

A42. Who does what? Neural Representation of One's Own Subtask, a Partner's Subtask, and of Subtask Assignment

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Humans often coordinate their actions to more effectively reach shared goals. Previous studies have shown that people co-represent different parts of a general task when they carry it out together, even if the representation of the other's subtask is not necessary to perform their part of the task. However, it is still unclear how these task representations are encoded at the neural level. In this study, we used multivariate pattern classification on functional magnetic resonance imaging data to identify brain regions encoding either a player's or a partner's subtask. Twenty-four participants played a collaborative game in pairs. To win the game, the players had to consider both their own and the other's subtask. The shared task consisted in moving two pawns on a graphic path to match their positions. Each player moved one of the two pawns as specified by the subtask assigned to them. Importantly, the same subtask was assigned to one subject on some trials and to their partner on other trials. Despite that, subtask information was encoded in partially different brain networks depending on whom the subtask was assigned to: Ventrolateral and rostrolateral prefrontal cortex (RLPFC) encoded only information about the player's subtask, while medial prefrontal cortex (mPFC), temporal cortex, and insula only about the partner's subtask. RLPFC and mPFC represented also information about who performs a task. These findings suggest that task ownership determines where information about an active task is represented across the brain.