ing, translation, and word naming as encoding tasks for later picture naming and translation. Comprehension processes benefited from prior production in the same language, and production processes benefited from prior comprehension. However, these response time reductions were smaller than with identical process repetition, suggesting some degree of process directionality. Error rate reductions followed a different pattern, with comprehension at encoding eliciting the largest benefit in production. Possible methods of incorporating backward processes into a quantitative transfer-appropriate processing model are examined.

(2097)

Picture Priming in a Successive Two-Choice Discrimination Task in Pigeons. SUZETTE L. ASTLEY, HOLLY LATTERELL, & SASHA BURNETT, *Cornell College*—In a study of picture priming, pigeons were first trained to respond differentially in a two-key choice task in the presence of 1 of 20 pictures of cars or people to a criterion of 80% correct. In test sessions, target pictures were presented relatively briefly, and were preceded 60 sec earlier by a 10-sec presentation of either the same picture (e.g., Person 1 → 60-sec ISI → briefly presented Person 1) or a picture from the other category (e.g., Car 1 → 60-sec ISI → briefly presented Person 2). The results showed that seeing the same picture 60 sec earlier facilitated performance in some of the birds.

(2098)

Intuitive Gestalt Perception Rests on the Unconscious Activation of Semantic Concepts. ANNETTE BOLTE, *Braunschweig University of Technology*, & THOMAS GOSCHKE, *TU Dresden*—*Intuition* denotes the ability to judge stimulus properties better than chance levels without being able to express the basis of the judgments verbally. Here, we show that intuitive judgments in a gestalt perception task are based on the unconscious activation of conceptual object representations. Participants were presented fragmented line drawings which depicted meaningful objects (coherent fragments) or contained randomly displaced line segments (incoherent fragments). In three experiments, participants discriminated coherent and incoherent fragments at better than chance levels even if they did not recognize the objects. Moreover, object names produced faster lexical decision latencies when they were preceded by coherent rather than by incoherent fragments. Coherent fragments producing larger priming in the lexical decision task (indicating stronger activation of object representations) were more frequently judged as coherent. The results indicate that intuitive gestalt judgments rest on the activation of semantic object representations, which bias conscious decisions without being consciously retrieved.

• TOUCH •

(2099)

Haptic Memory Capacity. TOMOHIRO NABETA & TAKASHI KUSUMI, *Kyoto University*—The present study examined the capacity of the haptic memory and its modality specificity. The experiment consisted of the haptic study and the recognition test phases. In the haptic study phase, 100 or 500 objects were presented with the haptic modality. In the recognition test phase, the studied and distractor objects were presented with the haptic or visual modality. We obtained four main results: (1) Hit rate was very high after studying 500 objects as well as after studying 100 objects. (2) Hit rates in the haptic test and in the visual test were almost identical. (3) False alarm in the haptic test was lower than in the visual test. (4) The difference in the false alarm between the haptic and visual modalities after studying 100 objects was comparable with the difference after studying 500 objects. The results suggest that the capacity of the haptic memory depends on the modality specific system.

(2100)

The Haptic Horizontal–Vertical Curvature Illusion. MORTON A. HELLER, ANNE D. McCLURE, MICHELLE E. KERR, STEPHANIE

KIBBLE, KRISTEN RUSSLER, & ANDREANA BASSO, *Eastern Illinois University*—Blindfolded subjects used their index fingers to trace tangible convex curved lines with heights equal to their widths at the base. A generalized overestimation of height in comparison with width was found, showing a horizontal–vertical illusion with tangible curves. Overestimation of height and underestimation of width also occurred with stimuli in the frontal plane as well as flat on the table top. The illusion was obtained with curves that were closed as well as open. Finally, an experiment manipulating stimulus rotation showed evidence of radial–tangential scanning effects. The theoretical and practical implications of the results will be discussed.

(2101)

Haptic Stiffness Identification and Information Transfer. STEVEN A. CHOLEWIAK & HONG Z. TAN, *Purdue University* (sponsored by Hong Z. Tan)—This experiment investigated static information transfer (IT) in a stiffness identification experiment. Past research on stiffness perception has only measured the Weber fractions. In many applications where haptic virtual environments are used for data perceptualization, both the ability to discriminate stiffness (Weber fraction) and the number of correctly identifiable stiffness levels (2^{IT}) are important for selecting rendering parameters. Ten participants were asked to tap a virtual surface vertically using a custom-designed haptic force-feedback device and identify the stiffness level. Five stiffness values in the range 0.2 to 3.0N/mm were used. The virtual surface was modeled as a linear elastic spring and exerted an upward resistive force equaling the product of stiffness and penetration depth whenever it was penetrated. A total of 250 trials were collected per participant. The average static IT was 1.57 bits, indicating that participants were able to correctly identify about three stiffness levels.

(2102)

Haptically Guided Grasping and the Perceptual Effects of the Tactual Sander Illusion. ALAN C. SCOTT & RANDOLPH D. EASTON, *Boston College* (sponsored by Randolph D. Easton)—The Sander illusion has been used to demonstrate the lack of an effect on grip aperture during visually guided grasping despite the presence of a perceptual illusion which produces differentiable estimates of the lengths of the two equal diagonals (Stöttinger & Perner, 2006). With plans to investigate the possibility of differentiable effects of illusions on haptic perception and haptically guided grasping, two studies were conducted. Without the aid of vision, 20 participants attempted to reach out and grasp items of various lengths and orientations using left-handed exploration and right-handed grasping (Experiment 1). Haptically guided grasping did produce differences in grip aperture which were dependent on differences in stimulus length as small as 0.35 cm. In Experiment 2, 28 participants made judgments under blindfold about the length of various stimuli (including Sander's parallelogram) using simultaneous right-handed exploration and left-handed adjustments of a haptic ruler. Müller-Lyer and Sander stimuli both produced perceptual illusions of length.

(2103)

Discriminating Smooth From Grooved Surfaces: The Role of Skin Conformance. GREGORY O. GIBSON & JAMES C. CRAIG, *Indiana University*—The role of skin conformance and penetration on discriminating a smooth from a grooved surface (the smooth–grooved task, SM/GR) was examined at two locations (fingerpad and fingerbase). To establish a baseline, the penetration produced by a 100-g force was determined for each subject. One psychometric function was generated using a constant level of penetration (the baseline level). A second psychometric function was generated using five different penetrations (baseline, ±1,000, and ±500 μm of penetration); these were achieved by varying force. The results indicate that randomly varying penetration of the contactor into the skin had no significant effect on SM/GR performance. If subjects had based their decision of smooth versus grooved on overall intensity, thresholds should have increased substantially in the variable penetration condition. Greater confor-