Scene Processing
Grand Ballroom, Friday Morning, 8:00–9:35

Chaired by Carrick C. Williams, Mississippi State University

8:00–8:15 (1)

Encoding and Visual Memory: Is Task Always Irrelevant? CARRICK C. WILLIAMS, *Mississippi State University*—Although some aspects of encoding (e.g., presentation time) appear to have an effect on visual memories, viewing task (incidental or intentional encoding) does not. The present study investigated whether different encoding manipulations would impact visual memories equally for all objects in a conjunction search (e.g., targets, color distractors, object category distractors, or distractors unrelated to the target). Participants were presented sequences of 12 real-world pictures for 637 msec each and were asked to search for prespecified targets (e.g., green apple), memorize all objects, search for specified targets while memorizing all objects, search for postidentified targets (e.g., *How many green apples were there?*), or memorize all objects with one object prespecified. Encoding task significantly affected visual memory, but only for targets and unrelated distractors, indicating differences in the encoding processes of visual memories. Finally, confidence ratings indicated that participants were able to accurately judge the veracity of their visual memories.

8:20–8:35 (2)

When Does Memory Facilitate Perception (of a Scene's Layout)? After One or Two Episodes. THOMAS SANOCKI & NOAH SULMAN, *University of South Florida*—Four experiments indicate that prior memory of a scene is necessary for a top-down spatial priming effect. We measured spatial processing within scenes that were immediately preceded by either a (same) scene prime or a control prime. The scene was either new or repeated on a trial. When new, scenes primes did not cause more accurate processing than did the control prime. However, after one or two repetitions, scene primes increased accuracy (sensitivity) of spatial processing of the briefly presented scene target, relative to the control prime. Thus, facilitation of scene layout processing was not immediate (first primed trial) but required memory for at least one prior episode with the scene. In a fifth experiment, reaction time methods suggested that scene primes can cause a bias effect on the first trial with a new scene.

8:40–8:55 (3)

The Influence of Scene Context on Parafoveal Processing of Objects. MONICA S. CASTELHANO, *Queen's University*—Does scene context influence object recognition before the object is directly fixated? We examined this question using a modified boundary paradigm (Rayner, 1975). The participants' task was to indicate whether a target object matched an object name presented earlier. Critically, objects were presented on either a scene or a gray background. On each trial, a cue appeared, and, once fixated, an object preview would onset 4º or 10º away. The preview object could be identical to the target, of the same category (but with the same or a different shape), of a different category (but with the same or a different shape), or a control (rectangle). During the saccade toward it, the target object replaced the preview. The results revealed that, although there was no effect of preview category, same-shape previews presented at 4º produced a greater benefit on a scene than on a gray background. Two possible influences of scene context on parafoveal preview benefit will be discussed.

9:00–9:15 (4)

The Role of Semantic Memory in Learning Contextual Regularities in Real-World Scenes. JAMES R. BROCKMOLE, *University of Notre Dame*, & MELISSA L.-H. VO, *University of Edinburgh*—When encountering familiar scenes, observers can use episodic memory to facilitate the guidance of attention to objects appearing in known locations or configurations. We investigated whether and how memory for semantic contingencies that exist across different scenes is used to guide attention. Observers searched for letter targets embedded in different bedrooms. In a between-subjects manipulation, targets were always on bed pillows or randomly positioned. When targets were systematically located within scenes, search for them became progressively more efficient. Learning was abstracted away from bedrooms and transferred to a living room, where the target was on a sofa pillow. These contingencies were explicit and led to central tendency biases in memory for precise target positions. These results broaden the scope of conditions under which contextual cuing operates and demonstrate for the first time that semantic memory plays a causal and independent role in the learning of associations between objects in real-world scenes.

9:20–9:35 (5)

Visual Memory: Confidence, Accuracy, and Recollection of Specific Details. GEOFFREY R. LOFTUS, *University of Washington*, MARK T. REINITZ, *University of Puget Sound*, WILLIAM PERIA, *University of Washington*, & JULIE SEGUIN, *University of Victoria, Wellington*—How does the confidence/accuracy relationship differ when picture recognition is based on general familiarity versus specific features? Pictures were presented for varying exposure durations, followed by an old–new recognition test. Observers provided a confidence rating for each old–new response and also indicated whether each response was based on the picture's general familiarity or on one or more specific features in the picture. Feature-based responses produced higher confidence and higher accuracy. However, holding confidence constant, a feature-based response was less accurate than a familiarity-based response. The scientific conclusion is that confidence and accuracy are not based on the same internal events. The practical conclusion is that, contrary to common sense and to normal behavior (see Bell & Loftus, 1988), an eyewitness's accuracy in a legal setting should be discounted more when his or her recognition responses are based on memories for specific features than when they are based on general familiarity.

