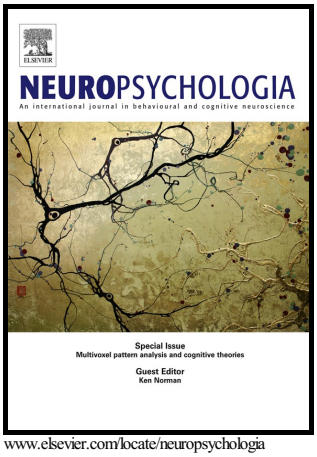

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Social responsiveness to inanimate entities Altered white matter in a 'social synaesthesia'

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Abstract

Judgments about personalities and social traits can be made by relatively brief exposure to animate living things. Here we show that unusual architecture in the microstructure of the human brain is related to atypical mental projections of personality and social structure onto things that are neither living nor animate. Our participants experience automatic, life-long and consistent crossmodal associations between language sequences (e.g., letters, numbers and days) and complex personifications (e.g., A is a businessman; 7 a good-natured woman). Participants with this 'Ordinal Linguistic Personification' (Simner & Hubbard, 2006) which we describe here as a form of social synaesthesia, showed lower fractional anisotropy (FA) values in five clusters at whole-brain significance, compared with non-synaesthetes (in the pre-postcentral gyrus/ dorsal corticospinal tract, left superior corona radiata, and the genu, body and left side of the corpus callosum). We found no regions of the brain with increased FA in synaesthetes. A number of these regions with reduced FA play a role in social responsiveness, and our study is the first to show that unusual differences in white matter microstructure in these regions is associated with compelling feelings of social cohesion and personality towards non-animate entities. We show too that altered patterns of connectivity known to typify synaesthesia are not limited to variants involving a 'merging of the senses', but also extend to what might be thought of as a cogno-social variant of synaesthesia, linking language and personality attributes in this surprising way.

[1] These authors contributed equally to the work