Williams Syndrome and Social Fearlessness

Why are some brains keenly attuned to happy faces?

By Michele Solis for MSN Health & Fitness

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1 | 2 | Next >

We humans are social creatures, but people with Williams syndrome are more so than most. Famously outgoing, these people will approach even strangers to say hello.

A rare genetic condition, Williams syndrome is characterized by an 'elfin' appearance, disrupted spatial abilities such as difficulties reading a map, and a curious enhancement in social skills. Charming and friendly, they excel at reading emotional expressions on people's faces—at times even better than the rest of us—and they eagerly engage people with conversation.

But people with Williams syndrome also struggle to understand social boundaries. For example, at a restaurant, they may try repeatedly to talk to someone at another table. Their social fearlessness makes it hard for them to discern what is appropriate, and even what is safe.

This excessive gregariousness may be a window into the science of sociability. According to a study published in the *Journal of Neuroscience* earlier this year, people with Williams syndrome have brains that are especially attuned to happy facial expressions and not so much to fearful ones.

This is surprising because it involved the amygdala, an almond-shaped region deep in the brain that's traditionally thought of as a fear center. This finding helps reshape thinking about what the amygdala does, and suggests that the amount of brain space it reserves for fearful expressions and for friendly ones could reflect social tendencies in all of us.

The flipside of fear

Using a brain scanner, a team of scientists at Stanford University studied the brain activation as people with and without Williams syndrome looked at pictures of facial expressions: happy, neutral, or afraid.

Like a previous study, the scientists found that the amygdala in Williams syndrome was rather unmoved by the afraid faces. It's as though their brain did not register that those faces were something to feel nervous about, and might explain the hallmark social fearlessness of Williams syndrome.

But—and this was the new finding—the amygdala was highly activated when people with Williams syndrome looked at happy faces.

It was the other way around for the group without the syndrome: The amygdala turned on to fearful faces but not so much to happy ones.

This doesn't mean that people with Williams syndrome are frightened by happy faces, says Brian Haas, Ph.D., first author of the study. Instead, he says it reflects what's emotionally riveting for people.

Motivated to interact

"Happy facial expressions may be more rewarding for those with Williams syndrome," Haas says. "This may explain their increased drive and motivation to approach others and to socially interact."

This finding also fits with a broader picture of the amygdala that has been emerging recently. Rather than solely devoted to fear, the amygdala seems to deal with other strong emotions too, like sadness and happiness.

Haas says that the amygdala tunes into the things that are very relevant to us now and that can sway our feelings. So if you spot a snake, or watch a friend break into tears, the amygdala leaps to attention and points the brain's resources to these emotionally charged situations.

And for people with Williams syndrome, a happy face tugs powerfully on their attention. Haas hopes that this affinity for happy expressions may somehow be used to motivate or reinforce people with Williams syndrome when they are taught about what is socially appropriate. This could help those with the syndrome form closer social bonds with others, which often suffer due to their overly outgoing ways, he says.

And while researchers don't yet have any data, there's work being done on potential uses of this discovery into behavioral treatment for autism: Teaching social skills to someone with autism might work by retuning the amygdala's responses to happy faces.

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1 | 2 | Next >

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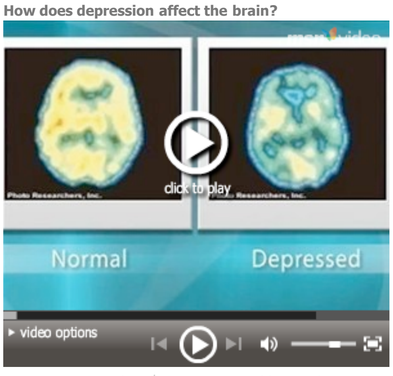

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< Previous | 1 | **2**

Extroverts and introverts

What's the difference, say, between a guy who can befriend a taxi driver with a rollicking conversation that gets him a free ride, and me, who sits silently in a taxi, watching the scenery (and, alas, paying my fare)? Part of the answer may also lie in the amygdala.

That's because Haas's study also found a hint of separation of facial expressions in the amygdala, akin to a happy spot and a fearful spot. That is, the part of the amygdala activated by happy faces in people with Williams syndrome was different from the part activated by fearful faces in those people without the disorder.

If it turns out that each person really has separate compartments within the amygdala for dealing with different facial expressions, the amount of neural territory given over to different emotions could reflect a person's tendency in social situations: a larger happy spot might indicate more of an extrovert and a smaller one might be found in an introvert.

So the amygdala could be hardwired to determine whether we're an extrovert, an introvert, or somewhere in between.

And because Williams syndrome is a genetic condition—caused by the loss of a small portion of chromosome 7—this can help scientists piece together which genes have a hand in setting up the wiring in the brain that controls social skills in all of us.

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After spending 15 years in the lab doing her own neuroscience research, Michele Solis is now putting her Ph.D. to work as a science writer. Her work covers a variety of topics including autism, linguistics, and animal communication. She contributes regularly to the Autism Speaks, Simons Foundation, and Crosscut Web sites.

< Previous | 1 | **2**

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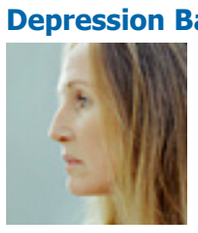

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