Hello Botox, Bye-Bye Sadness—But Not for the Reasons You Think

Paralyzing the "frown" muscles also inhibits the ability to understand anger and sadness.

by **Sharon Begley**

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And here I thought my Botoxed friends were happy, mellow, and sweet-tempered because a couple of injections of a neurotoxin had eliminated their frown lines, knocked years off their apparent age, and made them no longer look "tired and unapproachable," as the company's Web site cheerfully puts it. (If someone starts selling makeup named "Unapproachable," send me a case. But I digress.) But no! According to an amusing little study, by paralyzing the frown muscles that ordinarily are engaged when we feel angry, Botox short-circuits the emotion itself.

It's a version of the classic finding in psychology that facial expressions can produce the very emotion they usually reflect. Called the facial feedback hypothesis, it implies that forcing your lips and cheeks into a smile can make you feel happy and scowling can make you feel annoyed, at least a little. Building on that research, graduate student David Havas of the University of Wisconsin-Madison decided to study people who had received Botox treatments that paralyzed one pair of their corrugator muscles, which cause the forehead to constrict into a frown. The idea was to see whether the treatment affected their ability to feel certain emotions. We already know that Botox affects the ability to *convey* emotions such as anger, and a 2006 study found that it might even alleviate depression, as NEWSWEEK reported, presumably by the same mechanism: block the facial expression of sadness, prevent the related emotion.

Havas found an even deeper effect. As he described at the annual meeting of the Society for Personal and Social Psychology last week, he had 40 volunteers who were planning to be Botoxed in two weeks read statements with particular emotional freight: angry ("the pushy telemarketer won't let you return to your dinner"), sad ("you open your e-mail inbox on your birthday to find no new e-mails"), or happy ("the water park is refreshing on the hot summer day."). After reading each sentence, the volunteers pushed a button to indicate they had understood it. Then, two weeks after their Botox injections, they repeated the exercise, reading and understanding another list of emotion-producing sentences.

The volunteers pressed the "I've read and understood this" button just as quickly when the sentence conveyed something happy. But when it conveyed something infuriating or unhappy, people took longer to read and understand it. The emotions just did not compute as easily as before their sadness and anger muscles were paralyzed.

This is the first study suggesting that Botox affects the ability to understand the emotional content of language. "Normally, the brain would be sending signals to the periphery to frown, and the extent of the frown would be sent back to the brain," UW-Madison professor emeritus of psychology Arthur Glenberg (and Havas's adviser) said in a statement. "But here, that loop is disrupted, and the intensity of the emotion and of our ability to understand it when embodied in language is disrupted." Even though the temporal delay is less than a second, says Glenberg, who is now at Arizona State University, "in conversation, people respond to fast, subtle cues about each other's understanding, intention, and empathy. If you are slightly slower reacting as I tell you about something that made me really angry, that could signal to me that you did not pick up my message."

The research is part of a burgeoning field called "embodied cognition," which posits that all our cognitive processes are rooted in, and reflected in, the body, as Natalie Angier described very nicely in her *New York Times column*on Feb. 1. Research in embodied cognition has

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shown that people pitch forward when they talk about events in the future, for instance, but lean back when they discuss the past. When they hold a mug of hot coffee, they judge people as warmer and friendlier than when they clutch an iced latte. When they ponder their moral transgressions, they have an urge to wash. And as other researchers reported at the Personal and Social Psychology meeting last week, that figurative/literal connection between all things dirty can be amazingly specific. When volunteers left an unethical message on someone's voice mail (telling a lie, making a threat), they had an urge to wash out their mouth, but when they sent the same message by e-mail (using their hands to type), they wanted to wash their hands.

The body, it's clear, is no mere bystander in our thoughts and emotions. At least before Botox.

Sharon Begley is NEWSWEEK's science editor and author of The Plastic Mind: New Science Reveals Our Extraordinary Potential to Transform Ourselves*and* Train Your Mind, Change Your Brain: How a New Science Reveals Our Extraordinary Potential to Transform Ourselves.

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