



How Do You Feel Now?

Emotional States: Technology gives autistic kids a hand

By Temma Ehrenfeld
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Feb. 28 issue - To most people, the human face is a compelling object fraught with meaning. But for autistic children, who can't get a read on other people's emotions, eye contact is terrifying. When they do look at faces, they tend to stare at the mouth. Fortunately, researchers now think that technology can help overcome the barrier that isolates these kids. Software that enables robots to respond to a child's feelings a little bit—but not too much—can help train him or her to interact more freely with people. "The beauty of a robot or software is that it's not human," and therefore not as intimidating, says Stephen Porges, an autism expert at the University of Illinois in Chicago.

Computer-generated faces are already having an impact in the classroom. Psychologist Dominic Massaro at the University of California, Santa Cruz, has created Baldi, a lively computer character, as a stand-in for human teachers. For three years, Baldi and his female counterpart, Baldette, have been giving autistic kids in the Bay School in Santa Cruz lessons in vocabulary and in understanding facial expressions. The character has been so successful that he's spawned imitators—Baldini in Italian, Baldir in Arabic and Bao in Chinese.

Porges thinks that the real role of cartoon personas is not so much to teach patients as to calm them. Autistic kids live in a state of hyperalertness, as if they were constantly suffering stage fright. If technology can put them at ease, Porges argues, social skills will develop naturally. In a recent study, Porges exposed 20 autistic people, ranging from 10 to 21 years old, to engineered speech and music. He removed low frequency sounds, which the body tends to interpret as indicating danger, and exaggerated vocal intonations, much as people dramatize emotions when speaking to infants. After 45 minutes, all but one of the subjects began looking at the eyes of a person on a video screen just as a normal viewer would. The improvement persisted at least a week, but had faded after six months. Porges is now developing headphones that reduce low frequencies. He also hopes to test whether ongoing exposure to the engineered sounds can lead to long-term improvement.

Other technology may be effective for less severely autistic children. Whereas normal babies learn from caretakers to mirror emotions—smile at a smile, frown at a frown—autistic children often lack this basic skill. Cognitive scientists Javier Movellan and Marian Stewart Bartlett at the University of California, San Diego, have built a robot that can "read" faces. They hope that playing with the robot and watching it interact with others will inspire autistic children to return the smiles of humans.

Commercial emotion-reading software about to hit the market could be a boon for some high functioning autistic and Asperger's patients in dealing with social situations. Affective Media, a firm near Edinburgh, Scotland, has created a prototype phone that "hears" the emotion in voice messages and conveys it explicitly to the owner. A person checking messages would hear something like this: "You have two bored calls, one surprised call, and one angry call." "Three years ago this was science fiction," says Christian Jones, co-founder of Affective Media. Researchers at the Massachusetts Institute of Technology have built a similar voice-mail system, called Emotive Alert, that evaluates a caller's intonation, speed and volume. It identifies whether a call sounds urgent, informal or formal, and whether the speaker was happy or sad.

Emotion-reading software might improve the way we all interact with machines. Computers at call

centers may soon be able to alert employees to an irate caller who might need special handling. Scientists at Affective Media, Stanford and Toyota are developing a system for cars that responds to cues in the driver's voice and face, perhaps turning on appropriate music if a driver seems sad. It's another barrier emotionally adept software might help overcome.

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