using several different types of evidence. Support and likelihood judgments were measured and compared across evidential settings. The results demonstrated the impact of various types of arguments on degree of belief, and showed a significant positive correlation between the cumulative strength of arguments and assessments of likelihood.

**The Effect of Confidence on the Accuracy of Physicians' Judgments of Survival**
*Neal V Dawson and Charles Thomas (Case Western Reserve Univ.), Hal Arkes (Ohio University), Theodore Speroff (Cook County Hospital, Chicago, IL), Alfred F Connors, Frank Harrell (University of Virginia)*
Physicians' perceptions of prognosis for survival are important for patient care. Using data from a five-site prospective cohort study of hospitalized adults, we compared the overall accuracy (mean probability scores) of physicians' survival estimates and components of accuracy (Murphy and covariance decompositions) for 7404 patients. Each survival estimate had an associated level of physician confidence in the correctness of the estimate (0-10 scale): dichotomized as low (0-7) or high (8-10) confidence. High confidence in survival estimates significantly enhances overall accuracy and is associated with significant improvement in multiple components of accuracy: discrimination, calibration, and noisiness of estimates.

**Thinking Harder is not Thinking Better: Consequences of Higher Level Cognitive Demands on Overconfidence and Confidence Discrimination**
*Judith Puncochar, Paul W. Fox (University of Minnesota)*
The present study investigates overconfidence and confidence discrimination in college classrooms for course-related information. We examined students' accuracy-confidence judgments for exam items which evoke higher level thinking processes. Results show that overconfidence did not occur on items that required cognitive processing at the levels of application and analysis, as opposed to simple knowledge recall. However, higher levels of cognitive processing failed to improve students' confidence discrimination. Rather, thinking at more analytic levels appears to decrease confidence discrimination for students. We examine these processes on accuracy-confidence judgments of individuals and groups.

**The Role of Intuition in Problem-Solving Confidence and Performance**
*Paul Zarnoth, Lucinee Pashaian (Bryn Mawr College)*
Participants were classified as either intuitive or analytic using Agor's (1989) AIM Survey. All participants completed two decision tasks, the first of which was manipulated to be either difficult or relatively easy. Participants who received positive feedback (because they completed the easy first task) reported working more diligently on the second task. However, previous task difficulty did not influence the performance of intuitive decision makers, and analytic participants actually performed better if they experienced an earlier failure. Intuitive individuals were consistently more confident than analytic participants. Analytic participants, however, were more sensitive to task difficulty when reporting their confidence.

**The Impact of Rewarding Calibration on Classroom Performance**
*Catherine Hackett Renner, Michael Renner (West Chester University)*
Previously we found using debiasing techniques in course examinations had a beneficial effect on performance (Renner & Renner, 1999). This study provided rewards for being well calibrated in 7 sections of an upper-division psychology course. Using on-line testing, students took quizzes and indicated their confidence in their answers. At the end of the quiz students were presented with their average confidence compared to their overall performance. Incentive groups received a bonus point for being well calibrated if their average confidence estimate was within 3% of their quiz performance. Course performance and calibration of incentive groups was compared to no incentive groups. Metacognitive implications are discussed.

**The Psychological Side of Hempel's Paradox of Confirmation**
*Craig R. M. McKenzie, Laurie A. Mikkelsen (Univ. of California, San Diego)*
People often test hypotheses about two variables (X and Y), each with two levels (e.g., X1 and X2). When testing "If X1, then Y1", observing the conjunction of X1 and Y1 is usually perceived as overwhelmingly more supportive than observing the conjunction of X2 and Y2, although both observations support the hypothesis. Normatively speaking, the X2&Y2 observation provides stronger support than the X1&Y1 observation if X2 and Y2 are rare. Our results show that participants were sensitive to the rarity of observations, even judging the X2&Y2 observation to be more supportive than the X1&Y1 observation under certain conditions.

