

Who am I? Adolescents' replies depend on others (w/ Video)

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University of Oregon psychologist Jennifer Pfeifer has documented with fMRI that a teen's self identify is indeed linked to what friends think. Credit: Photo by Jim Barlow

Ask middle-school students if they are popular or make friends easily, they likely will depend on social comparisons with their peers for an answer. Such reliance on the perceived opinions of others, or reflected self-appraisals, has long been assumed, but new evidence supporting this claim has now been found in the teen brain.

Using functional magnetic resonance imaging (fMRI), researchers looked at adolescent and young-adult brain activity related to both direct

self-appraisals, such as "Do I think I'm smart?" and perceptions of others' opinions -- reflected self-appraisals: "Do I think my friend thinks I'm lonely?"

During direct self-appraisals, researchers found that adolescents show more activity than adults in neural networks tied to self-perception (medial prefrontal and parietal cortices) and in areas linked to social cognition (dorsomedial prefrontal cortex, temporal-parietal junction and posterior superior temporal sulcus). The results, said lead author Jennifer H. Pfeifer, a psychology professor at the University of Oregon, suggest that adolescent self-perceptions depend heavily on others.

The study is detailed in the July/August issue of the journal *Child Development*. Pfeifer briefly describes the research in a video.

The findings even allowed researchers to extrapolate on which outside influences -- such as friends or parents -- drive particular self-appraisals. If a topic involves academics, moms got the nod, which translated into the brain tagging what teens believed mom thought about these abilities as highly self-relevant, Pfeifer said. When it came to social skills, however, reflected self-appraisals from a best friend's perspective mattered most at the neural level.

"As you transition into junior high, peers gain a lot of influence over certain domains, especially in the social realm," Pfeifer said. "Parents manage to maintain this influence in the academic domain."

Three highly active areas of current research in adolescent social development include family relations, peer relations and self-development, said Pfeifer, a former doctoral student at the University of California, Los Angeles, where the research was conducted.

"At the intersection of these fields, we inquired to what extent are adolescent self-views relatively independent, versus being reliant on perceptions of how others view them, particularly peers and family members," she said. "Rather than just relying on self-reports, our study benefited from a relatively new technique, by examining the neural systems supporting self-perception and taking the perspective of others on the self."

The study involved a dozen 11- to 13-year-old students (five girls, seven boys) middle school students and 12 adults (six males, six females) ranging in age from 23 to 30. Participants responded to some 40 questions while inside the scanner over two separate eight-minute sessions. The responses about academics, social abilities and the perspectives of various others allowed researchers to identify what areas of the brain were utilized.

"It wasn't a huge surprise to us that reflected self-appraisals elicited responses in the brain's social cognition network for perspective taking and thinking about other people," said Pfeifer, who heads the UO's Developmental Social Neuroscience Lab. "This includes dorsal aspects of the medial prefrontal cortex and also the temporal parietal junction in adolescents and adults. What was most remarkable, however, was that adolescents also used those regions when asked to think about themselves directly, but adults did not.

"If we asked, 'Do you think you are good at spelling?' teens till seemed -- by way of patterns of brain activity -- to be consulting what they thought other people's perceptions of them were. This is evidence not contaminated by self reporting," she said. "Their perceptions of themselves really are more dependent on how they think others see them."

The study was a follow up to research published in 2007 in the Journal

of Cognitive Neuroscience. In that study, Pfeifer and colleagues at UCLA sought to identify neural systems supporting self-knowledge retrieval in younger children. Until that study opened the possibility of using fMRI, most research focused on explicit self reflection as revealed by children.

"It will take additional studies to see how we can harness these findings," Pfeifer said. "We already know that peers really matter when it comes to a person's social self-concept. These studies provide us with a new way to examine this topic. It's a methodological advance that might help us think about kinds of interventions to improve self-esteem and who -- parents or peers -- might be best used in them."

Source: University of Oregon

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