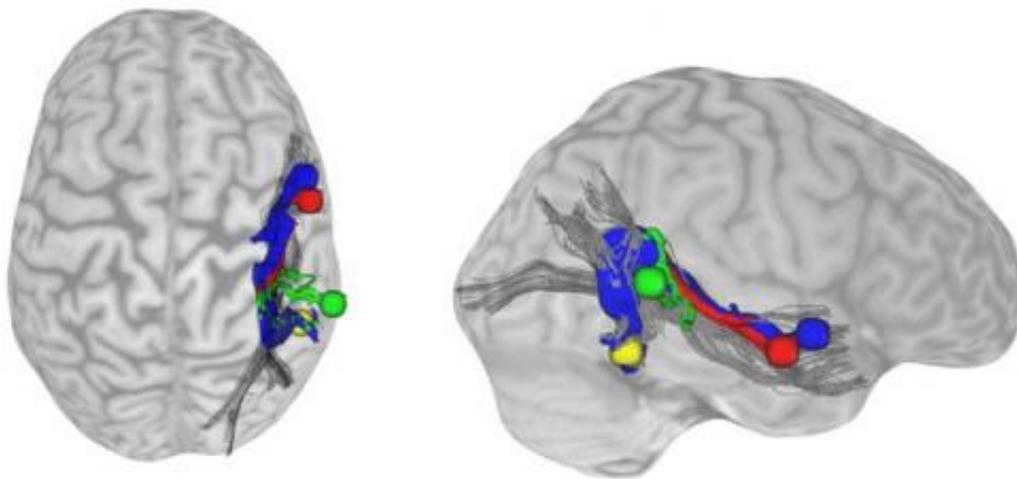


## Have we met before? Direct connections between brain areas responsible for voice, face recognition

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Direct structural connections exist between the two voice recognition areas (blue and red spheres) and the face recognition area (yellow sphere). In comparison, the connection to the area responsible for more general acoustic information (green sphere) is less strong. The connections appear to be part of larger fibre bundles (shown in grey).

(Medical Xpress) -- Face and voice are the two main features by which we recognise other people. Researchers at the Max Planck Institute (MPI) for Human Cognitive and Brain Sciences have now discovered that there is a direct structural connection consisting of fibre pathways

between voice- and face-recognition areas in the human brain. The exchange of information, which is assumed to take place between these areas via this connection, could help us to quickly identify familiar people in everyday situations and also under adverse conditions.

Theories differ as to what happens in the [brain](#) when we recognise familiar persons. Conventionally, it is assumed that [voice](#) and face recognition are separate processes which are only combined on a higher processing level. However, recent findings indicate that voice and face recognition are much more closely related. Katharina von Kriegstein, Leader of the Max Planck Research Group “Neural Mechanisms of Human Communication”, found in previous research that areas of the brain which are responsible for the identification of faces also become active when we hear a familiar voice. These activations were accompanied by better voice recognition.

“We now assume that areas in the brain which are involved in voice and face recognition interact directly and influence each other,” says Helen Blank, a member of von Kriegstein’s research group. In a new study, Blank could show that a structural connection between voice and face recognition areas exists. She used diffusion-weighted magnetic resonance imaging, a method with which the course of white matter tracts in the brain can be reconstructed when combined with tractography, a mathematical modelling technique. Blank had located the areas responsible for voice and face recognition in her study participants by measuring the reactions of the brain to different voices and faces using magnetic resonance imaging.

Blank discovered a direct connection consisting of fibre pathways between the voice- and the face-recognition area. “It is particularly interesting that the face recognition area appears to be more strongly connected with the areas involved in voice identification, despite the fact that these areas are further away than areas which process information

from voices on a more general level,” says the researcher.

This direct connection in our brains could be used in everyday contexts to simulate the faces of our conversation partners, e.g. when we speak on the telephone to a familiar person. However, the precise nature of the information that is exchanged between the voice- and [face-recognition](#) areas remains unclear. A forthcoming study which Blank is currently preparing aims to clarify this issue.

Obtaining a more detailed understanding of how the brain works in relation to the processing of such basic tasks as person recognition could be of benefit in many different areas. “The finding is of interest for research on unusual neurological conditions, such as prosopagnosia and phonagnosia, which prevent people from being able to recognise others from their faces or voices,” says Blank. The new insights could also stimulate innovations in computer technology and improve person recognition by machines.

**More information:** Blank H, Anwander A, von Kriegstein K: Direct structural connections between voice- and face-recognition areas. *The Journal of Neuroscience*, 31(36): 12906-12915.

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