

The occurrence of a 6.8-magnitude earthquake in the Pacific Northwest during a long-term study looking at activity and emotional changes in dogs as a function of weather allowed exploration of this question. Forty-one percent of 193 dogs showed a marked increase in activity level and apparent distress the day before the earthquake. Hearing-impaired dogs did not appear to anticipate the event. Dogs with floppy ears, which slightly raises hearing thresholds, were less likely to be responsive. Dogs with smaller head size (with lower thresholds for higher frequencies) were more likely to anticipate the earthquake. This suggests that high-frequency sounds of underground rocks breaking or scraping that are beyond human hearing range may be the signal that dogs are responding to.

2:10-2:25 (85)

**Predicting Cognitive Impairment From Olfactory Sensitivity Measures: A "Continuous" Approach.** ANA GARRIGA-TRILLO, CEEN-UNED, & FRANCISCO AGUILERA-GENICIO, *Universidad Nacional de Educación a Distancia, Madrid*—Deficits in olfactory sensitivity have been found in neurodegenerative diseases, using various sensitivity measures. Devanand (2004), using a 10-smell test, has predicted Alzheimer's disease when considering healthy subjects, patients with minimal to mild cognitive impairment (MMCI), and patients with Alzheimer's disease. Not considering neuro-degenerative diseases or groups with differential cognitive impairment, this research will study whether olfactory sensitivity can predict "continuous" cognitive impairment in an elderly Spanish sample ( $N = 65$ ), using both parametric and nonparametric techniques. Cognitive impairment was measured by the Mini-Mental State Examination and the Eurotest (Carnero, 2005). Olfactory sensitivity was measured by the number of correct odor identifications with a nonverbal task and by thresholds. Results show that (1) the number of odors correctly identified can predict cognitive impairment with both tests and (2) olfactory thresholds can only predict Eurotest's scores. Therefore, olfactory sensitivity can predict cognitive impairment when both types of statistical analyses were used.

2:30-2:45 (86)

**Haptic Recognition of Static and Dynamic Expressions of Emotion in the Live Face.** SUSAN J. LEDERMAN, *Queen's University*, ROBERTA L. KLATZKY, *Carnegie Mellon University*, & ANETA ABRAMOWICZ, KATHERINE SALSAMAN, RYO KITADA, & CHERYL HAMILTON, *Queen's University*—If humans can detect the wealth of tactile and haptic information potentially available in live facial expressions of emotion (FEEs), they should be capable of haptically recognizing the six universal expressions of emotion (anger, disgust, fear, happiness, sadness, and surprise) at levels well above chance. With minimal training, the overall mean recognition accuracy was 51% for statically expressed FEEs that were actively explored using both hands. The corresponding mean accuracy was 74% when the FEEs were dynamically expressed beneath the subject's stationary hands. Chance was 16.7%. With the exception of static fear, all FEEs were successfully recognized above chance level. Overall confidence and information transmission were also higher for dynamic than for corresponding static faces. Our performance measures—accuracy, response latency (dynamic FEEs only), and confidence ratings—confirm that happiness, sadness, and surprise are well recognized, followed by anger, disgust, and fear.

2:50-3:05 (87)

**Incorporating External Objects Into the Body Schema.** FAY SHORT & ROBERT WARD, *University of Wales, Bangor* (read by Robert Ward) (sponsored by Charles Leek)—We investigated the plasticity of the body schema and the conditions under which external objects, in a virtual reality environment, could be incorporated into the body schema. Previous research has shown that faster responses are made to targets on the body, in comparison with just off the body (Hari & Jousmäki, 1996). A similar effect was found for virtual "limbs," with faster responses to targets on versus off the virtual limb. For this measure, the visual appearance and spatial location of the virtual limbs

were irrelevant, but controllability, predictability, and task relevance of the limbs were necessary for incorporating the limb into the body schema. We conclude that the body schema can be extended to incorporate objects under the consistent, predictable control of the individual.

3:10-3:25 (88)

**Prism Adaptation Is Not Abolished by Delayed Visual Feedback.** ROBERT B. WELCH, *NASA Ames Research Center*, MERRIT HOOVER, *University of California, Santa Cruz*, & JENNIFER SWEETON, *Stanford University*—On the basis of the research of Richard Held and his colleagues (e.g., Held, Efstathiou, & Greene, 1966), it has long been an article of faith that visual feedback delays as short as 0.3 sec completely abolish prism adaptation and, by extension, adaptation to any form of sensory rearrangement. We think there are several reasons why Held et al. found this result: (1) the absence of error-corrective feedback during their exposure phase and (2) their use of continuous, rather than discrete, visual-motor responses. Our research compared prism exposure with and without visual error-corrective feedback from discrete target-reaching responses, with delays ranging from 0 to 10 sec. Congruent with our expectations, we obtained substantial adaptation in even our longest delay condition, as measured by post-/preshifts in open-loop hand-eye coordination, partial intermanual transfer of these shifts, and adaptive changes in visual straight ahead.

3:30-3:45 (89)

**The Cross-Modal Spotlight of Attention.** HONG Z. TAN, *Purdue University*, & ROB GRAY, *Arizona State University East*—Previous research on cross-modal attentional orienting has reported speeded reaction times (RTs) when the stimuli from the different modalities have been in the same location and slowed RTs when the stimuli have been presented in very different locations—for example, opposite sides of the body. However, little is known about what occurs between these two extremes. We systematically varied the separation between cues and targets to quantify the spatial distribution of cross-modal attention. In all the experiments, the participants judged whether a visual target (presented at different lateral positions) appeared above or below their forearm. We used two cross-modal cuing conditions (vibrotactile cues presented on the forearm or auditory cues presented below the forearm) and one unimodal cuing condition (visual cues presented on the forearm). The distribution of attention following the cross-modal cues was generally more diffuse than the distribution for the unimodal cues. Implications for the development of multimodal interfaces are discussed.

#### Psycholinguistics

Grand Ballroom I, Friday Afternoon, 1:30-3:10

Chaired by Boaz Keysar, *University of Chicago*

1:30-1:45 (90)

**Cultural Differences in Perspective Taking.** SHALI WU & BOAZ KEYSAR, *University of Chicago* (read by Boaz Keysar)—Theories suggest that East Asian cultures promote an "interdependent" self, whereas Western cultures promote an "independent" self. We investigated whether this cultural difference affects the mental processes that underlie perspective taking. Chinese pairs and American (non-Chinese) pairs played a communication game. One participant instructed the other ("the addressee") to move objects in an array that included mutually visible objects and objects that only the addressee could see. Eye movement of the addressee served as an index of referent identification. We found a clear difference between the Americans and the Chinese. Americans showed a strong egocentric tendency, often treating objects the instructor could not see as targets. This interfered with the detection of the target. In contrast, Chinese addressees were almost never egocentric. This suggests that cultural patterns that focus attention on either the self or the other determine the way people take perspective in communication.