



4 University Center for Excellence—Postsecondary Education for Students With Intellectual Disabilities



5 TRIAD—Autism and Multisensory Processing



8 Susan Gray School Graduations



11 Celebrating Community Friends

Discovery

The Environment & Autism

By Jan Rosemergy



Dan Marino

The numbers are staggering. We come into contact with an average of 500 manufactured chemicals every day, have over 200 synthetic compounds in our bodies, and the paucity of testing of these compounds is cause for alarm among both parents and scientists. The numbers strike home when put into the context of a report from the National Academy of Sciences, which reported that 3% of all neurobehavioral problems in children are directly caused by a chemical exposure and 25% are caused by environmental exposure interacting with a genetic trigger.

Faced with these numbers, the Vanderbilt Kennedy Center (VKC) hosted a day-long intensive examination of these issues on Earth Day, April 22. VKC patrons Dan and Claire Marino sponsored the symposium titled “Environment and Autism Etiology.”

Symposium chair BethAnn McLaughlin, Ph.D., assistant professor of neurology, summarized the impetus to organize this meeting: “The public operates under the assumption that chemicals used in agriculture, industry, and in our households have been rigorously tested and have been deemed safe by government regulatory agencies. In truth, only a few thousand of the over 80,000 compounds registered for use in the U.S. have been tested. For the vast majority, their safety is not known, and children, before and after birth, are enormously vulnerable to even small amounts of compounds that can detrimentally affect the course of development.”

Marinos Thank VKC and Community Champions

Dan and Claire Marino came to Vanderbilt on a mission. For the last 3 years, the Marinos have sponsored VKC research on autism spectrum disorders (ASD) under the umbrella of the Marino Autism Research Institute (MARI). Their Vanderbilt visit provided the opportunity for the family to see the impact of their investment, galvanize VKC researchers and a national gathering of investigators, and thank other VKC patrons (see p. 11).

The NFL Football Hall of Fame quarterback and his wife Claire began their visit with a tour of cellular and molecular neurobiology research labs. They visited with McLaughlin, Daniel Campbell, Ph.D., Kathie Eagleson, Ph.D., and members of research groups working with Pat Levitt, Ph.D., and McLaughlin.

Jeannette Stankowski, a neuroscience student in the McLaughlin lab, was one of many awestruck scientists in the group. “It was tremendously exciting to see this incredibly famous family come to see what we were working on,” Stankowski said. “We all spend so much time working in lab, and to see how excited they were by our work was inspirational.”

Continued on page 2

Moving From Need to Value

By Jan Rosemergy

“I want to challenge us to think differently about where the field of disability is going,” Timothy Shriver, Ph.D., said.

Shriver leads the worldwide Special Olympics movement, which has 3 million athletes and 1.3 million coaches and volunteers taking part in 182 countries. During his visit to the Vanderbilt Kennedy Center on April 1, he met with Vanderbilt Medical Center leaders and then spoke to a rapt audience at the VKC Celebration of Community Partners, “Growing Together,” as he shared his life’s work and passion.

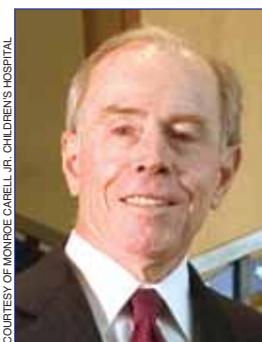
Introducing Shriver, Elisabeth Dykens, Ph.D., VKC Associate Director, praised Shriver for his “leadership in novel Special Olympics programs to promote positive attitudes toward people with disabilities, to train athlete leaders, to build inclusive international disability public policies,

Continued on page 3



Timothy Shriver receiving gift of photograph by Matthew Drumright

Monroe Carell, Jr., Friend to Families, Passes



Monroe Carell, Jr.

Philanthropist Monroe Carell Jr., whose generosity and passion for children’s health led to the building of the Monroe Carell Jr. Children’s Hospital at Vanderbilt, died June 20. He was 76. The Carell family name is virtually synonymous with caring about children and families—including children with autism and other developmental disorders served by the Vanderbilt Kennedy Center.

“Monroe Carell was a man of great heart and spirit who understood the strengths of families at the same time that he understood the need to support families whose children are challenged by illness or disability,” said Pat Levitt, Ph.D., Vanderbilt Kennedy Center director. “His gifts to the Vanderbilt Kennedy Center funded workshops for families of young children with autism and allowed us to serve additional children and families in TRIAD autism clinics. The Carrells supported innovative research through the Ann and Monroe Carell Preterm Care and Diagnosis Discovery Grant. His legacy will continue in many ways.”

Environment & Autism

from page 1

MARI Symposium

"Environment and Autism Etiology" was attended by over 175 scientists, clinicians, and trainees. Associate Vice Chancellor for Research Jeffrey Balsler, M.D., Ph.D., spoke to the pressing need for cutting-edge collaborative research in difficult funding times. "We now face the challenges of inspiring new methods, new researchers, and new collaborative programs. It is the Marino's vision of excellence, collaboration, and information sharing that has set the standard of today's program."

Dan Marino in his welcome said, "I love seeing the passion you have for what you're doing. We all share the common goal of making a difference for families affected by autism. Research is the next step to making an impact on the lives of children with autism and their families."

The symposium covered a wide range of possible toxicological factors, including pesticides, metals, organic pollutants, viruses, bacteria and other infections, pharmaceuticals, and food additives. The event is available via webcast at www.kc.vanderbilt.edu. Brief highlights are summarized below.

Clinical and Behavioral Aspects

The symposium opened with an overview of clinical and behavioral aspects of ASD by Peter Mundy, Ph.D. (Education, University of California-Davis). He reviewed the changes in diagnostic criteria and screening that have occurred over the last several decades, which contribute to the difficulty in accurately determining the extent of the rise in ASD prevalence.

"The essence [of ASD] hinges on attentional function," Mundy said. "It's taken us a long time to define the social phenotype of autism, and we have to tie our biological, genetic, or epidemiological science to that, to try to link the biological processes to what we are coming to understand are the cardinal behavioral symptoms of the disorders."

If the increase in prevalence is related to changes in diagnostic criteria, one would expect to see prevalence increases not just in younger children—who would be most vulnerable to new environmental factors—but also in older children, Mundy argued. He indicated that more epidemiologic studies are needed to address that question.

A recent provocative finding, Mundy said, are two studies in different parts of the country following children in neonatal intensive care units (NICU) that showed an increase in ASD prevalence in infants stressed by low birth weight. Another epidemiological factor appears to be more years of higher education in parents.

As prevalence is increasing, there are proportionately more children with ASD without intellectual disability than in the past. "If biology or environment is driving ASD, why is it driving it in the higher functioning children?" Mundy asked.

Genetics of ASD

James Sutcliffe, Ph.D. (Molecular Physiology &

Biophysics, Vanderbilt) stressed the substantial genetic component in ASD etiology, describing it as "enormously complicated." Sutcliffe explained, "Different genes contribute to susceptibility, and different constellations of genes in different families—not causing ASD but conferring additional risk."

Sutcliffe discussed work from his group using large groups of patients to identify genetic "susceptibility" factors or candidate genes that may cause ASD or greatly increase the chance that, under as yet to be defined environmental agents or other influences, cause one to be at high risk of developing ASD. Sutcliffe described for the nongeneticists how genome-wide linkage screens, genome-wide association studies, and candidate gene studies allow researchers to find common genes associated with

system travel together," Levitt said. "Is the MET signaling pathway a convergent node in ASD?" he asked, pointing out that MET signaling affects the development of multiple biological systems: central nervous system, peripheral nervous system, gastrointestinal system, and the immune system. Signaling of genes other than MET, including *PLAUR* and *SERPINE1*, is involved. "Some combination of genes causes vulnerability to maternal and environmental factors," Levitt summarized.

Epidemiology of ASD

"Derived from the Greek, meaning 'what is upon the people,' population approaches are critical to definitions of epidemiology," said Craig Newschaffer, Ph.D. (Epidemiology & Biostatistics, Drexel



MARI directors, MARI Symposium presenters, and Dan Marino Foundation leaders—(left to right, seated) Craig Newschaffer, Wendy Stone, Isaac Pessah, Darryl Hood, BethAnn McLaughlin, Mark Noble

(left to right, standing) Irva Hertz-Picciotto, James Sutcliffe, Michael Aschner, Pat Levitt, Claire Marino, Dan Marino, Mary Partin, Daniel Messinger, Theodore Slotkin, Peter Mundy, Michael Alessandri

ASD risk. Other approaches Sutcliffe described included mapping chromosomal translocations and inversion breakpoints, and copy number variations. Of particular recent interest is the idea that genes controlling neural development and transmission may be associated with ASD, which are active areas of research for his group.

