

space processing. To investigate this prediction we asked participants to respond as fast as possible to a tactile stimulus on the hand, while looking at an animation of an approaching or receding spider or butterfly. Tactile stimulation was applied at one of 25 possible time points during the animation. Tactile reaction times were faster when an approaching stimulus was closer to the hand at the time of tactile presentation. Critically, this effect of distance on reaction times was larger when participants saw an approaching spider compared to an approaching butterfly, but only for participants that were afraid of spiders. This finding demonstrates that the perceived threat of an approaching stimulus modulates visuotactile coding in peripersonal space and is consistent with the idea that visuotactile predictions are an important aspect of peripersonal space processing.

Talks Session 5: **BODY OWNERSHIP AND AWARENESS**

Monday 15th June – Pacinotti Meeting Room 11.30 – 1.00 pm

T5.1 BODY OWNERSHIP TOWARDS THE MOVEMENT END-EFFECTOR MODULATES MOTOR PERFORMANCE UNDER VIOLATION OF MOTOR INTENTION

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When we perform voluntary actions, our sense of body ownership and agency are dynamically shaped through an interaction between efferent and afferent signals under a consistent accordance between our intention-motor program and the perceived sensory reafferences. Previous studies examined the effects of spatiotemporal mismatches between the actual and intended consequences of the movement on motor performance and perception. We investigated the specific role of body ownership on motor performance when the seen and the intended movements do not match. Thirty healthy participants were asked to draw straight vertical lines while seeing a virtual body either from a first or a third person visual perspective. Initially, the virtual arm moved congruently with the participant's arm, drawing straight lines synchronously. At a certain point, the movements of the virtual hand deviated spatially from the real hand movements, drawing clockwise ellipses instead of lines. We found that the ovalization index (i.e. the deviation of the real trajectory from an absolute vertical line) was significantly higher in 1PP (i.e., when the seen hand was attributed to the own body) as compared to 3PP (i.e., when the hand was attributed to another person). Additionally, this was positively correlated to the degree of body ownership and its pattern revealed an adaptation of the real drawings to the seen ellipses - as if copying them. We interpret the present findings in terms of a different weighting of prediction errors in updating one's sensorimotor system depending on the experienced body ownership.

T5.2 FLEXIBLE EXPANSION OF THE TEMPORAL WINDOW OF VISUOTACTILE INTEGRATION DURING BODY OWNERSHIP ILLUSIONS.

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Body ownership illusions (BOIs) are rooted in the binding of multisensory stimuli streaming from the physical body and from a fake body seen in first person perspective. Once established, BOIs have been shown to affect the processing of sensory cues as well as higher-order aspects of behavior. In this study we specifically tested the hypothesis that BOIs extend the temporal window for the integration of spatially congruent visuotactile cues. The rationale is that BOIs establish an illusory causal binding between tactile and visual stimuli on the body surface, and that such causal binding acts as a top-down factor enhancing the probability of integrating temporally misaligned cues. We implemented a temporal order judgment (TOJ) task in an immersive virtual reality setup in which vivid BOIs could be elicited. In two independent experiments we tested (i) the role of causal binding (manipulating the semantic congruency among the visual and tactile target cues of the TOJ) and (ii) the role of BOIs in establishing such causal binding (manipulating directly the sense of ownership). Results from both experiments support our hypothesis, showing that the temporal window for visuotactile integration (measured as the just noticeable difference –JND- extracted from the TOJ) is significantly increased when the visual and tactile target cues appear to be semantically congruent (experiment 1), through a causal binding mediated by the BOI (experiment 2). Importantly, subjective reports of illusory feelings are positively correlated with individual JNDs. These results provide new evidence for the impact of BOIs on multisensory integration.

T5.3 WHERE AM I? INVESTIGATING WHICH PERSPECTIVES ARE TAKEN ON AMBIGUOUS TACTILE SYMBOLS

Auvray Malika{1}, Arnold Gabriel{2}, Hartcher O'Brien Jess{1}, Hayward Vincent{1}, Spence Charles{1}