



A lightpath for simultaneous fMRI of social interaction

Everyday we effortlessly interact with other people. To capture how the brain achieves this social behavior is the ultimate goal in the field of social neuroscience.

Playing the game Charades in the fMRI scanner

In most experimental paradigms social processes are studied by having participants watch pictures or movies of other people while monitoring brain activity. While informative, these studies are unfortunately still far from resembling real social interactions. In order to find out which brain areas play a role in social communication, we therefore went beyond this and had romantic couples play the game Charades ('hints' in Dutch) in an fMRI scanner (Schippers, Gazzola, Goebel & Keysers, submitted). The participants took turns going in the scanner and either gestured words that were written on the screen (while their hand movements were video recorded) or tried to guess from the previously recorded video what their partner was trying to depict. Results showed that areas in the brain that are associated with mirroring other people are strongly implicated, while higher-level mentalizing areas are not.

Linking two fMRI scanners

Although closer to real social interactions than previous studies, this experimental setup still lacks true interplay between people. During natural communication, we adapt our behavior to the reactions they evoke in others, an interactivity that our video-recording technique cannot provide. This drawback could be overcome by linking two fMRI scanners through a high-speed connection. This would allow two participants from cities as far apart as Groningen and Maastricht to play the game charades interactively. The participants will then communicate in real-time with each other through a video stream. To our knowledge, scanning two people at the same time while they are interacting has only been done twice (Montague et al., NeuroImage, 2002; Goebel et al., 2005, HBM Conference). The scarcity of such experiments is mainly due to difficulties finding a location where two fMRI scanners are readily available and difficulties getting a reliable connection if two video streams and scanners have to be connected over a greater distance.

Reliability, velocity and security: exactly what we need!



The connection needs to be highly reliable and fast: we all know from bad phone connections how artificial social interactions become if delayed. Additionally, investigating how one partner's brain responds to the other critically depends on the temporal resolution with which data from the two scanners can be compared. Finally we need a secure connection, because the video-channel contains private information of the participants. Existing connections fail to meet these criteria but a lightpath of SURFnet would give us the reliable, high-speed and secure connection we need.

Practical considerations

The project would be embedded in the PhD-project of Marleen Schippers under supervision of Prof. dr. Christian Keysers (both working at the University Medical Center Groningen) and in collaboration with Rainer Goebel from the Maastricht Brain Imaging Center. Together we have the experience and expertise to make this venture a success and open up a new era in brain research.