**Instructions and Learning Format Influence Multiple Diagnosis**
*Leslie J. Robison, Carla C. Chandler (Washington State University)*
A multiple diagnosis requires that clinicians find distinguishing symptoms of two illnesses. The process requires a strategy of asking about the distinguishing symptoms of each illness, and a knowledge/appreciation that only the distinguishing symptoms are diagnostic. When symptoms implicated illness A, people asked more questions about illness B if instructed to "consider both illnesses" rather than to "be complete". Participants who "considered both illnesses" showed greater appreciation of distinguishing symptoms if the illnesses had been contrasted rather than presented sequentially. Participants instructed to "be complete" showed little appreciation regardless of learning format; perhaps a matching strategy had been instilled.

**Cultural Orientation and Competitive Decision Making: A Cross-Cultural Comparison**
*Shu Li (Nanyang Technological University, Singapore), Xiao-Ping Chen (University of Washington)*
We report a cross-cultural study in which the effects of territory and compatriot on competitive behavior were examined. 289 Australian and Hong Kong students participated in a simulation in which they were asked to make a decision in a social dilemma. Cultural orientation in terms of individualism-collectivism was measured. We found a main effect of national origin--Australians behaved less competitively than their Hong Kong counterparts; and a territory by compatriot interaction--subjects behaved most competitively in others' territory dealing with compatriots but least competitively when dealing with non-compatriots. Mediation analyses revealed that subject's cultural orientation mediated both effects.

**Tolerance of Free Riding: The Effects of Defection Size and Defection Pattern**
*Xiao-Ping Chen (University of Washington), Daniel Bachrach (Indiana University)*
Tolerance of free riding is defined as the extent to which group members are willing to continue cooperation after observing other members' defective behavior. We hypothesized that the defection size (proportion of other members who defect) and the defection pattern (fixed or diffused) in a repeated social dilemma would influence members' level of tolerance. Results from a computerized lab experiment suggest that the effect of defection size was initially significant but diminished over trials. In contrast, the effect of defection pattern was initially insignificant but became increasingly significant over trials. A "perceived impact" hypothesis was proposed to explain these results.

**The Role of Expert Advisor Format Specificity on Individual and Group-level Aggregation of Expert Opinion and Subjective Confidence Ratings**
*Adrian K. Rantilla (University of Illinois, Urbana-Champaign)*
In this study, 785 undergraduates aggregated expert opinions, both individually and in groups. Format of expert advice (numerical, verbal, none) was manipulated, and the variability in actual responses and confidence levels were examined. As expert advice became more precise (numerical), individual and group decisions showed less variability and were well modeled by a simple averaging aggregation model. Higher confidence levels were observed for groups relative to individuals, and also when expert advice was presented in a verbal format. Specific (numerical) expert advice had the greatest effect on actual decisions, but less precise (verbal) advice had the greatest effect on confidence.

**Cognitive Style and Team Performance: Is Similar Better?**
*Julia Pounds, Larry L. Bailey (Federal Aviation Administration Civil Aeromedical Institute)*
Analysis of performance data from 26 four-member teams found that homogeneous teams (n = 13) significantly outperformed heterogeneous teams (n = 13) in an air traffic control low-fidelity simulation. Performance was measured by the percent of team members' aircraft reaching assigned destinations during the experimental task. Teams were classified as heterogeneous or homogeneous using members' scores on the Adaptor-Innovator Inventory (Kirton, 1991). Results support Hammerschmidt's (1996) finding that organizing teams based on members' similarity of cognitive style produced better performance.

**The Effects of Reward Contingencies on Decision-making in a Judge Advisor System**
*Gunnar Schrah, Reeshad Dalal, Janet Sniezek (University of Illinois at Urbana-Champaign)*
The Judge Advisor System (Sniezek & Buckley, 1989, 1995) studies judgment formation through interactions between a decision-maker (judge) and one or more advisors. This research investigates the effects of reward contingencies on judges' and advisors' accuracy and confidence, and on the influence exerted by advisors. Untrained judges gave price estimates and confidence ratings for backpacks both before and after receiving advice from trained advisors. Results showed that judges in the reward condition were more influenced by their advisors and, consequently, were more accurate than judges in the non-reward condition. Implications for organizations and client-consultant relationships are discussed.

