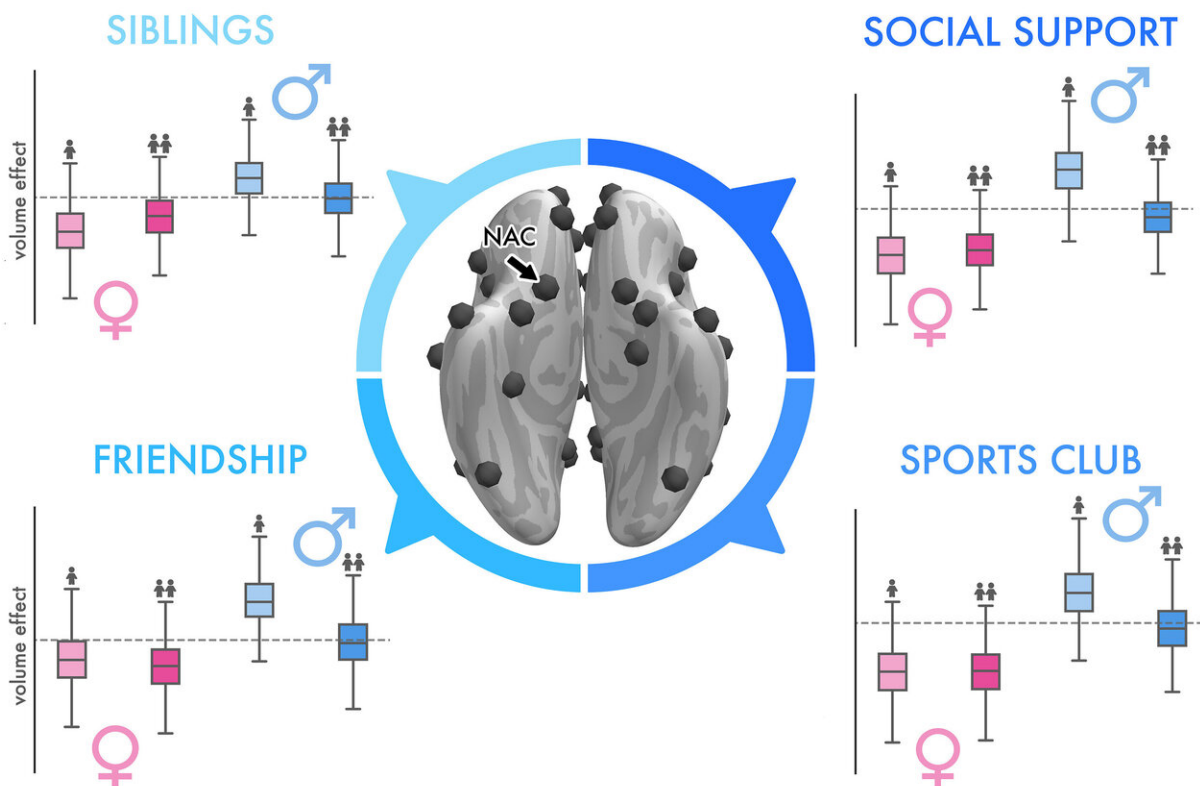


# Study shows major gender differences in the human social brain

March 19 2020, by Bob Yirka

## Less-social men show similar deviations in reward circuitry



Men exposed to a less enriched social environment show similar grey matter volume effects in the reward-related area of the social brain. Credit: Hannah Kiesow

A team of researchers from Germany, the U.K., the U.S. and the Netherlands has found evidence showing that there are major gender differences in the human social brain. In their paper published in the journal *Science Advances*, the group describes how they studied information in the U.K. Biobank database and what it showed them about social behavioral differences between the sexes.

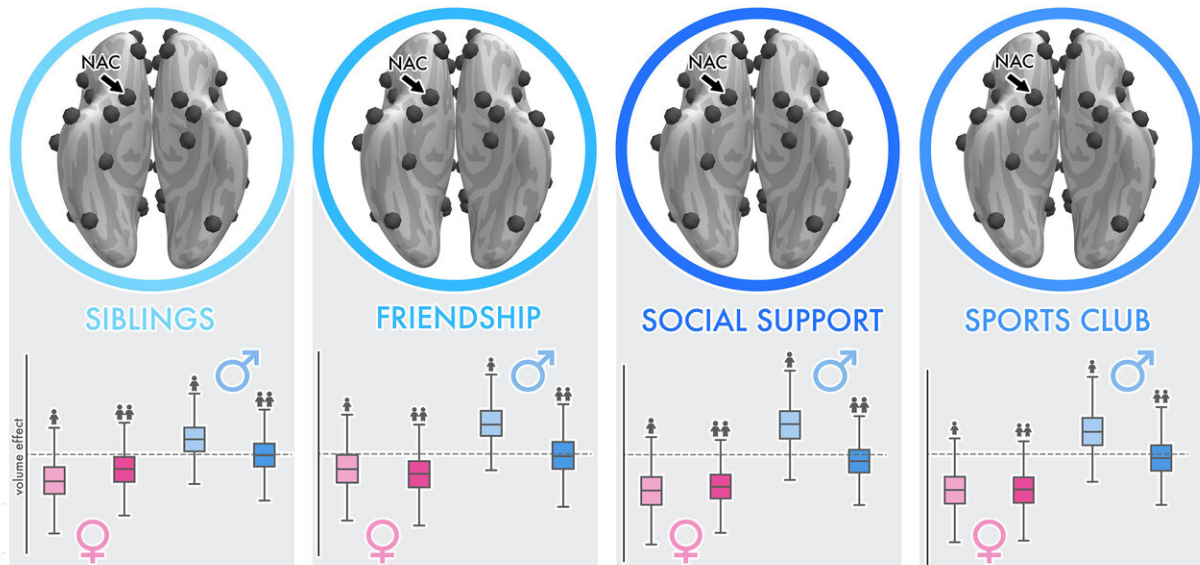
Prior research surrounding [social behavior](#) among primates, including humans, has led to a theory called "the social brain hypothesis." It is based on the idea that the reason primates have such large brains is because of the need to process very large amounts of social information. In this new effort, the researchers have found evidence that suggests that as primate brains grew, [gender differences](#) arose in the parts of the brain involved in processing social information.