Genes and Neurobiology

"Brain biology is altered early on," said Pat Levitt, Ph.D. (Pharmacology, Vanderbilt), as he reviewed evidence that included accelerated brain growth in the first 9-12 months and increases in the size of white matter. "There's an early maturing and then a flattening," he said.

Reviewing a list of genetic syndromes that co-occur with ASD, he pointed out that what they all have in common is "a disruption of [brain] connectivity." Illustrating the complexity, he pointed out that as many as 14,000 genes are active at the point of synapse between brain neurons.

Levitt focused on findings in genetic research that he has conducted, with Daniel Campbell, Ph.D., and colleagues, involving the MET gene, which is expressed in forebrain circuitry and is related to gastrointestinal function, a system often disrupted in ASD. "Changes in brain development and the GI

University). Newschaffer contrasted descriptive versus analytic studies. The latter includes hypothesis-driven studies grounded in some *a priori* evidence, as well as exploratory analytic studies. He then provided an overview of basic epidemiologic designs relating ASD and environmental factors, noting strengths and weaknesses of each.

Ecologic studies involve a correlation between group-level exposure data and group-level outcome data. They do not consider individual-level data and individual subjects. Studies correlating childhood vaccines and ASD are ecologic studies. "These studies tend to be exploratory, and you have to use caution when you're interpreting these group-level studies," Newschaffer warned. "They are important studies, they can generate ideas, but as causal evidence, we need to interpret them with caution."

As an example of a case control study, Newschaffer cited a recent study on pesticide exposure linking a database of agriculture pesticides used in California counties to the mother's geographic location during pregnancy. This study found a higher incidence of ASD when mothers were exposed in the first trimester. Other current studies include the Center for Disease Control's SEED—Study to Explore Early Development, a 5-year, multisite collaborative *Continued on page 7*

Moving From Need to Value from page 1

to foster family support networks, and to promote athlete health and wellness through large-scale health screenings.”

Healthy Athletes

Shriver focused on the need for improved health care, in this country and worldwide, for individuals with intellectual disabilities when he met with VMC physicians, administrators, and faculty responsible for medical education. He emphasized the *new* Special Olympics, which is now a global movement that uses sports to change attitudes and behavior, and which bridges service, research, and social change.

Healthy Athletes screenings at the 1995 Games demonstrated significant untreated health and dental problems. These disparities in health care were further confirmed by the U.S. Surgeon General's 2002 report, *Closing the Gap: A National Blueprint to Improve the Health of Persons with Mental Retardation*.

The Healthy Athletes program has had significant impact. There are programs in 85 countries. Over 650,000 screenings have been done. Over 76,600 health care professionals have been trained. Providers report improved perceptions of athlete competence; 90% acknowledge need for more training after volunteering; and 72% say they will seek out new patients with intellectual disabilities. Cross-sectional data from screenings in 159 countries are available for analysis in collaboration with universities.

Shriver called on health care professionals and university researchers to address the pressing health care needs.

“We need to rethink the curriculum of health care professionals, so that they are prepared to serve persons with intellectual and other developmental disabilities,” he said. “Significant changes are needed in insurance and reimbursement policies to enable improved access to health care.”

“The Search for Value”

As the featured speaker for the Center's Celebration of Community Partners, Shriver addressed an audience of over 100 individuals with disabilities and family members, disability advocates, and VMC faculty and staff involved in community outreach.

Shriver made his points by telling stories of change. The Opening Ceremony of the 1995 World Special Olympics was the first ever attended by a U.S.

President. A professional photographer taking photos of President Clinton in the distance saw a group of Special Olympians holding their disposable cameras up—but with the lens toward their own faces. Concerned that they did not know how to take photos, he explained the need to turn the camera, lens outward. They thanked him—and then explained that the lens functions like magnifying binoculars when one looks through it.

“I like that story,” Shriver said, “because it frames expectations and changes in expectations. The photographer's assumption was about incompetence. Who was the most changed person on the field that day? That photographer changed just as much as the athletes. It's that kind of change we need to think about as community partners and as scholars.”

Shriver readily acknowledged the substantial progress of the last several decades focused on inclusion, social justice, services and supports, education and IDEA, ADA, housing, employment, and more.

“But this is about social justice and need,” Shriver pointed out. “It's not so much about the *value* of individuals with intellectual or other disabilities.”

Shriver characterized the care of individuals with intellectual disabilities in many places around the world as “simply criminal,” and indicated that



Pat Levitt, Vanderbilt Chancellor Nicholas Zeppos, Elisabeth Dykens, Timothy Shriver

national and international agencies are not addressing this population. He showed findings of a review of national data systems in 12 countries worldwide to illustrate the disparity between the large number of national data systems tracking indicators of well-being for the typical population and the far smaller number of national data systems tracking indicators for persons with disabilities, and fewer yet for those with intellectual disabilities.

“If you have no problem identified, you have no solution identified,” Shriver said. “You have no gap between what's ideal and what's real. And so you do nothing.”

Every individual has weaknesses, every individual has strengths, Shriver stressed. “But we don't talk about strengths in this field as much as we ought to. We don't talk about the absolute benefit of being a colleague, a friend, a brother, a sister, a father, a mother, a team mate of a

Continued on page 7

Director's Message

Who We Are

Last fall, the Vanderbilt Kennedy Center (VKC) launched a strategic planning process that included more than 50 faculty, staff, and community partners. Four main groups emerged: Message to Leadership; Balance Among Research, Training, and Service; Membership; and Infrastructure for Collaboration and Communication. Far-reaching recommendations were made that will sharpen the mission of the VKC.

The Message to Leadership Committee helped us realize how complex we are. With so many ongoing research, training, and service activities, it is difficult to keep up. The group developed a wonderful strategy of providing monthly one-page synopses to the senior leadership of the University in the form of *VKC Notables*. Each synopsis highlights three elements that comprise our own Vision 20/20—multilevel partnerships, empowering the community, and best practices. This new way of communicating to leadership illustrates not only the growing human development and disability research portfolio across campus, but also our emerging influence in other areas, including policy, clinical service, and training.

The goal of the Balance Committee is to achieve a seamless integration of research, service, and training in half of our activities by 2013. This is a challenging task, because these activities typically occur in academic silos. However, our faculty, staff, and community partners are developing specific goals and timelines to garner the space and intra- and extramural resources needed to meet our trifold mission.

The Membership Committee had a difficult task of defining the meaning of VKC membership for faculty. One recommendation was clear—the commitment by the VKC for promoting the intellectual atmosphere on behalf of faculty engaged in research, service, and training relevant to our mission must be met with a reciprocal commitment to the VKC. Input is being sought before enacting recommendations regarding administrative structure and function.

Finally, VKC members will incorporate 21st-century ways of communicating, with each other and with colleagues and the community, the vast array of scientific knowledge that accumulates on a daily basis. The Collaboration and Communication Committee was visionary in its recommendations to provide the best in tools and infrastructure.

We have grown into a truly unique multidisciplinary center. Any great venture needs a well-honed plan, with input from stakeholders. We hope all of you will be part of our efforts to set the future of human development and disability research, service, and training for generations to come. ●

Vanderbilt Kennedy Center for Excellence in Developmental Disabilities

Creating Postsecondary Education Opportunities for Students With Intellectual Disabilities *By Courtney Taylor*

Securing employment can be a necessary and fulfilling milestone in a person's life. Receiving a college education that leads to the securing of employment is an opportunity every person should have. Historically, individuals with intellectual disabilities have not had many postsecondary education opportunities. However, as science and as self-determination help to improve the quality of life and skills of these individuals, the college experience becomes a more desirable option, and the need for programs becomes more apparent.

The Tennessee Task Force for Postsecondary Education for Students With Intellectual Disabilities was formed in May 2007 to increase awareness about the need for postsecondary opportunities in Tennessee, to gather information about postsecondary programs in other states, and to develop a pilot program on a Tennessee college campus. The task force is composed of representatives from State and local agencies, self-advocates and family members, representatives from colleges and universities in Tennessee, and business owners who are potential employers for these individuals.