**Cultural Variation in the Deliberations of Chinese and American Decision Making Groups**
*Michael Tschirhart, James R. Taylor, J. Frank Yates (University of Michigan)*
The aim of this study was to deepen our understanding of cultural variations in group decision processes. American and Chinese groups of business school graduate students each participated in a single-round, interactive product marketing simulation requiring numerous decisions. We examined the average quantity and proportion of utterance types (e.g., questions, directions, suggestions) used during group deliberations. The study confirmed that American groups made more total utterances than Chinese groups, and revealed some differences in the average number and proportion of certain utterance types for these groups.

**The Effect of Individual Differences on Influence in Group Decision Making on a Moderately Intellective Task**
*Reeshad S. Dalal, Michael R. Baumann, Bryan L. Bonner (University of Illinois, Urbana-Champaign)*
There exists a paucity of research on the effects of individual differences on group decision-making. In the current study, several individual differences variables were measured. Participants were randomly assigned to three-person groups to complete a moderately intellective task (the game Mastermind), in which both individual preferences and final group hypotheses were recorded. A member's influence was defined as the frequency with which the group adopted that member's individual preference as its final hypothesis. The effects of each individual differences variable on member influence were tested separately. Few of these variables were found to have a significant effect on influence.

**Individual Risk-Taking Patterns as Functions of Frame, Scenario and Probabilities of Success**
*Francis Cleland, Sandra Schneider (University of South Florida)*
In the area of the framing of decisions under risky versus sure-thing choice conditions, we will describe differences in the tendency to take risks as a function of frame, scenario, and probability level (of saving all items at risk). We provide a corroboration of group findings by examining individual differences in risk taking tendencies. We conducted the experiment by asking participants to choose a sure thing (save a definite number of the items that are at risk) versus a risky choice (chance of saving all or none) for five different scenarios and probability levels. In all cases, the value of the sure thing option was equal to the expected value of the gamble.

**An Empirical Examination of Competing Theories to Explain the Framing Effect in Business Contexts**
*Sin-Hui Yen (Tamkang University, TAIWAN), Chengyee Janie Chang (San Jose State University),Rong-Ruey Duh (National Taiwan University, TAIWAN)*
This study reports the results of two experiments with 271 subjects in an attempt to explore the ability of three competing theories to explain the framing effect in a business decision context. In Experiment 1, 86 undergraduate students made choices between two alternatives on a managerial decision problem, which was a business version of the classical Asian disease problem. Results showed that the subjects committed the framing effect bias, and that prospect theory, fuzzy-trace theory and probabilistic mental models predicted equally well. In Experiment 2, a variant of the Asian disease problem was designed to distinguish the explanatory ability of these theories. Results indicated that fuzzy-trace theory predicts the framing effect best across two versions of business decisions. Implications of this finding are offered.

**Sign Theory: A Theory of Preference Construction**
*Shuyeu Lin (University of Oregon), Paul Slovic (Decision Research)*
A non-extensional theory of preference, called Sign Theory, is proposed and tested. Sign Theory assumes that judgments are not attached to objects in abstraction, but to representations of those objects. Sign Theory considers preference construction as an evidence-building process, in which local evaluation of evidence combines additively to form a global judgment. At the heart of this treatment is the notion that local evaluation generates positive or negative valuation outcomes (signs). Thus, signs are the building blocks in preference construction. Sign Theory can be considered an extension into preference construction of Support Theory, which applies to belief construction.

**Goal-Relevant Dimensions of Smoking Cessation Sequelae in Young Adults**
*Heather Cooney, Maria Prokic, Anthony Ong (University of Southern California)*
How are goal cognitions related to the decision to quit smoking? The present study examined the discriminating role of motive systems in the process of nicotine dependence in young adult smokers. A college sample of 85 male and 78 female smokers completed measures of nicotine dependence and psychological distress. They also provided cognitive evaluations for goals related to smoking cessation on scales measuring self-efficacy, value, planning, self-reward, self-criticism, self-monitoring, social comparison, and positive/negative goal-based arousal. Goal cognitions significantly predicted nicotine dependence, even after controlling for the highly comorbid conditions of depression. Results support a motivational account of smoking cessation.

