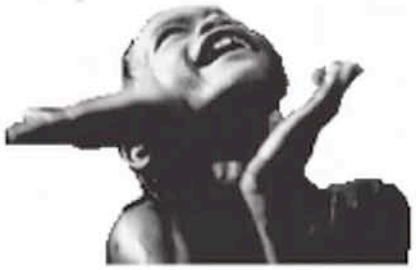
A Friend for Autistic Children

By Susan Maya

Even into adulthood, many people recall with fondness the names of imaginary friends from long ago—the ones who came to tea, helped find treasures in the backyard, and got squashed by Grandpa when he sat in the wrong seat (oops). With the aid of twenty-first century technology, a new kind of make-believe companion may help children with autism spectrum disorders overcome social dysfunction. At the annual meeting of the American Association for the Advancement of Science (AAAS), psychologist and linguist Justine Cassell of Northwestern University presented evidence that autistic children interacting with virtual playmates exhibit dramatically improved communication skills.

Children with autism have difficulty engaging in reciprocal conversation, interpreting body gestures and facial cues, and employing their imagination to play with peers. They often do not show a grasp of the "theory of mind", the notion that others have thoughts, beliefs and desires which differ from their own (1). Although there is no one-size-fits-all treatment for the disorder, behavioral therapy for autism may include typically developing peer "buddies" or formal social skills training workshops. Selective serotonin reuptake inhibitors (SSRIs), anti-anxiety drugs, and other medications are sometimes used to alleviate the symptoms of autism, but none can actually provide a cure (2). Designed specifically for children with autism, Cassell's Authorable Virtual Peer (AVP) does not serve as a tutor for proper social etiquette, but instead provides a medium through which patients can practice peer-to-peer learning in a risk-free environment.



The novelty of Cassell's AVP lies in its highly interactive design. Sam the Castlemate, as the virtual friend is called, is programmed to engage in a collaborative narrative and respond to input from the child with speech and gestures modeled after that of a typical eight year-old (3). Instead of content, the system teaches communication itself (1). Sam is comprised of two parts: a life-size animated child of ambiguous gender projected on a screen, and a toy castle. Subjects can play with the castle parts and pass them back and forth between the real and virtual worlds—sensors on the equipment allow Sam to retrieve a virtual object when a child hands over the real one (4).

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Cassell first developed Embodied Conversational Agents, the precursors to AVPs, almost ten years ago as a means to study development of literacy and conversation in normal children (4). When the system was employed to study speech contingency, the relevance of what one says to what was said previously, the effects on autistic children surpassed expectations. During unsupervised play with the virtual friend, autistic patients improved the contingency of their responses and engaged in normal conver-

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sation after merely 20 minutes. In comparison, they exhibited no overall change when chatting with typically-developed peers (3). Likewise, the subjects' ability to stay on topic improved during the course of their interactions with the virtual peer. Cassell believes that the predictability of the AVP could explain the altered behavior. Whereas preliminary brain scans show that normal adults must think harder when interacting with virtual technologies, the opposite may be true for autistic children (4). In fact, when autistic children are given control over the virtual peer's actions—like a "virtual puppeteer"—the children were able to use the virtual puppet to converse better in the presence of a real child (5). This role playing allows the children to test hypotheses—i.e. "what would happen if I said X?" These experiments, along with the increasing prevalence of online virtual communities and computer-based learning, raise the question of whether technology can in fact produce lasting effects on behavior. The next step for Cassell and colleagues is to demonstrate that autistic children can retain the advances made during their play-date with Sam, and translate those skills to real life situations. H

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References

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