SCiP 2010 PROGRAM

St. Louis, Missouri
Thursday, November 18 2010

Message from the SCiP President

Welcome to the 40th annual meeting of the Society for Computers in Psychology (SCiP)! **The purpose of the Society is to increase and to disseminate knowledge of the use of computers in psychological research and other educational activities.**

We expect to have a wonderful meeting with excellent speakers, keynotes, papers, posters, and vendors. Thanks are due to the officers of the organization for their dedication to the organization and their efforts to improve its organization, Website, and its other activities.

I am looking forward to learning of the new developments and discoveries that have been made in recent years and that will be presented at our meetings.

An issue that has been a focus of discussion for several years is the size of the organization. Although the use of computers in psychological research has increased dramatically over the last decade, our organization remains about the same size from year to year. There is a belief that we have a lot to offer other psychologists who use techniques pioneered by our members and that they can also provide much of value to our organization. The officers welcome suggestions from the membership for this and other ways that we might improve the society.

I am currently involved in an activity that I hoped will increase our accessibility to this wider audience of psychologists. I have secured a grant from the division of Decision Research and Management Science in National Science Foundation for the purpose of providing Advanced Training Institutes to active researchers who want to learn the techniques of On-line, Web-based research. Instructors who have taught in previous ATI institutes aimed at Social Psychologists include Anja Goeritz, John H. Krantz, Gary McClelland, Ken McGraw, Ulf Reips, William C. Schmidt, and John Williams. The next session will be held in January, 2011 following the Edwards Bayesian Research Conference in Fullerton, California and will feature instructor Ulf Reips, who will teach the techniques of logfile analysis. There will also be a day of preliminary instruction that I will teach. We are also planning for a session to be held in Summer of 2011. Please spread the word to your former students and colleagues who would profit by this instruction.

I hope you will enjoy our meetings and your time in St. Louis!

Michael Birnbaum

General Information

About SCiP

The Society for Computers in Psychology is a non-profit organization of researchers interested in applications of computers in psychology. Its primary purpose is to "increase and diffuse knowledge of the use of computers in psychological research." Over the past several years the organization has set a special goal of aiding psychologists in using microcomputers in their teaching and research. We have also encouraged consideration of the psychological aspects of hardware and software development and design. Membership is open to any person who has an academic degree and who is active in scientific applications of computers to psychological research.

SCiP Officers

SCiP 2010 is organized by the SCiP officers and steering committee members listed below. Please contact them if you have any problems during the conference.

- **President: Michael H. Birnbaum**
  mbirnbaum@fullerton.edu

- **President-Elect: Joseph P. Magliano**
  Northern Illinois University
  jmagliano@niu.edu

- **Past President: Xiangen Hu**
  The University of Memphis
  xhu@memphis.edu

- **Secretary-Treasurer: Michael Jones**
  Indiana University
  jonesmn@indiana.edu

Steering Committee

- **Michael Schulte-Mecklenbeck**
  michael@schulte-mecklenbeck.com

- **Kim-Phuong Vu**
  kvu8@csulb.edu

- **David Waller**
  wallerda@muohio.edu

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- **Doug J. K. Mewhort**
  mewhortd@queensu.ca

- **Kay Livesay**
  klivesa@linfield.edu

Conference Program

The conference program contains the conference schedule, the abstracts of all presentations and a list of authors. Please bring the program with you each conference day. Printouts of the conference schedule and maps of St. Louis are available at the secretarial desk in the central hall free of charge.

SCiP Time

In order to allow people to visit presentations in different sessions we need to keep a tight schedule. For this

reason we will be timing each presentation according to SCiP time. SCiP time is determined by the clock displayed at the secretarial desk in the central hall. Please synchronize your watches!

Presentation Guidelines

Tutorial

Bayesian approach has become more popular in psychology and other disciplines. Dr. John Kruschke will give a tutorial to the graduate students and other researchers who want a ground-floor introduction to Bayesian data analysis.

Talks

For oral papers, presentation time will be limited to a total of 15 minutes, which includes five minutes for discussion. Sessions will be strictly timed. Presentations will be shown using Microsoft Powerpoint or Acrobat Reader on a Windows XP computer.

Posters

Poster presentations have the advantage of longer discussion time, less formality, and closer audience contact. The poster session will be held on Thursday, November 18th, from 13:30 till 14:45.

Key Note

Dr. James L. McClelland will give the key note talk titled "Decision Dynamics and Decision States in the Leaky Competing Accumulator Model".

Location

The Millennium Hotel St. Louis

The conference will be held at the Millennium Hotel in St. Louis, MO. The hotel address is: 200 South 4th Street, St. Louis USA 63102-1804. The hotel location is shown in the map below.
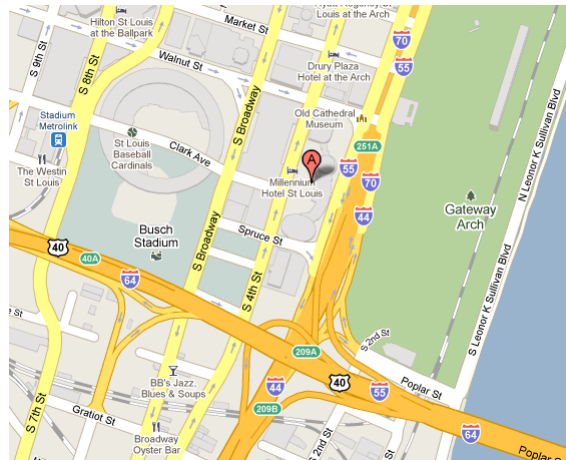

Figure 1: Millennium Hotel St. Louis

Minutes of the Business Meeting
Annual Meeting of the Society for Computers in Psychology
Boston, Massachusetts; Thursday, November 19, 2009

1. Opening Remarks
X. Hu, President

2. Secretary / Treasurer Report
Election. Mike Jones announced that Joe Magliano had been elected as the new President-elect. Danielle McNamara, Doug Mewhort, and Kay Livesay were elected as new members of the Steering Committee (2009-2012), replacing Joe Magliano, Ulf-Dietrich Reips, and Ping Li.

Finances. Mike Jones reported that the Society currently held $7,327 in interest-bearing accounts. The modest increase in registration fees has helped to offset the rapidly rising costs of running a hotel-based conference. This year's conference had approximately 75 registered attendees, down slightly from previous years. Conference costs are up.

3. Report of the Program Chair
David Waller reported that this year's conference featured 40 talks (including 2 symposia) and 13 poster presentations. Due to the increasing size of the conference, the plan for next year is to significantly increase the size of the poster session and to introduce a best poster award. Xiangen Hu volunteered to serve as program chair for SCiP 2010 in St. Louis.

4. Student Awards
The Castellan Award was presented to Brendan Johns, Indiana University, for his presentation with Michael N. Jones, "Using automated semantic measures to test the assumptions of memory models: Do random representations reflect the organization of semantic memory?" The society also congratulates winners of the Birnbaum Scholarship: Justin Brunelle, Tara McHugh, Sean Matthews, Jon Freeman, Adam Renner, Davin Pavlas, Carol Forsyth, and Evan Patton.
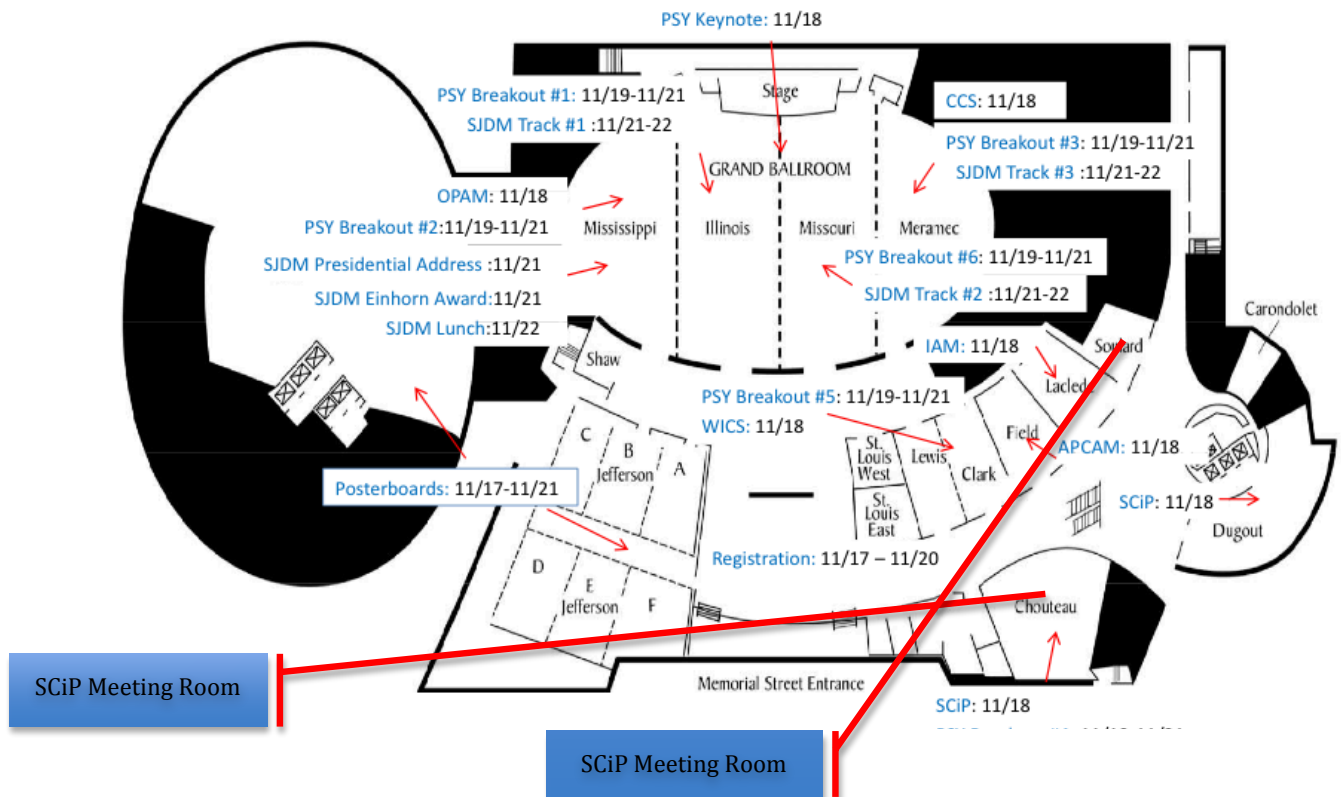
6. Closing Remarks
Xiangen Hu thanked all Society Officers and the Steering Committee for their service, then adjourned the meeting.