**Chronic Anger, Perceived Health Risks, and Substance Use**
*Laura Cousino Klein (The Pennsylvania State University), Jennifer S. Lerner (Carnegie Mellon University)*
Eighty-seven respondents reported their substance use and health-risk perceptions. Consistent with Lerner and Keltner's (in press) appraisal-tendency model, chronically angry individuals were less likely to perceive tobacco use (e.g., smoking, chewing) as a health risk, were more likely to use tobacco, and were more likely to perceive tobacco's effects as stimulating. Moreover, increased reports of chronic anger predicted increased stimulant (i.e., caffeine, nicotine) consumption but not increased sedative consumption (i.e., alcohol). Taken together, results imply that chronic anger predicts under-sensitivity to health risks and a heightened desire for stimulation. Results are discussed with respect to anger, risk-taking, and drug use.

**Improving Judgemental Forecasts with Bootstrap and Cognitive Feedback Support**
*Marcus O'Connor (University of NSW), William Remus (University of Hawaii), Kai Lim (Case Western Reserve University)*
Judgemental forecasts are notoriously inconsistent and often biased. In this experiment, we examine and compare the efficacy of improving the accuracy of judgemental forecasts by providing feedback either by bootstrap forecasts or by providing cognitive feedback on past performance. The advantage of the former is that subject inconsistencies can be eliminated and the advantage of the latter is that subjects have an opportunity to compare their own decision rules with optimal. Both support conditions are provided in a stable and an unstable environment. The major result was that bootstrap support was clearly inferior to cognitive feedback support.

**Culture, Dilution Effect and Accountability**
*Li-Jun Ji (University of Michigan), Frank Yates (University of Michigan), Zhiyong Zhang (Peking University, China)*
American and Chinese participants were provided diagnostic information or diluted information (diagnostic plus irrelevant information) about some students, and asked to predict their academic performance and popularity. Half of the participants were told that they would be accountable for their predictions. Both Americans and Chinese showed the dilution effect. The effect was stronger for Chinese than for Americans. Accountability led to more conservative predictions, however, neither group showed any magnified dilution effect by accountability. Self report data showed that Chinese were more confident than Americans, though both groups were less confident when diagnostic information was diluted.

**Accuracy, Bias and Efficiency in Fixed Event Judgementally Estimated Sales Forecasts**
*Michael Lawrence, Marcus O'Connor (University of New South Wales)*
Theory and the opinions of practicing forecasters expect that as the lead time reduces, updates to sales forecast will be more accurate and less biased. However there may be some inefficiency due to excessive anchoring, leading to positive correlations in forecast revisions. This study tests these expectations using a large sample drawn from judgementally estimated sales forecasts from ten manufacturing organisations. The results suggest: forecast accuracy does not improve as much as anticipated as the lead time reduces, and the forecast revisions display negative not positive first order autocorrelations, due to the tendency for forecasters to over-adjust their forecast revisions.

**Evidence Used in Judgmental Forecasting**
*Rahul M. Dodhia, David. H. Krantz (Columbia University)*
Forecasts of future values for a time series can be influenced both by cues related to recent trends in the series and by cues derived from the values of a correlated variable. We demonstrate conditions under which people successfully combine both types of cues in their forecasts, and we explore variables that affect forecasts under these conditions, including hypothesis generation, dilution, and multiple cues. We relate our findings to the more general question of how different types of evidence are combined in human judgment.

**Wishful Thinking About the Future**
*Paul C. Price (California State University, Fresno)*
Correlational studies of voters and sports fans have demonstrated strong relationships between people's desires and predictions. Experimental studies, however, have revealed only weak effects of people's desires on their predictions. This has raised the question of whether the correlational results truly reflect wishful thinking. A new experimental paradigm, however, has revealed strong wishful thinking effects. College students were assigned to one of two teams and then predicted the results of dart-throwing competitions between opposing team members. On average, they judged the likelihood that their team members would win to be significantly greater than that likelihood that the opposing team members would win. This suggests that the results of past correlational studies really do reflect wishful thinking.

