Cognitive Science Association for Interdisciplinary Learning

Hood River, Oregon

July 31 - August 4, 2003

Cognitive Science Association for Interdisciplinary Learning

July 31 – August 4, 2003
Hood River Hotel
Hood River Oregon

Note that all talks are 30 minutes and 10 minutes are allocated between talks for questions and discussion.

Thursday Evening Session, July 31

5:00 – 5:15 p.m.	Welcome and Introductory Remarks
5:15 p.m.	Appetizers
5:30 – 5:40 p.m.	*A simon effect for the direction of linear motion* Stephen Killingsworth & Dell Rhodes, Reed College Department of Psychology
5:45 – 5:55 p.m.	*The affective Simon Effect: How automatic, how conscious, how specific?* Katia Duscherer, Université René Descartes (Paris V), & Daniel Holender, Université Libre de Bruxelles
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6:10 - 6:40 p.m.	*Consciousness as a prominent source of dimensional overlap in stimulus-stimulus and stimulus-response relations* Daniel Holender, Université Libre de Bruxelles & Katia Duscherer, Université René Descartes (Paris V)
6:50 - 7:20 p.m.	*Coordination of component mental operations in a multiple-response task* Roger Remington, Shu-Chieh Wu, NASA Ames Research Center & Harold Pashler, University of California, San Diego
7:30 – 8:00 p.m.	*Attentional focus and balance learning* Gabriele Wulf, University of Nevada, Las Vegas
8:00 p.m.	Adjourn For Evening

Friday Morning Session, August 1

8:30 a.m.	Morning Refreshments
9:00 - 9:30 a.m.	*Eye position signals influence pointing responses in the human posterior parietal cortex* Paul van Donkelaar & Jaymi Dreiling, University of Oregon
9:40 - 10:10 a.m.	*The relationship between perceived length and egocentric location in müller-lyer figures with one versus two chevrons* Robert B. Welch, NASA Ames Research Center, Wayland Lum, California State University, San Jose, Robert B. Post, University of California, Davis, & William Prinzmetal, University of California, Berkeley
10:20 - 10:50 a.m.	*Space, time and reference frames: The quantification of stroboscopic induced motion* Paul Dassonville, University of Oregon
11:00 a.m.	Break until 5:00 p.m.

Friday Evening Session, August 1

5:00 p.m.	Appetizers and Posters
5:15 – 5:25 p.m.	*Task effects on erp measures of sentence processing* Ean Huddleston, Libbey White, Lisa Sanders, Eric Pakulak, Donna Coch, & Helen Neville, University of Oregon
5:30 – 5:40 p.m.	*Neural plasticity in a case of primary progressive aphasia with a selective disconnection between lemma and lexeme levels of processing*. Michael Sullivan, Portland VA Medical Center, Oregon Health & Science University

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5:50 - 6:20 p.m.	*The role of the fusiform face area in perceptual decision processes* Jagdeep Kaur Bala & Paul Dassonville, Department of Psychology & Institute Of Neuroscience, University of Oregon
6:30 – 7:00 p.m.	*Neural systems involved in making category judgments about faces* Joe DeGutis, University of California, Berkeley
7:10 - 7:40 p.m.	*The effect of context on reading mammograms* George Wolford & Anne Rowland, Dartmouth College, Pat Carney & Claudia Kasales, Dartmouth Medical School
7:50 p.m.	Adjourn For Evening

Saturday Morning Session, August 2

8:30 a.m.	Morning Refreshments
9:00 - 9:30 a.m.	*Remembering emotional events* Friderike Heuer, Willamette University & Daniel Reisberg, Reed College
9:40 - 10:10 a.m.	*Novelty effects in recognition memory* Andy Yonelinas, Mark Kishiyama, & Michele Lazzara, University of California, Davis
10:20 - 10:50 a.m.	*The role of emotional content on item and source memory* Arthur P. Shimamura, University of California, Berkeley
11:00 a.m.	Break until 5:00 p.m.

Saturday Evening Session, August 2

5:00 p.m.	Appetizers and Posters
5:15 – 5:25 p.m.	*Bilingual auditory word recognition: Language context and lexical access* Dylan E. Stone & Enriqueta Canseco-Gonzalez, Reed College, Portland
5:30 – 5:40 p.m.	*The effects of age and vascular disease risk factors on clustering and switching in verbal fluency: Findings from the normative aging study* Rebecca Williams[1], Christopher B. Brady[1,2], Avron Spiro, III[1,3] & Sarah R. Schalman-Bergen[1] [1]VA Boston Healthcare System, [2]Harvard Medical School; [3]Boston University School of Public Health

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5:50 - 6:20 p.m.	*Suppressing unwanted memories: Neural mechanisms* Michael Anderson, University of Oregon
6:30 – 7:00 p.m.	*A neural correlate of visual working memory maintenance* Edward K. Vogel, Masahiro Machizawa, & Jason A. Fair, University of Oregon
7:10 - 7:40 p.m.	*Hemispheric asymmetries in visual symmetry perception: Implications for stimulus bisection judgment*s David Wilkinson, Harvard Medical School & VA Boston Healthcare System & Peter Halligan, University of Cardiff, Wales, UK
7:50 p.m.	Adjourn For Evening

Sunday Morning Session, August 3

8:30 a.m.	Morning Refreshments
9:00 - 9:30 a.m.	*Endogenous control over spatial selection via retinotopic maps of distractor probability* Edward Awh, Antoinette Sgarlata, & John Kliestik, University of Oregon
9:40 - 10:10 a.m.	*Measuring the allocation of attention* Lachter, Ruthruff, & Remington, NASA Ames Research Center
10:20 - 10:50 a.m.	*Attentional inhibition for spatial location in parkinson's disease* Laura Grande, Harvard Medical School & Boston VA Healthcare System (GRECC), Russell Bauer, Bruce Crosson, Duande Dede, James Algina, & Kenneth Heilman
11:00 a.m.	Break until 5:00 p.m.