Submitted by Michael Jones, Secretary-Treasurer

Society for Computer in Psychology (SCiP) annual conference is a branch of Psychonomic Society annual conference. Below is the floor map of the Millennium Hotel St. Louis during the whole conference.

Psychonomic Society – November 2010

Millennium Hotel – St. Louis, MO

PSY Keynote: 11/18

PSY Breakout #1: 11/19-11/21
SJDM Track #1 :11/21-22

Stage

CCS: 11/18

PSY Breakout #3: 11/19-11/21
SJDM Track #3 :11/21-22

GRAND BALLROOM

OPAM: 11/18
PSY Breakout #2:11/19-11/21
SJDM Presidential Address :11/21
SJDM Einhorn Award:11/21
SJDM Lunch:11/22

Mississippi   Illinois   Missouri   Meramec

PSY Breakout #6: 11/19-11/21
SJDM Track #2 :11/21-22

Carondolet

Shaw

IAM: 11/18   Soulard

Lacled

PSY Breakout #5: 11/19-11/21
WICS: 11/18

C   B
Jefferson   A

St.
Louis
West   Lewis   Clark

Field

APCAM: 11/18

Posterboards: 11/17-11/21

St.
Louis
East

SCiP: 11/18

Dugout

D   E
Jefferson   F

Registration: 11/17 – 11/20

Chouteau

SCiP Meeting Room

Memorial Street Entrance

SCiP: 11/18

SCiP Meeting Room

| time	Doing Bayesian Data Analysis Tutorial (Soulard)	Talks (Chouteau)
8:00 AM		Towards a scalable holographic word-form representation (Cox)
8:15 AM	Bayes' Rule,	Operations analysis of behavioral observation procedures (Ray)
8:30 AM	Grid Approximation, & R.	Mining Twitter (Reips)
8:45 AM		A novel integrative method for analyzing eye and hand behavior during grasping (Lawrence)
9:00 AM	Break	Break
9:15 AM		The Role of Feature Congruity in Categorization of Race (Peterson)
9:30 AM	Markov Chain Monte Carlo	Intelligent Error Feedback in a Tutorial (Papa)
9:45 AM	BUGS	Predicting Comprehension processes during reading (Todaro)
10:00 AM		Ascribing Intentions to simple Geometric Figures in 2D Animations (Pautler)
10:15 AM	Break	Break
10:30 AM		Automatic NLP (Boonthum)
10:45 AM	Linear Regression	A new computational model of vocabulary learning (Landauer)
11:00 AM		A Computational approach to the Comparative Analysis of Religious Concepts (Burgess)
11:15 AM		Modeling Age of Onset in First Language Lexical Attrition (Zinszer)
11:30 AM	Break	Assessing the contribution reader resources and inference processes on comprehension (Magliano)
11:45 AM		Pursuit of Balance: The Trade-off between Engagement and Learning (Dempsey)
12:00 PM	Hierarchical Models	Effects of video gaming on Visual Search (Conley)
12:15 PM		Conflict resolution in Dynamic Decision Making Games (Martin)
12:30 PM		
12:45 PM		
1:00 PM	LUNCH	
1:15 PM		
1:30 PM	Posters (ready before 12:30PM)	
1:45 PM	(Psychonomics Poster Room)	
2:00 PM		
2:15 PM		
2:30 PM		
2:45 PM		
3:00 PM	SCiP Presidential Address: Michael H. Birnbaum	
3:15 PM	Room: Chouteau	
3:30 PM		
3:45 PM		
4:00 PM	Break	
4:15 PM	Key Note: James L. (Jay) McClelland	
4:30 PM	Room: Chouteau	
4:45 PM		
5:00 PM		
5:15 PM	Business Meeting	
5:30 PM	Room: Chouteau	

SCiP Keynote Address

Decision Dynamics and Decision States in the Leaky Competing Accumulator Model

James L. (Jay) McClelland

Lucie Stern Professor & Chair
Department of Psychology, Stanford University

Classical theory starting with Signal Detection Theory and the Sequential Probability Ratio Test has provided a foundation for considering the optimal policy for decision-making as observers accumulate uncertain information. Certain features of human data run counter to the predictions of the classical models in their purest forms and have motivated exploration of mechanistic computational formulations that can be related both to issues of optimality and to principles of information processing dynamics.
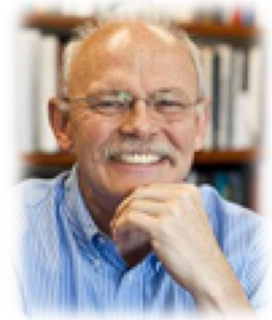
I will describe ongoing collaborative work on these issues. The focus will be on the leaky competing accumulator model of the accumulation of uncertain stimulus information under externally imposed limits in the time allowed to reach a decision. I will present relevant behavioral data as well as mathematical analysis of the model and computer simulations. The balanced role of analytic approximation and computer simulation in this work will be emphasized.

We are exploring a version of the model in which mutual inhibition between accumulators corresponding to choice alternatives outweighs the leakage or decay of activation. This version of the model provides a way of understanding an extensive body of recent data, and introduces a hybrid type of decision state, which has features of continuous as well as discrete decision state

SCiP Presidential Address

A program of Web-Based Research on Decision Making

Michael H. Birnbaum

California State University, Fullerton

I will describe a series of studies done over the last dozen years via the Internet, investigating properties of risky decision making. The first was designed to test if properties we observed in the lab with students would also be descriptive of highly educated experts in the field of decision making. These people could be recruited via the Web and could participate via browser-based Web forms. As many have found, this method provides several conveniences, which led to its adoption in almost all studies done in my research program either with students in the lab or other people recruited via the WWW as well as tested that way. Use of Web studies has also been success in making the methods of experiments more transparent to others, in fostering cooperation between investigators at different institutions, and permitting quick tests of experimental hypotheses suggested by other researchers. Other useful practices are also supported via the Web; for example, one can archive data in a form that can be easily downloaded for reanalysis; one can archive calculation spreadsheets showing how to fit a theory to data; and one can place computer programs contained in Web pages, allowing users to make calculations using alternative theories. Such programs can be very useful to rivals planning to design new experiments to test between different models. The research program has found systematic violations of both versions of prospect theory. These violations are found with a variety of methods for displaying choices and representing probability, they are found in experts as well as among college students, and they are found in analysis of long experiments conducted with individuals.

Tutorial

Doing Bayesian data analysis with R and BUGS

John K. Kruschke
Professor of Psychological and Brain Sciences

This half-day tutorial shows you how to do Bayesian data analysis, hands on. The software is free; the intended audience is grad students and other researchers who want a ground-floor introduction to Bayesian data analysis. No mathematical expertise is presumed. If you can handle a few minutes of summation notation like $\Sigma_i x_i$ and integral notation like $\int x\, dx$, you're good to go. Complete computer programs will be worked through, step by step.

- **Topics to be covered:**
    - Familiarization with software: R, BRugs, BUGS.
    - Probability and Bayes' rule.
    - Markov chain Monte Carlo. Why it's needed, how it works, and doing it in BUGS.
    - Bayesian linear regression.

