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**Neural alpha oscillations index the balance between self-other  
integration and segregation in real-time joint action.**

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**Abstract**

Shared knowledge and interpersonal coordination are prerequisites for most forms of social behavior. Influential approaches to joint action have conceptualized these capacities in relation to the separate constructs of co-representation (knowledge) and self-other entrainment (coordination). Here we investigated how brain mechanisms involved in co-representation and entrainment interact to support joint action. To do so, we used a musical joint action paradigm to show that the neural mechanisms underlying co-representation and self-other entrainment are linked via a process – indexed by EEG alpha oscillations – regulating the balance between self-other integration and segregation in real time. Pairs of pianists performed short musical items while action familiarity and interpersonal (behavioral) synchronization accuracy were manipulated in a factorial design. Action familiarity referred to whether or

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