Sunday Evening Session, August 3

4:30 p.m.	Poster Session (NOTE EARLIER START TIME)
4:45 – 4:55 p.m.	*Explicit and implicit priming in a change detection task* Elizabeth Walter, Jagdeep K. Bala, & Paul Dassonville, Dept. of Psychology and Institute of Neuroscience, University of Oregon

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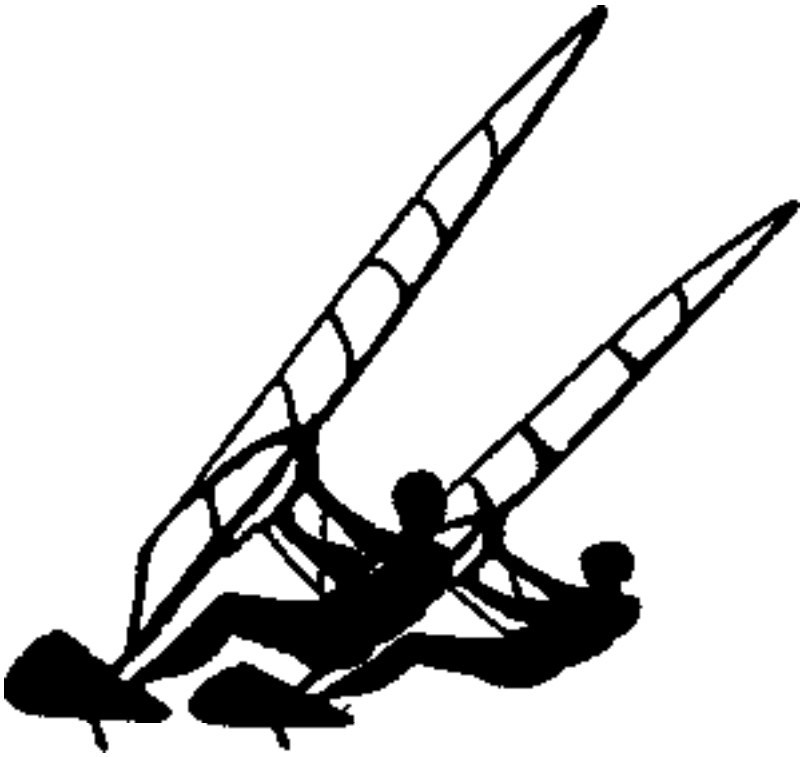
5:00 – 5:10 p.m.	*Does the attentional blink prevent spatial shifts of attention?* Pierre Jolicoeur, University of Montreal, Canada, Paola Sessa & Roberto Dell'Acqua, University of Padua, Italy
5:20 - 5:50 p.m.	*Age versus disease effects on frontally mediated cognitive processes* Christopher B. Brady, VA Boston Healthcare System, Harvard Medical School, & Avron Spiro, III, VA Boston Healthcare System, Boston University School of Public Health
6:00 – 6:30 p.m.	*Hierarchical organization in audition and vision* Alexandra List, Timothy Justus, University of California, Berkeley & Lynn C. Robertson, University of California, Berkeley and Martinez Veterans Affairs Medical Center,
6:40 - 7:10 p.m.	*Auditory perception and cortical reorganization in congenital and acquired blindness* Alexander Stevens, Oregon Health & Science University
7:20 p.m.	*Banquet at Pasquale's Restaurant*

Monday Morning Session, August 4

8:30 a.m.	Morning Refreshments
9:00 - 9:30 a.m.	*The phenomenology of dead reckoning* Edward H. Cornell & Elaine Greidanus Department of Psychology, University of Alberta
9:40 - 10:10 a.m.	*Change blindness and change detection in a structured visual field* Bruce Bridgeman, University of California, Santa Cruz, CA, & Massimo Turatto, University of Trento, Rovereto, Italy
10:20 - 10:50 a.m.	*Why can't we see things change? Representation and comparison failures in change blindness* Bonnie L. Angelone, Daniel T. Levin, & Melissa R. Beck, Kent State University
11:00 a.m.	See you next year!



Abstracts

(Listed by First Author Alphabetical Order)

Suppressing unwanted memories: Neural mechanisms

Michael Anderson, University of Oregon

People are often confronted with reminders to things that they would prefer not to think about. In this talk, I will present an experiment showing that the capacity to suppress awareness of unwanted declarative memories is mediated by cognitive and neural control mechanisms also involved in overriding prepotent motor responses, and that these processes cause persisting memory failures for suppressed items. The memory impairment caused by suppression appears to be produced by frontally mediated down-regulation of activity in the hippocampus.

Why can't we see things change? Representation and comparison failures in change blindness

Bonnie L. Angelone, Daniel T. Levin & Melissa R. Beck, Kent State University

Observers often fail to see large visual changes in natural and artificial scenes, a phenomenon known as change blindness. The most intuitive explanation for this occurrence is that observers' have failed to represent details from the scene. However, another possibility is that observers represent details, but fail to compare the before and after representations in order to detect a change. Research has shown that despite observers' failure to detect changes, they often reveal that they have represented information from the scene. In several experiments we explored change detection and recognition memory for several types of changes to central objects in motion pictures. Observers who failed to detect a change still performed at above chance levels on a recognition task in almost all conditions. In addition, observers who detected the change were no more accurate in their recognition than those who did not detect the change. This suggests that observers represent information in the face of change blindness and that their performance may be due to a comparison failure. In other experiments we have examined whether a similar pattern of results can be observed when a load is placed on observers' short-term memory capacity. Using similar motion pictures we have developed visual and verbal load tasks to investigate the relevance of short-term memory load in incidental change detection. The findings are preliminary and suggest that change detection is similar for a more difficult visual processing task and a simple one. However, difficult verbal processing tasks lead to lower change detection levels compared to more simple verbal tasks.