  As time permits, a brief overview of the following topics will also be offered:
    - Hierarchical models.
    - Bayesian analysis of variance.
    - Bayesian power analysis and replication probability.
- **Bayesian data analysis is not Bayesian modeling of cognition.** Data analysis involves "generic" descriptive models (such as linear regression) without any necessary interpretation as cognitive computation. The rational way to estimate parameters in descriptive models is Bayesian, regardless of whether or not Bayesian models of mind are viable.

John Kruschke has taught introductory Bayesian statistics to graduate students for several years (and traditional statistics and mathematical modeling for over 20 years). He is five-time winner of Teaching Excellence Recognition Awards from Indiana University, where he is Professor of Psychological and Brain Sciences, and Adjunct Professor of Statistics. He has written an introductory textbook on Bayesian data analysis, to be published in November 2010; see also the articles linked above. His research interests include models of attention in learning, which he has developed in both connectionist and Bayesian formalisms. He received a Troland Research Award from the National Academy of Sciences. He chaired the Cognitive Science Conference in 1992.

- **If you plan to attend the tutorial, you need to get ready by following instructions from the following URL:**

  http://www.indiana.edu/~jkkteach/TutorialSCiP2010.htm

Abstracts

Talks

Nov 18 08:00–08:15
Room: Chouteau

Towards a scalable holographic word-form representation

Greg Cox, Indiana University
George Kachergis, Indiana University
Gabriel Recchia, Indiana University
Michael N. Jones, Indiana University

Phenomena in visual word-form priming, lexical decision, and word identification are typically explained in terms of similarity between word-forms. Despite the apparent commonalities between these sets of phenomena, the representations and similarity measures used to account for them are not often related. In an attempt to bridge this gap, we build on the work of Hannagan, Dupoux, & Christophe (in review) to explore several methods of representing visual word-forms using distributed holographic representations and evaluate them on their ability to account for effects in word-form priming, lexical decision, and identification. A representation that assumes that word-internal letter groups are encoded relative to word-terminal letter groups is found to predict qualitative patterns in word-form priming as well as lexical decision and identification latencies. Such a holographic representation is also valuable because it can be easily incorporated into models of lexical semantics (e.g., Jones & Mewhort, 2007) that posit distributed, holographic representations.

Nov 18 08:15–08:30
Room: Chouteau

Operations analysis of behavioral observation procedures: A taxonomy for modeling in expert training systems

Roger D. Ray, Rollins College
Jessica M. Ray, University of Central Florida
David A. Eckerman, University of North Carolina, Chapel Hill

This paper introduces a taxonomy based upon an operations analysis (Verplanck, 1996) of various procedures found in the behavior observation research literature. How these alternative procedures impact the recording

and subsequent analysis of behavioral events based upon the type of time and behavior recordings made is also discussed. The taxonomy was generated as a foundation for the continuing development of an expert training system called Train-To-Code1 (Ray & Ray, 2008). Presently in its second version, TTC V2.0 is software designed for errorless training (Terrace, 1963) of student accuracy and fluency in the direct observation and coding of behavioral events depicted via digital video. Two of 16 alternative procedures classified by the taxonomy are presently modeled in TTC and are used to illustrate how the taxonomy guides software user interface and algorithm development. The remaining 14 procedures are described in sufficient operational detail to allow similar model-oriented translation.

Nov 18 08:30–08:45
Room: Chouteau

Mining Twitter: microblogging as a source for psychological wisdom of the crowds

Ulf-Dietrich Reips, Universidad de Deusto
Pablo Garaizar Sagarminaga, Universidad deDeusto

Over the last few years, microblogging has gained prominence as a form of personal broadcasting media where information and opinion are mixed together without an established order, usually tightly linked with current reality. Location awareness and promptness provide Internet scientists with the opportunity to create "psychological landscapes", i.e. detect differences and changes in voiced (twittered) emotions, cognitions, and behaviors. In our paper we present a Web service for researchers. This service allows to assess the effect of specific events in different places as they are happening, make comparisons between cities, regions or countries regarding psychological states and their evolution in the course of an event. Technologically, the service is based on Phirehose (a PHP library), JSON and Twitter's Streaming API. In our paper, we provide empirical data that test the service's functionality.

Nov 18 08:45–09:00
Room: Chouteau

A novel integrative method for analyzing eye and hand behavior during grasping in an MRI environment

Jane Lawrence, University of Manitoba
Kamyar Abhari, University of Manitoba
Steven L. Prime, University of Manitoba
Benjamin P. Meek, University of Manitoba
Loni Desanghere, University of Manitoba
Lee A. Baugh, University of Manitoba
Jonathan J. Marotta, University of Manitoba

In the past, it has been difficult to monitor and measure visuomotor behavior in a Magnetic Resonance Imaging (MRI) environment. The present paper describes novel specialized software (BIRA) that integrates video with kinematic data derived from the hand and eye, acquired from independently operated MR-compatible equipment. This type of integration of kinematic information into a common reference frame is essential for investigating eye-hand coordination. Subjects grasped symmetrical wooden blocks in a mock scanner,

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while eye, hand and video data was streamed to a computer running BIRA. BIRA's data analysis function confirmed that grip scaling and gaze patterns during grasping were consistent with our previous behavioural studies outside the magnet. This investigation demonstrates BIRA's value as a visuomotor tool. Further, its use in functional MRI will allow for more sophisticated analyses of neural activity by allowing kinematic data to be used as covariates in general linear models.

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Nov 18 09:15–09:30
Room: Chouteau

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The Role of Feature Congruity in Categorization of Race along Morphed Facial Continua

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Dwight J. Peterson, University of Nevada, Reno
Otto H. MacLin, University of Northern Iowa
Kim MacLin, University of Northern Iowa

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According to MacLin and MacLin's Cognitive Gating Mechanism model (2008), faces from one's own racial group are routed and processed differently than faces from other racial groups. Recent research in our laboratory has examined racial categorization using various psychophysical methods in concert with morphing techniques to manipulate certain facial features characteristic of African Americans and Caucasians. We have found that holding one feature (e.g., hair) characteristic to a certain race constant across all faces along the morphed continua will shift categorizations of these morphed faces in predictable ways. However, the role that congruity between multiple salient features plays in shifting categorizations has not been established. The current study examines racial categorizations of faces wherein congruent (e.g., blue eyes, blonde hair) and incongruent (e.g., blue eyes, African American hair) salient features are held constant across morphed facial continua. Resulting differences in shifts along categorical boundaries and their implications will be discussed.

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Nov 18 09:30–09:45
Room: Chouteau

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Intelligent Error Feedback in a Tutorial for Teaching Medical Students Diagnostic Categorization

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Frank J. Papa, University of North Texas College of Osteopathic Medicine
David G. Aldrich, University of North Texas College of Osteopathic Medicine
Michael W. Oglesby, University of North Texas College of Osteopathic Medicine
Robert M. Hamm, University of Oklahoma College of Medicine

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We report over a decade's experience using a web-based tutor (KBIT/DDX) designed to expedite the development of diagnostic competence in medical students on a problem by problem basis. It is designed to train students to recognize diagnostic categories for one clinical presentation (e.g., chest pain, difficulty breathing) at a time. Based on expert description of each disease's probabilistic prototype, a set of confusable disease pairs is identified, and cases similar to both members of a pair are constructed. Students diagnose these cases, and are given dynamically generated error feedback, comparing the prototypes of their wrong and the right diagnosis for a particular patient description. This presentation will outline the instructional paradigm KBIT/DDX utilizes and review the results of published and unpublished outcome studies demonstrating the utility of this paradigm.

Nov 18 09:45–10:00
Room: Chouteau

Predicting comprehension processes during reading: A multilevel analysis of text-based and reader-based factors

Stacey Todaro, Adrian College
Joseph P. Magliano, Northern Illinois University
Christopher Parker, Northern Illinois University

Various factors can influence comprehension processes, including features of the text and characteristics of the reader. Assessing the joint (additive and interactive) contributions of these factors is untenable using single-level statistical techniques, such as ANOVA and multiple regression. ANOVA and multiple regression require data to be aggregated across sentences, or disaggregated across persons, respectively. Consequently, there is no way to estimate the joint contributions that text-based and reader-based factors have on comprehension processes. In this study, we explore an alternative approach that utilizes multilevel modeling (Richter, 2006). Several multilevel models, in which sentences were nested within persons, were tested. Sentence-level predictor variables were identified via a discourse analysis and the person-level predictor variable, reading skill, was identified using a standardized test of comprehension. Results revealed significant additive effects of text-based factors, but little support for cross-level interactions. Nonetheless, this study provides insight into the use of multilevel modeling to study comprehension processes.