The work involved analyzing data in the U.K. Biobank database—the focus was on background data and MRI scans of the brains of 10,129 male and female participants. By comparing brain scans with background data, the researchers were able to make out sociodemographic and lifestyle factors that were common to one or the other gender. More specifically, they looked at 36 parts of the brain that prior research has found to be involved in processing social cues and behavior, and compared what they found with factors such as how many people were in a household, whether a person was married, how much they enjoyed their relationships and degree of social support.

In making their comparisons between genders, the researchers found distinct differences in [brain regions](#) such as those that make up the limbic system, the [ventromedial prefrontal cortex](#) and the amygdala. They report clear gender-specific differences in areas that could be linked to social activities such as bonding or engaging in intense social contact. As one example, they found neuroanatomical associations in the amygdala that were predominant in socially stimulated women, but

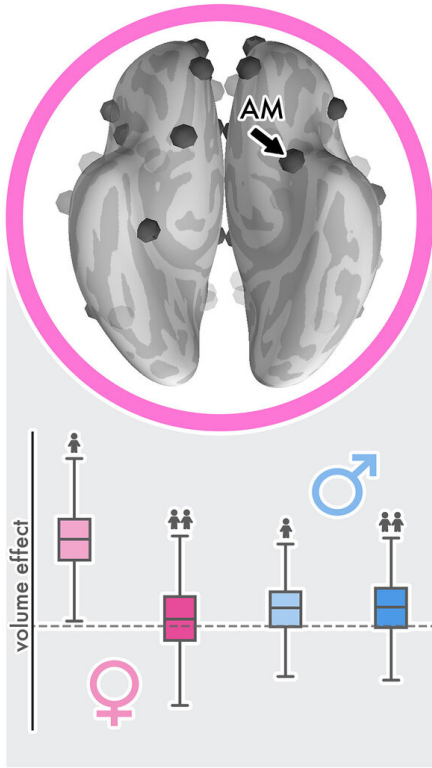
barely present in most of the males. Conversely, they found differences in volume of the ventromedial prefrontal cortex of men who lived alone versus those who were socially stimulated—variations not generally seen in the brains of the women under study. The researchers conclude by noting some degree of gender differences in all of the regions they studied, which suggests there are major [gender](#) differences in the human social [brain](#).

### Less-social men show similar deviations in reward circuitry



Men exposed to a less enriched social environment show similar grey matter volume effects in the reward-related area of the social brain. Credit: Hannah Kiesow

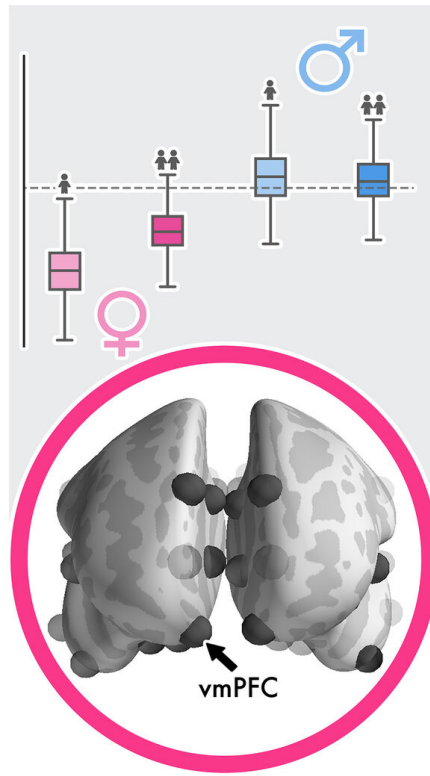
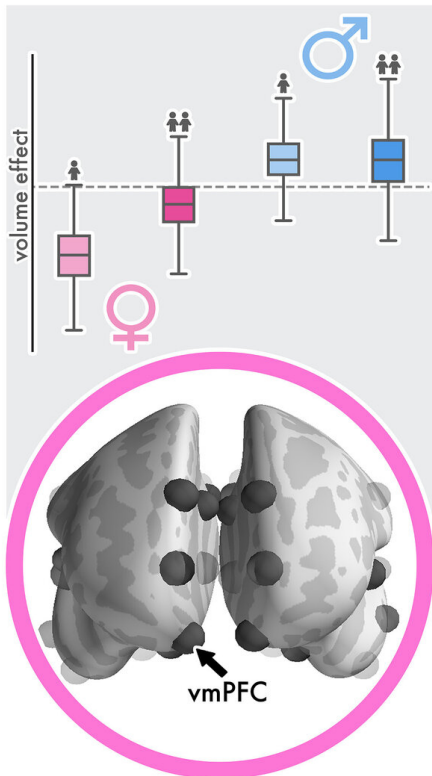
# Women with fewer social ties show similar limbic deviations



FRIENDSHIP



SOCIAL SUPPORT



Women with weaker social ties to close friends and peers show similar volume effects in two emotion-related areas of the social brain. Credit: Hannah Kiesow

**More information:** Hannah Kiesow et al. 10,000 social brains: Sex differentiation in human brain anatomy, *Science Advances* (2020). [DOI: 10.1126/sciadv.aaz1170](https://doi.org/10.1126/sciadv.aaz1170)

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