Title: Could the neural basis of consciousness be interactively extended? From intrabrain to interbrain large-scale synchrony

Presenting Author: Ana Lucia Valencia Zambrano

Author(s): Ana Lucia Valencia, Tom Froese

Abstract: 2.22

The realization of a cognitive act involves the integration of widely distributed regions of the brain. This large-scale neural integration can be explained in terms of transient patterns of functional connectivity, mediated by phase synchrony across low and high frequency bands. Authors such as Cleeremans, Engel, and Varela have proposed that this mechanism of neural synchrony could form the neural basis of the unity of consciousness, i.e. of the integrated flow of first-person experience. Intriguingly, a growing number of EEG hyperscanning studies reveal that comparable patterns of neural synchrony also appear across brains during social interaction. Initial research demonstrated interbrain phase coherence in predominantly lower frequency bands, such as alpha-mu/phi complex, whereas the faster gamma band, which has been associated with cognitive integration and conscious awareness, was largely absent. Nevertheless, more recent studies have found evidence of interbrain gamma synchrony, and, moreover, found it to be associated with subjective reports of social connectedness. We interpret these findings in the context of theories of consciousness that allow its basis to be interactively extended, and as particularly consistent with dynamical, enactive approaches to cognitive science. Although proponents of the extended mind hypothesis like Clark had raised doubts about the possibility of extended consciousness, because it requires operations on such a fast temporal scale that these can only be achieved by neural activity inside a brain, we argue that current evidence has removed this potential limitation. We hypothesize that experience can be integrated by functional networks extended across two brains during social interaction, precisely by the same neural mechanisms that integrate it within a single brain, thereby giving rise to a genuine second-person perspective or we-intentionality. If this is on the right track, it casts doubt on the traditional assumption that all aspects of consciousness are necessarily private and first-person singular.