"This Task Force will effectively plan and implement steps to begin programs in Tennessee that will meet the needs of today's secondary school students who have an intellectual disability and who are seeking a postsecondary education," said Wanda Willis, executive director of the Tennessee Council on Developmental Disabilities. "There are several complex areas of discussion that the Task Force has tackled, including eligibility criteria for a pilot program, and the risk of unintended segregation of students with disabilities by creating a special college-based program. Open and thoughtful discussion of these and other issues help to clarify and firm up goals and desired outcomes for postsecondary programs in Tennessee."

Approximately 120 postsecondary programs for individuals with intellectual disabilities exist across the nation. Some are 2-year or 4-year degree programs, while others issue certificates for completion of a course of study. Some offer individual courses for credit, and others offer auditing courses as the sole option. Currently, there are no postsecondary programs on a college campus for students with intellectual disabilities in Tennessee.



KYLIE BECK

Edward Nesbitt, III

Gathering Information

The members of the Task Force have investigated and explored many postsecondary programs across the United States. One such program is Pathway at University of California, Los Angeles Extension. Pathway is a 2-year certificate program that emphasizes educational enrichment, career exploration and work readiness, life skills, and transition to independent living through its research-based curriculum. In 2007, Pathway had 17 students enrolled, 16 of whom requested housing in the program's dormitory. All were between the ages of 18 and 25 and had completed a high school program.

Interested students enroll in the program and go through a typical university application process. They also are required to interview, as are their parent(s), and to undergo an independent living skills assessment. The program has no public funding, and out-of-state tuition applies. Outcome measures are competency-based and are constructed around the students' strengths. Courses support the development of these competencies, and students leave with a comprehensive portfolio and a college certificate.

"The Task Force has looked at many postsecondary programs," said Sheila Moore, the executive director of the Down Syndrome Association of Middle Tennessee. "All have pros and cons. It is our hope that by holding conversations with representatives from existing programs, we can learn what has worked and what has not. As we continue to work toward developing these opportunities in Tennessee, we must not lose sight of the fact that our work is fueled by individuals with intellectual disabilities who want the same

opportunities as their siblings and their typically developing peers. They want to live in the community, be meaningfully employed, and have their dreams come true."

Developing a Pilot Program on a Tennessee College Campus

"Both individuals with disabilities and the postsecondary institutions have much to gain by developing these programs," said Garret Westlake, coordinator of Disability Services at Volunteer State Community College. "Individuals with disabilities who attend college gain the opportunity to improve their academic, social, and vocational skills. These are the same opportunities that any student gains by attending college. Nearly all colleges and universities across this country stress the

importance of diversity as well as the values of teaching and learning in their mission statements. By accepting and educating students with disabilities who have unique talents and personalities, and who have a strong desire to learn, colleges and universities are simply fulfilling their missions. It is a win-win situation."

While the structure of the program still is in question, the mission of the Task Force is to create a program that provides meaningful college experiences that also may lead to a greater variety of career opportunities. It is a fact that a college degree affords more job opportunities. For individuals with intellectual disabilities this may be doubly so.

"Individuals with disabilities need every competitive advantage in the job market that they can gain," said Andrea Cooper, assistant commissioner of the Tennessee Division of Rehabilitation Services. "This is especially true with the unfortunate attitudinal barriers that exist in many workplaces. We see a lot of success at the community college level in developing job skills that can be applied directly and immediately at work. Making college opportunities accessible to individuals with intellectual disabilities makes a lot of sense in helping these individuals be competitive in the employment market."

Members are eager to see a planning grant awarded to a Tennessee college or university in the coming year.

For a list of Task Force members and for a Tips and Resources fact sheet, see kc.vanderbilt.edu/kennedy/community/postsecondary.html. ●

Autism and Multisensory Processing *By Jan Rosemergy*

Many individuals with autism spectrum disorder (ASD) appear to have difficulty managing sensations. Some may be hypersensitive and avoid stimulation, while others may seek extra stimulation.

Mark Wallace, Ph.D., a neuroscientist who studies multisensory processing, and Wendy Stone, Ph.D., a psychologist who studies the diagnosis and treatment of autism, have teamed up to compare multisensory processing in children with ASD and in children who are typically developing. Wallace is associate professor of hearing & speech sciences and psychology, and Stone is professor of pediatrics and psychology. Their project is funded by a Nicholas Hobbs Discovery Grant.

Multisensory Processing

To understand the basic processes of perception, scientists have focused on each sensory system, and today much is known about how the brain processes visual stimuli, auditory stimuli, and tactile (touch) stimuli—but largely as separate systems.

“If we think about how we perceive the world, it’s in a multisensory way,” Wallace explained. “How does the brain combine information from multiple senses? That’s a real gap in our knowledge.”

Initially, Wallace investigated multisensory processing by focusing on information encoding—how individual neurons in the brain encode information from different senses, and how this encoding is changed when stimuli occur in combination, e.g., a visual cue with an auditory cue.

“My goal was to relate this understanding of basic multisensory processes to human perception, and now we’re doing this in more of a clinical context,” Wallace said. “What kinds of neurodevelopmental disabilities might have a basis in sensory processing, or even in multisensory processing? When I began reading the research literature on autism, I found numerous reports of disturbances in sensory processing but little concrete empirical evidence.”

Current Study

Over the years, Wallace and colleagues have developed a battery of basic tests to assess multisensory perception. Now Wallace and Stone, with graduate students Leslie Dowell and Jennifer Foss-Feig, are using these tests to compare multisensory processing in 10 children with ASD and 10 who are typically developing.

Children range in age between 8 and 17 years.

One important way of examining multisensory functioning is to focus on temporal processing. “If a visual event and an auditory event happen *within* a certain window of time, the brain strives to unify the two events. If the two events happen *outside* that window of time, the brain signals that they are not related,” Wallace explained. “Our hypothesis was that if persons with ASD have a longer temporal window than those who are typically developing, their brains may ‘bind’ unrelated visual and auditory information, resulting in altered sensory perception.”

Wallace’s lab has focused on defining the basic

participant recognizes that there was only a single flash.”

When Wallace’s team compared the performance of children with ASD and typically developing children, they found that the children with ASD continued to perceive the illusory flashes over much longer temporal intervals than the comparison group.

Temporal Order Judgment. A second task involves a judgment in temporal order in which participants indicate which of two lights appears first. If the two visual stimuli occur at long intervals, participants are good at the task. As the time interval

decreases, performance worsens until finally it is at chance, “because we’ve surpassed the ability of the visual system to distinguish between the two stimuli,” Wallace explained. When auditory cues are added to the visual pairings, with a specific temporal structure, performance improves. For persons with ASD, the window of time during which they receive the benefit from the auditory cues is significantly enlarged.

Findings. Preliminary data indicate that the multisensory temporal window may be almost twice as long in children with ASD compared with children who are typically developing. “That is a very exciting finding,” Wallace said, “because it provides an empirical foundation for suggesting that a core set of sensory

and multisensory processing deficits may contribute to the complex constellation of behaviors seen in individuals with ASD. The effects are robust, and we’re seeing them in several different test paradigms.”

Next Steps

Wallace and Stone are continuing the multisensory testing with additional children. To provide a more socially relevant task, they will add a multisensory speech-related task in which perception is again dependent on the temporal window. Finally, they plan to conduct the tasks in combination with brain imaging.

“Our ultimate goals are to develop more sensitive diagnostic tools,” Wallace indicated, “and to use what we learn to improve treatment.”

Families of children, ages 8 to 17, typically developing or with a diagnosis of ASD, who are interested in taking part in these studies can contact Jennifer Foss-Feig (615) 936-0265. ●



Research participants are asked to make judgments about the relative timing and number of visual and auditory events that they perceive.

characteristics of this temporal window. In their experiments, they use simple, low-level stimuli consisting of flashes of light and tone bursts. The tests are simple so that they can be used with brain imaging to identify brain areas involved in multisensory processing, and so that they can be used in young children and in clinical populations.

Flash-Beep Illusion. In this test, participants sit in a quiet room viewing a computer screen and are asked to press one of two buttons to indicate whether they perceived one or two flashes of light. In one condition, the single flash of light is paired with one beep; in the other condition, the single flash of light is paired with two beeps. If the time interval between the flash and beeps is short enough, the participant has the illusion of seeing two flashes when two beeps are heard.

“It shows that auditory cues have a strong ability to drive visual perception,” Wallace said. “When there is more time between the two beeps and the single light flash, the illusion falls apart, and the

Leading the Vanguard of Discovery



LARRY WILSON

DOUG FUCHS, PH.D.
LYNN FUCHS, PH.D.

