◆ **Compatibility of context sizes in face perception—a different perspective on holistic effects**

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The holistic hypothesis is one of the most noted hypotheses in face processing, empirical proof being provided by the whole-to-part superiority (Tanaka and Farah, 1993). Leder and Carbon (2005) investigated whole-to-part superiority in face recognition and found evidence suggesting compatibility between learn and test conditions as an important factor. The present study further investigates the compatibility hypothesis in face perception, using a sequential matching paradigm. Context sizes for prime and target were fully crossed on the levels 'eyes' (eyes region only), 'eyes & nose' (eyes & nose region) and 'full' (whole face). Faces were matched on distinctiveness, attractiveness and typicality, based on a preliminary rating study (N=10). The main study (N=36) revealed systematic compatibility effects on reaction times: the more compatible the two contexts of a trial were, the faster participants reacted. The RT data thus supports the idea that holistic effects can mainly be explained by compatibility effects.

POSTER SESSION: HAPTICS

◆ **Visuohaptic integration in softness estimation of softness of deformable objects**

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Softness perception intrinsically relies on haptic information. Everyday-life experience teaches us some correspondence rules between perceived softness and the concurring visual effects of exploratory movements that are executed to feel softness. We investigated whether and how the brain integrates visual and haptic information while estimating the softness of deformable objects. We created 2 sets of rubber specimens, whose compliance varied in a controlled fashion: a hard set (0.12 to 0.25 mm/N) and a soft set (0.74 to 1.26 mm/N). In the experiment, participants touched these real stimuli, while they watched a simulation of their finger movements and stimulus deformation on a collocated visual 3D display. The experiment used the method of constant stimuli combined with a 2AFC task: participants always explored two stimuli and judged which one was softer. They either used haptic and visual input simultaneously, only haptic input, or only visual input. Input in the visual-only condition was based on movement sequences in previously run visuo-haptic trials. In the visuo-haptic conditions, we introduced slight discrepancies between visual and haptic compliance information. The results suggest that visual and haptic inputs are integrated to form visual-haptic softness estimates. Moreover, the visual weight is larger for soft as compared to hard stimuli.

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◆ **Effects of visible contact point on visual–haptic integration in 3D shape perception**

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This study investigates the influence of a visible contact point on integrating visual and haptic information in 3D shape perception using a force-feedback device and stereo shutter goggles. Virtual stimuli were pair-wise presented fixed haptic surfaces and various visual surfaces whose coronal sections were described by hyperpolic tangent function with different inclination and amplitude. A small sphere, which followed hand movements on the haptic surface while its position complied with the visual surface, was visible in one condition and invisible in the other. It gave subjects the illusion of contact point on the visual surface. Subjects were asked to freely explore and judge whether the two surfaces were the same or not, and if not, which surface was steeper or higher. Adaptive staircase procedure was applied to obtain the range of inclination and amplitude in which subjects could not sense the incongruity of the surfaces they were looking at and touching. The ranges expanded when the contact point was visible, averagely 155% and 265% of the values of the other condition for inclination and amplitude, respectively. The results suggest that the visible contact point plays an important role in jointing vision and touch information to form an integrated representation.

◆ **Influence of 3-D objects' shape on weight perception**

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The size-weight illusion has been studied since 1891 (for overview see (Murray et al, 1999 *Perception & Psychophysics* **61** 1681-1685)). Recently, Kahrimanovic et al (2010 *Attention, Perception, & Psychophysics* **72** 517-527) demonstrated the existence of another perceptual phenomenon: the haptic

shape-size illusion. Based on these illusions, we hypothesized that the perceived weight of objects should (besides their mass) not only depend on their size but also on their shape: the shape-weight illusion. The present study investigated a possible existence of this illusion with 3D objects, which subjects could explore freely. We tested whether this illusion could be explained by a combination of the shape-size and the size-weight illusions, and whether the effect is altered by the availability of visual cues, compared to a purely haptic condition. Fourteen subjects participated in both a haptic and a bimodal condition. They were presented with tetrahedrons, cubes and spheres (16.8–117.6 g). A magnitude estimate of perceived weight was obtained on each trial. The results showed a significant effect of objects' shape on the perceived weight. However, this effect could not be explained entirely by a combination of the former two illusions. Similar patters are observed in the haptic and bimodal conditions.
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◆ **Choice blindness for haptically presented objects**

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Choice blindness is the failure to notice a mismatch between intention and outcome when making decisions [Johansson et al, 2005 *Science* **310**(5745) 116–119). In the original task, participants were asked to choose which of two facial photographs they found more attractive. While justifying this choice, the preferred and non-preferred images were sometimes switched. Only about 25% of such manipulations were typically detected. In the current work, we asked if choice blindness occurred with common 3D objects that were felt rather than seen. Participants placed their hands inside a specially constructed box that had two individual compartments. They were told to feel the two objects, remove their hands and then indicate a preference. On some trials they were asked to again feel the preferred object and justify why it had been selected. A silent turntable was used to switch objects between choice and justification. For similar pairs of objects, we found detection rates of around 22%, but for pairs consisting of more distinctive exemplars, this rate rose to 70%. A control experiment confirmed that similar pairs were easily distinguishable from identical pairs. Our results suggest that object complexity and similarity strongly modulate the occurrence of choice blindness.

◆ **'Feeling by seeing': Reconstructing haptic sensing by non-attentive visual method**

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Effectiveness of minimally invasive surgery robots is limited by the surgeon's lack of haptic sensation while remotely operating the robot. Thus, reconstruction of haptic sensation has become an important research goal. Here we report an experiment in which visual stimuli successfully evoked haptic sensation. Participants tracked predefined paths on silicon surfaces, while maintaining constant stylus pressure. Visual feedback on pressure was provided as a color signal (color performance-lines displayed on the task screen) and as a frequency signal (pulsating ellipses displayed on a unique haptic sense display (HSD) developed for this study). The HSD was positioned peripherally at a 40 deg visual angle, and a secondary 'Landolt C' detection task ensured that HSD was unattended. Comparing acquisition phase performance with trials (HSD-only, color-line-only, and no-feedback conditions), pressure was efficiently maintained in the color-line-only condition, as expected, and in the HSD-only condition. Performance significantly declined in the no-feedback condition. Further test phases utilizing virtual surfaces (no contact between stylus and tracking surface), yielded similar results and subjective haptic sensation reports. Our results indicate a crossmodality processing of haptic sensation, induced by a non-attended peripheral-visual stimulus.

◆ **Touched by the moment? Factors modulating haptic and visually-based mere exposure effects**

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Zajonc (1968 *Journal of Personality and Social Psychology* **9** 1-27) showed that the attitude towards stimuli to which one has previously been exposed is more positive as compared to novel stimuli. This mere exposure effect (MEE) has been tested extensively using various visual stimuli. However, research on MEE is sparse for other sensory modalities. We used objects of two material categories (stone and