**Generating Support: The Influence of Perceived Category Size on Probability Judgments**
*Kevin W. Eva, Lee R. Brooks (McMaster University)*
Human judgment is often inconsistent with the rules inherent in standard probability theory. For example, the judged probability of an event can be heavily influenced by the alternatives that are explicitly presented. To our knowledge, research in this area has focused solely on the stimulus-specific aspects of explicitly mentioned alternatives. In addition to the role played by this explicit presentation, we suggest that people are also sensitive to the influence of alternatives that are not considered explicitly. We present the term 'implied numerosity' in an attempt to indicate that probability ratings are influenced by a general impression of the number of potential alternatives that exist.

**Magical Probability and Predictive Behavior**
*August Fenk (University of Klagenfurt, Austria)*
The following problem was presented to 144 university students: With a dice, the results of the first 15 casts was 2, 3, 1, 4, 6, 3, 4, 5, 6, 5, 3, 1, 1, 1, 1. If you correctly guess whether the following result will be an even or an uneven number, your stake is doubled, otherwise it is lost. Subjects showed a marked preference to decide for even (after so many cases of uneven!). This preference was stronger in female than in male students and stronger in the Humanities than in students of Economics, Informatics, and Mathematics. Their arguments indicate that it is based on a view of probability as a magic power providing for compensation between frequencies.

**How Does the Specificity of the Retrieval Cue Affect Judgments of Probability?**
*Ana M. Franco-Watkins, Michael R. P. Dougherty (U. of Maryland)*
This research investigated the effect of retrieval cue specificity on judged probability. We simulated the effect of retrieval cue specificity using MDM (Dougherty, Gettys, & Ogden, 1999) and show that decreasing the number of details in the retrieval cue leads to a corresponding decrease in the model's predicted probability. In the context of MDM, decreasing the number of details in the retrieval cue reduces the similarity between the retrieval cue and matching instances stored in memory, which in turn leads to lower predicted probability. This prediction was tested experimentally.

**Partitive Formulation of Information in Probabilistic Problems: Beyond Heuristics and Frequency Format Explanations**
*Laura Macchi (Università degli Studi di Milano-Bicocca)*
I propose a simple theory of the use of the base rate according to which neither heuristic nor frequentist factors underlie demonstrations of the occurrence or the elimination of the base-rate fallacy. However, what is crucial for the occurrence or elimination of the base-rate fallacy is the absence or presence respectively of what can be called a partitive formulation (Macchi, 1995) of the conditional likelihood datum. A partitive formulation defines the set of which the numerical datum is a part (in terms of percentages or frequencies) by making the datum itself relative. Whether probabilistic or frequentist, the partitive versions lead to an almost complete elimination of the bias which remains when non-partitive versions are used.

**Conjunction, Disjunction, and Representation: The Effects of World Knowledge on Joint Probability Estimation**
*Christopher R. Wolfe (Miami University), Valerie F. Reyna (University of Arizona)*
In making joint probability estimates, people combine world knowledge with naive probability theory. Knowledge determines the relationships between variables: identical-, sub-, independent- or overlapping- sets. People prefer reasoning with simplified representations (gist) and their errors correspond to oversimplified representations. Errors of representation were manipulated with analogies. Participants estimated P(A), P(B) P(A and B) and P(A or B) for problems describing identical, sub, independent, and overlapping sets. As predicted, for identical sets, analogies reduced the errors from 85% of control participants to 58% of analogy participants, $X2\ (1) = 4.76$, $p<.05$. For overlapping sets, 90% of control participants and 71% of analogy participants made errors, $X2\ (1) = 4.03$, $p < .05$.

