

Communicating brains and communicating cultures

John-Dylan Haynes¹, Silke Anders¹, Jörg Niewöhner² & Stefan Beck²

¹Bernstein Center for Computational Neuroscience Berlin, Charité Universitätsmedizin, Berlin, Germany

²Institute for European Ethnology, Humboldt Universität zu Berlin, Berlin, Germany

When people interact, information is transmitted between their brains. Modern imaging techniques permit to investigate the dynamics of this brain-to-brain transfer of information. In previous work we used information-based functional magnetic resonance imaging (fMRI) to investigate the flow of affective information between the brains of senders and perceivers engaged in facial communication of affect (Anders & Haynes, in preparation). We found that the level of neural activity within a distributed network of the perceiver's brain can be successfully predicted from the neural activity in the same network in the sender's brain, depending on the affect that is currently being communicated. Furthermore, there was a temporal succession in the flow of affective information from the sender's brain to the perceiver's brain, with information in the perceiver's brain being significantly delayed relative to information in the sender's brain. This delay could not be explained by fMRI signal latencies and decreased over time, possibly reflecting some 'tuning in' of the perceiver with the sender. Our data support current theories of intersubjectivity by providing direct evidence that during ongoing facial communication a 'shared space of affect' is successively built up between senders and perceivers of affective facial signals.

These findings correspond with anthropological perspectives on *grounded* or *socially situated cognition*. Here cognition is conceptualized as embodied, situated, interactive and flexible in the limits of established socio-cultural patterns. What is termed "shared space of affect" above is conceptualized in socio-cultural anthropology with the concept of "proxemics" (Hall 1968; Watson 1969), aiming at the analysis of (a) infracultural (physiological), (b) precultural (culturally shaped sensuality) and (c) microcultural (cultural conventions in structuring of interactive space). Similarly, performance theoretical approaches (Turner 2005; Pilgrim 2001) analyse moment-by-moment interaction in social, material and social environments using ethnographic methods.

Here we propose to extend this previous work in both neurology and anthropology in two important ways: First, we will investigate the transmission of cognitive information in *real-world* interaction scenarios – what we term "*minimal interactions*" – using a *mobile recording device* that permits to record a combination of galvanic skin conductance, pulse, heart rate plus 5-channel scalp EEG. Please note that only the switch from fMRI to mobile recording will permit real-world investigations. Second, we will design different experimental spatial situations to measure

transmission of information and to observe ethnographically these minimal interactions. In a third step we will use culture as a variable, measuring / observing interactions of individuals belonging to *different versus the same “cultures”*. However, “culture” will not be understood as an independent factor, neatly delineated using language or nationality as a criterion, but will be conceptualized as a dynamic domain (Vogeley & Roepstorff 2009). Hence, recruiting strategies for study-participants will use a range of socio-cultural criteria to maximise diversity of study participants. In addition to physiological measurements and ethnographic observations of minimal interactions, study participants will answer a battery of cultural and personality questionnaires (e.g. NEO-FFI) in order to further assess whether the classical effect that “similarities attract” (Byrne 1997; McPherson et al. 2001) is modulated by cultural variables.

References

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