

regions for abstract word access and phonological processing, suggesting the hypothesis that abstract words are more sensitive than concrete words to phonological variables. Moroschan and Westbury (submitted) tested this hypothesis by manipulating imageability and phonological neighborhood size in lexical decision and semantic decision tasks, both auditorily and visually. Significant interaction effects were found in experiments with the auditory modality, which stresses phonological processing, but not with the visual modality. We provide evidence of these effects in another task that emphasizes phonology: a rhyme priming task. These findings are buttressed by a dictionary study showing the predicted pattern: Abstract words tend to have smaller phonological neighborhood sizes than do concrete words. The implications of these findings are discussed.

(3009)

Distributional Analyses in Auditory Lexical Decision: Neighborhood Density and Word Frequency Effects. WINSTON D. GOH, LIDIA SUAREZ, MELVIN J. YAP, & SEOK HUI TAN, *National University of Singapore*—The effects of phonological neighborhood density and word frequency in spoken word recognition were examined using distributional analyses of response latencies in auditory lexical decision. A density \times frequency interaction was observed in mean latencies; frequency effects were larger for low-density words than for high-density words. Distributional analyses revealed that this interaction was primarily due to differential shifting of the modal portion of the latency distribution between high- and low-frequency words as a function of density. For low-density words, frequency effects were reflected in both distributional shifting and skewing. For high-density words, frequency effects were mediated purely by distributional skewing. The results suggest that word frequency plays a role in early auditory word recognition only when there is relatively little competition between similar-sounding words.

(3010)

Are Two Stimuli Better Than One? Forced Choice Lexical Decisions. GREGORY O. STONE & MAGGIE GORRAIZ, *Arizona State University* (sponsored by Peter R. Killeen)—We introduce a new version of the lexical decision task (LDT)—forced choice lexical decision. Participants are simultaneously presented with two stimuli, one of which is a word (PEARL) and one of which is not (GLUMP). They must indicate as quickly and as accurately as possible which stimulus is the word (i.e., word on right vs. word on left). In the principal experiment, participants run in a large number of trials in both standard and forced choice LDTs (400 trials each). The full patterns of data (especially reaction time distributions) are used to empirically test hypotheses about how performance in a forced choice LDT relates to performance in a standard LDT. For example, forced choice processing could employ self-terminating serial access for the two stimuli, exhaustive serial access, independent parallel access, and so on. Additional experiments demonstrate some uses for this new task.

(3011)

Pathway Control in Visual Word Processing: Consequences for Memory Performance. SEAN H. K. KANG & DAVID A. BALOTA, *Washington University*, & MELVIN J. YAP, *National University of Singapore*—Can readers exert strategic control in speeded pronunciation, and does this have consequences for later memory performance? The pathway control hypothesis claims that the relative contributions of the lexical and nonlexical pathways can be modulated by the task context. In Experiment 1, subjects named high- and low-frequency regular words in the context of low-frequency exception words or nonwords. Frequency effects (faster latencies for high-frequency targets) were smaller in the nonword context, consistent with the notion that nonwords emphasize the characteristics of a relatively frequency-insensitive nonlexical pathway. Importantly, we also assessed memory for targets, and a similar attenuation of the frequency effect occurred in recognition memory. In Experiment 2, we found that neighborhood size effects on naming and recognition memory were similarly modulated. These memorial effects are most consistent with the pathway control account and cannot be fully accommodated by alternative accounts based on changes in response time criteria or target distinctiveness.

(3012)

Pupil-Blah-Metry: Word Frequency Reflected in Cognitive Effort. MEGAN H. PAPESH & STEPHEN D. GOLDINGER, *Arizona State University*—We used a modified delayed naming procedure to assess postperceptual word frequency effects. In addition to standard naming latencies, we examined changes in pupil dilation; these served as a real-time index of cognitive effort. Using a dual-task procedure with various delays after word perception and a constant response (“blah”) for catch trials, we extended previous findings (Goldinger et al., 1997). In two experiments, we observed frequency effects in naming latencies across delays and levels of task difficulty. Pupil dilation was a relatively late-arriving index of attention, reflecting cognitive effort displaced from events by several hundred milliseconds. Pupil dilation was sensitive to word frequency: Low-frequency (LF) words triggered greater increases in dilation, relative to high-frequency (HF) words. Frequency also affected the “blah” trials. Pupillary frequency effects were strongest when the response tone followed shortly (250 msec) after word presentation and were exacerbated as dual-task difficulty increased. We interpret the data as reflecting attentional differences in the processing of LF and HF words.

(3013)

Effects of Lexical Status and Morphological Complexity in Masked Priming: An ERP Study. JOANNA A. MORRIS, *Hampshire College*, JAMES H. PORTER, *Tufts University*, JONATHAN GRAINGER, *LPC, CNRS, and Aix-Marseille University*, & PHILLIP J. HOLCOMB, *Tufts University*—This study examined event-related potential responses to simplex targets (e.g., *work*) preceded by masked primes in which the target was embedded. Primes were (1) true derivations of the target (*worker*), (2) nonwords consisting of the target and a nonmorphological ending (*workel*), (3) morphologically complex pseudowords consisting of an illegal combination of the target and a suffix (*workness*), and (4) unrelated primes (*musical*). Decompositional models of morphological processing predict that priming from both true derivations (*worker*) and complex pseudowords (*workness*) should be greater than priming from monomorphemic pseudowords (*workel*). In contrast to this prediction, we found that all prime types—existing derived words, complex pseudowords, and monomorphemic pseudowords—led to a similar reduced N400 to the following target. This finding suggests that in some instances, masked morphological priming cannot easily be distinguished from orthographic priming.

(3014)

The Time Course of Orthography and Phonology: ERP Correlates of Masked Priming Effects in Spanish. MARTA VERGARA-MARTINEZ, *University of California, Davis*, MANUEL CARREIRAS, *Universidad de La Laguna*, MANUEL PEREA, *Universidad de València*, & ALEXANDER POLLATSEK, *University of Massachusetts, Amherst* (sponsored by Debra L. Long)—One key issue for computational models of visual word recognition is the time course of orthographic and phonological information during reading. Previous research has shown that orthographic codes are activated very early and immediately after phonological activations comes into place. Here, we report an ERP masked priming experiment in which a very strict orthographic control condition was used and phonological effects were tested under a maximal orthographic overlap. The critical phonological comparison was between sets of primes that had the same orthographic similarity to the target words but differed in phonological similarity (e.g., *conal*–CANAL vs. *cinál*–CANAL vis-à-vis *ponel*–PANEL vs. *pinel*–PANEL), whereas the critical orthographic condition was between sets of primes that had the same phonological similarity but differed in orthographic similarity (e.g., *conal*–CANAL vs. *konal*–CANAL). The results showed that orthographic priming was observed mainly at the 150- to 250-msec time window, whereas phonological priming occurred at the 350- to 550-msec window.

(3015)

No Influence of Articulatory Suppression on Word and Pseudoword Superiority Effects. MONICA STILLWELL & GIORDANA GROSSI, *SUNY, New Paltz* (sponsored by Jonathan Grainger)—In this study, we explored the role of phonological recoding in word and pseudoword superiority effects, previously characterized as pure orthographic effects.