Thursday

\^ \textbf{The weight of representing the body: factors influencing multisensory integration}

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Perception and action have been functionally dissociated within the visual system. Here we investigate whether the somatosensory system shows a similar dissociation. So far the most commonly used dissociation is between the body schema underlying actions, and the body image used to make perceptual judgments. In a number of experiments using several somatic bodily illusions, we show that: (i) action is robust against bodily illusions that do affect perceptual body judgments, (ii) additional proprioceptive information provided by actions reduces illusion perceptual displacement, and (iii) this dissociation is likely to have distinct neural substrates, as evidenced by reduced illusion sensitivity for perceptual judgments after transcranial magnetic stimulation. Although these results are in line with a perception/action dissociation, the question remains whether we need multiple body representations to explain these functional differences. We propose an alternative approach in which multisensory information is weighted and integrated differently depending on whether we use our body as a goal (perceptually), or as a means to a goal (action).

\^ \textbf{Scenario-based crossmodal touching: How top \^ down processes influence tactile and visual appreciation}

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Research in cognitive psychology on the tactile appreciation is still very limited, for two major reasons: (a) lack of standardized and well-established tactile reference test frames, (b) absence of clearly defined standard procedures for testing. Here we develop a new scenario-based test procedure utilizing a tactile test frame from the automobile industry (Sensotact) with 3 top-level tactile qualities (thermal, orthogonal, tangential) and 10 second-order qualities with 5 levels each. In a sight and a blind-folded condition, sixty-four participants had to evaluate their appreciation of the whole material without specific instruction (base condition) and with instruction reflecting four everyday life scenarios. The resulting pattern of data of the base condition differed strongly from the scenario-based instructions, with more inter-rater reliability for scenarios showing indifferent answering for the non-specific instruction. In both modality conditions similar effects were found. These findings underline the strong influence of top \^ down processes on tactile and visual appreciation and help to develop a more ecological valid test for applied research.

\^ \textbf{Modality-specific involvement of occipital cortex in the early blind}

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What happens in occipital cortex when neuronal activity is no longer evoked by regular visual stimulation? Studying brain activity induced by tactile and auditory stimuli in the blind may provide an answer. Several studies indicate that occipital cortex in the blind is recruited in simple tasks, like auditory localization, and complex tasks, involving verbal memory. The goal of the current study was to establish whether or not this occipital recruitment is modality-specific when highly comparable tactile and auditory tasks are carried out. Early-blind subjects performed auditory and tactile duration discrimination tasks while their EEG was being measured. Source localization on secondary activity, after about 250 ms, revealed an occipito-parietal and occipito-temporal focus in case of auditory and tactile stimuli, respectively. This modality-specific result was underlined by a correlation between right occipital activity and performance on auditory targets. These findings suggest that specific parts of occipital cortex are more suitable for the takeover of modality-specific functions, which may possibly be related to the distinction between dorsal and ventral visual pathways.

\^ \textbf{Psychophysical evidence for face-centered visuo-tactile neurons in humans}

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Information from different senses, such as vision, audition, and touch, is neurally integrated to provide a unified perception of our world and body. For example, certain bimodal, face-centered neurons in monkeys are driven by both tactile and close visual stimuli in congruent regions thus mapping the immediate peripersonal space. Receptive fields of such neurons often involve large regions of the face. Here we provide evidence for similar neural substrates in humans by inducing crossmodal conflict between vision and touch. Participants inserted an occluder contact lens into one eye thus inducing monocular blindness without any somatosensation, such as that of the eye being closed or covered, that could explain such blindness. Observers reported