

journal *NeuroImage* sheds light on brain mechanisms underlying this trait.

The study showed that detached and individualistic subjects seem to process information associated with social and non-[social contexts](#) in similar ways, as demonstrated by similar activation patterns in the prefrontal cortex, whereas in more agreeable subjects the activation patterns arising from social and non-social situations show more differences. This suggests that individuals with high levels of [agreeableness](#) are able to discern social contents that are important, and particularly informative, for achieving successful interactions with others. This should not be surprising, since individual agreeableness is associated with characteristics, such as empathy, cooperation and generosity, which require the ability to recognize the cognitive, emotional and motivational aspects of others in [social situations](#). These findings could contribute to future development of more objective and sensitive personality tests, including individuals' brain responses to stimuli varying in social content as a measure of agreeableness. The research was carried out by Dr. Sandra Arbula and Elisabetta Pisanu, and coordinated by Professor Raffaella I. Rumiati.

Visual tests and functional magnetic resonance imaging

"Personality traits reflect key aspects of variability among individuals. Understanding the mechanisms that give rise to these differences requires an in depth investigation of the behaviors associated with such traits, and their underlying neural sources," explain the scientists. The SISSA team recruited dozens of volunteers for their research according to their degree of agreeableness, one of the five major dimensions of personality, assessed with a questionnaire. "Participants were presented with short animations of different shapes that moved randomly or

interacted in a socially meaningful way. Their [brain activity](#) was then recorded using [functional magnetic resonance](#) imaging, which enables detection of brain areas activated while they perform a given task, and has application in both research and clinical fields."

An important link between neural mechanisms and social behavior

"Our results suggest something particularly interesting about agreeableness," explain Arbula and Rumiati. "We observed that representations of social information extracted from visual scenes are formed in the dorsomedial [prefrontal cortex](#): based on their distinctiveness we are able to predict individual variations in agreeableness. The present finding reveals the link between neural and behavioral mechanisms underlying this specific personality trait," conclude Arbula and Rumiati. "Additionally, these sorts of connections provide new opportunities for the development of more objective personality measures."

More information: Sandra Arbula et al, Representation of social content in dorsomedial prefrontal cortex underlies individual differences in agreeableness trait, *NeuroImage* (2021). [DOI: 10.1016/j.neuroimage.2021.118049](#)

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