Nov 18 10:00–10:15
Room: Chouteau

Ascribing Intentions to Simple Geometric Figures in 2D Animations

David Pautler, Agency for Science, Technology and Research (A*STAR), Singapore
Bryan Koenig, A*STAR, Singapore & National University of Singapore
Boon Kiat Quek, A*STAR, Singapore
Andrew Ortony, A*STAR, Singapore & Northwestern University, Evanston, Illinois, USA

People spontaneously ascribe intentions on the basis of observed behavior, and research shows that they do this even with simple geometric figures moving in a plane. This latter fact suggests that 2D animations isolate critical information – object movement–,that people use to infer possible intentions (if any) underlying observed behavior. This paper describes an approach to using motion information to model the ascription of intentions to simple figures. The approach uses spatiotemporal constraints about simple figures and their observed movements to propose candidate intentions or non-agentive causes. Candidates are identified via partial abductive matches across a library of rules, and confidence scores are assigned so that candidates can be ranked. Finally, as observations come in, the system revises its candidates and updates the confidence scores. We describe a pilot study demonstrating that people generally perceive a simple animation in a manner consistent with the model.

Nov 18 10:30–10:45
Room: Chouteau

Automatic Natural Language Processing and the Detection of Comprehension Processes

Chutima Boonthum-Denecke, Hampton University
Joseph P. Magliano, Northern Illinois University
Phillip McCarthy, The University of Memphis
G. Tanner Jackson, The University of Memphis
Danielle S. McNamara, The University of Memphis

The primary goal of this study was to assess two approaches for detecting comprehension processes, one based on LSA and one based on a combination of literary word matching and Soundex. A secondary goal was two assess if there are differences in the validity of these tool across text types, such as science texts, history text, or fictive narratives. Participants typed "thinking aloud" protocols while reading texts presented on computers. Word matching algorithms and LSA were used to assess the presence of strategies that were also identified by hand coding. Across all text topics, the correlations between human judgments and word counts were higher than those for LSA cosines. Additionally, neither approach was particularly successful for detecting elaborations. The current results indicate that automatic natural language approaches based on word counts may be more appropriate for analyzing verbal protocols produced during reading (e.g., think aloud or self explanation protocols).

Nov 18 10:45–11:00
Room: Chouteau

A new computational model of vocabulary learning

Thomas K. Landauer, Pearson Knowledge Technologies and University of Colorado

A new model and metric for vocabulary knowledge, Word Maturity, is introduced. Developing knowledge of words is simulated by changes in their LSA vectors as text is added to a corpus in a natural order up to the vocabulary of a typical adult. The quantitative metric is based on the evolving similarity of the word (its cosine) to its vector in the full LSA space. Qualitative information is provided by changes in neighboring words and passages. The current maturity of individual words for individual readers is estimated by an adaptive test. Some applications to vocabulary assessment and teaching are described.

Nov 18 11:00–11:15
Room: Chouteau

A Computational Approach to the Comparative Analysis of Religious Concepts

Curt Burgess, University of California, Riverside
Aaron Lorentzen, University of California, Riverside
Krystle Tran, University of California, Riverside
Stacey Acevedo, University of California, Riverside
Michelle Morris, University of California, Riverside

Religious texts have, at times, provided a source of conflict due to the ambiguity in the narrative or inherently conflicting information. For example, hate groups have used passages in the Christian Bible as a justification of their racist positions. This research uses a computational model of semantics (HAL) that can learn

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word meaning and can compute a measure of similarity between words. This metric can be used to compute semantic neighborhoods for concepts. In this set of analyses, two models were built (the Bible and the Koran). Distance analyses were conducted to determine that the semantic neighborhoods for common objects, foods, and animals were congruous. Results are presented based on a comparison of the two texts that were compared on a set of violently related words that were compared to unrelated controls as well as frequency counts of these words (controlled for text length).

Nov 18 11:15–11:30
Room: Chouteau

Modeling Age of Onset in First Language Lexical Attrition

Benjamin Zinszer, Pennsylvania State University
Ping Li, Pennsylvania State University

While computational models of language acquisition have flourished since Rumelhart and McClelland's (1986) past-tense model, there has been no systematic computational study of language attrition, a phenomenon that is characterized by the speaker's loss of his or her first language due to immersion in a second language environment. In this study, we present a computational model of first language lexical attrition based on the self-organizing feature map (SOM). Two SOMs are trained in phonological and semantic representations, respectively, of a first (L1) and second (L2) language and associated via Hebbian connections. Age of onset (AoO) of L2 is varied, and proficiency in L1 is tested throughout the model's lifespan. We find that loss in L1 performance is described by an exponential decay function, with an effect of AoO on the function parameters. This prediction by the model compares favorably with existing studies of language attrition.

Nov 18 11:30–11:45
Room: Chouteau

Assessing the contribution reader resources and inference processes on comprehension

Joseph P. Magliano, Northern Illinois University

How do these reader resources and inference processes interact to achieve comprehension? To explore this question, college students took the Reading Strategy Assessment Tool (RSAT), which provides a measure of comprehension during reading and the processes that support it (e.g., bridging and elaborative inferences). Additionally, we administered several instruments that provided assessments of both prior knowledge and self-regulatory resources that can support comprehension. Using structural equation modeling, we found evidence for a partially mediated model indicating that attributes of the reader support the comprehension processes that give rise to comprehension, but that these attributes also have independent contributions to comprehension. We also found similar models based on human coding and computer scoring of protocols produced in RSAT.

Nov 18 11:45–12:00
Room: Chouteau

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Pursuit of Balance: The Trade-off Between Engagement and Learning

Kyle Dempsey, University of Memphis
G. Tanner Jackson, University of Memphis
Chutima Boonthum-Denecke, Hampton University
Danielle S. McNamara, University of Memphis

Increasing user enjoyment, persistence, or engagement is a challenge within many learning environments that often comes at the cost of pedagogical effectiveness. The current study involves two natural language environments pulled from a larger Intelligent Tutoring System: a practice module with game elements (Coached Practice) and a game module with practice elements (Showdown). To further investigate the balance between engagement and efficacy we compared both user experience and self-explanation skills (during training) for the two modules. The preliminary results indicate that the game-based practice significantly increased user engagement, however it was also associated with a decrease in the overall quality of self-explanations during training. While increasing engagement in ITSs may increase user persistence within the system, the increased engagement has reduced the pedagogical effectiveness. Analyses are currently being conducted to further investigate the complex interaction between these two modules, and what implications this may have for researchers.

Nov 18 12:00–12:15
Room: Chouteau

Effects of Video Gaming on Visual Search

Patrick Conley, University of Wisconsin, Stevens Point
Andrew Schultz, University of Wisconsin, Stevens Point
Justin Durtschi, University of Wisconsin, Stevens Point
Samuel Matteson, University of Wisconsin, Stevens Point

In this study, we attempted to determine what aspects of the participants history with video games might affect visual attention. To accomplish this, we used a simple visual search task consisting of vertical line targets among distractors. To analyze how video game playing affects this visual search we created a questionnaire that asked specific questions relating to participants video game habits. Using regression analysis, we found that the most significant subject variable in predicting response time was not the sheer hours of video games played, but rather the age at which the participants began playing video games. Whether the participants parents played video games also affected response time; participants with video gaming parents were faster on the visual search task. The results demonstrate that the background of video game players must be taken into account when attempting to determine the effects of video game practice on visual attention.

Nov 18 12:15–12:30
Room: Chouteau

Conflict Resolution in Dynamic Decision Making Games

Jolie M. Martin, Carnegie Mellon University
Cleotilde Gonzalez, Carnegie Mellon University

We describe the use of games to study dynamic decision making (DDM) in conflict resolution. Part of the difficulty with assessing DDM in the lab is designing appropriate stimuli that allow control over variables of interest while also simulating important features of real-world conflict: complex networks of relationships among parties with varying monetary and social incentives; an uncertain environment that changes both exogenously and endogenously, including possible time lags and nonlinearities; cognitive limitations in attention and memory for relevant information; and emotional responsiveness to events. We employ two methodologies to understand behavior in this setting. In a bottom-up approach, participants play abstract games with simplified actions and outcomes to represent generic conflict. In a top-down approach, participants play realistic games depicting conflict in a natural context. We discuss examples of experimental paradigms we have used for each, and efforts to integrate their results into a coherent theoretical framework.

Posters

3-D Geon Encoding: A Platform to Explore Shape Semantics

Brent Kievit-Kylar, *Indiana University*
Michael N. Jones, *Indiana University*

Object shape information in lexical representation is taking a prominent role in cognitive and developmental research. Many current models of lexical processing include perceptual or embodied information, but we lack experimental paradigms to carefully evaluate the role of shape information in representing and transmitting meaning. We present an open-source 3D Java program and interface for designing experiments to explore the representation and transmission of meaning via shape information. The basis of the program is a 3D editor that allows subjects to efficiently build representations of words using geons (Biderman, 1987) attached at control points. The objects built may then be viewed by new subjects to "decode" the object back into the target word, producing a measure of information transmission. The program provides a flexible framework to create various experiments and stimuli. We demonstrate the utility of the encoding/decoding paradigm with an experiment exploring prototypical examples in conceptual combination.

