New study analyzes how people choose friendships at school
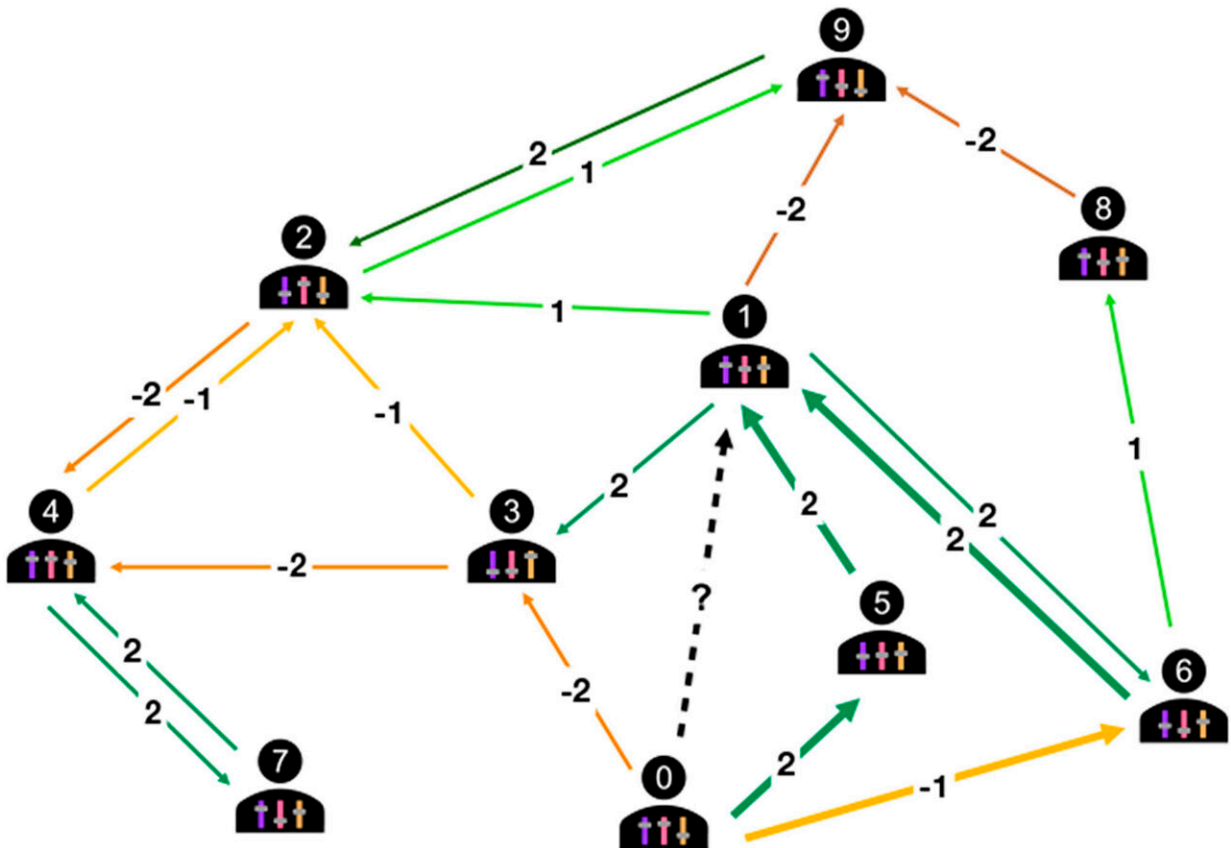
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Diagram of a social network that includes personality traits and computation of the triadic influence. Credit: *Proceedings of the National Academy of Sciences* (2023). DOI: 10.1073/pnas.2215041120

Researchers from the Universidad Carlos III de Madrid (UC3M), the

Polytechnic University of Madrid (UPM) and Loyola University have discovered that personality does not seem to have much influence when it comes to choosing social friendships at school, which are based more on the closeness of our contacts, according to a study recently published in the journal *PNAS*.

"This is pioneering work in the sense that it uses [machine learning](#) and artificial intelligence techniques to predict whether there is a [relationship](#) (good or bad) between two people," says one of the study's authors, Anxo Sánchez, a professor in UC3M's Department of Mathematics and a researcher in the Complex Systems Interdisciplinary Group (GISC, in its Spanish acronym).

"But beyond this prediction itself, the work provides an understanding of how we build our friendships, by identifying common relationships and not [personal characteristics](#) as the main reason for being connected."

This work, [published in the *Proceedings of the National Academy of Sciences*](#), presents a detailed study of the social relationships of students at 13 [secondary schools](#), including more than 3,000 students and around 60,000 reported positive and negative relationships, along with evidence of students' personal traits.

"We can predict quite accurately (90%) whether two people are friends or if they do not get on simply by knowing how many friends and enemies they have in common," adds Anxo Sánchez.

"Our results suggest a nucleation mechanism of social relationships based on individual traits, followed by a growth and evolution of the friendship network dominated by a triadic influence (friends of friends of friends)," says another of the study's authors, María Pereda, from UPM's Department of Organizational Engineering, Business Administration and Statistics.

"This suggests that not only do our [close friendships](#) have an effect on us, but even people we know indirectly can affect our behavior and decisions. This discovery has exciting implications for how we understand [social dynamics](#) and the role we play in it," she adds.

This work is important because it challenges the common belief that friendships are based on similarity—that is, homophily—say the researchers. This understanding may have important implications for how we understand and build our friendships, especially in societies where cultural and thought homogeneity may be highly valued.

"If people understand that they do not need to be the same to be friends, they may be more willing to seek friendships with people who have different backgrounds, interests and perspectives," says Maria Pereda.

"In addition, if homophily is not the only important thing when it comes to creating new relationships, but we can connect with other people simply because they are friends of our friends, then diversity will increase and, with it, polarization will decrease," adds another of the study's authors, Pablo Brañas, a professor in the Department of Economics at Loyola University.

This research provides useful data and results for the management of classrooms, schools and educational centers. "For example, it allows us to know when students may be at risk of social exclusion, because they have few good relationships and many bad ones," says another of the study's authors, José Antonio Cuesta, a professor in UC3M's Department of Mathematics.

"We detect the social climate in the classrooms very well, it takes a complete picture of how people get along at the school and what these relationships are like (which the teaching staff are sometimes unaware of), and thanks to this, this issue could be reorganized to try to improve

the social climate." In fact, UC3M is collaborating in this area with a company from Zaragoza, Kampal, to produce software that will help school counselors to intervene in situations of vulnerability.

In addition, the research may also have implications for the creation of workplace policies and practices. For example, if employers understand that differences among workers can be beneficial for creativity and job performance, they could encourage diversity in their teams and work environments.

In short, this research can help us build healthier and more productive relationships in our personal and professional lives.

More information: Miguel Ruiz-García et al, Triadic influence as a proxy for compatibility in social relationships, *Proceedings of the National Academy of Sciences* (2023). DOI: 10.1073/pnas.2215041120

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