2012 YOUNG SCIENTIST

SELECTED FROM A POOL OF WELL-QUALIFIED APPLICANTS by renowned experts in the field, these young researchers are making outstanding contributions to our understanding of ADHD. The chair of CHADD's professional advisory board, Ann Abramowitz, PhD, will present the awards during CHADD's annual international conference, to be held this year in San Francisco, California. The award program is administered by Zuali Malsawma, research librarian at CHADD's National Resource Center on ADHD. The awards are currently supported through generous funding from Janssen Pharmaceuticals, Inc. of Titusville, New Jersey, and by a number of individual donations.

Michael J. Kofler, PhD,

is an assistant professor in the department of human services at the University of Virginia, where he is affiliated with the Youth-Nex Center to Promote Effective Youth Development. He earned his doctoral degree in clinical psychology at the University of Central Florida and completed his clinical internship at the Medical University of South Carolina (Charleston Consortium).

In his submission, "Central Executive Working Memory Training for Children with ADHD: A Translational Research Agenda," Kofler described a series of studies examining how working memory problems result in ADHD symptoms and academic and peer difficulties. He also discussed how these findings are helpful in developing new treatments for children with ADHD.

To date, research has identified large working memory deficits in children with ADHD that may help explain why parents, teachers, and peers describe these children as inattentive, hyperactive, and impulsive. These findings indicate that children with ADHD have not developed their working memory abilities to the same extent as children who don't have ADHD—in fact, brain imaging studies suggest that children with ADHD may be three to five years behind when it comes to working memory. This underdevelopment appears to play a key role in behavioral problems experienced by many children with ADHD. Recent research Kofler conducted with Mark Rapport, PhD, and the Children's Learning Clinic team, suggests that children with ADHD are not more hyperactive, not more inattentive, and not more impulsive than children without ADHD after accounting for their underdeveloped working memory abilities. Additionally, these working memory problems strongly predict ADHD-related social problems and academic underachievement.

Given this evidence, several "working memory" training programs have been developed and marketed. Unfortunately, these programs don't work very well (if at all). At this year's American Psychological Association conference, Rapport and Kofler presented a meta-analytic review of twenty-three studies that found overall small or no benefits of these training programs for reducing inattention, hyperactivity, or impulsive behavior for children with ADHD. One reason for this disappointing conclusion is that most of these programs target the wrong parts of working memory: They're training the short-term memory part, rather than the "working" part, of working memory.

Based on these findings, Kofler is currently collaborating with a group of nationally recognized experts in the fields of neurocognition, ADHD treatment efficacy research, serious game design, positive youth development, and biostatistics. The goal of this work is to develop an effective working memory training program for children with ADHD. This work is in its early stages, and the team is currently designing the game-based tasks that will be used to improve working memory abilities in children with ADHD. Based on the evidence reviewed above, this treatment will have the potential to significantly reduce ADHD symptoms and improve academic, peer, and family functioning. Ultimately, Kofler plans to use this treatment as a tool for early intervention and prevention services.