A Systematic Comparison of EM and Bayesian Approach with Examples in MPT Models

Quan Tang, *University of Memphis*
Xiangen Hu, *University of Memphis*

Analysis of MPT models (Riefer & Batchelder, 1988) has been primarily conducted using traditional statistical methods (Hu & Batchelder, 1994). Specifically, EM algorithm was used in parameter estimation of MPT models since 1990s. In the last ten years, new theories and methodologies have been introduced in MPT modeling. Most notably, Bayesian inference has been one of the most promising alternative. In this paper, we develop the GPT-R package and use MCMC approximation (in both Gibbs sampler and Metropolis-Hasting algorithm) to obtain Bayesian estimates for the MPT parameters and compare with the estimates using EM algorithm in Batchelder and Riefer's classic MPT paper (1990). In addition, we discuss advantages and disadvantages of EM and Bayesian approaches, and the perspective of Bayesian analysis in MPT.

Cardio-respiratory aspects of the interreality paradigm for behavioral health care

Pietro Cipresso, *Applied Technology for Neuro-Psychology Lab IRCCS Istituto Auxologico Italiano*
A. Gaggioli, *Catholic University of Sacred Heart*
A. Grassi, *Catholic University of Sacred Heart*

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F. Pallavicini, *Catholic University of Sacred Heart*
S. Raspelli, *Catholic University of Sacred Heart*
C. Vigna, *Catholic University of Sacred Heart*
G. Riva, *Catholic University of Sacred Heart*

The raising of technology is bringing an increased interest in paradigms for behavioral health care involving new devices and systems for assessment and treatment. A recently funded European project, "INTER-STRESS - Inter-reality in the management and treatment of stress-related disorders" (FP7-247685) propose the inter-reality paradigm integrating assessment and treatment within a hybrid environment, that creates a bridge between the physical and virtual worlds. Cardio-respiratory activity is monitored to evaluate both voluntary and autonomic effect of respiration on heart rate in both physical and virtual environment interactions, analyzing both R-R interval (from electrocardiogram) and respiration (from chest strip sensor) and their interaction. Furthermore standard HRV spectral methods indexes and akin can be used to evaluate the autonomic nervous system response. A chance for assessment, management and treatment of stress-related disorders could rely on devices and systems to automatically detect and process psychophysiological signals, acquired through an unobtrusiveness electrocardiogram integrated in a chest respiration strip sensor.

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Poster 4
Nov 18 13:30–15:00
Room: Psychonomics Poster Room

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Considerations for Adapting Computer Tasks to Paper Administrations

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Christopher Koch, *George Fox University*
Breanna Barr, *Warner Pacific College*
Gale Roid, *Warner Pacific College*

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Computers provide a number of advantages for lab research. However, the basic findings from research conducted in the lab need to be generalized and applied in practical settings. Unfortunately, those practical settings are not always conducive to computer usage. For instance, intelligence tests are typically administered with paper-and-pencil tasks along with manipulatives (e.g., blocks, pictures). Converting computer-based tasks used in the lab to paper-and-pencil tasks produces a number of challenges. This paper explores those challenges and emphases the need to (1) translate computerized tasks into applied non-computer tasks and (2) create computerized test batteries for assessment.

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Poster 5
Nov 18 13:30–15:00
Room: Psychonomics Poster Room

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WoMMBAT: a graphical user interface for hierarchical Bayesian estimation of working memory capacity

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Richard D. Morey, *Rijksuniversiteit Groningen*

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Change detection paradigms have become important tools for researchers studying working memory, especially in studying visual working memory, where recall paradigms are difficult to employ. Pashler (1988) and Cowan (2001) suggested formulas for estimating working memory capacity from change detection data. Although these formulas have become widely used, I have recently shown (Morey, in press) that the formulas suffer from a number of issues, including inefficient use of information, bias, volatility, uninterpretable parameter estimates, and violation of ANOVA assumptions. I presented a hierarchical Bayesian extension of

the Pashler's and Cowan's basic model, which mitigates these issues. Here, I present WoMMBAT (Working Memory Modeling using Bayesian Analysis Techniques), graphical software to fit the hierarchical Bayesian model to data. WoMMBAT is easy to use through its graphical user interface, freely available, and cross-platform, running on Windows, Linux, and Mac operating systems.

Poster 6
Nov 18 13:30–15:00
Room: Psychonomics Poster Room

What can video games do for you? A glimpse at their benefits to visual attention abilities

William Graves, *New Mexico State University*
Igor Dolgov, *New Mexico State University*
Jeremy Schwark, *New Mexico State University*
Daniel Hor, *New Mexico State University*

Computing users of all ages enjoy playing video games, and may be latently benefiting from such activity. Bavelier & colleagues find that video game playing experience has a beneficial impact on people's visual attention abilities, as measured by their performance in various cognitive testing paradigms. We sought to replicate Green & Bavelier (2003) by evaluating whether video game playing experience was beneficial towards gamers' performance on flanker (serial and pop-out variations), enumeration, and attentional blink tasks as compared to non-gamers. This testing paradigm was chosen because it reflected aspects of tasks that gamers typically engage in. We failed to replicate, and did not find evidence for attentional advantages for video-game players in the tasks mentioned above, except in the pop-out version of the flanker task, indicating that video-game players solely exhibited a parallel processing advantage in that condition.

Poster 7
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Room: Psychonomics Poster Room

Using Linux for programming and running cognitive experiments and questionnaires

Gijsbert Stoet, *University of Leeds*

This paper discusses the PsyToolkit package for programming and running psychological experiments. Psy-Toolkit is a software package (designed for use on the Linux operating system) that offers various tools for empirical psychological research. It has a scripting language aimed for programming cognitive experiments. This language has numerous codes for presenting stimuli, registering behavioural input, and control structures. Further, PsyToolkit has a separate C library for programming experiments. One of the novelties of PsyToolkit is its cross compiler, which translates the high-level scripting language into human-readable and editable C code. And finally, PsyToolkit comes with a questionnaire presenter which enables presentation of multiple choice questions and scoring using the mouse.

Poster 8
Nov 18 13:30–15:00
Room: Psychonomics Poster Room

Using computer-assessment tools to study task-oriented reading

Joseph P. Magliano, *Northern Illinois University*
Karyn Higgs, *Northern Illinois University*
Eduardo Vidal-Abarca, *University of Valencia*
Danielle S. McNamara, *University of Memphis*

Relatively little is known about the relationship between comprehension processes and how readers approach a text in a task-oriented situation (e.g., reading to answer questions). The goal of this study was to use on-line computer-based assessment tools explore the relationship between comprehension processes and how readers search and use a text to answer questions about it. We used two automated assessments. The Reading Strategy-Assessment tool (RSAT) provides measures of processes that support the construction of mental models. Read&Answer (R&A) provides assessments of how students initially read and then search a text in order to answer questions. Comprehension processes measured by RSAT were correlated with measures of question processing, but not text processing measured by R&A. How people search a text to answer questions is most likely driven by the quality of the reader's mental model of the text, which is based on the nature of the inference processes measured by RSAT.

Poster 9
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Room: Psychonomics Poster Room

Train To Code V2.0: An example of errorless discrimination training in adaptive software design

Tiffany Frizzell, *Rollins College*
Roger D. Ray, *Rollins College*

In Ray & Ray's (2008) introduction of the expert training system Train-To-Code (TTC), they suggest that training observers to code behavior reliably might produce transfer-of-training. Specifically, they suggest that a trainee should learn to perform the same behaviors as those being observed and coded. While a substantial literature exists on "learning from observation," the degree to which imitative learning relies upon a direct correspondence between the behavior being observed vs. a transfer to more generalized responding is not well documented. Bandura and Jeffery (1973) found that symbolically coding an observed behavior was required for performances acquired through observation. The present study extends prior research by using video showing the production of signs from American Sign Language. Trainees taught to select textual words corresponding to signs (i.e, to code) generalized that training by actually producing orally requested signs, even though neither audio translations nor behavioral productions were involved in their training.

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Room: Psychonomics Poster Room

The Computational Memory Toolchain

Yuvi Masory, *University of Pennsylvania*
Per B. Sederberg, *Ohio State University*
Alec Solway, *Princeton University*
Sean Polyn, *Vanderbilt University*
Joshua Jacobs, *Drexel University*
Michael J. Kahana, *University of Pennsylvania*

The Computational Memory Toolchain (CMT) is a suite of freely available software libraries and applications for performing cognitive psychology experiments, processing subject responses, and analyzing results. CMT provides a complete research toolchain for a wide range of memory research, and is particularly well suited for examining the Free Recall task. For data collection, CMT includes PyEPL, for writing experiments with static images and text, and PandaEPL, for writing 3D virtual reality experiments. These libraries support the collection of accurately synchronized EEG and audio recordings, along with automatic logging of input from keyboards and pointing devices. The next step of the toolchain, Penn TotalRecall, provides a waveform editor specially designed for the rapid timestamp annotation of audio files by non-technical users. Finally, for data analysis, CMT includes two Matlab toolboxes: EEG Toolbox and Free Recall Toolbox. CMT has been deployed at several universities and used for dozens of experiments.