Nicholas Hobbs Chair in Special Education and Human Development
Professors of Special Education
Vanderbilt Kennedy Center Investigators
Co-Directors, Vanderbilt Kennedy Reading Clinic
Joined Vanderbilt Kennedy Center 1986

Research Interests

In our research, we develop assessment and instructional methods to increase academic achievement of students with learning disabilities (i.e., students with severe reading or math deficits), as well as of high-, average-, and low-achieving students without disabilities in mainstream classrooms. To test the efficacy of these instructional methods, we conduct large-scale, school-based randomized control trials. We also develop “differentiated” instruction (e.g., small group tutoring procedures) for children chronically unresponsive to mainstream reading and math instruction. In this regard, we are exploring how child characteristics moderate the efficacy of various instructional methods. Our goal is to understand how to match instruction to individual learner needs.

Principal Investigators

- National Research Center on Learning Disabilities, U.S. Department of Education
- Preventing and Understanding Math Disability, Eunice Kennedy Shriver National Institute of Child Health and Human Development
- Scaling-Up Peer-Assisted Learning Strategies to Strengthen Reading Achievement, Institute of Educational Sciences, U.S. Department of Education
- Understanding/Preventing Math Problem-Solving Disability, Eunice Kennedy Shriver National Institute of Child Health and Human Development
- Remediating Students' Mathematics Disabilities, Eunice Kennedy Shriver National Institute of Child Health and Human Development

Joint Honors and Awards

- Jeannette E. Fleischner Award for Outstanding Contributions to the Field of Learning Disabilities, The Council for Exceptional Children's Division for Learning Disabilities, 2008
- Identified as among the 300 most highly cited researchers in the social sciences, Thompson ISI, 2008
- College of Education and Human Development's 100 Distinguished Alumni in its first 100 years, University of Minnesota, 2006
- Earl Sutherland Award for Distinction in Research, Vanderbilt University, 2005
- Distinguished Researcher Award, American Educational Research Association, Special Education Special Interest Group, 2005
- Career Research Award, Council for Exceptional Children, 2003
- Joe B. Wyatt Distinguished University Professor, 2001-2002
- Article of the Year, *School Psychology Review* for best article in the 2000 volume year, 2001
- Alumni Distinguished Faculty Scholar Award, Peabody Alumni Board of Vanderbilt University, 2000
- Palmer O. Johnson Award for the outstanding article appearing in an AERA-sponsored journal for the 1997 volume year, American Educational Research Association, 1998
- Mayor's Disability Educator of the Year Award, Nashville, TN, 1998

Selected Publications

- Fuchs, D., Compton, D. L., Fuchs, L. S., & Davis, G. C. (in press). Making “secondary intervention” work in a three-tier responsiveness-to-intervention model: Findings from the first-grade longitudinal study at the National Research Center on Learning Disabilities. *Reading and Writing: A Contemporary Journal*.
- Fuchs, L. S., Compton, D. L., Fuchs, D., Hollenbeck, K. N., Craddock, C., & Hamlett, C. L. (in press). Dynamic assessment of algebraic learning in predicting third graders' development of mathematical problem solving. *Journal of Educational Psychology*.
- Fuchs, L. S., Fuchs, D., Craddock, C., Hollenbeck, K. N., Hamlett, C. L., & Schatschneider, C. (in press). Effects of small-group tutoring with and without validated classroom instruction on at-risk students' math problem solving: Are two tiers of prevention better than one? *Journal of Educational Psychology*.

Lemons, C., Key, S., Fuchs, D., Yoder, P., Fuchs, L. S., Compton, D. L., Williams, S., & Bouton, B. (in press). Predicting reading growth with event-related potentials: Thinking outside the box about indexing “responsiveness.” *Journal of Learning Disabilities*.

Fuchs, L. S., Fuchs, D., Stuebing, K., Fletcher, J. M., Hamlett, C. L., & Lambert, W. E. (2008). Problem-solving and computations skills: Are they shared or distinct aspects of mathematical cognition? *Journal of Educational Psychology*, 100, 30-47.

Al Otaiba, S., & Fuchs, D. (2006). Who are the young children for whom best practices in reading are ineffective? An experimental and longitudinal study. *Journal of Learning Disabilities*, 39(5), 414-431.

Fuchs, D., & Young, C. L. (2006). On the irrelevance of intelligence in predicting responsiveness to reading instruction. *Exceptional Children*, 73(1), 8-30.

Education

Doug Fuchs, Ph.D.

B.A., 1972, Psychology, Johns Hopkins University
M.S., 1973, Elementary Education, University of Pennsylvania
Ph.D., 1978, Educational Psychology, University of Minnesota

Lynn Fuchs, Ph.D.

B.A., 1972, Humanities, Johns Hopkins University
M.S., 1973, Elementary Education, University of Pennsylvania
Ph.D., 1981, Educational Psychology, University of Minnesota

Attraction to Developmental Disabilities Research and Reasons for Vanderbilt Kennedy Center Membership

Each of us began our careers as general education classroom teachers, where we struggled to address the needs of students with learning disabilities. This motivated us to work hard over the years to provide general and special education teachers with methods that can help them address the needs of these students more effectively.

We believe in the mission of the Vanderbilt Kennedy Center, which includes fostering collaborative relationships among investigators from different disciplines. For example, in our recent work, the Vanderbilt Kennedy Center has helped us forge meaningful collaborations with researchers in the Vanderbilt Kennedy Center Psychophysiology Laboratory and with investigators in the Vanderbilt Institute of Imaging Science. This work has broadened our understanding of learning disabilities in important ways. ●

Grants Awarded

Neuroimaging and Genetic Study of Inhibited Temperament

Jennifer Blackford, Ph.D. (Psychiatry)
Mentored Research Scientist Career Development Award, National Institute of Mental Health

Related Services Intervention for Expressive and Receptive Language Skills in Autism Spectrum Disorder and in Cognitive Impairments

Stephen Camarata, Ph.D. (Hearing & Speech Sciences)
Institute of Education Sciences, U.S. Department of Education

Defendants with Intellectual Disabilities in Nashville's Mental Health Court: Using Court Records to Shed Light on a Local Criminal Justice Problem

Elisabeth M. Dykens (Psychology & Human Development) & **Robert Hodapp**, Ph.D. (Special Education)
Vanderbilt Center for Nashville Studies

Genetic Analysis of the L/R Asymmetric Parapineal Neurons in the Zebrafish Brain

Joshua Gamse, Ph.D. (Biological Sciences)
Eunice Kennedy Shriver National Institute of Child Health and Human Development

Functional Analysis of ZNF9 in Myotonic Dystrophy Type 2

Andrew Link, Ph.D. (Microbiology and Immunology)
National Institute of Arthritis and Musculoskeletal and Skin Disease

Melatonin for Sleep in Children With Autism: Safety, Tolerability, and Dosing

Beth Malow, M.D. (Neurology)
Eunice Kennedy Shriver National Institute of Child Health and Human Development

Enhancing Theological and Professional Education in Spiritual Supports for Persons With Disabilities

Terri Urbano, Ph.D. (Pediatrics) and **Courtney Taylor**, M.Div.
Vanderbilt Center for Medicine, Health, & Society

Predicting Useful Speech in Children With Autism

Paul Yoder, Ph.D. (Special Education)
National Institute on Deafness and Other Communication Disorders

Environment & Autism

from page 2

study that will help identify risk factors in ASD and other developmental disabilities.

In cohort studies, children are monitored prospectively. "This maintains temporality in relationship between exposure and disease, and it offers us an opportunity to measure those exposures in real time," Newschaffer explained. A disadvantage is that such studies are expensive and time-consuming to conduct. The National Children's Study, just under way, will follow 100,000 pregnancies, representative of the entire U.S., through age 21 and will collect comprehensive exposure data during pregnancy and in early life and will track many developmental outcomes, including ASD.

Environmental Exposures

The latest findings from the CHARGE Study, a case-control epidemiological study being conducted by the University of California-Davis Center for Children's Environmental Health, was reviewed by Irva Hertz-Piccioto, Ph.D. (Epidemiology and Preventive Medicine, University of California-Davis). Its goals are to identify causes and contributing risk and protective factors for childhood autism, including genetic susceptibility and environmental exposures.

The study design has three groups: children with autism, children with developmental delay, and children drawn from the general population of births, frequency-matched on age, gender, and geography. Hertz-Piccioto presented findings on immunologic deviations; genomics, genetics, and epigenetics; dysmorphology; lipids; environmental chemicals; and labor induction and/or augmentation.