Endogenous control over spatial selection via retinotopic maps of distractor probability
Edward Awh, Antoinette Sgarlata, & John Kliestik, University of Oregon

In a crowded visual scene, multiple visual objects compete for limited processing resources. Spatial attention can bias these competitive interactions in favor of stimuli in specific locations. The impact of this process of biased competition has been clearly demonstrated, but the mechanisms of endogenous control over this form of selection are less well specified. We find that experience with a specific visual environment is associated with the formation of a retinotopically-organized map of the prior probability of distractor interference at different target positions. This probability map interacts with online shifts of attention, eliciting increased levels of distractor exclusion when the target is likely to be in competition with distractors. In addition, we find evidence for object-based control over the specific probability map that is implemented. Thus, even during involuntary shifts of spatial attention, the role of biased competition during visual selection is determined by a long-term record of the prior visual experiences of the observer.

Age versus disease effects on frontally mediated cognitive processes
Christopher B. Brady, VA Boston Healthcare System, Harvard Medical School & Avron Spiro, III, VA Boston Healthcare System, Boston University School of Public Health

Certain cognitive aging models posit age effects on frontally mediated cognitive processes, such as executive function, working memory, and memory retrieval. These age effects could be related, at least in part, to vascular disease risk factors (e.g., hypertension) that may selectively affect frontal system functions. Despite this, cognitive aging research usually documents age effects by comparing the performance of younger and older adults, without assessing the vascular health of the participants. Although age group comparisons are useful to document age-differences in frontally mediated cognitive processes, little is learned about the etiology of age effects on these processes. Longitudinal studies that include physical and laboratory examinations, such as the VA Normative Aging Study (NAS), provide an opportunity to delineate more carefully the effects of age and vascular health on cognition. We report the results of several studies that document the role of vascular disease risk factors on the pattern and size of age effects on certain measures of frontally mediated cognitive processes. In concert, these findings emphasize the importance of considering vascular disease risk status in cognitive aging research.

Change blindness and change detection in a structured visual field
Bruce Bridgeman, University of California, Santa Cruz, CA, & Massimo Turatto, University of Trento, Rovereto, Italy

Since detection of changes in the visual world is central to many perceptual tasks, we studied change detection under controlled conditions simulating some important properties of natural images. Each image consisted of 12 different objects, sorted by color into three different levels of probability of change. In experiment 1 change of one object was detected frequently in objects having the highest probability of change, which we hypothesize attracted attention to these objects. Changes in other objects, however, were unlikely to be detected. Detection

improved for less attended objects if the changed stimulus simply disappeared (experiment 2), allowing visual persistence to hold information about the object until attention could be shifted to it. This hypothesis was tested in experiment 3, where stimuli disappeared and then were masked. Compared to experiment 2, detection worsened for unattended objects but remained nearly unchanged for attended objects. The results can explain some properties of change blindness, especially the need for focused attention to detect changes in naturalistic scenes.

The phenomenology of dead reckoning
Edward H. Cornell & Elaine Greidanus Department of Psychology, University of Alberta

In situations where landmarks are indistinguishable, humans and a variety of animals are capable of calculating their position by monitoring their own movement. We contrast two methods that rely on feedback from inertial and non inertial sensations. Path integration involves continuous updating of position and provides no history of legs and turns that comprise a route. Dead reckoning relies on intermittent estimation of direction and distance information from memories. We assessed people¹s dead reckoning during a 1 km walk in an unfamiliar neighborhood. Groups were either fully sighted, blindfolded, or had their vision restricted to a 1 m radius near their feet. Under conditions of visual deprivation, participants identified the configuration of their route and estimated bearings to its origin on the basis of the direction and order of turns. Interestingly, the accuracy of the group whose vision was restricted to textures on the path was not reliably different than that of fully sighted way finders. This suggests that optical flow provides critical non inertial information for human dead reckoning.

Space, time and reference frames: The quantification of stroboscopic induced motion
Paul Dassonville, University of Oregon

In a stroboscopic induced motion display, a large frame that is instantaneously displaced in a horizontal direction will induce an opposing illusory horizontal motion component in a vertically displaced target. Bridgeman & Klassen (1983) demonstrated that this illusory motion is best explained by the induced Roelofs effects, with the displaced frames causing a misperception of target location. Recently, our laboratory has demonstrated that the induced Roelofs effect is itself caused by a distortion of the subject's apparent midline: a frame, offset from the subject's true midline, serves to pull the subject's apparent midline in the same direction. Taken together, these findings suggest that a stroboscopic induced motion display can be used to conveniently measure the time course of the apparent midline distortions that underlie the Roelofs effect. In a series of experiments, we investigated the spatial and temporal characteristics of the Roelofs effect, with the surprising conclusion that the visual system can predict the future! Or maybe not.