Poster 11
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Room: Psychonomics Poster Room

Teaching Flash Programming for Psychology

Yana Weinstein, *Washington University in St. Louis*

Adobe Flash is currently one of the most popular languages for animated web content, and almost all modern computers are capable of playing Flash content. Psychologists have recently started to take advantage of this to collect experimental data online. Flash can be used not only for questionnaire-based studies, but also for sophisticated experiments involving stimuli such as pictures, dynamic shapes, and animation. This language arguably offers the most flexibility to psychologists: it allows accurate reaction time measurement, absolute control over visual aspects, and perhaps most importantly, online implementation. I would like to argue that a dedicated "Flash Programming for Psychology" class should be made available to all Psychology graduate students, and present some of my own teaching materials designed for this purpose.

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Room: Psychonomics Poster Room

Socially Facilitated Alignment and Novelty in an Interactive Micro-Task with Online Crowdsourcing

Monica A. Riordan, *University of Memphis*
Rick Dale, *University of Memphis*
Roger J. Kreuz, *University of Memphis*

Two viewpoints of interactive alignment are tested using simulated online conversation. Participants were recruited using Amazon's Mechanical Turk. Participants were led to believe they were interacting with another person or seeing database examples. Prompts varied by verb, tense, topic, and emoticons. Those who believed they were conversing aligned less than those in the example condition, but recalled more prompts and used more emoticons. A more complex theory is necessary in which levels of alignment are modulated differentially to account for conversation fluidity. We argue that online interactive micro-tasks, with crowdsourcing technology, can be an exciting new avenue for researching interaction.

Semantic Organization in Schizophrenia: A Discriminant Analysis

Sean Matthews, *Indiana University, Bloomington*
Michael N. Jones, *Indiana University, Bloomington*
Olga Rass, *Indiana University, Bloomington*
William Hetrick, *Indiana University, Bloomington*
Brian O'Donnell, *Indiana University, Bloomington*

Disorganized speech in schizophrenia has been hypothesized to be the result of abnormalities in the semantic memory system. Semantic fluency tasks have been useful for examining this phenomenon in individuals with schizophrenia, suggesting a degradation in category structure. However, these analyses are often constrained to examining only the most commonly produced category exemplars due to limitations imposed by the standard method of calculating inter-item distances. Alternatively, we used a high-dimensional semantic space model of lexical semantics (Jones & Mewhort, 2007) to calculate semantic similarity values and number of intervening neighbors between exemplars produced in a semantic fluency task, along with semantic neighborhood density (SND) and frequency information. A classifier built using linear discriminant analysis indicated that compared to controls, individuals with schizophrenia produced exemplars that were more semantically similar to the previous exemplar, stayed in regions of space with higher SND, and made less use of frequency information than controls.

Sample size planning for structural equation modeling: Software implementation with the MBESS R package

Keke Lai, *University of Notre Dame*
Ken Kelley, *University of Notre Dame*

This paper serves as a tutorial for conducting sample size planning for structural equation modeling (SEM) from various perspectives with the MBESS R package. Sample size for SEM can be planned based on different effects in the model (i.e., overall effects, targeted effects) and different statistical inference methods (i.e., power analytic, confidence interval). All of these above approaches are now implemented in the MBESS package, as a comprehensive solution to sample size planning for SEM. Worked-out examples are provided based on several representative models, with emphasis on (a) the specification of the necessary input information for sample size planning procedures, and (b) steps to take when the assumptions of sample size planning methods are violated.

Properties of Semantic Similarity Measure Techniques

Fazle Elahi Faisal, University of Memphis
Abhijit Kumar Nag, University of Memphis
Iftekhar Tanveer, University of Memphis
ASM Iftekhar Anam, University of Memphis
Xiangen Hu, University of Memphis

There are three different ways to measure semantic similarity named as combinatorial, permutational and quantitative similarity measure proposed by Hu et al. (2005). This poster explores characteristics and properties of these techniques. Combinatorial similarity is guaranteed to reach 1, when all the words in a corpus are considered. Expected value of this similarity is x/(2-x), where x is the proportion of neighborhood words. On the other hand, the two other similarity measures do not guarantee to reach 1, unless the order of neighborhood words is same. Expected value of permutational similarity is 0.5, when all the words are considered. Mean and standard deviation for each number of neighborhood words represent characteristic curve for all pair of words within a corpus using any similarity measure. This gives us the interpretation of boundary of significant difference. At boundary point, we get a Gaussian distribution. P-value of the distribution facilitates to figure out significantly similar or dissimilar words. We developed web application to display these characteristic curves for real world corpus varying different parameters.

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Personality in Affective Computing: Neuroticism as a Predictor

Jeremy Schwark, New Mexico State University
Daniel Hor, New Mexico State University
William Graves, New Mexico State University

To date, affective computing research has acknowledged individual differences with regard to detecting affect, yet little research has explored which individual difference traits may contribute to the success of affective computing manipulations on a computer user. The current study looked at using personality measures to predict how much an individual can be influenced by a positive, affective computing paradigm. The results showed that personality measures could predict changes in 9 of the 13 state affect scales defined by the PANAS-X, of which neuroticism was a predictor in 7. The authors conclude that neuroticism plays a large role in the potential impact of affective computing paradigms and individual differences should be considered in future affective computing research and design.

Poster 17
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Room: Psychonomics Poster Room

Optimizing Toolbar Placement for Response Speed in a Graphical User Interface

Daniel Hor, New Mexico State University
Igor Dolgov, New Mexico State University
Jeremy Schwark, New Mexico State University
William Graves, New Mexico State University

Toolbars in computer graphical user interfaces are usually placed at the top of the program window. Yet, our studies showed that people did not always respond fastest when toolbars were placed at the top. In some

situations, they responded fastest when toolbars were placed on the left or right side, despite the four sides being of equal distance from the center of the screen. Moreover, responses were consistently slowest when toolbars were placed at the bottom. We also found that participants performed significantly slower when presented with multiple toolbars and when toolbar position was unpredictable.

Poster 18
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Room: Psychonomics Poster Room

Optimizing Experimental Materials In Euclidean Space: Software that Balances Items Across Any Number of Stimulus Dimensions

Naveed A. Sheikh, *McGill University*
Debra A. Titone, *McGill University*

A well-controlled experiment isolates the effects of an independent variable or variables from other potentially confounding variables with respect to a dependent measure. In psycholinguistic studies, however, it has become increasingly difficult to select experimental materials that isolate single lexical dimensions (e.g., emotional valence) and hold constant the ever-growing set of other lexical attributes known to affect word processing (e.g., frequency, length, orthographic or phonological density, age of acquisition, etc.). To address this challenge, we developed a software application that eliminates the difficult and error-prone work of creating and balancing stimulus sets "by hand". The software equates user-provided word stimuli across user-defined conditions for an arbitrary number of lexical characteristics. Conditions are equated, to the extent possible, on the basis of words' spatial representations in an n-dimensional Euclidean space. Consequently, this software permits researchers to generate optimal stimulus configurations for any set of words to be used in psycholinguistic experiments.

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Operations analysis of behavioral observation procedures: A taxonomy for modeling in expert training systems

Roger D. Ray, *Rollins College*
Jessica M. Ray, *University of Central Florida*
David A. Eckerman, *University of North Carolina, Chapel Hill*

This paper introduces a taxonomy based upon an operations analysis (Verplanck, 1996) of various procedures found in the behavior observation research literature. How these alternative procedures impact the recording and subsequent analysis of behavioral events based upon the type of time and behavior recordings made is also discussed. The taxonomy was generated as a foundation for the continuing development of an expert training system called Train-To-Code1 (Ray & Ray, 2008). Presently in its second version, TTC V2.0 is software designed for errorless training (Terrace, 1963) of student accuracy and fluency in the direct observation and coding of behavioral events depicted via digital video. Two of 16 alternative procedures classified by the taxonomy are presently modeled in TTC and are used to illustrate how the taxonomy guides software user interface and algorithm development. The remaining 14 procedures are described in sufficient operational detail to allow similar model-oriented translation.

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Room: Psychonomics Poster Room

Modeling Semantic Feature Effects Without Features

Gabriel Recchia, *Indiana University*
Michael N. Jones, *Indiana University*

Verbal production norms collect human-generated attributes to describe words (e.g., "is_red", "has_teeth", etc.). These verbal descriptions are often treated as stand-ins for features, high-level properties that some accounts of semantic memory assert are integral to lexical representations. Phenomena commonly taken to provide evidence for the explanatory power of semantic features include feature-based priming, number-of-feature effects, and the influence of shared and distinctive features on tasks such as lexical decision, semantic decision, and feature verification. However, many of these phenomena may also be explained by co-occurrence-based metrics of mutual information–e.g., the fact that words that share features tend to co-occur in similar lexical contexts, while words with diverse features appear in diverse lexical contexts. We show that co-occurrence-based metrics account or partially account for many phenomena traditionally considered to be feature-driven, suggesting that a closer look at possible causal mechanisms for these effects is warranted.