Isaac Pessah, Ph.D. (Molecular Biosciences, University of California-Davis) focused on environmental agents in ASD from molecular and toxicologic perspectives. Pessah emphasized that few people realize that the thousands of commercial

chemicals in use, including industrial chemicals, pesticides, ingredients, and food additives, often lack adequate toxicity testing, especially for neurodevelopmental toxicity. Moreover, even for the scant chemicals on which this testing was performed, it is highly likely that, as in any population, some individuals will be more hypersensitive and others will be more resistant compared to the typical population. This likelihood would not be reflected in standard testing.

"Could autism represent a multisystem disorder whose outcome is likely to be more profoundly impacted by environment than other disorders and diseases," Pessah asked, "and if so, what are the possible mechanisms involved?" He proposed that a common mechanism in autism susceptibility may stem from abnormal ratios of excitatory/inhibitory neurons and the networks they form. Many of the most heavily used pesticides alter the balance of excitation/inhibition within the developing nervous system.

Toxins and Cell Stress

BethAnn McLaughlin, Ph.D. (Neurology, Vanderbilt) discussed her work on cellular energetics and how common themes have emerged in understanding cellular risks when exposed to stressful circumstances. "Individual cells are exquisitely sensitive to disturbances in global metabolism," she explained, "which can change cell architecture, cell communications, and cell fate."

Pesticides, herbicides, solvents, and other well-appreciated "probable toxins" have a profound effect on the cell's ability to make sufficient energy. When this energy is depleted, she explained, communication is sometimes irreversibly damaged. McLaughlin then pointed to recent data from drug company screens showing that many prescription medications had profound effects on cellular metabolism, or "mitochondrial liability." She sees many parallels between young cells with energetic requirements and those she

Continued on page 9

Moving From Need to Value

from page 3



TOMMY LAWSON

Timothy Shriver

person with a disability. We talk about adapting to them instead of talking about making a world where their gifts are celebrated."

"Our movement is not about 'them,'" he continued. "There is no *them*. It's about all of *us*. Everybody has a gift. Everybody has a need. We come together to celebrate both."

Shriver called for social science research on the positive psychology of individuals with intellectual and other disabilities, their strengths and their families' strengths.

Shriver's remarks concluded with the story of Troy Daniel, "TD" to his friends, a Special Olympics athlete with Down syndrome who was a Valedictorian for his Vermont high school class. Shriver characterized his remarks as one of the greatest speeches he had ever read. Troy Daniel wrote, "The law says I'm included. But it's my friends who say, 'TD, come sit by me.'"

This story illustrates the transformational change required in the disability field from "need" to "value." ●

Susan Gray School Graduation By Courtney Taylor



their questions, some of their anxieties might be eased. I know in my heart that the children are ready to transition. My question is for the parents—“Are you ready?”

“Do you know, I have a video at one of my grandmother’s houses, and it gets me ready for kindergarten,” said Sam, a soon-to-be preschool graduate. “Actually, I got two tapes. It’s good. It just makes us do stuff. It makes us know what it is. Some ones are very hard.”

Teachers Graduate Too

This year two Susan Gray School teachers will graduate as well. Catina Martinez will graduate with a Bachelor of Science in psychology from Tennessee State University (TSU), and Suzy Reese has just completed her Masters in Early Childhood Education at Peabody College.

Martinez started as an intern at SGS in 2004. After her internship was complete, she continued to attend classes at TSU full-time and also began working full-time at a car dealership. One day, while

studying for tests. She is looking forward to the summer and to having three months to relax and “just work a full-time job.” She is thinking about applying to Peabody in the fall and plans to continue working at Susan Gray School throughout.

Suzy Reese began working part-time as an SGS teacher in August 2004 as a part of her graduate assistantship. A full-time student at the time, in August of 2005, Suzy decided to change her student status to part-time and to begin working at SGS full-time.

“My parents were not exactly thrilled with the decision,” remembered Reese. “They wanted me to finish school and were a little worried that I might not. I admit the first several weeks were exhausting. I would go home from work and just crash, but in the long run it was a great choice. It usually takes people two years to get through the program and it only took me an extra year and a half. That’s not bad. I was able to gain so much from working in the field I was studying, and I broadened my interests in the process.”

Reese began teaching full-time in a classroom for 2-year-olds. It is this class that will be graduating this year and going off to kindergarten.

“I am so excited for them,” said Reese. “I know I’m going to be crying my eyes out at their graduation.

For the Susan Gray School (SGS) graduating class of 2008, going to kindergarten is a very popular topic of conversation.

“Kindergarten is gonna be fun,” said Johnny, a soon-to-be graduate. “We’re gonna play.”

“Yeah,” said Daschell, best friend of Johnny and fellow graduate-to-be. “Yeah, because Johnny and me, we’re going to be the next ones! Know what I’m going to do? Know what I’m doing in kindergarten? I’m going to have lots of fun there with Johnny.”

“Yeah,” added Johnny. “We’re gonna tell our moms we’re going to kindergarten. We never went there before.”

This is just a taste of what SGS preschoolers are thinking when interviewed about what adults recognize is one of their first major life transitions—preschool to kindergarten. And some of their teachers are experiencing wonderful transitions of their own.

Graduating From Preschool

When questioned about what they expect will happen in kindergarten, many of the graduating students predict that they will “learn more words.” Several say they have plans to learn how to read and how to write letters and numbers. Some know how to write their letters and numbers “good enough” already and don’t expect to learn that at all. Some are excited to learn how to draw “different kinds of cars” that they don’t know how to draw at present, and one young lady expressed how wonderful it feels to be moving to a “big kid’s school” where her brother is enrolled and waiting for her.

Deep concerns about kindergarten are circulating as well. Many worry there will be “hard homework” and “a million rooms and a million classes.” One graduating preschooler confesses she is nervous about making new friends. She hopes the people aren’t mean, because then she will have to be mean back, and she doesn’t like being mean.

“Talking about expectations and concerns with children who are transitioning from preschool to kindergarten can be very helpful,” said Michelle Bryant, a teacher at the Susan Gray School. “The children are dealing with a lot. They are moving to a new place and they will have to adjust to new peer groups and new teachers. They aren’t really sure what to expect, and some are anxious about it. If we can talk about the transitioning and answer



at work selling cars, one of Martinez’s customers seemed very familiar to her. Martinez soon realized it was Michelle Wyatt, coordinator of the Susan Gray School.

“Michelle told me they had an opening for a teacher position and that I should apply,” remembered Martinez. “I had loved interning there and was so excited. I interviewed and was hired and started the following November. Working there changed my entire focus in school. When I first started taking classes, I had no idea I would want to work with kids with disabilities.”

Martinez is thrilled to be graduating. Working full-time and going to school full-time has meant her “free time” has been filled with writing papers and

They are such a good group of kids, and I learned as much from them as they learned from me. To see them going off to kindergarten after making so much progress in their own individual ways is great, but I’m going to be sad not to see them in the hallways anymore.”

“The kids are beautiful,” added Martinez. “They love to learn and to teach. They are going to rub off some of their goodness on all the people they meet. If they can pass on what they have learned here about accepting differences, then our world is going to be a little better.”

Congratulations to the students and the teachers in the graduating classes of 2008. ●

Environment & Autism

from page 7

studies in neurodegenerative states like stroke. She discussed how clinical and basic tools could be brought to bear on understanding if adaptive response pathways could augment stressed cells in both kinds of disorders. McLaughlin also discussed how contact with families affected by autism who were relying heavily on dietary supplements led her to include ASD in her research program. MARI Discovery Grants help support McLaughlin's work.

Metals in ASD

Results of studies of methylmercury vs. ethylmercury (thimerosal) were reviewed by Michael Aschner, Ph.D. (Pediatrics, Vanderbilt).

Two studies performed in the UK examined whether thimerosal in vaccines caused neurodevelopmental or psychological problems (Parker et al., *Pediatrics*, 2004). Neither found evidence that early exposure to thimerosal was harmful. Thompson et al. (*New England Journal of Medicine*, 2007) also found no evidence of neurological problems in children exposed to mercury-containing vaccines or immune globulins. In a study of time trends in the prevalence by age and birth cohort of children with autism (1995-2007), where the estimated prevalence in children aged 3 to 5 years with autism increased for each quarter from 1995 through 2007, no evidence was found for a recent decrease in California despite the exclusion of thimerosal from nearly all childhood vaccines since 2001 (Schechter and Grether, *Archives of General Psychiatry*, 2008).

