Biomedical/Educational Update:

Simple treatment reduces air-swallowing

Aerophagia—the repetitive swallowing of large amounts of air—is a serious behavior problem that can cause pain, gastrointestinal problems, or even death. A new study, however, suggests that the behavior can be successfully reduced using a simple behavior modification technique.

David Garcia et al. treated a 22-year-old mentally retarded and hearing-impaired woman with a nine-year history of aerophagia resulting in severe abdominal extension. The first phase of their procedure consisted of watching to see when the woman tilted her head backward and opened her mouth in preparation for air-swallowing, and physically placing the woman's hand over her mouth for five seconds to prevent aerophagia. Next, the researchers placed a wristwatch on the girl's arm before each intervention session, removing it during breaks in the training sessions, so that the watch would become associated with the physical act of stopping the woman's aerophagia. In the third phase, the researchers used the wristwatch alone, and did not respond physically to episodes of aerophagia.

Garcia et al. report that episodes of aerophagia dropped significantly during the physical intervention, and remained low when the wristwatch alone was used. They caution, however, that their study involved only one subject. However, they say, "These data are encouraging because in previous studies [using other approaches}, rates of aerophagia returned to pretreatment levels immediately following withdrawal of treatment."

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"Treating aerophagia with contingent physical guidance," David Garcia, Stephen Starin, and Robert M. Churchill, *Journal of Applied Behavior Analysis*, Vol. 34, No. 1, Spring 2001, pp. 89-92. Address: Stephen Starin, Behavior Analysis, Inc., 1012 Spoonbill Circle, Weston, FL 33326.

Rett syndrome, autism: boundaries blurred

A recent screening of autistic girls reveals that the boundaries between autism and Rett syndrome are not clear-cut as once believed.

Rett syndrome, a disorder that almost exclusively affects girls, initially causes some autistic symptoms such as speech regression and withdrawal. However, girls with Rett syndrome often outgrow their autistic symptoms, while developing other serious and progressive symptoms such as scoliosis, hyperventilation, severe mental retardation, and loss of purposeful hand use. Many exhibit a constant hand-rubbing or hand-wringing gesture. The cause of Rett syndrome, a mutation in the MeCP2 gene, was discovered two years ago.

Margaret Pericak-Vance and colleagues screened 69 girls who were diagnosed as autistic and showed no classical symptoms of Rett syndrome, and report that two of their subjects exhibited MeCP2 gene mutations. Based on their findings, they recommend that female patients diagnosed as autistic should be considered for screening for MeCP2 mutations.

The researchers also note that some females with symptoms resembling Rett syndrome do not exhibit the MeCP2 gene mutation. *(Editor's note: Also, some males do exhibit the MeCP2 gene, previously believed to be fatal to males.)* "Based on clinical descriptions, we find patients who look like they have Rett disorder, but don't have MeCP2 mutations, and we can find patients without the classical clinical signs of Rett disease who do have MeCP2 mutations," Pericak-Vance says. "However, we're finding this occurs more and more as we get into the genetic roots of different diseases—what we see clinically isn't always as straightforward once we understand the underlying genetics of a disorder."

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Margaret Pericak-Vance, John Gilbert, Jeffery M. Vance, et al., presentation to the International Congress of Human Genetics, Vienna, May 18, 2001. Duke University press release available at http://www.psycport.com/news/2001/05/19/eng-dukeuniversity/eng-dukeuniversity_035420_111_247629777063.html.

Testosterone fingered

British researchers say that many autistic children have unusually long ring fingers in comparison to the length of their index fingers, and that their non-autistic siblings and parents also have unusual finger-length ratios.

John Manning et al., who studied 72 children with autism or Asperger's syndrome, say that relative finger length is established by the 14th week of gestation. Finger length is strongly linked to testosterone exposure in the womb, and the researchers say their findings suggest that "high testosterone seems to be running through these families."

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"The 2nd to 4th digit ratio and autism," J. T. Manning, S. Baron-Cohen, S. Wheelwright, and G. Sanders, *Developmental Medicine and Child Neurology*, Vol. 43, No. 3, March 2001, pp. 160-164. Address: John Manning, Population and Evolutionary Biology Research Group, School of Biological Sciences, University of Liverpool, Liverpool, UK. See also: "Pointer for autism," Alison Motluk, *New Scientist*, March 14, 2001.

Prism glasses improve posture, movement

Several years ago, Melvin Kaplan and colleagues reported that ambient prism lenses at least temporarily reduce the behavior problems of autistic individuals (see ARRI 12/3). A new study by Kaplan, Dennis Carmody, and Alexa Gaydos indicates that the glasses also improve spatial orientation in autistic subjects and reduce their abnormal movements and postures.

Ambient prism lenses consist of eyeglass frames with a pair of wedge prisms replacing the lenses. (In this study, the prisms were positioned either base-up or base-down in the frames.) Objects seen through the base edges of the prisms appear compressed, while objects viewed through the apex edges appear expanded.

The researchers evaluated 24 autistic children, ranging in age from 3 to 18, diagnosed at a Hong Kong child development center. The children were assessed while watching television or catching a ball without glasses, and then were tested with prism glasses in which the bases of the prisms faced down, and with glasses in which the bases of the prisms faced up.

The researchers report that children varied in their responses to base-up or base-down lenses. When evaluating the children using the prism glasses that best suited each subject, they researchers found that:

—erect head position increased from 13 percent during baseline to 88 percent.

—erect body posture increased from 22 percent during baseline to 83 percent.

—relaxed facial expression increased from 9 percent during baseline to 71 percent.

In addition, they say, the children were significantly better at approaching, reaching for and catching the ball during the ball-catching task. Changes were seen immediately when the children put on the prism glasses.

"Ambient lenses," the researchers conclude, "may prove to be a powerful and simple intervention to modify the visual attention style of some children with autism and pervasive developmental disorder."

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"Spatial orientation adjustments in children with autism in Hong Kong," Dennis P. Carmody, Melvin Kaplan, and Alexa M. Gaydos, *Child Psychiatry and Human Development*, Vol. 31, No. 3, Spring 2001, pp. 233-247. Address: Dennis P. Carmody, Professor of Psychology, Saint Peter's College, 2641 John F. Kennedy Blvd., Jersey City, NJ 07306, carmody_d@scpvxa.spc.edu.

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