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Health

Genes and the Friends You Make

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Genes play an important role in how people make friends and form social networks, according to a new study that may help researchers better understand the spread of ideas and diseases in a society.

In the age of Facebook and other social-networking Web sites, the study may also help explain why one person may have a thousand virtual friends, many of whom know one another, while someone else has 40 friends who aren't connected among themselves.

"Our work shows how humans, like ants, may assemble themselves into a 'super-organism' with rules governing the assembly, rules that we carry with us deep in our **genes**," says Nicholas Christakis, a professor of medical sociology at Harvard Medical School, who co-wrote the study with two political scientists at the University of California in San Diego. The study appeared online in the Proceedings of the National Academy of Sciences journal.

The researchers drew their data from a pre-Facebook source: the National Longitudinal Study of Adolescent Health, a wide-ranging survey of the social, economic and physical state of high-school students in the 1994-1995 school year, which included detailed questions about friendships.

The researchers narrowed that pool to 1,110 same-sex twins, split roughly equally between identical twins, who share all their **genes**; and fraternal twins, who share about half of their **genes**. Then they explored the twins' social networks and noticed greater similarity in the identical twins' social structure, which suggests that **genes** helped shape it.

The scientists looked at how many students in the longitudinal study named a given student as a friend, which it termed "in-degree" affinity; how many students a given student named as friends (out-degree affinity); what the odds were of a given student's friends knowing each other (transitivity); and how central or peripheral to a network a given student might be (centrality).

The researchers found that in-degree, transitivity and centrality are "significantly heritable." This means that your genetic background may help determine not only how many people count you as a friend, but also how many of your friends are friends among themselves. This sheds light on the kind of social network you inhabit, and whether your presence is central to it, or not.

"Given that social networks play important roles in determining a wide variety of things ranging from employment and wages to the spread of disease, it is important to understand why networks exhibit the patterns that they do," Matthew Jackson, a Stanford University economist, wrote in a commentary accompanying the study.

James Fowler, a University of California political scientist who co-wrote the study, said its implications go beyond the theoretical. For some time, scientists have suspected a genetic role in certain conditions, such as obesity. Now, Mr. Fowler wants to investigate whether the dynamics of social networks might affect public-health outcomes, for instance, by exposing people to certain behaviors, such as smoking.

"The next step is to look for specific **genes**, to see if social networks can explain these associations with obesity, smoking, depression," he says. In an earlier study published in the New England Journal of Medicine, Mr. Fowler and colleagues concluded that "network phenomena appear to be relevant to smoking cessation."

Networks also affect the spread of ideas and innovation, and there is a study suggesting that an individual's happiness depends on the happiness of others in his or her social network.

Speaking of the latest study's authors, Mr. Jackson of Stanford University said "the most striking thing they established is that genetics are impacting social interactions and networks people are involved in." The study, he adds, "opens a whole series of questions as to why."

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