

## Identity: Linking Mental Files in the Brain

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### Abstract

Identity management is a fundamental for tracking objects over time. A mental file represents a particular object, tracks it and stores information about it. Ideally each encounter with a familiar object should activate its existing file. But this is not always possible, e.g. if introduced like this, “Susi’s *teacher* is at school. Susi goes to visit *her aunt*,” we come to represent teacher and aunt with different files even when they happen to co-refer to a single person. To correct we need identity information, e.g., “Susi’s aunt **is** her teacher,” which is encoded by linking the two co-referential files.

Linking of co-referential files also occurs when processing mathematical equations, belatedly recognizing a familiar person, and dealing with different perspectives (e.g., false beliefs). We found a direct conjunction of brain activation for identity statements and equations in left dorsal inferior parietal lobe (IPL), and precuneus. This conjunction overlaps with activations when recognizing a person and when faced with different perspectives.

These overlaps provide a cognitive explanation for why left IPL forms a “hub”—a strongly connected area responding to different domains of knowledge: It is involved in processing identity, i.e., linking coreferential files. This also provides a cerebral basis for explaining why problems of identity and perspective are mastered at the same age of about 4 years.

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