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Measuring grammatical number prediction using a visual world paradigm

Abby Carter, *Indiana University*
Sean Matthews, *Indiana University Brian Riordan, Aptima Inc*
Michael N. Jones, *Indiana University*

Recent studies of eye movements in world-situated language comprehension have demonstrated that rapid processing of morphosyntactic information – e.g., grammatical gender and number marking – can produce anticipatory eye movements to referents in the visual scene. Using a visual world paradigm, we investigated how type of morphosyntactic information and the goals of language users in comprehension affected eye movements, focusing on the processing of grammatical number morphology in English-speaking adults. Participants' eye movements were recorded as they listened to simple English existential (There are the lions.) and interrogative(Where are the lions?) sentences. Across three visual world experiments, we found that the time locking of visual fixations and sentence processing depends on the type and complexity of both the referent set and target grammatical class.

Poster 22
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Room: Psychonomics Poster Room

Looking in the Lab: A Comparison of Eye-Tracker Systems

David Washburn, *Georgia State University*
Holly A. Phillips, *Georgia State University*
Natasha B. Schultz, *Georgia State University*

Elizabeth A. Schroth, Georgia State University
Erin M. Tone, Georgia State University

Eye-tracking technologies have become increasingly powerful and useable in recent years, even as the number of commercial options has increased for researchers seeking to study gaze, eye movements, and pupil dilation. In this presentation, researchers from four laboratories that employ four different manufacturers' systems (ASL, EyeLink, ISCAN, Tobii) will summarize their experiences with each option. Going beyond the technical specifications and software features, these researchers will discuss the benefits and challenges that they have experienced with their respective systems in their different research programs (on attention, reading, and emotion perception). The scientists will also present data for a common experimental task to permit direct comparison of the options. It is anticipated that these candid insights will serve useful to other researchers considering purchasing an eye-tracking unit, as well as to investigators who already employ one of the systems that will be reviewed.

Poster 23
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Gender Differences in Language use on Facebook

Kay Livesay, Linfield College
Arnbjorn Stokholm, Linfield College
Vanessa Therson, Linfield College

Social networking sites (e.g., Facebook) are a popular medium for communication. Researchers (Thomson & Murachver, 2001) have found gender differences in language use in computer-mediated communication (e.g., email, IM) that are similar to traditional face-to-face communication. However, social networking sites like Facebook differ from emails and IM in that the members post items to a wall that is publically viewed, unlike an email. Wall posts have conversational elements to them but can also be more like a formal blog post. We randomly selected profile pages within a variety of location-based networks on Facebook. All profiles were publicly available. The word content was processed using LIWC 2007 to analyze word use frequency. We found that females use personal pronouns, and positive emotion words more frequently than males. Additionally, we saw compelling evidence to suggest that Facebook wall postings are a hybrid between formal text and personal text.

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Room: Psychonomics Poster Room

ez does it: Statistical programming for the non-programer

Michael A. Lawrence, Dalhousie University

R, a free and open source statistical programming environment, is the lingua franca of statistics and has become increasingly popular in the psychological sciences. By using R, researchers not only avail themselves of the most cutting edge statistical procedures, but also bolster open science by ensuring open and reproducible data analysis. However, many psychologists lack computational backgrounds and are intimidated by the programmatic nature of the R interface. This [talk/poster] presents"ez", a package for R that attempts to wrap common yet complex analysis workflows into easy to use and flexible functions, providing a means by which programming novices can ease into R.

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Exploring the Use of Feedback in Models of Semantic Acquisition

Brendan T. Johns, *Indiana University*
Michael N. Jones, *Indiana University*

Co-occurrence models have demonstrated great success at accounting for a variety of human semantic data. Co-occurrence models are passive learning systems, where associations between words are extracted from a large textbase. However, in human language learning incremental feedback is available: our utterances have an effect on our environment. We explore a simple functional equivalent to this feedback scenario in co-occurrence models using an Internet search engine as our feedback mechanism. By considering the number of times that a model's utterance occurs across the Internet, a simple metric of the semantic cohesiveness of that utterance is created, which can then be fed back to the model. We demonstrate that this type of feedback can be a valuable source of information for training models. Simple methods of training co-occurrence models with this type of feedback will also be discussed.

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Exploring Conditional Similarity based on Semantic Vectors

Iftekhar Tanveer, *University of Memphis*
Xiangen Hu, *University of Memphis*
Mohammed Yeasin, *University of Memphis*

Human has an ability to evaluate, judge and detect similarity among various written texts. One way people can do it is to remove similarities from the texts - which can be considered as noise - and focus only on the differences. In this paper we have proposed a mathematical model for imitating such behavior of human being. Using semantic vectors we have proposed a metric that represents maximum possible separation between two textual documents. This separation is calculated by the use of Fisher1's linear discriminant ratio applied in semantic spaces. We have performed experiments on both real and synthetic data to evaluate the effectiveness of this metric. It has been shown that the metric has an effective correlation with human intuition.

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Using HTML5 in Internet-based research

Ulf-Dietrich Reips, *University of Deusto, Spain and IKERBASQUE, Basque Foundation for Science*

In this paper I will present the potential of the new standard HTML5 for Internet-based research. HTML5 already works partially in the leading Web browsers, and likely will be a fully functional de facto standard in 2011. With new features such as cross-document messaging, WYSIWYG editable elements, canvas basic support (dynamic graphics from Javascript), text API for canvas (displaying text on canvas elements), offline

web applications, and inline SVG the options for Internet-based research can be extended by new methods and procedures, with better usability and reliability. For example, new form field types with input validation can be created much easier, alert the participant to mistakes, and thus provide better quality of data. Furthermore, options like identifying geo location and drag and drop are much improved in HTML5. The new options for Web researchers will be illustrated with examples and data from pre-HTML5 and HTML5 based research studies.

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Room: Psychonomics Poster Room

Dropout in Web experiments: Methodology

Ulf-Dietrich Reips, *University of Deusto, Spain and IKERBASQUE, Basque Foundation for Science*

The talk will summarize more of a decade of Web research on dropout in Web experiments. Techniques of dropout management that once were generated from experience or were derived theoretically have since been studied empirically. Such techniques include the seriousness check, the warm-up technique, the high hurdle technique, and the use of dropout to detect motivational confounding. The talk will explain these techniques, their empirical basis, and their relative importance in dropout management. A second portion of the talk will be devoted to using dropout as a dependent variable. Results from a series of experiments on factors influencing dropout will be presented. Finally, some recommendations are developped for authors, reviewers and editors of articles reporting results from Web experiments. It is good practice to always report dropout rates for all conditions in Internet-based research.

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Askito: An open source Web questionnaire tool

Ulf-Dietrich Reips, *University of Deusto, Spain and IKERBASQUE, Basque Foundation for Science*
Tobias Heilmann, *University of Zurich, Switzerland*

We present the development and use of 'Askito', a novel open source Web application for creating and conducting questionnaire-based research on the Web. Askito is also applicable for e-learning, teaching, and evaluation purposes. Following an examination of 400+ tools that can be used to create Web questionnaires, the development of Askito focused on two goals: First, to comply with recommendations and findings from research on Web surveying methodology. Second, to create a maximum of ease and fun in the usability experience, e.g., via the use of drag&drop functionality. In our paper, we explain our philosophy and its roots in the methodological literature, present the editing component, the user and questionnaires management, and provide a step-by-step example how to use Askito (http://askito.deusto.es/). Askito received an award as a model e-learning application by the faculty for Philosophy at the University of Zurich.

Poster 30
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Cognitive Modeling Repository

Jay Myung, *Ohio State University*
Mark Pitt, *Ohio State University*

Quantitative modeling has contributed substantially to the advancement of the cognitive sciences. Papers introducing and testing cognitive models regularly appear in the top journals. The growth and success of cognitive modeling demonstrate why modeling itself should be a primary quantitative method in the researcher's toolbox. Yet this method of scientific investigation remains under-utilized by the research community at large, in part because of the hassles in obtaining data sets to model and the difficulties in implementing models. The goal of this project is to assist scientists in their cognitive modeling efforts by creating an online repository containing data sets that can be modeled and the cognitive models themselves. The current state of the project and future plans will be presented. Prior to the conference, the work-in-progress repository website (cmr.osu.edu/cmr/) will be opened up to conference attendees for their comments and feedback.