Neural systems involved in making category judgments about faces
Joe DeGutis, University of California, Berkeley

Ventral temporal and prefrontal cortices have been implicated in the formation and representation of visual categories. By training participants to become proficient in separating faces into two arbitrary categories, we sought to examine how these areas respond to stimuli with varying degree of category membership. In the fMRI scanner, subjects

performed the face categorization task as well as a 1-back task where they were shown the training faces, novel faces, and novel scenes. The 1-back task was used to functionally define the fusiform face area (FFA) in each subject. When categorizing, the FFA responded significantly more to the least diagnostic faces (faces with mean feature values) compared to the most diagnostic faces (faces with the most extreme feature values). The right dorsolateral prefrontal cortex and anterior cingulate showed a similar pattern of results suggesting that more attention is being applied to the least diagnostic faces. In contrast, the anterior parahippocampus and left anterior prefrontal cortex shows a greater response to the most diagnostic faces than the least diagnostic faces. This suggests that these areas represent the category rule.

The affective Simon Effect: How automatic, how conscious, how specific?
Katia Duscherer, Université René Descartes (Paris V), & Daniel Holender, Université Libre de Bruxelles

In Experiment 2 of J. De Houwer and P. Eelen (1998), participants responded by saying "positive" or "negative" depending on the grammatical category of a word having either a positive or a negative affective connotation. The authors argued that the resulting affective Simon effect is a useful tool for the study of automatic affective processing, because they consider any variant which mirrors the formal relations between the stimulus and the response sets of the original spatial Simon paradigm as functionally equivalent to the latter. We dispute their logic and claim that while the spatial Simon effect can reflect both conditional and unconditional automaticity, the affective Simon effect is only based on conditional automaticity. Our results confirm this interpretation, indicating that the affective Simon effect can only be obtained in situations in which participants are aware of the relationship between the different elements of the experimental situation. We shall cast the discussion of this research into the broader context of the use of Stroop-like and priming paradigms. The question is: Can these paradigms reveal something which is specific to affective processing or do the observed effects depend on general processing constraints that apply equally well to spatial, categorical, and emotional stimulus properties?

Attentional inhibition for spatial location in parkinson's disease
Laura Grande, Harvard Medical School & Boston VA Healthcare System (GRECC) Russell Bauer, University of Florida Bruce Crosson, University of Florida Duande Dede, University of Florida James Algina, University of Florida Kenneth Heilman, University of Florida

Individuals with Parkinson's disease (PD) demonstrate a discrepancy across endogenously-evoked and exogenously-evoked motor actions. Exogenously-evoked movements, which are actions based upon factors external to the individual, typically remain intact in PD patients whereas endogenously-evoked movements, which are actions based on an internal state, are disrupted. In addition to the characteristic motor impairment, PD patients have also been described as suffering from cognitive deficits. similar to those noted in patients with frontal lobe damage. Additionally, these cognitive deficits appear to parallel the distinction between exogenously and endogenously-evoked actions. The current study investigated the possibility that endogenously-evoked attentional inhibition (driven by goal directed behavior) is disrupted in PD with sparing of exogenously-evoked attentional inhibition (driven by sensory information). Two computerized tasks were employed to investigate these hypotheses in PD patients and healthy controls (HC). An inhibition of return (IOR) paradigm was employed to investigate exogenously-evoked inhibition for spatial location, and a negative priming (NP) paradigm was employed to investigate endogenously-evoked inhibition for spatial location. Participants completed these tasks on two occasions, and PD patients completed each measure both on and off their dopamine medication. On the IOR task, PD patients and HC both demonstrated inhibition, and the magnitude of inhibition was similar across groups. On the NP task, PD patients and HC both demonstrated a pattern of inhibition, although the magnitude of inhibition was significantly reduced in the PD group. The current study proposes the involvement of a cortico-striato-pallido-thalamo circuit in understanding the disruption of inhibitory functions in PD.

Remembering emotional events
Friderike Heuer (Willamette University) & Daniel Reisberg (Reed College)

How do we remember the emotional events of our lives? This is an important question from several perspectives: Emotional memories are central to our autobiographies and sense of self, and these memories are often a source of crucial evidence for the courts. In addition, the study of emotional memories provides a natural meeting place for biological and psychological approaches to memory, and also requires an integration of questions about memory with questions about attention (and, in particular, how we allocate our attention during a consequential event). In this talk, we will review emotional remembering from all of these perspectives, describing the broad pattern of evidence already in the literature, and also several of our own more recent studies. We will focus in particular on the fact that some but not all emotional memories contain an "attention magnet" (a threatening weapon, a gaping wound, a destroyed car), and we will discuss how the presence of such a "magnet" influences memory for the event.

Consciousness as a prominent source of dimensional overlap in stimulus-stimulus and stimulus-response relations
Daniel Holender, Université Libre de Bruxelles & Katia Duscherer, Université René Descartes (Paris V)

The notion of dimensional overlap defined as “the degree to which stimulus and/or response sets are perceptually, conceptually, or structurally similar” plays the role of a representational component in the dimensional overlap models developed by Kornblum and associates since 1990 (see Kornblum, Hasbroucq, & Osman, 1990; Kornblum & Stevens, 2002). As such, dimensional overlap provides a useful basis for a taxonomy of common experimental tasks. The models also have a processing component in which the notion of automatic activation plays a central role in explaining how some aspects (whether relevant or irrelevant) of the stimulus/situation can irrepressibly activate a response in the response repertory of the task. However, inadequate specification of the sources of dimensional overlap favors misleading interpretations of the observed effects in which consciousness of the critical relations plays no role. Once it is realized that for a person, what is perceptually or structurally similar is ipso facto conceptually/linguistically similar, important consequences follow for the interpretation of the role of attention and consciousness in the determination of Stroop and Stroop-like and of Simon and Simon-like effects. This holds true whether these effects are elicited by the identity, a specific denotative meaning, or a specific connotative meaning of the relevant and irrelevant stimulus components.

