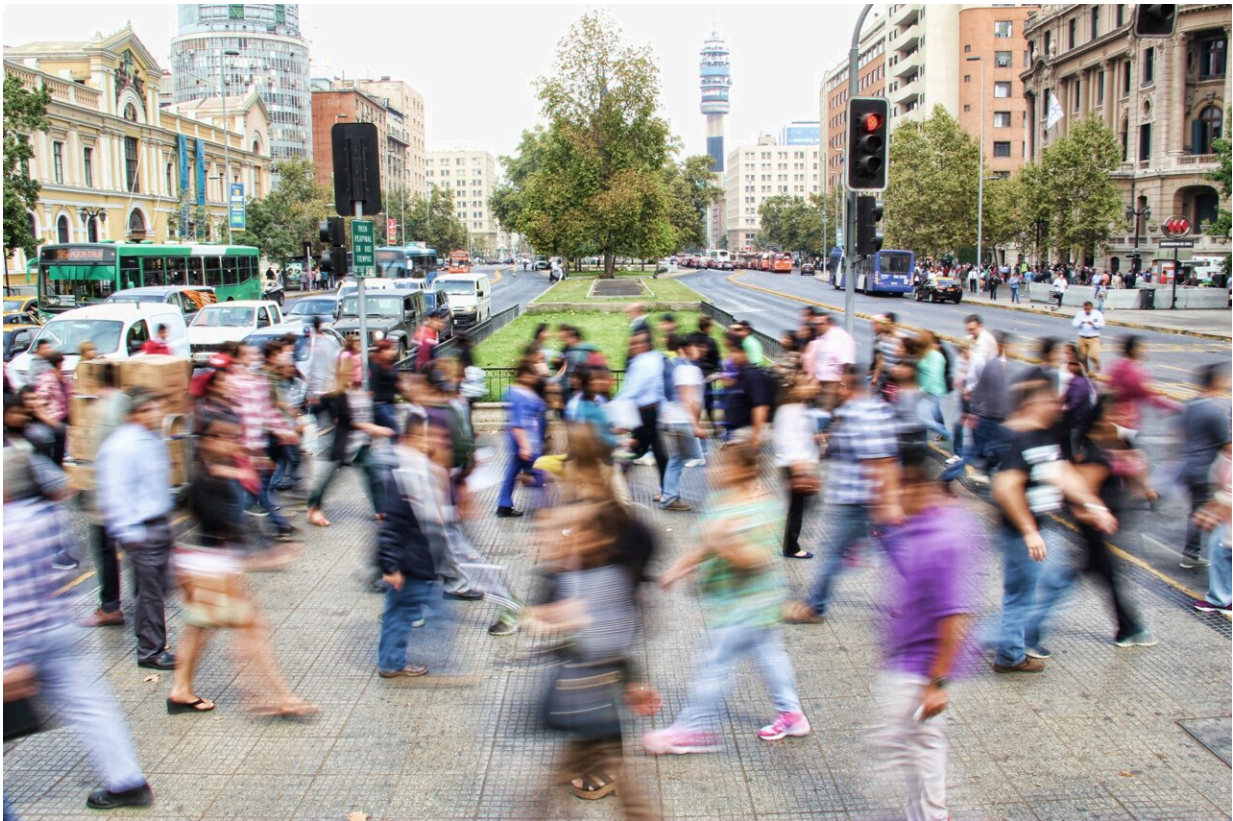


# No evidence that the shift to farming made males and females more physically similar

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Credit: pxhere.com

Scientists have proposed that males and females started to become more similar in size and shape after the origin of farming due to natural selection. However, a new evolutionary and genomic analysis by George

Perry of Pennsylvania State University and colleagues, published in the journal *PLOS Genetics*, finds no evidence that this occurred.

The males and females of many species often have slightly different sizes and shapes—think lions and lionesses, for example. The same is also true for humans, with [adult males](#) being slightly taller and heavier on average than females. Some scientists think that the differences between the sexes used to be greater, but that the shift to farming and a more equal division of labor about 10,000 years ago created evolutionary pressure that pushed males and females to become more similar. Others, however, think that any changes that have occurred in that time are just due to chance.

In the new study, the researchers tested this hypothesis by seeing if genetic variations linked to certain [physical traits](#) to a greater degree in either males or females have become more or less common during the last 3,000 years. Specifically, they looked at height, body mass, hip circumference, body fat percentage and [waist circumference](#), using genomic data from about 194,000 females and 167,000 males from the UK Biobank. They found more than 3,000 variations in the [human genome](#) linked to those traits to a greater degree in either in females or males. However, only variations associated with one of the traits had become significantly more common—those associated with higher body fat in females.

Overall, the findings contradict the longstanding idea that sex differences have become less pronounced due to natural selection since humans transitioned from hunting and gathering to agriculture, at least for the UK population. Additionally, the researchers point out that their study demonstrates the value of using genomic approaches to test anthropological hypotheses.

"In this study we analyzed genome-wide association study data from the

UK Biobank to identify thousands of genetic variants that are differentially associated with trait variation between [females](#) and males for five body size and shape phenotypes," the authors state. "We then studied the evolutionary history of these loci, finding no support for the longstanding hypothesis that sex differences adaptively decreased following subsistence transitions from hunting and gathering to agriculture."

**More information:** Arner AM, Grogan KE, Grabowski M, Reyes-Centeno H, Perry GH (2021) Patterns of recent natural selection on genetic loci associated with sexually differentiated human body size and shape phenotypes. *PLoS Genet* 17(6): e1009562.

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