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Bayesian Ordinal Analysis of State-Trace Data

Andrew Heathcote, *University of Newcastle, Australia*
Melissa Prince, *University of Newcastle, Australia*
Guy Hawkins, *University of Newcastle, Australia*
Scott D. Brown, *University of Newcastle, Australia*

State-trace analysis (Bamber, 1979) is a graphical method for determining whether one or more than one latent variable mediates an apparent dissociation between the effects of two experimental manipulations. State-trace analysis is attractive because it makes only ordinal assumptions, and so avoids confounding from range effects that plague other methods of investigating dissociations when performance is measured on a bounded scale (e.g., accuracy). However, state-trace analysis suffers from a number of drawbacks, including problems associated with analysing data averaged over participants, a lack of inferential methods that also make only ordinal assumptions, and the need to calibrate experimental designs to produce appropriate data. We describe and illustrate the application of GUI driven software written in the R language that addresses these drawbacks using newly developed Bayesian methods (Heathcote, Brown and Prince, submitted) based on Klugkist, Kato and Hoijtink's (2005) encompassing prior method for estimating Bayes factors.

Poster 32
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Room: Psychonomics Poster Room

Athletes adapt their anticipatory performance to the computationally manipulated opponent's motion

Hirofumi Ida, *Tokyo Medical and Dental University*
Kazunobu Fukuhara, *Tokyo Medical and Dental University*
Motonobu Ishii, *Tokyo Medical and Dental University*

Skilled athletes can predict future events by viewing their opponent's motions, for example, tennis players anticipate the ball direction before the racket-ball impact. Eight experienced tennis players and 8 novice

counterparts viewed computer graphics (CG) showing visual stimuli of captured tennis serve motions and made anticipatory responses to ball direction on a visual analogue scale. The server's arm motion was computationally manipulated with a forward kinematics calculation at the forearm and elbow joint. The experienced group significantly changed the anticipatory performance in regard to ball direction dependent on the degree of arm motion change, while the novice group did not. The results suggest that athletes are sensitive to their opponent's local motion and may develop their perceptual skills with CG animation.

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Room: Psychonomics Poster Room

Analyzing Directed Data by Using MPT Models of Source Monitoring

Jun Xie, University of Memphis
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William Marks, University of Memphis

Multinomial Processing Tree (MPT) models for source monitoring paradigm are orginally introduced by Batchelder and Riefer (Psychological Review, 1990). Their model has total of 7 parameters: two detection parameters, two discrimination parameters, one response bias parameter for old/new and two response parameters for the sources (bias to source A with successful item detection and bias to source A with unsuccessful item detection). One of the issues for the original model was the limitation of testing hypothesis about discrimination differences when there were strong differences between the two responses biases for the sources. A proposed solution to such limitation was to increase numbers of sources to 3 or more (Batchelder, Hu, & Riefer, 1995). We present a solution to such limitation without increase the numbers of sources. In this paper, we introducea paradigm where two types of sources are used in a typical source monitoring experiment: Implicit sources and explicit sources. The model for such paradigm includes total of 5 tree models. We will use such model to analyze data in three directed forgetting experiments. We found that the new models offer some explanations of directed forgetting phenomena that are different from those in the literature.

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Nov 18 13:30–15:00
Room: Psychonomics Poster Room

Adaptive design for model discrimination

Maarten Speekenbrink, University College London
Nick Chater, University College London
David R. Shanks, University College London

Psychology is rich in formal models of learning, categorization and decision-making, to name but a few areas. While competing models differ in substantive assumptions, they often make highly similar predictions and model comparison is often inconclusive. Optimizing the design of an experiment for model discrimination is not trivial, especially when individual participants differ widely in terms of model parameters. We present a method to design experiments adaptively and on-line, at each trial choosing the stimulus which is expected to minimize the entropy of the posterior probability distribution over a set of competing models. Actual use in single experiments puts strong constraints on computation time.Therefore, we rely on Sequential Monte Carlo techniques to estimate the model's parameters. We will show the advantages of the method and practical issues in its implementation.

Nov 18 13:30–15:00
Room: Psychonomics Poster Room

A tool to analyze pupil dilation data in R

Pablo Gomez, *DePaul University*
Jason Geller, *DePaul University*

Although pupil size studies have a long history, there has been a renewed interest in the recent past; hence, a free tool to analyze and display data from those experiments could benefit a number of newcomers into pupil size studies. The R environment is a free and widely used tool within cognitive psychology. We present an R based tool to analyze and display pupil dilation data obtained with the EyeLink 1000 system. The tool allows the user to remove manually blinks and other artifacts. It also presents with a choice of linear or quadratic interpolation for missing values. This tool allows users to average trials within experimental conditions locked on stimulus presentation or response. We present data from a flanker task study to exemplify the tool's capabilities.

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Room: Psychonomics Poster Room

A Synchronization Account of False Recognition

Brendan T. Johns, *Indiana University*
Michael N. Jones, *Indiana University*
Doug J. K. Mewhort, *Queen's University at Kingston*

False recognition phenomena provide a challenge for most current formal models of recognition memory. Although advances have been made using broad conceptual frameworks such as Fuzzy Trace Theory (FTT; Brainerd & Reyna, 2002) and source monitoring (Johnson, Hashtroudi, & Lindsay 1993), false recognition effects still elude computational accounts. We introduce a global memory model based on the Iterative Resonance Model of Mewhort and Johns (2005) that makes use of structured semantic representations from a co-occurrence learning mechanism and a neural synchronization process to account for false recognition. The model elegantly accounts for a wide range of challenging recognition memory effects (mirror effect, null list strength/length effects) as well as item-specific and performance-based false recognition effects from experiments using the DRM paradigm. The model reinforces many of the assumptions of FTT, and provides a unified formal framework in which to understand both false and standard recognition memory effects.

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Room: Psychonomics Poster Room

The Use of Eye Tracking in Psychology and Law Research

Kim MacLin, *University of Northern Iowa*
Ryan Betts, *University of Northern Iowa*
Otto H. MacLin, *University of Northern Iowa*

Eye tracking technology has been used by researchers in fields as diverse as education, chemistry, vision science, and psychology. This technology is just recently starting to be used to study phenomena of interest to researchers in the area of psychology and law. This poster reviews the small, but growing body of literature on the use of eye tracking to study topics such as police lineups, weapon focus, and the cross race effect. We review the studies themselves and explore the methodological benefits and challenges of using this technology to study the basic science (psychology) of an applied field (law and police practice).

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Room: Psychonomics Poster Room

A Study Space Approach to a Growing Literature Base on the Facebook Phenomenon

Kim MacLin, *University of Northern Iowa*
Ashley Green, *University of Northern Iowa*

The popularity of social networking sites among people of all ages is hard to deny. Researchers have also felt the pull, and a growing body of literature is developing around the phenomenon. This poster reviews the well over 100 studies on social networking sites like Facebook and Myspace using a study space approach (Malpass et al., 2008) in order to draw conclusions about the variables, methods, and procedures used. Research topics include applied work on educational, health, and business uses, as well as more basic research on social psychology including relationships, identity, communication, and personality. Studies range from experimental to narrative; and journal outlets range from established discipline specific journals (e.g., in medicine, psychology, and computing) to more topic specific journals (e.g., journals devoted to cyberpsychology). Lastly, over one fifth of the studies are dissertations indicating a rising, and likely continued interest by researchers for years to come.

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Room: Psychonomics Poster Room

A memory-based account of retrospective revaluation

Randy Jamieson, *University of Manitoba*
Matthew J. C. Crump, *University of Manitoba*
Samuel D. Hannah, *University of Manitoba*

We adapt an instance model of human memory to simulate retrospective revaluation. In the account, memory preserves the events of individual trials in separate traces. A probe presented to memory contacts all traces in parallel and causes each to become active. The information retrieved from memory is the sum of the activated traces. Learning is modeled as a process of cued-recall. Encoding is modeled as a process of differential encoding of unexpected features in the probe (i.e., expectancy-encoding). We demonstrate that the model captures recovery from blocking, backward blocking, and backward conditioned inhibition. The work integrates an understanding of human memory and complex associative learning.

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A Comparative Study of Multinomial Processing Tree Model with Other Models

Gahangir Hossain, *The University of Memphis*
Xiangen Hu, *The University of Memphis*
Mohammed Yeasin, *The University of Memphis*

In behavioral science, multinomial models are used to measure and study cognitive processes from categorical data. A popular approach of cognitive modeling known as Multinomial Processing Tree (MPT), is used to model observed categorical data as a function of a sequence of unobservable states. In symbiotic environment, it is important to model the collaborative behavior between human and machine that is by and large mixture of observable and unobservable data. There are some other models that mostly deal with observable behavior of machine. In this comparative study we research on the existing approaches like fault tree, event tree, probabilistic decision table, factor graph and hyper graph models. We estimate the relative contributions of different models in terms of cognitive factors and compare their different aspects associated with the MPT/GPT models. Finally, we consider the current role of MPT models in psychological research and propose a behavior bonding approach between human and machine as a possible future direction of MPT model.

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