

# Amygdala gone, she knows no fear: woman lacking basic brain structure can't be frightened

---

*Science News*, January 15, 2011

A middle-aged woman known as SM blithely reaches for dangerous snakes, giggles in haunted houses and once, upon escaping the clutches of a knife-wielding man, didn't run but calmly walked away. A rare kind of brain damage precludes her from feeling fear of any sort, finds a study published online December 16 in *Current Biology*.

[ILLUSTRATION OMITTED]

SM has an unusual genetic disorder called Urbach-Wiethe disease. In late childhood, this disease destroyed both sides of her amygdala, which is composed of two structures the shape and size of almonds, one on each side of the brain.

Animal experiments have strongly implicated the amygdala in fear processing. "But one thing we've never known for sure, because they're animals, is whether they can consciously feel fear" says study coauthor Justin Feinstein of the University of Iowa in Iowa City. "So we said, 'Let's take a human patient who has this same sort of damage, and for the first time, actually figure out how they're feeling.'"

SM told Feinstein and his colleagues that she never felt fear, even when threatened with a knife or a gun. The researchers gave her an electronic diary that she carried for three months to record her emotional state. Fear didn't appear once. On a battery of questionnaires, SM wrote that she wasn't afraid of public speaking, death, her heart beating too fast or being judged negatively in a social setting.

The researchers showed SM clips from scary movies: She was interested, but not afraid. They took her to a haunted house. Instead of screaming, she laughed and poked one of the monsters in the head. SM claimed to dislike snakes and spiders. But during a visit to an exotic pet store she was overcome with curiosity, repeatedly asking to touch the snakes.

"Perhaps the amygdala is acting at a very instinctual, unconscious level," says Feinstein. "Without this area, instead of just losing your interest in things, you do the very thing that's opposite. She tends to approach the very things she should be avoiding."

A study of one person can't be extended to everyone, says neuroscientist Hans Markowitsch of the University of Bielefeld in Germany. And pinning a complex emotional state to a single brain structure isn't straightforward. "One could argue that the amygdala cannot act on its own--it's dependent on connections, on circuits, on other brain regions," he says.

The study's authors can't dismiss other brain regions' roles in fear. Yet SM's complete inability to experience the emotion, in a wide variety of forms, highlights the amygdala's pivotal role.

Sanders, Laura

**Full Text:** COPYRIGHT 2011 Society for Science and the Public.  
<https://www.societyforscience.org/>

---

**Source Citation**

Sanders, Laura. "Amygdala gone, she knows no fear: woman lacking basic brain structure can't be frightened." *Science News*, 15 Jan. 2011, p. 14. *Science in Context*, [link.galegroup.com/apps/doc/A247223208/SCIC?u=pl3806&xid=8db1f6a6](http://link.galegroup.com/apps/doc/A247223208/SCIC?u=pl3806&xid=8db1f6a6). Accessed 13 Oct. 2017.

**Gale Document Number:** GALE|A247223208