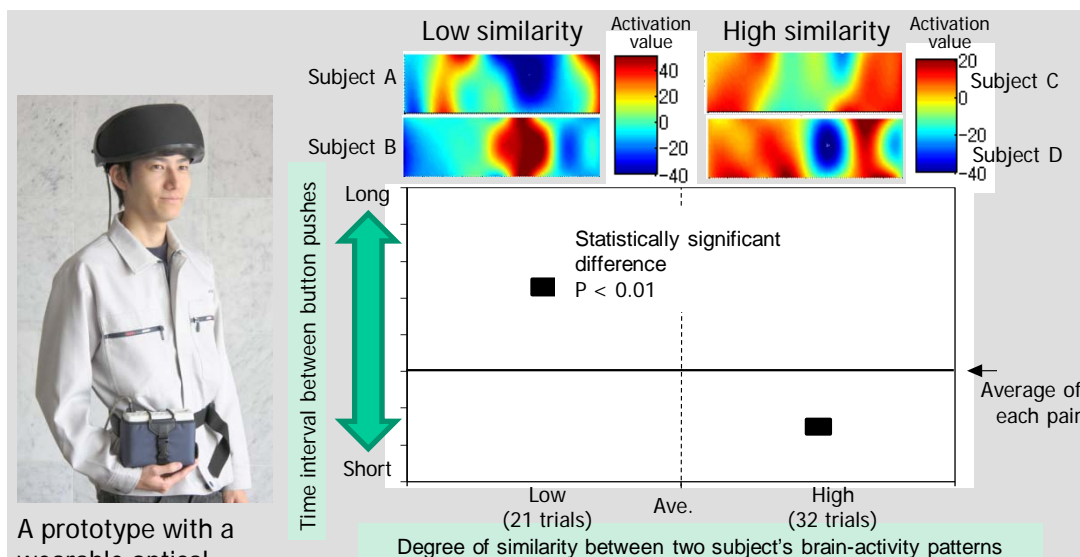


Advanced Research

Central Research Laboratory
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Using wearable optical topography to measure the brain activity of two people working on a cooperative task



A prototype with a wearable optical topography system

Fig. Relationship between brain activity similarity and time interval between button pushes.

By measuring brain activities of the frontal lobe of two subjects partaking in a cooperative task* with a wearable optical topography system (which can measure daily brain activities), it was possible to analyze the association between a brain activity and the cooperative task. The measured brain activities involved in the cooperative task show that the subjects whose frontal-lobe brain-activity patterns had higher similarity pushed their buttons with closer timing. *cooperative task: two subjects count ten seconds with their eyes closed and simultaneously push a button in time to their counting.

Experimental method

The time interval between the button pushes of each subject is indicated by a continuous beep. In the next trial and the following trials, the subjects synchronize their button-pushing timings according to this beeped interval. The time intervals between button pushes were measured while the subjects performed the cooperative task ten times. Brain-activity distributions were then statistically analyzed by calculation based on the time interval and blood-volume changes in the frontal lobe. (Blood-volume changes were measured by using a wearable optical-topography system.)

Future directions

The wearable optical-topography system will contribute to advancing social brain science, which aims to elucidate the information processing in the brain that accompanies social interactions between people (such as collaboration, confrontation, and communication).

A word from the development team

We aim to develop a technology for analyzing brain activities of many people interacting in a daily environment and for investigating associations between their brain functions.