Task effects on ERP measures of sentence processing
Ean Huddleston, Libbey White, Lisa Sanders, Eric Pakulak, Donna Coch, & Helen Neville, University of Oregon

Previous event-related brain potential (ERP) studies have investigated syntactic processing and identified at least two components specific to grammatical violations: a left anterior negativity (LAN) and a posterior positivity (P600). However, little is known about what experimental variables might affect the LAN and P600. We manipulated task (grammaticality judgments vs. simple probe questions) and presence of semantic information

to explore potential effects on syntactic processing. We found that requiring grammaticality judgments affects primarily the amplitude of the P600. In contrast, presence of semantic information affects both the LAN and P600. These results support the hypotheses that the P600 indexes strategically controlled processes such as recovering meaning from a syntactically flawed sentence, while the LAN indexes more automatic syntactic processing whenever listeners process speech as language.

Does the attentional blink prevent spatial shifts of attention?
Pierre Jolicoeur (University of Montreal, Canada) Paola Sessa, & Roberto Dell'Acqua (University of Padua, Italy)

Subjects performed an attentional blink experiment while we recorded electroencephalographic brain responses. The first target, a pink H or S, was presented in an RSVP stream of other letters, at the center of the screen, and was followed by at least one distractor. The second target was a pink X or Y, presented 3 degrees to the left of right of fixation simultaneously with a distractor (the letter W in white). The second target and the distractor were replaced by the letter M, which served as a mask. We focused on the N2pc ERP response time-locked to the onset of the second target. The N2pc is a greater negativity in the ERP response at posterior recording electrodes contralateral to the visual field in which the target was presented. N2pc can reveal the engagement of spatial attention on a processed target. We present preliminary results from our initial experimentation in a program of research designed to determine the interplay between the attentional blink and spatial visual attention.

The role of the fusiform face area in perceptual decision processes
Jagdeep Kaur Bala and Paul Dassonville, Department of Psychology & Institute Of Neuroscience, University of Oregon

While many converging streams of evidence argue for the critical role of the fusiform face area (FFA) in processing face stimuli, the exact nature of its role is as yet undefined. We employed a rapid-presentation, event-related fMRI paradigm to analyze modulations in the activation of the FFA while subjects made perceptual decisions in discriminating low contrast face and scrambled-face stimuli. For identical physical stimuli, activation of the FFA was found to be significantly higher during trials in which subjects (correctly or incorrectly) reported seeing a face than during trials in which subjects reported seeing a scrambled image. The relative contributions of the possible sensory and perceptual factors that contribute to the variance in FFA activation were calculated with a step-wise multiple regression analysis for each of the subjects. Perceptual responses and stimulus contrast contributed significantly to the activation in five of the six subjects. However, after modulations due to perceptual responses and contrast were accounted for, levels describing stimulus identity did not contribute to the magnitude of FFA activation in any of the cases. We propose that the FFA activation reflects the processing of equal/unbiased sensory information for all stimuli and that modulations in this activation reflect the critical role the FFA plays in making perceptual discriminations between face and non-face images.

A Simon Effect for the direction of linear motion
Stephen Killingsworth and Dell Rhodes, Reed College Department of Psychology

The possibility of obtaining a Simon effect for the direction of linear motion was explored in an experiment intended to resolve previous discrepant findings. We used sinusoidal gratings moving leftward or rightward within an aperture centered on the screen. In contrast with previous research, there was no clear “beginning” or “ending” position of an individual object. The task-relevant stimulus dimension was the base luminance of the gratings, which increased or decreased 0, 100, or 400 ms after the beginning of movement. Brightness changes were mapped to left and right keys. A significant Simon effect, which decayed with

increased SOA, was obtained. Participant awareness of the stimulus-response congruency affected responses. Explanations are suggested for why some previous research did not obtain a direction-of-motion Simon effect, and for differing effects of SOA across experiments.

Measuring the allocation of attention

Lachter, Ruthruff & Remington, NASA Ames Research Center

We used briefly presented (~50 ms) masked primes to contrast parallel and serial processes in word identification and exogenous cuing. Because there is insufficient time to reallocate attention to these primes, their effectiveness reflects only the attentional state at prime onset. We found that primes were effective only when exogenously cued, and therefore attended. This finding suggests that previous evidence for the identification of words in irrelevant locations was due to serial shifts of attention rather than to parallel processing without attention. Next we used masked primes to examine exogenous cuing of irrelevant locations when the target location was known in advance. Yantis and Jonides (1990) previously found that exogenous cuing increased compatibility effects at irrelevant locations without slowing target processing. They argued that attention shifted to the exogenously cued location only after target processing had been completed. However, our masked primes at irrelevant locations were effective when cued exogenously, even with a known target location. These results indicate that exogenous cues caused attention to spread before the target was processed, resulting in parallel processing of the exogenously cued and target locations. These studies demonstrate the effectiveness of masked priming in contrasting serial and parallel processing in attention research.