Selective Attention I
Constitution Ballroom, Friday Morning, 8:00–9:35

Chaired by Jeremy M. Wolfe
Brigham and Women's Hospital and Harvard Medical School

8:00–8:15 (6)

Two Dissociable Decision Criteria in Visual Search Revealed by Varying Target Prevalence. JEREMY M. WOLFE, *Brigham and Women's Hospital and Harvard Medical School*, & MICHAEL J. VAN WERT, *Boston University*—The frequency of targets in visual search (*target prevalence*) shapes search behavior. When targets are rare (1%–2% prevalence), observers use conservative response criteria, producing high miss rates. This might be just a version of a speed–accuracy trade-off, since low prevalence yields fast absent responses. We disprove this hypothesis by showing that very high target prevalence (98%) shifts response criteria in the opposite direction, leading to elevated false alarms, without leading to fast target-present responses. Rather, the rare target-absent responses are greatly slowed. In a second experiment, prevalence was varied sinusoidally over 1,000 trials. Observers' criterion and target-absent RTs tracked prevalence, whereas sensitivity (d') and target-present RTs did not. The results support a model with two criteria, both influenced by prevalence. One criterion governs perceptual decisions about each attended item. The other influences a quitting threshold that modulates RTs for target-absent responses.

8:20–8:35 (7)

Reward-Induced Attentional Amnesia in Visual Search. BRIAN R. LEVINTHAL, *Northwestern University*, & ALEJANDRO LLERAS, *University of Illinois, Urbana-Champaign* (read by Alejandro Lleras)—Intertrial effects in visual search have been demonstrated in a wide variety of paradigms and are known to be remarkably robust. The distractor previewing effect (DPE) is a particularly robust intertrial effect that emerges during oddball feature searches and reflects purely inhibitory attentional biases against one specific visual feature (or category). Previously, we have argued that these inhibitory biases reflect an implicit assessment of the usefulness of the information encountered in recent

(2087)

Adaptive Sequencing in Perceptual Learning. EVERETT W. METTLER & PHILIP J. KELLMAN, *UCLA* (sponsored by Philip J. Kellman)—In perceptual learning (PL), learners come to extract distinguishing features of categories across a series of classification trials, enabling transfer to novel instances. Little is known about practice schedules that optimize this type of PL, nor their relation to laws of learning for factual items. We tested an adaptive algorithm for PL that arranged spacing for categories as a function of the individual learner's trial-by-trial accuracy and reaction time. We taught participants to classify images from 12 butterfly genera. Participants received (1) random presentation, (2) adaptive sequencing, or (3) adaptive sequencing with sets of three sequential category exemplars (miniblocks). Learning efficiency (accuracy per learning trials invested) was reliably greater for adaptive sequencing. Effects persisted over a 1-week delay and were larger for novel items. The results suggest that adaptive sequencing increases the rate of learning and novel transfer—key components of PL and fundamental aspects of learning in many domains.

(2088)

Keeping an Eye on the Spatial Contiguity Principle. CHERYL I. JOHNSON & RICHARD E. MAYER, *University of California, Santa Barbara*—Forty-four participants had their eye movements recorded while viewing a short multimedia presentation about how car brakes work. Half of the participants viewed a separated presentation, in which the words and pictures were presented far away from each other on the screen, whereas the other half viewed an integrated presentation, in which words and pictures were presented close to one another. Previous multimedia learning research has shown that performance on retention and transfer tests is higher for those who receive an integrated presentation, a finding researchers call the spatial contiguity effect (Moreno & Mayer, 1999). In the present study, the eyetracking analysis showed that individuals in the integrated condition made significantly more eye movements between the pictures and text in comparison with those in the separated condition ($d = 1.50$). The results are explained by the cognitive theory of multimedia learning (Mayer, 2009).

(2089)

Causal Reasoning in Pedagogical Settings. PATRICK SHAFTO, *University of Louisville* (sponsored by John D. Coley)—Much of human learning takes place in pedagogical settings, settings in which there is a person who chooses data for the purpose of teaching someone else a concept, and this has been argued to be an important difference between humans and other animals. I will present a computational model of pedagogical reasoning, which formalizes the problem and explains when and how teaching can facilitate learning. I will present the results of a teaching experiment in which participants chose interventions to teach someone the latent causal structure among sets of three variables. I will also present the results of a learning experiment contrasting data from pedagogically and randomly chosen interventions. The results show that the pedagogical model predicts which interventions people choose, and that in learning situations in which the data are ambiguous or surprising, learners use knowledge about the pedagogical nature of the data to guide inferences.