The Rotunda at The University of Virginia

RESEARCH FUND AWARDS

James J. Li, MA,

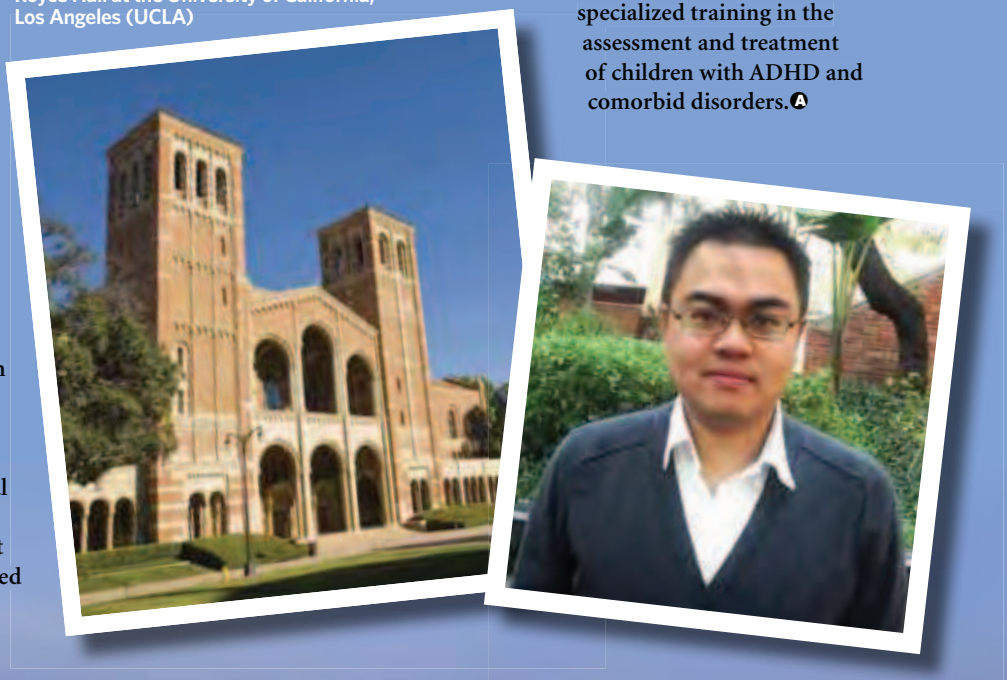
is a doctoral candidate in clinical psychology at the University of California, Los Angeles (UCLA) and is currently completing his clinical internship at Western Psychiatric Institute and Clinic/University of Pittsburgh Medical Center. Li has previously been awarded the National Science Foundation Graduate Research Fellowship to study gene-environment interactions for neurocognitive phenotypes related to ADHD and a fellowship from the UCLA Institute for Society and Genetics, where he collaborated with multidisciplinary faculty on research related to legal, ethical, biological, and sociological implications of genetic research. His recent work has examined associations between candidate genes and natural variations in parenting behavior on childhood ADHD symptoms, and the interaction of risk genotypes with family environmental factors on adolescent depression.

Li's research is rooted in understanding how genetics and environmental influences contribute to psychological disorder. Diathesis-stress conceptualizations are central to theories of psychopathology, such that biologically vulnerable individuals are more likely to develop psychopathology when exposed to environmental adversity. However, this view has been challenged because some individuals either do not develop psychopathology in the face of adversity and genetic risk or develop better outcomes than others in similar situations (resilience). Recent theoretical work suggests an alternative explanation, whereby certain individuals may be simultaneously more responsive to the effects from environmental adversity and enrichment than others (differential susceptibility). Some genes may confer increased or reduced sensitivity to variations in rearing environments and may explain why some children develop negative outcomes in the face of adversity and others do not.

Understanding this interplay is vital because it will not only help explain potential mechanisms of influence, but also impact intervention designs focused on environmental change and enrichment. Li's research submission, "Risk and Resilience: An Empirical Examination of Differential Susceptibility for ADHD," investigates the plausibility of genetic differential susceptibility in the context of ADHD. His study involves an ongoing prospective longitudinal study of children with and without ADHD. The primary objective of this study is to test the independent and interactive effects of a functional polymorphism in the dopamine transporter (DAT1) gene and parenting behavior, including negative and positive parenting, on the trajectory of ADHD. It is hypothesized that children with the "sensitive genotype" of DAT1 will be most responsive to the effects of positive parenting (fewest symptoms) and negative parenting (most symptoms) compared to children without the sensitive genotype.

Li's research encompasses developmental theory, molecular genetics, and quantitative applications with the goal of better understanding childhood psychopathology. To this end, Li has formed collaborations with other ADHD researchers to refine the phenotype, which will aid in the search for candidate genes for ADHD. Li is continuing his clinical education at Western Psychiatric Institute and Clinic, where he is pursuing specialized training in the assessment and treatment of children with ADHD and comorbid disorders.

Royce Hall at the University of California, Los Angeles (UCLA)



ISTOCK