Hierarchical organization in audition and vision

Alexandra List, University of California, Berkeley, Timothy Justus, University of California, Berkeley & Lynn C. Robertson, University of California, Berkeley and Veterans Affairs, Martinez

Various approaches have addressed how the auditory and visual systems integrate stimulus elements to form perceptual wholes, and correspondingly, disintegrate wholes into their component parts. Cognitive psychology, neuropsychology and neuroimaging have all contributed to this enterprise but have examined the visual and auditory systems independently. A number of researchers have postulated asymmetrical hemispheric processing for different hierarchical levels of information (e.g., Ivry & Robertson, 1998 and Poeppel, in press). In a series of experiments, we used a priming paradigm to examine whether we could identify analogous hierarchical processing strategies between the auditory and visual modalities, as suggested by certain theories. We have demonstrated hierarchical level priming in audition comparable to that shown in vision (e.g., Robertson, 1996), for both auditory frequencies (as proposed by Ivry & Robertson, 1998) and temporal ranges (e.g., Poeppel, in press). We have also presented auditory and visual hierarchical stimuli intermingled and found that while the evidence does not currently suggest that auditory primes influence visual processing, it does suggest that visual primes influence auditory processing. These findings will be discussed in light of their implications for theories of perception, attention and hemispheric asymmetry.

Coordination of component mental operations in a multiple-response task
Roger Remington, Shu-Chieh Wu, NASA Ames Research Center & Harold Pashler, University of California, San Diego

Models of human performance typically focus on the mental components of task processing from discrete task trials. This approach neglects the advance planning of actions and overlapping of task processing characteristic of natural settings. Here we examine the relative timing of eye movements and manual responses in a typing-like task with the goal of extending models of discrete task performance to continuous domains. Following Pashler (1994) participants made separate choice responses to a series of five letters spread over a wide viewing area. Significant preview effects were found in both response time and eye movement data. Responses to the first stimulus were delayed, while inter-response intervals for all subsequent items were rapid and constant. The eyes moved away from a letter about 350 ms before the corresponding manual response. We present a computational model of the component mental operations that accounts for the reaction time and eye movement patterns.

The role of emotional content on item and source memory
Arthur P. Shimamura, University of California, Berkeley

Investigations of memory for an emotional event have generally demonstrated enhanced memory for central or emotion-related information. Yet, the status of source or peripheral information has been rather mixed. In some cases source memory is enhanced during an emotional event and in other cases source memory is disrupted. Several studies using emotional stimuli (words, pictures, film clips, facial expressions) assess both item and source memory during the presentation of emotional and neutral stimuli. Conditions under which item/source enhancement or item/source tradeoffs will be elucidated and discussed.

Auditory perception and cortical reorganization in congenital and acquired blindness
Alexander Stevens, Oregon Health & Science University

As a consequence of blindness, auditory perception plays a prominent role in recognition and discrimination of objects and events in the environment. Several lines of evidence suggest that there is general auditory perceptual enhancement in the blind, including speech perception. In addition neuroimaging studies of the blind have suggested that posterior cortical areas normally involved in vision, show functional responses stimuli presented in other sensory modalities. Our recent investigations of auditory discrimination and memory suggest that only the congenitally blind show superior performance than sighted control subjects. Additionally, functional magnetic resonance imaging during speech and non-speech discrimination indicate that the congenitally blind have substantial functional reorganization of posterior cortical areas normally involved in vision, and these areas are particularly sensitive to speech stimuli. Such changes were less apparent for speech stimuli in cases of acquired blindness. These studies will be discussed in terms of developmental factors influencing perceptual compensation and cortical plasticity.

Bilingual auditory word recognition: Language context and lexical access
Dylan E. Stone, Reed College, Portland, Enriqueta Canseco-Gonzalez, Reed College, Portland

Research on bilingual speakers can be used to test the validity of universal models of language processing. We examined speech processing in Spanish-English bilinguals using the eye-tracking technique. Participants heard sentences instructing them to "Click on the X" where X was one of several nouns. Simultaneously, participants gazed at a computer screen presenting four different pictures representing the nouns used in the study. The participants' gaze pattern provides us with a detailed and accurate on-line evaluation of word activation while they process the acoustic information. We tested two competing models of the role of contextual information on bilingual lexical access. The 'late context' models argue that words are initially accessed in both languages, with the context playing a role only in the final stage of the process. Contrasting models argue that context plays an early role by limiting the activation of candidate words only to those in the contextual language.

Neural plasticity in a case of fluent primary progressive aphasia with a selective disconnection between lemma and lexeme levels of processing
Michael Sullivan, Oregon Health & Science University, Portland VA Medical Center

MB is an individual with primary progressive fluent aphasia (FPPA) who presented at onset with an anomia. In contrast to most individuals with FPPA (or semantic dementia), detailed testing revealed that the locus of his anomia was due to a selective disconnection between essentially intact lemma (semantic) and lexeme (phonological) levels of processing. An initial MRI, at the time of testing, revealed a faint lesion within the anterior portion of the left insula. This selective impairment provided a unique opportunity to determine if the lemma-lexeme connection required for object naming could be improved with circumlocution induced naming and phonemic cuing. The results showed consistent stimulus-specific treatment effects with no generalization to untreated stimuli. In addition, there was either no change or a marked decline in other control tasks.

Eye position signals influence pointing responses in the human posterior parietal cortex
Paul van Donkelaar & Jaymi Dreiling, University of Oregon

Previous research has demonstrated that the planning and generation of pointing movements are influenced by signals arising from the saccadic system. However, the type of information carried by these oculomotor signals and how and when they influence the limb movement are unclear. It is possible that signals related to both saccade amplitude and eye position each contribute to the response of the arm, but may do so in unique ways and at specific times. In the present study, we demonstrate that during visual fixation, eye position signals can dominate pointing responses when the activity in the posterior parietal cortex (PPC) in the hemsiphere contralateral to the moving limb is disrupted with transcranial magnetic stimulation (TMS). This dominance of the eye position signal resembles the clinical condition of magnetic misreaching and suggests that the PPC normally compensates for the influence of eye position to allow relatively accurate reaches to targets in peripheral vision.

