Educational/Biomedical Update:

Real-world benefits of virtual reality explored

In the near future, virtual reality could become a powerful tool for educators teaching social skills to autistic students, according to a new research review.

S. Parsons and P. Mitchell note that computer programs allow users to move through a virtual environment in real time, interacting with people and objects in a naturalistic way. Such programs are already being used successfully to teach learning disabled children daily living skills such as shopping, and to help people overcome vertigo and phobias.

One strength of virtual reality in teaching social skills to autistic individuals, Parsons and Mitchell say, is that "responses can be practiced in realistic settings in the absence of potentially threatening and frightening real-world consequences." In addition, computer programs can present social situations of increasing complexity, allowing students to build on their skills. "For example," the researchers say, "a café environment—in which the user has to order some food and find a place to sit down—could start off with lots of empty seats, but become increasingly populated and busy as the user moves through the program."

The researchers say an additional advantage of virtual reality programs is that unlike rule-based teaching, computer programs can create changing environments that promote cognitive flexibility in users. By introducing small changes in scenarios, Parsons and Mitchell say, virtual reality role-playing can encourage autistic participants to think and plan, rather than relying on programmed responses to social situations.

The use of "thought bubbles," the researchers say, could also help autistic students develop a theory of mind—that is, the understanding that other people have thoughts and feelings. In addition, the researchers note, visual and auditory stimuli can easily be regulated in a computer program, allowing students to learn in the absence of distracting cues.

While some educators have expressed concern that using computers can cause autistic students to withdraw even further from the real world, Parsons and Mitchell say that virtual reality programs would require active, not passive participation. "Consequently," they say, "the child's interaction with the computer would be more active, less predictable, and therefore, less obsessional." In addition, they recommend that computerized social skills training be done in collaboration with teachers and parents. "The aim is not to circumvent real-world social interaction altogether," they say, "but to provide a teaching aid that would allow practice and demonstration alongside normal input from a teacher or support worker."

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"The potential of virtual reality in social skills training for people with autistic spectrum disorders," S. Parsons and P. Mitchell, *Journal of Intellectual Disability Research*, Vol. 46, Part 5, June 2002, 430-443. Address: Sarah Parsons, School of Psychology, University of Nottingham, University Park, Nottingham NG7 2RD, UK.

British university reports remarkable success rate for early intervention

Ninety-four percent of young autistic children attending an early intervention program run by Bristol University in the UK are able to successfully transition to mainstream schools, according to preliminary data.

Children in the South West Autism Programme (SWAP) receive up to 25 hours per week of intensive, individualized therapy provided by professionals and parents. The program incorporates applied behavior analysis methods, the "PECS" (Picture Exchange Communication System), and the techniques developed by the TEACCH (Treatment and Education of Autistic and Related Communications Handicapped Children) program at the University of North Carolina at Chapel Hill. Children are enrolled between the ages of two and four.

Program director Alec Webster says data from 26 families are now available and reveal that "all of the children without exception have made huge gains in their development." One child with a developmental quotient (DQ) of 24, for instance, gained more than 60 points in 18 months. (DQ is the child's developmental age divided by chronological age and multiplied by 100.) One third of participants showed an increase of more than 45 DQ points, and half gained 20 points or more.

Webster notes that "children made huge gains in academic skills, but more significantly, acquired the social skills to take part in group activities and follow everyday school routines."

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"Major breakthrough in treating autism," press release, University of Bristol, Bristol, UK, September 2002.

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"Intensive therapy helps with autism," BBC News, Friday, September 13, 2002.

—and—

South West Autism Programme (SWAP) information sheet, http://www.bristol-lea.org.uk/services/pdf/swap.pdf.

Warning: self-injury possible in children with vagal nerve stimulators

The vagal nerve stimulator (VNS) is a small, battery-powered device used to control otherwise intractable seizures. Implanted in the chest under the collarbone, the VNS transmits intermittent electrical pulses to the vagus nerve, inhibiting seizures for reasons that are not yet fully understood.

Long-term follow-ups show that VNS treatment can dramatically reduce seizure frequency, reduce or eliminate the need for anticonvulsive drugs, and even improve mood (see ARRI 15/2). Side effects have been minor and generally limited to coughing or voice changes A new report cautions, however, that a small number of developmentally disabled individuals may injure themselves by rotating the device under the skin.

J. G. Kalkanis et al. report the cases of two developmentally disabled adults who suffered vocal cord paralysis resulting from injury to the vagus nerve when the individuals tampered with the devices. "As the use of vagus nerve stimulation becomes widespread," they say, "it is important to consider the potential for this adverse event." According to a recent report by H. Le and colleagues, the problem can be prevented by by implanting the VNS between the shoulder blades.

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"Self-inflicted vocal cord paralysis in patients with vagus nerve stimulators: Report of two cases," J. G. Kalkanis, P. Krishna, J. A. Espinosa, and D. K. Naritoku, *Journal of Neurosurgery*, Vol. 96, No. 5, May 2002, 949-51. Address: J. G. Kalkanis, Department of Neurology, Southern Illinois University School of Medicine, Springfield, IL 62794.

—and—

"Interscapular placement of a vagal nerve stimulator pulse generator for prevention of wound tampering: technical note," H. Le, M. Chico, K. Hecox, and D. Frim, *Pediatric Neurosurgery*, Vo. 36, No. 3, March 2002, 164-6. Address: H. Le, Section of Pediatric Neurosurgery, University of Chicago Children's Hospital, Chicago, IL 60637.

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