Aschner also reviewed studies that examined metals and ASD. Adams et al. (*Journal of Toxicology and Environmental Health*, 2007) determined the level of mercury, lead, and zinc in baby teeth of children with ASD. Children with autism had significantly (2.1-fold) higher levels of mercury but similar levels of lead and similar levels of zinc. Children with ASD had significantly higher usage of oral antibiotics during their first 12-36 months of life, and antibiotic use is known to almost completely inhibit excretion of mercury due to alteration of gut flora.

Kern et al. (*Journal of Toxicology and Environmental Health*, 2007) examined the difference between sulfhydryl-reactive metals (mercury, lead, arsenic, and cadmium) in the hair of 45 children with ASD (1-6 years) and matched controls. Arsenic, cadmium, and lead were significantly lower in the hair of children with ASD than in matched controls. Mercury also was lower in children with ASD but did not achieve statistical significance.

Aschner and colleagues are conducting a study funded by NIEHS that is based on the hypothesis

that inherited variations in metal transporters or metal clearance genes may render certain individuals more susceptible to mercury (Hg) toxicity and, in the context of environmental exposure to Hg, are associated with ASD. To date, 64 polymorphisms are identified. Preliminary data indicate that polymorphisms in genes for Hg transport and clearance do not exhibit allele frequencies or genotype frequencies that differ significantly between populations with and without ASD.



Dan Marino, Daniel Campbell, Ph.D., Claire Marino in Levitt Lab

Cells and Toxicology

"The most important enemies are ignorance and arrogance," said Mark Noble, Ph.D. (Genetics, University of Rochester), emphasizing, like others, how much is yet to be known about ASD, in particular questions about regressive ASD and even remissions in ASD and whether there may be unifying metabolic disorders in ASD. "All disease is based on cellular dysfunction," he explained, "but what cells are dysfunctional in ASD?" He theorized that ASD may be caused, at least in part, by disruption of normal stem and progenitor cell function—although this does not mean that autism would be amenable to stem cell therapies.

Many children with ASD are more oxidized than is typical, he indicated, asking whether this might be important in pathogenesis. He pointed out that the World Health Organization estimates that about 30-40% of the burden of childhood diseases is due to environmental factors. There are 80,000 to 150,000 registered chemicals for which we have no information, meaning that these substances are unregulated. "We each have hundreds of these chemicals in our bodies," he said, "and we know nothing about combined activities." Noble stressed that many environmental toxicants are potent pro-oxidants. "We need data, not belief systems," he summarized.

Toxins and Prenatal Development

The developmental effects of benzo[a]pyrene was the topic of the presentation by Darryl Hood, Ph.D.

(Biological Sciences, Meharry Medical College). Benzo[a]pyrene has been linked to cancers and is found in a variety of environmental sources, including coal tar, auto exhaust fumes, and tobacco smoke. Among geneticists, it is known to dysregulate MET temporary developmental expression. Previous research demonstrated that exposure during pregnancy affected early cognitive development.

Hood and colleagues are conducting a study, using a rodent animal model, to test the hypothesis that prenatal exposure to the combustion byproduct benzo[a]pyrene is associated with behavioral learning and memory deficits mediated through downregulation of developmental glutamatergic receptor subunit expression at a time when synapses are being formed. Hood and his colleagues have developed a model system to expose animals prenatally to toxins and assess the cellular and behavioral events associated with discrete exposure. Ongoing work described by Hood will address how the genetic risk factors associated with ASD may combine with environmental factors to "push the balance into CNS dysfunction."

Animal Models of Exposure

"Developmental neurotoxicity is the 'silent pandemic,'" said

Theodore Slotkin, Ph.D. (Pharmacology, Duke University). Over 5,000 new chemicals appear annually. The EPA estimates that 25% are neurotoxic, and 67% of high-production chemicals are not tested for neurotoxicity. The developing brain is highly vulnerable, and Slotkin questioned whether increases in ADHD and other learning and cognitive problems may be related to environmental toxins.

Presenting a model of how neuroactive agents may disrupt brain development, Slotkin indicated that the same neurotransmitter is used for multiple decisions in cell processes. Neuroactive agents disrupt neurotransmitter signals that control cell fate, thus disrupting brain development. If this happens *during* a critical period of development, it creates a change in cell differentiation that can lead to permanent change in the response to stimulation. If it happens *after* a critical period, the result is a short-term response that is either reversible or for which the cells can compensate.

Slotkin traced the effects of two neuroactive agents that have been linked to neurodevelopmental deficits in animal models and in humans that may have relevance to ASD: organophosphate pesticides, which are widely used, and terbutaline, which is used in preterm labors. Neurodevelopmental disorders have multiple causes, not a single cause, he argued. "The origins of ASD may not be so distinct from other neurodevelopmental disorders."

See www.kc.vanderbilt.edu for the MARI symposium program, videos of presentations, poster abstracts, and photo gallery. ●

Spotlight

Courage, Networking, and “The Boss”

DONNA ESKIND

By Courtney Taylor

“I was raised in a suburb outside of Boston called Brookline,” said Donna Eskind, Vanderbilt Kennedy Center Leadership Council member and co-chair of the 2008 Nicholas Hobbs Society Leadership Dinner. “I graduated from Harvard College and worked in Boston for a number of years. I met my husband there when I was 28 years old. It was on our second date that he said to me, ‘You know I’m going back to Nashville when I finish here.’ I told him, ‘No, I didn’t know that,’ and I didn’t. I’ve been in Nashville for 23 years.”

When Eskind arrived in Nashville, she was 6 months pregnant with her eldest son, David, today a New York University graduate who will study medicine at Vanderbilt in Fall 2008. Eskind’s middle child, Matt, a junior at Tulane, is studying business and is “loving it.”



Donna and Jeff Eskind

GERLINDE PHOTOGRAPHY, MICHAEL HOPKINS

“My daughter, Sarah, is in 11th grade,” said Eskind. “She was attending Currey Ingram Academy but switched schools recently. She decided she needed a change. Now she goes to a good school in Connecticut. It’s really working out for her. She has made some great friends already, and I have to say, I think she is very brave. It took a lot of courage to make such a big change.”

Sarah was born with dyspraxia, a disorder affecting both motor and social-skills development. Sarah attended the Susan Gray School during her first year of preschool and then transferred to the Mama Lere Hearing School at Vanderbilt, attending from age 2 until 10.

“I started spending a lot of time at the Vanderbilt Kennedy Center 15 years ago,” said Eskind. “I’m

really glad to be spending time here again.”

In addition to her involvement with the Leadership Council, Eskind also works with the Nashville Convention Center Commission and serves on the advisory board of the Legal Aid Society of Middle Tennessee. She is a board member for the Jewish Federation and is co-chairing a fundraiser for the Tennessee Performing Arts Center. In her spare time, Eskind enjoys reading books and is a member of a book club. She also enjoys live rock music.

“I drag my husband, Jeff, out to a lot of concerts,” said Eskind. “I love to go out and hear live music. I am a music lover. I am a huge Bruce Springsteen fan. I try to go to his concerts whenever I can. I just know my husband is going to tease me for bringing up Bruce Springsteen during this interview!”

Eskind’s dedication to doing what she enjoys is inspiring. Whether she is talking about her work with the Vanderbilt Kennedy Center, about her family, or about dancing at a rock-n-roll concert, her passion and commitment are keeping her body, mind, and spirit curious and young.

“More people need to know about the work the Vanderbilt Kennedy Center is doing, and we need to connect with more organizations that are working toward similar goals,” Eskind said. “Aren’t we stronger that way? I think networking is so important. The more networking that goes on, the better the work will be, because everyone helps each other.” ●

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New since February 15, 2008
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kc.vanderbilt.edu/kennedy/giving/give2hobbs.html

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Through their gifts, Hobbs Society members advance groundbreaking research in human development. For information about joining the Hobbs Society or making Honor or Memorial gifts, contact (615) 343-5322.

Every effort has been made to ensure the accuracy of this report, which reflects Honor and Memorial gifts **February 15-June 15, 2008**. If an error has been made, we offer our sincerest apology and ask that you bring it to our attention by contacting (615) 343-5322.