A neural correlate of visual working memory maintenance
Edward K. Vogel, Masahiro Machizawa, & Jason A. Fair, University of Oregon

Visual working memory is a limited capacity system for maintaining online representations of visual information. Here, we recorded ERPs from subjects while they performed a VWM task in which they were presented a bilateral array of colored squares and were asked to remember the items in only one hemifield. Memory was tested with the presentation of an array that was either identical to the memory array or differed by one color. 200 ms following the onset of the memory array we observed a posterior negative wave over the hemisphere that was contralateral to the memorized hemifield in the array, which persisted throughout the entire duration of the memory retention interval. In subsequent experiments we found that this component was strongly modulated by the number of remembered objects in the array up to the storage capacity limit (~4 items), suggesting that it reflects a specific process of maintaining representations in VWM.

Explicit and implicit priming in a change detection task

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Visual change detection can be quite difficult. In general, changes are noticed more quickly and accurately if they occur in the location of the current focus of attention, or in a location that was recently attended. This experiment investigated the effects of explicit and implicit semantic priming on a subsequent change detection task. Participants first attempted to read aloud a briefly presented prime word and then looked for a difference between two alternating versions of a real-world scene. Successfully read primes were coded as "Explicit," and unidentifiable primes as "Implicit." Primes named either the object that changed (Helpful), or named another object in the picture (Misdirected). Across all subjects, Helpful primes yielded faster change detection times than did Misdirected primes in both the Explicit and Implicit trials. Thus, implicit semantic information can indeed be used to assist in the guidance of attention within a real-world visual scene.

The relationship between perceived length and egocentric location in Müller-Lyer figures with one versus two chevrons

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We examined the apparent dissociation of perceived length and perceived position with respect to the Müller-Lyer (M-L) illusion. With the traditional (two-chevron) figure, participants made accurate open-loop pointing responses at the endpoints of the shaft, despite the presence of a strong length illusion. This apparently non-Euclidean outcome replicated that of Mack, Heuer, Villardi, and Chambers (1985) and Gillam and Chambers (1985) and contradicts any theory of the M-L illusion in which mislocalization of shaft endpoints plays a role. However, when one of the chevrons was removed, a constant pointing error occurred in the predicted direction, as well as a strong length illusion. Thus, with one-chevron stimuli perceived length and location were no longer completely dissociated. It was speculated that the presence of two opposing chevrons suppresses the mislocalizing effects of a single chevron, at least for figures with relatively short shafts.

Hemispheric asymmetries in visual symmetry perception: Implications for stimulus bisection judgments

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Line bisection impairment is greater following right compared to left hemisphere damage, suggesting that some of the underlying visuo-spatial mechanisms may be lateralized. Although there have been many studies of the natural biases inherent in bisection performance, relatively few have examined the means by which bisection decisions are reached. In the present study, we used healthy adults to first examine if the cerebral hemispheres are equally able to differentiate bisected from misbisected stimuli. We show that the right, relative to the left, hemisphere is both faster and more accurate at apprehending bisected stimuli, but no better at apprehending misbisected stimuli. We then tested whether

this hemispheric advantage is based on a greater sensitivity to stimulus symmetry; many geometric shapes retain their symmetry when bisected, but appear asymmetrical when misbisected. The results supported our claim that the bisection behavior of the right, but not left, hemisphere, is intimately tied to mechanisms of symmetry detection. In a further study, we used functional MRI to delineate the neural mechanisms underlying these reported effects. We show that the presence/absence of stimulus symmetry strongly modulates activity of the right hemisphere during bisection judgments. Our data provide further reason why damage to the right hemisphere is closely associated with poor bisection performance.

The effects of age and vascular disease risk factors on clustering and switching in verbal fluency: Findings from the Normative Aging Study

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The number of items generated in verbal fluency tasks is mediated by cognitive processes termed clustering and switching (e.g., Troyer et al., 1997). Troyer et al., and others, have defined clustering as the production of words within a semantic (e.g., birds) or phonemic (e.g., rhymes) subcategory, and switching as the ability to move between subcategories. Although the effects of aging on these cognitive processes have been examined in previous research, the effects of age-related vascular disease risk factors on these processes have not. We (Brady et al., 2001) have shown that the effect of overall stroke risk rivals the effects of age on verbal fluency performance. The present study sought to extend those findings to examine the effects of specific vascular disease risk factors (e.g., hypertension, diabetes, hypercholesterolemia) on clustering and switching in verbal fluency. We examined 187 older men (mean age = 67.9) who were participants in the longitudinal Boston VA Normative Aging Study. These men received a thorough medical exam and a short battery of neuropsychological tests, one of which was animal fluency. We used regression to examine the effects of vascular disease risk factors on verbal fluency total score, mean cluster size, and number of switches. After controlling for age and education, only hypercholesterolemia was associated with total score. However, when looking at the component processes of clustering and switching, a more complex pattern emerged. For example, both systolic blood pressure and diabetes affected the number of switches and mean cluster size, but in opposite directions: a higher systolic blood pressure was associated with a higher mean cluster size and fewer switches, whereas diabetes status was associated with a smaller mean cluster size and more switches. This opposite relationship may account for the lack of association between systolic blood pressure or diabetes status and verbal fluency total score. These findings emphasize the importance of considering vascular disease risk status in cognitive aging research and also highlight the complex nature of vascular disease risk and cognition relationships.

