

fMRI predicts outcome to talk therapy in children with an anxiety disorder

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A brain scan with functional MRI (fMRI) is enough to predict which patients with pediatric anxiety disorder will respond to "talk therapy," and so may not need to use psychiatric medication, say neuroscientists from Georgetown University Medical Center.

Their study, being presented at the annual meeting of the Society for Neuroscience in San Diego, showed that children and [adolescents](#), ages 8 to 16, who show fear when looking at happy faces on a screen inside an fMRI scanner were those who had least success with an eight-week course of [cognitive behavioral therapy](#).

Conversely, children who showed fear while looking at fearful faces benefitted from the treatment, which is also known as talk therapy, the researchers found.

"Anxiety and fear are intrinsically linked, so how the brain's fear center responds would naturally affect how [anxiety disorders](#) manifest," says the study's lead author, Steve Rich, a fourth year medical student.

"Indeed, the impact on their responses to therapy was impressive," he says. "Past studies have shown that many people react to fearful faces with fear themselves, but our most robust finding indicated that some anxiety disorder patients have more anxiety towards happy faces than fearful ones, and those patients were the least likely to respond to cognitive behavioral therapy."

The study enrolled 13 boys and 10 girls in this study, all of whom had been diagnosed with pediatric anxiety disorder.

While inside the fMRI machine, the participants were shown pictures of faces that expressed certain emotions strongly. "The questions we were trying to answer were: What emotions make people afraid when they witness them on others' faces, and does that pattern predict response to talk therapy," Rich says.

An fMRI is a type of scan that records changes in blood flow being used at each location in the brain, thus showing levels of activity. In this study, the researchers zeroed in on the amygdala, a brain structure known to represent the emotion of fear.

They then correlated the differing responses they saw in the amygdala with outcomes from an eight-week course in cognitive behavioral therapy.

The researchers found a significant correlation, indicating that pre-treatment fMRI can be used to select patients who likely do well with talk therapy alone, and those that may require other therapy, such as medication.

Rich says that one explanation for the results is that those patients who have greater anxiety towards happy faces than towards fearful ones have a subtly different disorder, one that is very similar but cannot be treated by cognitive behavioral therapy.

"In this subset of patients, that support may actually elicit even more anxiety, thus alienating them from the therapist," he says. "Further study is required to determine whether this is indeed a unique disease subtype, or whether a modified approach to cognitive behavioral therapy that requires the therapist to stay completely neutral could make therapy

more effective for these patients."

Rich and his co-authors do not expect that every pediatric anxiety disorder patient should receive an fMRI diagnosis.

"fMRI is expensive, and this study does not by any means suggest that it should be used as a universal screening tool," he says. "Even so, once the field develops further, our results suggest that neuroimaging studies like [fMRI](#) may be able to help us understand why a given patient might not be responding to the first-line treatment. In other words, when routine care is not enough, we can focus on the nuances of the individual."

Provided by Georgetown University Medical Center

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