Action and perception have been shown to be tightly linked. In a previous study, we explored this link by using an apparent motion task, wherein participants were asked to judge whether they perceived a clockwise or a counterclockwise rotation of visual stimuli pairs, i.e. human hands (BIO) vs. clock hands (NBIO). We found that the less ambiguous rotation was 45°-225°, being perceived as clockwise more for BIO than NBIO stimuli, while the 135°-315° rotation was the most ambiguous for both BIO and NBIO stimuli. We conjectured that this was primarily due to the joint-constraints affecting hand-rotation when motorically executed. A main aim of this study was to test whether an implicit processing of joints-constraints may *differentially* bias the perceived rotation of BIO and NBIO stimuli, employing a visual priming paradigm.

Participants underwent the apparent motion task with the two rotation trajectories (45°-225°/135°-315°) used in the previous experiment. Pictures lasted for 100 ms on screen and were separated by a 300 ms inter-stimulus interval. Before each pair of stimuli, a forward- and backward-masked prime was presented (43 ms), i.e. a static image oriented at 45°, 135°, 225° or 315°, suggesting either a clockwise or a counterclockwise apparent motion depending on the following stimuli pair. The task comprised 28 trials for each condition.

Average responses for each condition were entered in a 2*2*2 repeated measures ANOVA, with *stimulus* (BIO/NBIO), *rotation* (45°-225°/135°-315°) and *prime* (counterclockwise/clockwise) as within-subject factors. Results showed a significant interaction between stimulus, rotation and prime ($F_{1,20}$=22.47; p=0.0001). Post-hoc tests revealed no difference between BIO and NBIO stimuli in the 135°-315° counterclockwise- and clockwise-primed conditions, suggesting that visual priming exerted the same modulation on the ambiguous stimuli pair. Crucially, in the 45°-225° rotation, whose direction is ambiguous for the NBIO stimuli and not for BIO stimuli for which a clockwise direction is perceived, differential results emerged between priming conditions. No difference between BIO and NBIO stimuli emerged in the clockwise-primed condition. In the counterclockwise-primed condition, BIO stimuli lead to significantly more clockwise responses compared to NBIO stimuli (p<0.000).

This finding suggests that joint-constraints may actually shape motion perception, by differentially channeling the visual priming effect. Indeed, visual priming equally affected motion perception of both BIO and NBIO stimuli when the primed rotations were motorically consistent. On the contrary, the visual priming effect on motion perception was different between BIO and NBIO stimuli when the primed rotation (counterclockwise) violated the joint-constraints.