VKC Arts and Disabilities Display at Harding Academy Art Show



The 2008 Harding Academy Art Show in May marked the 33rd year of one of Middle Tennessee’s premier art events. The show highlights fine art available for purchase from over 65 artists from the Southeastern U.S. and is a principal fundraiser for the school, an independent Nashville school serving students in K-8 grades. This year, the Vanderbilt Kennedy Center had a promotional display booth to offer information about the VKC Arts and Disabilities Program and to display the work of several artists with disabilities. ●

Celebrating Community Partners



Kathleen O'Brien and Lori Ward of TPAC receiving Community Partners recognition from Doria Panvini, Chair of VKC Community Advisory Council

For 5 years now, our Community Partners have been incredibly important in working alongside the Vanderbilt Kennedy Center to support individuals with disabilities and their families,” said Elise McMillan, J.D., co-director of the Vanderbilt Kennedy Center for Excellence in Developmental Disabilities. “Having Community Partners that serve both urban and rural areas has helped us to better understand needs and also to share important information and resources with families across Tennessee.”

Support from Community Partners varies widely, McMillan indicated. “We could not hold our summer camps for youth with disabilities if it were not for the space provided every summer by University School of Nashville. The Tennessee



Joyce Sievers, Pacesetters; Wanda Willis, Tennessee Council on Developmental Disabilities; Sara Ezell, Vanderbilt Project Opportunity; and Walter Rogers, The Arc of Tennessee

Performing Arts Center has provided premium display space for artists with disabilities, enabling thousands of Tennesseans to see their talent. Some of our Community Partners use our facilities for their orientations and programs, helping us connect with families. The Cumberland Pediatric Foundation helps us share clinical services and research opportunities with community pediatricians. These few examples illustrate the greater impact we make working together.”

The Vanderbilt Kennedy Center recognized three new Community Partners at its Community Celebration Luncheon on April 1, with special guest Timothy Shriver (see story page 1). New Community Partners are the Tennessee Conference



Community Advisory Council member Ron Butler with Marsha and Robert Wilson representing Overcomers Ministry

on Social Welfare, the Tennessee Performing Arts Center, and Tennessee Special Olympics.

The 16 continuing Community Partners are the American Academy of Pediatrics—Tennessee Chapter, The Arc of Tennessee, Autism Society of Middle Tennessee, Catholic Charities of Tennessee, Cumberland Pediatric Foundation, Down Syndrome Association of Middle Tennessee, Frist Center for the Visual Arts, Mental Health Association of Middle Tennessee, Metropolitan Nashville Public Schools, Overcomers Ministry, Rochelle Center, Saddle Up!, Tennessee Council on Developmental Disabilities, Tennessee Disability Coalition, University School of Nashville, and Woodbine Community Organization. ●

Marinos Thank VKC Community Champions



Vice Chancellor Harry Jacobson and Dan Marino

Dan and Claire Marino hosted a cocktail party at the Parthenon honoring table hosts from the 2007 “From Dinner to Discovery” event and members of the Vanderbilt Kennedy Center Leadership Council who are in the Nicholas Hobbs Donor Society.

A visit last year to the Fall Leadership Council Meeting led Marino Foundation CEO Mary Partin to offer a challenge to Council members. If the Council raised \$140,000 to fund Discovery Grants for innovative interdisciplinary research, the



BethAnn McLaughlin, Dan Marino, Mary Partin, Jeff Balsler

Marinos would host a cocktail party in their honor. The 2007 Hobbs Committee Chairs Barbara Gregg Phillips and Sissy Allen leveraged this pledge to raise more money than any previous VKC event.

Dan Marino was truly impressed and told cocktail party attendees, “You are incredibly fortunate to have the best of the best in research and service right here in your backyard. Your investments are paying off for Nashville’s families—and families everywhere—and we will continue to do our part to help you.”



Cathy and Louis Brown, Dan Marino, Jean Ann Banker

Allen captured the meaning of the evening for all the VKC patrons: “As Hobbs Society members, we have one goal, one purpose—to fund research for future answers and cures for those affected with developmental disabilities. Dan and Claire Marino, while celebrities in the public eye, are parents of a child with autism. Having the Marinos here in April and having the Dan Marino Foundation as an outstanding collaborative partner helps to both validate and advance the outstanding work underway at the Vanderbilt Kennedy Center.” ●

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Levitt Presents at EKS NICHD Capitol Hill Briefing



Pat Levitt (left), Ph.D., director of the Vanderbilt Kennedy Center, was one of three directors of *Eunice Kennedy Shriver* National Institute of Child Health and Human Development's Intellectual and Developmental Disabilities Research Centers (IDDRCs) invited to present at a Washington, DC Capitol Hill briefing on May 22. Sponsored by the Association of University Centers on Disabilities and Friends of NICHD, the briefings celebrated 45 years of research accomplishments. Levitt presented new discoveries in autism and other neurodevelopmental disorders. Shown with Levitt are Martha Seltzer, Ph.D., University of Wisconsin's Waisman Center, and Steve Warren, Ph.D., University of Kansas IDDRC.

Discovery is a quarterly publication of the Vanderbilt Kennedy Center designed to educate our friends and the community, from Nashville to the nation. The Center is committed to improving the quality of life of persons with disabilities of thinking, learning, perception, communication, mood and emotion caused by disruption of typical development. The Center is a university-wide research, training, diagnosis, and treatment institute. It is a Eunice Kennedy Shriver Intellectual and Developmental Disabilities Research Center funded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, and a University Center for Excellence in Developmental Disabilities (UCEDD) funded by the Administration on Developmental Disabilities.

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Editor/Writer: Jan Rosemergy, Ph.D.
Writer: Courtney Taylor
Graphic Designer: Melanie Bridges, B.F.A.

Discovery is supported in part by Grant No. HD 15052 from EKS NICHD and Administration on Developmental Disabilities Grant #90DD0595
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Calendar of Events

Unless otherwise noted, events are free and open to the public. Events are subject to change.

Please check the calendar on our website kc.vanderbilt.edu or contact (615) 322-8240 or toll-free (1-866) 936-VUKC [8852].

For disability-related training and other events statewide and nationally see Pathfinder Disability Calendar www.familypathfinder.org.

Ann and Monroe Carell Jr. Families First

Free workshops serving parents of children, ages 2-5, diagnosed with an autism spectrum disorder. Held in Room 241 Vanderbilt Kennedy Center/MRL Building
Information (615) 343-4275
familiesfirst@vanderbilt.edu
Registration kc.vanderbilt.edu/registration

Free monthly Saturday workshops

10:15 a.m.-2 p.m.

Orientation session 8:30-10 a.m. on all dates.

SEPTEMBER 20, DECEMBER 6

Improving Communication

JULY 26, OCTOBER 18

Enhancing Social Interactions

AUGUST 16, NOVEMBER 15

Addressing Challenging Behaviors

Free 4-Week Workshop—NEW

AUGUST 5, 12, 19, 26

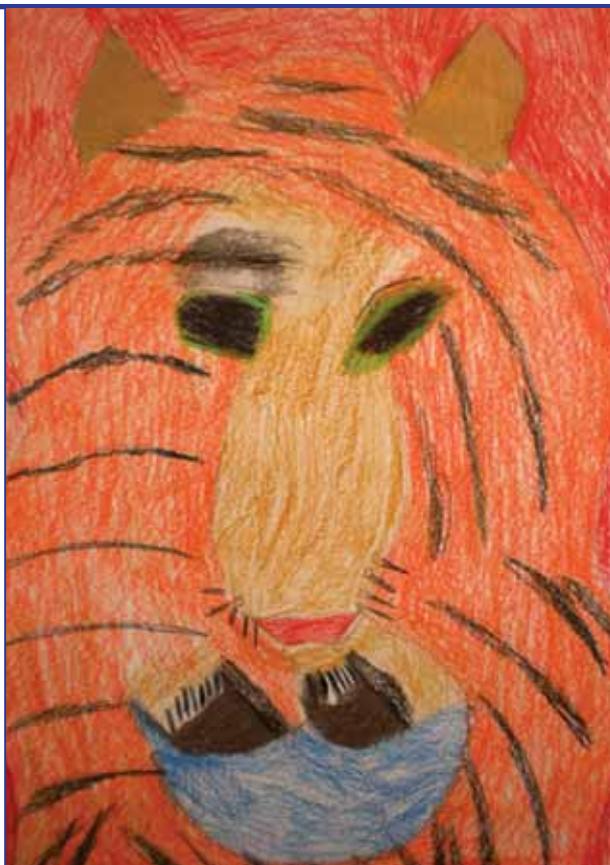
Solving Behavior Challenges at Home

Free on-site childcare will be available with registration

Tuesdays 6:30-8:30 p.m.

Parents are expected to attend all 4 sessions

Must register by July 15, 2008



From Indonesian Folk Tale by "Painting the Tale" Artists of Pacesetters, Inc.