(2090)

Virtual, Relatively Unfamiliar Environments and the Method of Loci: Significantly Worse or Equivalent to Traditional Approaches? ERIC L. LEGGE, ENOCH NG, & JEREMY B. CAPLAN, *University of Alberta* (sponsored by Douglas S. Grant)—The method of loci (MoL) is an ancient mnemonic used to aid memory recall by placing ideas within an imagined environment and imagining navigating the environment to recall the material in order. We investigated the strengths and weaknesses of the MoL in its conventional form as well as asking participants to learn a virtual environment and use it as the basis for their MoL strategy. Our results suggest that the virtual variant of the MoL can function almost as effectively as its traditional counterpart. Thus, a high degree of environmental familiarity was not required to use the MoL efficiently. Also, both MoL variants did not seem particularly specialized for concrete lists or particularly susceptible (or resilient) to proactive interference. Finally, we assessed participants' compliance in using the MoL as instructed and found that there was a large degree of individual variability in comparison with a different imagery-based mnemonic (the link method).

(2091)

Effects of Presentation Order During Training to Follow Navigation Instructions. VIVIAN I. SCHNEIDER & ALICE F. HEALY, *University of Colorado, Boulder*, IMMANUEL BARSHI, *NASA Ames Research Center*, & BLU MCCORMICK & LYLE E. BOURNE, JR., *University of Colorado, Boulder*—In what order should conditions varying in difficulty be presented during training? Subjects were trained to follow navigation instructions for movement in grids on a computer screen simulating a 3-D space. They repeated and then followed the instructions by mouse-clicking on the grids. They were trained, given a short distractor task, and then tested. Messages varied from one to six commands. Three groups differed in the order of message lengths during training: ascending (short to long), descending (long to short), and mixed (all lengths intermixed pseudorandomly), with all groups tested on all lengths in the mixed format. At test, there were no effects of training condition for short lengths, but performance was best with descending training for long lengths. This result is inconsistent with previous reports concerning the advantages of errorless learning (easy to difficult) but is consistent with previous reports concerning the advantages of initial training with complexity (difficult to easy).

• METAMEMORY/METACOGNITION •

(2092)

Structural Knowledge About Inaccessible Target Words During TOTs. ALAN S. BROWN & CHRISTOPHER N. BURROWS, *Southern Methodist University*—Prior research indicates that structural aspects of target words (letters, syllables) are available during tip-of-the-tongue (TOT) experiences. Laboratory support is often based on selective reporting, potentially exaggerating the incidence of such availability. To eliminate selectivity, we assessed target word partial knowledge on every trial in which retrieval was unsuccessful. Although it was most accurate during TOTs (35% above chance), first-letter recognition also occurred when the target word was rated as unfamiliar, vaguely familiar, and moderately familiar (10%, 14%, 23% above chance). The utility of alphabet search was supported: Correct letter selection precipitated target word retrieval most often during TOTs (23%), with no difference among lesser confidence levels (4%, 6%, 12%). Syllable number information is weak, and evident only on TOT and moderately familiar trials (5% above chance). Recognition was higher following correct (vs. incorrect) first-letter selection, raising methodological concerns about recognition tests with designs requesting partial TOT target word information.

(2093)

Error Prevalence Affects Detection in the Moses Illusion Paradigm. ANDREA N. ESLICK, *Duke University*, HAYDEN C. BOTTOMS, *University of Nebraska*, & ELIZABETH J. MARSH, *Duke University* (sponsored by Ian G. Dobbins)—The Moses illusion occurs when participants fail to detect semantic errors in questions and instead answer them as if they were correct (Erickson & Mattson, 1981). For instance, participants might answer the question "How many animals of each kind did Moses take on the Ark?" with "Two," despite knowing that Noah, not Moses, built the Ark. A correlation among published articles suggests that the frequency of errors affects participants' error detection; that is, if errors are more prevalent, detection ability increases. The present experiment directly manipulated this relationship and further examined whether failure to detect errors affected performance on later general knowledge tests. The results suggest that error prevalence affects participants' error detection: Detection increases when errors are common. Furthermore, failing to detect errors has negative consequences on later general knowledge tests: Participants are more likely to produce the misleading answer (e.g., Moses) if they previously failed to detect the error.

(2094)

Aging, Abilities, and Effective Monitoring of Part-Set Cuing Interference. EDWARD T. COKELY, *Max Planck Institute for Human*