**The Monty Hall Dilemma: Helping People Overcome Difficulties in Solving a World-Famous Brain Teaser**
*Stefan Krauss (Max-Planck-Institute for Human Development), X. T. Wang (University of South Dakota)*
We argue that the version of the Monty Hall dilemma (or "Three Door Problem") most commonly used by almost all journalists, newspaper columnists and psychologists is a counterintuitive one that hinders correct reasoning. It is no wonder that this standard version of the Monty Hall dilemma is used to demonstrate a "cognitive illusion" in human reasoning. We will show that a combination of well-known psychological facts and theories, namely "natural frequencies", "perspective change", "mental models" and the "less is more effect", can foster subjects' insight dramatically.

**Bayesian Reasoning Revisited: Mental Models That Improve Inference**
*Barbara Mellers, Robyn Ness(Ohio State University)*
Some Bayesian reasoning problems seem more difficult than others for drawing correct inferences. We present such a problem about a procedure for shifting the odds of the sex of an unborn child. We examine frequency vs. probability representations and what Gigerenzer and Hoffrage (1995) called the standard vs. short menu. Menus are the specific pieces of information provided. When frequency representations are combined with the menu that matches the natural order of events, reasoning is best. We believe that natural order may be more important than natural sampling in the formation of mental models based on nested sets.

**The Appropriateness of Adolescents' Confidence in Their Knowledge: AIDS-Related and General**
*Andrew M. Parker, Julie S. Downs, Baruch Fischhoff, Wändi Bruine de Bruin, Robyn M. Dawes (Carnegie Mellon University)*
Two groups of teens, differing in their rate of risk behaviors, completed two calibration tasks. A set of HIV/AIDS questions was derived from a study of teens' informational needs; a set of general knowledge questions used no systematic sampling. The high-risk teens knew less, but were more confident than the low-risk teens, producing a degree of overconfidence unusual for such moderately difficult items, as well as particularly poor calibration. Confidence seemed to be socially defined. Parents' and teens' confidence was more closely related than was their knowledge, while risk status predicted calibration more for HIV/AIDS than for general knowledge questions.

**Memory for Choices We Made vs. Choices Others Made for Us**
*Mara Mather, Eldar Shafir, Marcia Johnson (Princeton University)*
Do we remember options differently if we chose them ourselves than if we ended up with them through other circumstances? In a series of studies, we have found that when remembering their own past decisions, people tend to engage in choice-supportive memory distortion. In the current study, some participants made choices themselves whereas others had choices made for them by the experimenter. We found that participants show different patterns of memory distortion for choices they made themselves and choices made for them. Thus, how a decision was made can affect how the options are remembered.

**A Unified View of the Components of a Decision Model**
*Rebecca Lee (Menlo College), Ross D. Shachter (Stanford University)*
The clarity of distinctions is a cornerstone of decision analysis that underlies many fundamental concepts, including probabilistic modeling and the value of clairvoyance. Yet, often the most useful distinctions in decision situations--such as preferences and feelings--do not satisfy the classical clarity test which requires that distinctions have an unambiguous, physically determinable specification. We introduce personal and shared distinctions, and explore their relationship to unambiguous physically determinable distinctions. With these notions, we reconcile clarity requirements with modeling needs and achieve a unified view of all components of a decision model as personal distinctions.

**Why Missing the Bus is Not a Decision**
*Laura Niedermayer, Gretchen Chapman (Rutgers University)*
A large body of research focuses on the psychological processes underlying decision making; however, little attention has been paid to the issue of what qualifies as a decision. In many situations it is unclear whether the behavior exhibited was the result of an explicit decision or the result of less thoughtful behavior. In this study, 104 subjects rated 30 actions (e.g. brushing one's teeth, going to class, missing the bus) as to whether they make a decision about engaging in the activity. They also rated the actions on other attributes such as self-control, habit, influences of psychological drives, number of alternatives, amount of thought, etc. Our results showed that the decision rating is most strongly correlated with whether one thinks carefully about participating in an activity.