SEPTEMBER 12

Community Advisory Council Meeting

For details contact (615) 936-5118

SEPTEMBER 16

Documentary Film Showing and Community Discussion

"Praying with Lior" documenting the story of a youth with Down syndrome preparing for his Bar Mitzvah

Tuesday, 7 p.m. Multipurpose Room, Peabody Commons

Co-sponsors Best Buddies, Vanderbilt Hillel, Vanderbilt Office of Religious Life

Information (615) 322-8240

SEPTEMBER 22

Lectures on Development and Developmental Disabilities

Title to be announced

Lonnie Zwaigenbaum, M.Sc., M.D., Associate Professor of Pediatrics, Co-Director of Autism Research Centre, University of Alberta

Monday 4:10 p.m. Room 241

Vanderbilt Kennedy Center/MRL Building

October

OCTOBER 1

Developmental Disabilities Grand Rounds Response to Intervention and Learning Disabilities

Doug Fuchs, Ph.D., **Lynn Fuchs**, Ph.D., Nicholas Hobbs Chair in Special Education and Human Development, Professors of Special Education Co-Sponsor VKC Interdisciplinary Training Council and Pediatrics

Light breakfast provided

Wednesday 8 a.m. Room 241

Vanderbilt Kennedy Center/MRL Building

OCTOBER 6

Lectures on Development and Developmental Disabilities

Exploring the Neurobiology of Down Syndrome: Moving from Science to Medicine

William Mobley, M.D., Ph.D., Chair of Neurology and Neurological Studies, Director of Neuroscience Institute, Stanford University

Monday 4:10 p.m. Room 241

Vanderbilt Kennedy Center/MRL Building

November

NOVEMBER 5

Developmental Disabilities Grand Rounds Title and Speaker to be announced

Co-Sponsor VKC Interdisciplinary Training Council and Pediatrics

Light breakfast provided

Wednesday 8 a.m. Room 241

Vanderbilt Kennedy Center/MRL Building

NOVEMBER 11

Vanderbilt Kennedy Center Leadership Dinner

Tuesday 6:30-9 p.m. Loews Vanderbilt Hotel

Table Sponsorships—Contact kc@vanderbilt.edu (615) 343-5322

Proceeds support Nicholas Hobbs

Discovery Grants

September

SEPTEMBER 3

Developmental Disabilities Grand Rounds Lessons Learned by a Basic Scientist: How to Succeed in Business (of the Policy World) Without Really Trying

Pat Levitt, Ph.D., Annette Schaffer Eskind Chair, Professor of Pharmacology, and VKC Director

David C. Mills, Associate Director, Vanderbilt State Policy & Legislative Affairs, Community, Neighborhood & Government Relations

Co-Sponsor VKC Interdisciplinary Training Council and Pediatrics

Light breakfast provided

Wednesday 8 a.m. Room 241

Vanderbilt Kennedy Center/MRL Building



December

DECEMBER 3

Developmental Disabilities Grand Rounds Multisensory Processing, and Its Possible Role in Developmental Disabilities

Mark Wallace, Ph.D., Associate Professor of
Hearing & Speech Science and Psychology
Co-Sponsor VKC Interdisciplinary Training
Council and Pediatrics

Light breakfast provided

Wednesday 8 a.m. Room 241

Vanderbilt Kennedy Center/MRL Building

DECEMBER 3

Neuroscience Graduate Seminar Series Cadherin and Catenin Roles in Synapse Formation

Louis Reichardt, Ph.D., Jack D. and DeLoris
Lange Professor of Cell Physiology, Professor of
Physiology and Biochemistry & Biophysics,
University of California-San Francisco

Co-Sponsor Vanderbilt Brain Institute

Wednesday 4:10 p.m. Room 1220

MRB III Lecture Hall

DECEMBER 12

Community Advisory Council Meeting

For details contact (615) 936-5118

Arts & Disabilities

Vanderbilt Kennedy Center Exhibits

Monday-Friday 7:30 a.m.-5:30 p.m., Lobby

Vanderbilt Kennedy Center/MRL Building

For information contact (615) 322-8529 ext. 3

MAY 26-SEPTEMBER 26

An Indonesian Folk Tale

An exhibit by the "Painting the Tale" artists of
Pacesetters, Inc.

SibSaturdays

AUGUST 16, OCTOBER 11, DECEMBER 13

A Vanderbilt Kennedy Center for Excellence in
Developmental Disabilities program for siblings of
children with special needs, ages 5-7 and 8-13 years
Games, friends, conversation

\$10/child or \$20/family

Financial assistance available

Advance registration required

Contact (615) 936-5118

roxanne.carreon@vanderbilt.edu

Saturdays Location varies

See also SibSaturdays on alternate months sponsored
by Autism Society of Middle Tennessee and Down
Syndrome Association of Middle Tennessee

Take Part in Research

Vanderbilt Kennedy Center Research Studies

For children and adults, with and
without disabilities

Lynnette Henderson (615) 936-0448

Toll-free (1-866) 936-VUKC [8852]

Research Family Partners

kc.vanderbilt.edu/rfp

Register and be notified of research studies

StudyFinder

kc.vanderbilt.edu/studyfinder

View lists of studies, criteria, and

contact information

See also **VUMC Clinical Trials**

www.vanderbilthealth.com/clinicaltrials

Tennessee Disability Pathfinder

Phone, web, print resources

www.familypathfinder.org

English (615) 322-8529

Español (615) 322-8529 ext. 11

Toll-free (1-800) 640-INFO [4636]

tnpathfinder@vanderbilt.edu

Disability Calendar

Internet calendar of training and other
disability-related events

kc.vanderbilt.edu/tnpathfinder/calendar.html

Statewide Directory

2007-2008 Disability Services and Supports

West, Middle, and East Tennessee volumes

\$25 per directory

Contact (615) 322-8529 ext. 15

ashley.coulter@vanderbilt.edu

Project of Vanderbilt Kennedy Center for
Excellence in Developmental Disabilities and
Tennessee Council on Developmental Disabilities

Community Events

MAY 16-SEPTEMBER 14

The Artist's Voice: An Exhibition Featuring Tennessee Artists with Disabilities

Frist Center for the Visual Arts

919 Broadway, Nashville (615) 244-3340

Visitors may view this gallery space free of charge

SEPTEMBER 13

Walk Now for Autism Tennessee 2008

Sponsored by Autism Speaks

Saturday Nashville Superspeedway, Lebanon, TN

www.walknowforautism.org

DECEMBER 3-6, 2008

TASH 2008 Conference: Social Justice in the 21st Century

Advanced registration deadline September 1

Nashville Convention Center and Renaissance Hotel

For more information, visit www.tash.org/2008tash

ASMT Events

Autism Society of Middle Tennessee

www.tnautism.org

ASMT event information (615) 385-2077

Registration is requested for all events

ASMT members free; nonmembers \$5/family

JULY 17, SEPTEMBER 18, NOVEMBER 20

Autism Orientation

Thursday 6:30-8:30 p.m. Room 241

Vanderbilt Kennedy Center MRL Building

JULY 19, SEPTEMBER 20, NOVEMBER 15

SibSaturdays

Westminster Presbyterian Church

3900 West End Avenue, Nashville

Co-Sponsor DSAMT

JULY 24

Eating Right and a Gluten/Casein Free Diet

Ashley B. Hotle, R.D., Clinical Dietitian

Martha Ballew, M.Ed, R.D. C.N.S.D., L.D.N.,

Pediatric Nutrition Support Dietician

in Gastroenterology

Monroe Carell Jr. Children's Hospital at Vanderbilt

Thursday 6:30-8:30 p.m. Room 241

Vanderbilt Kennedy Center/MRL Building

AUGUST 28

Teaching Social Skills to Adolescents and Young Adults With High Functioning Autism or Asperger's Syndrome

Carol Garrett, M.Ed. Educational Consultant,

Learning Strategies, Inc.

Thursday 6:30-8:30 p.m. Room 241

Vanderbilt Kennedy Center/MRL Building

DSAMT Events

Down Syndrome Association of Middle Tennessee

www.dsamt.org

DSAMT event information (615) 386-9002

SEPTEMBER 20

The Fourth Annual Fall Fiesta Dinner & Auction

Saturday 6:30 p.m., The Factory, Franklin, Bldg 8

OCTOBER 18

2008 Buddy Walk

Saturday 9 a.m., Centennial Park, Nashville

www.buddywalk.org

SibSaturdays—See above