The effect of context on reading mammograms

George Wolford and Anne Rowland: Dartmouth College; Pat Carney & Claudia Kasales; Dartmouth Medical School

Missed breast cancers on mammograms have become the number one source of malpractice suits. The typical scenario is for the cancer surgeon to lament that the woman had not had mammograms earlier. To which she replies, but I have. The surgeon checks those earlier

mammograms and claims to see the tumor plain as day, sue away. As psychologists we understand the importance of hindsight bias. Using professional radiologists and medical students we examined and found the influence of the hindsight bias in reading mammograms.

Attentional focus and balance learning
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When acquiring motor skills, the learners? attention is often directed to the coordination of their body movements (internal focus). In a series of studies we found, however, that motor skill learning can be enhanced by directing the performer?s attention away from his or her body movements and to the effects that these movement have on the environment (external focus). An overview of studies using various balance tasks (similar to those required in windsurfing) will be given. Furthermore, evidence will be presented, which indicates that an internal attentional focus constrains the motor system by interfering with automatic control processes, whereas an external focus seems to promote the utilization of automatic processes in the regulation of movements.

Novelty effects in recognition memory
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The ability to detect novelty is a characteristic of all mammalian nervous systems (Sokolov, 1963), and it plays a critical role in memory in the sense that items that are novel, or distinctive, are remembered better than those that are less distinct (von Restorff, 1933). Although the effects of stimulus novelty on free recall are well documented, the effects on recognition are less well understood. Moreover, the brain regions involved in producing the novelty-related enhancements in memory are unknown. We report results from two experiments examining the effects of perceptual novelty using the von Restrorff paradigm that aim to determine how novelty influences the processes supporting recognition memory. We also report results from a study examining the effects of amnesia on novelty effects in recognition memory.

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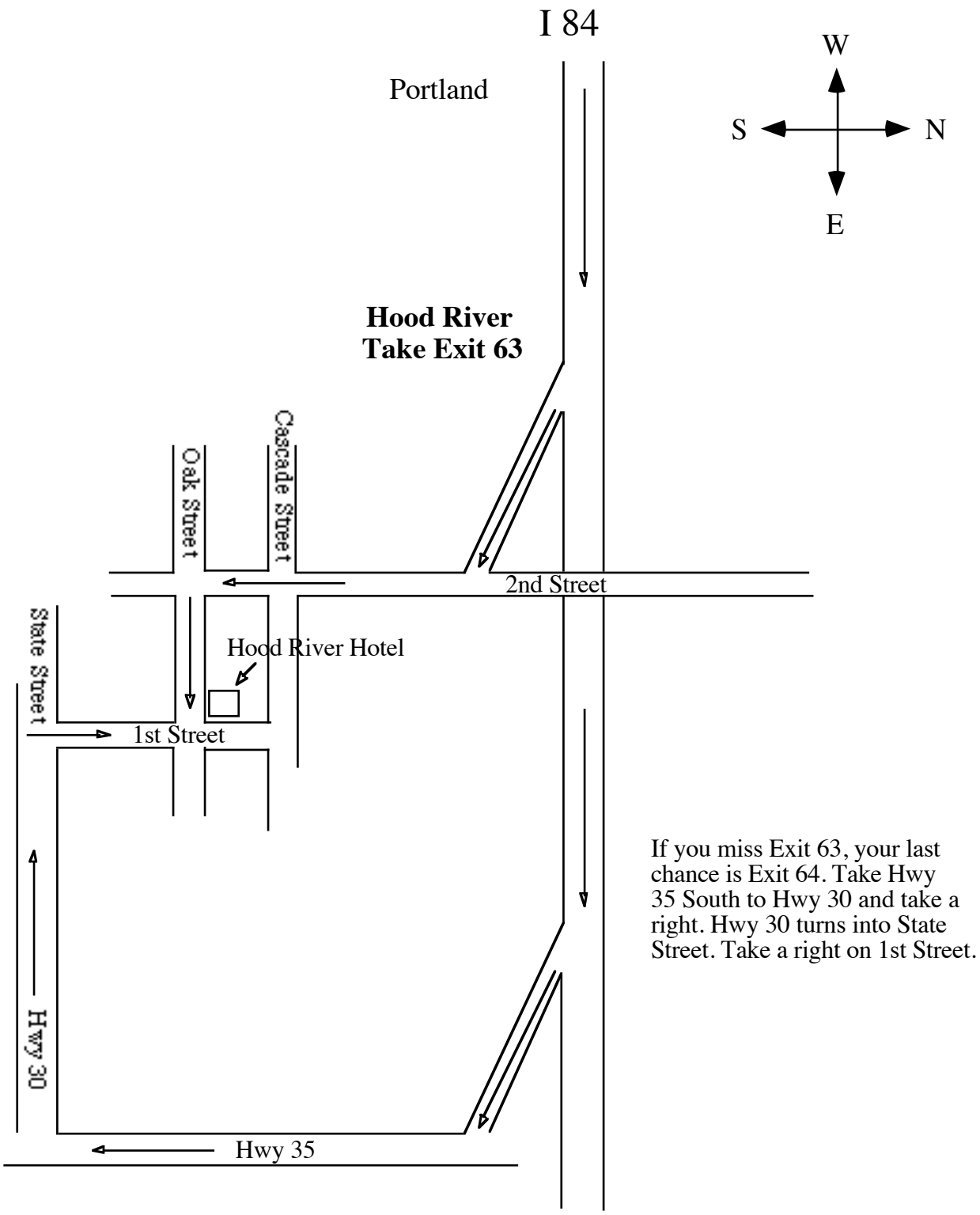
Directions to Hood River Hotel from Portland

(Approximately 60 miles)



If you miss Exit 63, your last chance is Exit 64. Take Hwy 35 South to Hwy 30 and take a right. Hwy 30 turns into State Street. Take a right on 1st Street.