Object Affordances and Action Congruency: Effects Limited to Peripersonal Space

To achieve our goals, we daily interact with multiple objects, perceiving and exploiting their function. The smooth interaction with reachable objects is supported by spontaneously evoked motor plans (i.e., object affordances) that allow us to use them. Plenty of studies investigated when these affordances were elicited, that is, when they are within the reachable space. However, do they influence our behaviour when their lay beyond our reach? How do they contribute to our actions? Do we react faster when the object-state orientation is canonical for the deployed action? This latter combination of object state and function, called congruent stimulus, is characterized by a response enhancement, defined as congruency effect. We tested this in a series of reaching experiments varying orientation and purpose when reaching for a mug, placed at different distances. Accordingly with previous results, we observed the congruency effect exclusively inside the reachable space. The congruency effect reflects through shorter reaction times (classical result) and smoother arm trajectories in congruent states as compared to incongruent ones. To our knowledge, this is the first time motion captures techniques used to characterize the congruency effect. Thus, we conclude that the qualitative intuition about congruency is supported by a quantitative assessment of movement smoothness, where congruent movements have both a shorter reaction time and a better efficiency.