**Valuing Environmental Outcomes: Preferences for Constant or Improving Sequences**
*Jeffery L. Guyse (University of California, Irvine), L. Robin Keller (University of California, Irvine), Thomas Eppel (Decision Insights, Inc.)*
Many decisions involve both short-term and long-term consequences. Such decisions require tradeoffs between different criteria and between the different time periods at which consequences occur. Furthermore, many decisions affect sequences of consequences (e.g., annual reductions in mortality risks). This paper discusses the results of an empirical study where subjects evaluated sequences of consequences related to air and near-shore water quality. It is shown that models that involve specific features of the sequence of outcomes (e.g., slope and uniformity) outperform traditional discounting models in predicting subjects' preferences. Implications for the assessment of preferences in environmental decision-making are discussed.

**Affective Manipulations Influence HMO Health Plan Choices**
*Ellen Peters (Decision Research), Paul Slovic (Decision Research), Judy Hibbard (Univeristy of Oregon)*
In a series of experiments we show that affective manipulations influence choices among student health plans. In two experiments, affective boundaries were present or missing in a choice between two student health plans. It was demonstrated that subjects gave greater weight to information in different affective categories (good and fair) compared to information in the same affective category (good). Altering the affective meaning of information to subjects influences the choices they make.

**Influence of Relationship Longevity, Character Sex and Participant Sex on College Students' Stay/Leave Judgments in Hypothetical Dating and Marriage Contexts**
*Helen Swanson, Cheryl Becker, Beth Winge, Tammy Smith (University of Wisconsin-Stout)*
Influence of relationship longevity, character sex and participant sex on stay/leave judgments were examined using dating (Study 1) and marriage (Study 2) scenarios. Both studies showed a character sex effect. Participants were slightly in favor of a same sex character leaving a somewhat troubled relationship; the same scenarios with an opposite sex character yielded judgments of undecided or slightly in favor of staying. The dating study showed a character sex x longevity interaction; in the marriage study, a participant sex x character sex x longevity interaction approached significance. Results were interpreted from both investment model and personal control perspectives.

**Attention Switching, Scanning and Shifting: How Does Each Influence Speeded Decisions?**
*David A. Washburn, R. Thompson Putney, Pamela R. Raby (Georgia State University and Center of Excellence for Research on Training at Morris Brown College)*
Terms such as attention switching, shifting, scanning, searching, and set-switching are frequently used interchangeably. This ambiguity between the terms belies the important distinctions between the concepts, particularly with respect to how each influences speeded decision making. In the present poster, we will distinguish between the terms using data from factor analyses and convergent evidence from laboratory studies of attention. The difference between these concepts will also be illustrated by examining the performance on criterion tasks requiring speeded decisions (e.g., shoot/don't-shoot) of groups of people who are skilled either in attention shifting, set-switching, or scanning.

**The Commander's Intent and Strategic Decision Making in a Distributed Dynamic Decision Task**
*Tobias Ley (Darmstadt University), Mary M. Omodei (La Trobe University), Alexander J. Wearing (University of Melbourne)*
Two concepts of importance in complex decision making are communication of (overall commander's) intent, and strategic decision making. The present study utilized a microworld (Firechief) to examine command style (high or low degree of intent) and level of strategic decision making on the mental workload of the commander and task performance on high and low complexity tasks. Among the main findings were as follows. Performance in the more complex task was poorer than in the less complex. Task performance in the high intent condition was much better than in the low intent condition. In the high task complexity condition, strategic performance was a better predictor of overall performance than in the low complexity condition. Tactical performance was a better predictor in the low task complexity condition than in the high task complexity condition. Teams operating under high intent performed better on both the tactical and the strategic level.

**A Methodology to Measure and Assess Program Effectiveness**
*Edward A. Molnar (Logistics Management Institute)*
This paper describes a methodology developed in response to a tasking from the Department of Defense to evaluate the effectiveness of its acquisition career development program, relative to workforce performance (outcomes). A Quality Function Deployment-like methodology relates the broad performance categories of cost, schedule, and quality, via several intermediate categories, to the various program features. The quantitative relationships can be applied in two directions to determine where emphasis should be applied in program features to best meet desired outcomes, and to evaluate the relative value of the program features.