

ADD Research: A Look at Today and Tomorrow

**An interview with Russell A. Barkley, Ph.D.
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Here at the Medical Center, there are five avenues of research that we are pursuing at the moment -- four of which are federally-funded initiatives and the fifth, which we are not receiving funding for.

The first and the longest running project is taking place in Milwaukee, Wisconsin, but is coordinated through the University of Massachusetts. This study has been going on for several years. Mary Ellen Fisher, of the Medical College of Wisconsin, and I have been following a large group of hyperactive children and a comparison group of children. We have been tracking these individuals since I first saw them, when they were between five and nine years of age. They are now in their mid-twenties. We recently finished bringing them back in for their young adult evaluation. We bring them back for evaluations roughly every five years.

Much of the information we have learned so far corroborates other follow-up studies, showing higher risks for educational problems, higher risks for conduct problems, and some delinquency. Difficulties with education, employment, and interpersonal functions are the three areas that seem to show widespread similarities with other findings. This study has also uncovered some additional risks that other studies really had not focused on.

One, for example, is in the area of medical risks, which I alluded to in my CHADD presentation last year. This area explores the lifestyles that these individuals are leading -- their lack of concern for health-related behavior, such as diet, exercise and so forth; and the fact that they are smoking and drinking more than our control group. These factors lead us to believe that they are placing themselves at greater risk for cardiovascular disease as they get into later life. Also, their general risk-taking behavior puts them at greater risk for accidents. We have established higher incidence of motor vehicle accidents, speeding, and other areas as being linked to this group.

A second area of the medical risk category that we studied is the rather heedless sexual conduct of our subjects that leads them to have more partners than our control group has had. Though the rates of intercourse are actually the same for the AD/HD group and the control group, those in the AD/HD group have more partners and have significantly more unprotected sexual relations. As a result, over half of the AD/HD group have had themselves tested for HIV. Fortunately, none of them have tested positive. About 25 to 30 percent of them, however, have already had a sexually-transmitted disease for which they have sought treatment.

Also indicating this rather high-risk sexual lifestyle is the fact that, out of forty-two births that occurred in the two groups, forty-one were born to the AD/HD group. While the control group is behaving like the general U.S. population and are waiting to have their children until their later twenties or even early thirties, individuals in the AD/HD group are conceiving children while they are still quite young -- in their late teens to early twenties -- which is about six years ahead of the control group. About 54 percent of the AD/HD group who have had children do not have custody of their children.

A second project we are involved in is studying the driving ability of young adults with AD/HD. We are using a variety of tactics to measure driving ability -- reviewing driving records; interviewing the individuals regarding their driving history; obtaining rating scales on their safety and driving behavior from parents and others who have driven with them; and conducting computer-generated driving simulations. So far, we are corroborating our earlier findings, which were that the individuals with AD/HD are in a high-risk category. They speed more and pay attention and obey the laws less; they are more erratic in their steering and braking; and they are not able to operate the motor vehicle as consistently as individuals who do not have AD/HD. Generally, those with AD/HD are not very good drivers. It has nothing to do with knowledge -- they know how to drive a car and they know the rules -- they simply do not know how to apply these rules when they get out there. By conducting studies like this one, we may be able to identify these high-risk drivers early, get them help, and forewarn their families.

The third project is one that we have been working on for five years and will be concluding later this year. As part of an early intervention program, during the last four and a half years, we have been screening young preschool children who are entering the Worcester, Massachusetts public school system's kindergarten program, for behaviors that indicate a high-risk for AD/HD, aggressiveness, and/or opposition. Once we have identified those children who are at high-risk, they receive a full evaluation. Then they are assigned to one of several different kindergarten programs, one of which we have designed ourselves and operate here. These children receive a year's worth of treatment in one of the kindergarten programs -- some of them get parent training, and some of them come to our kindergarten.

What that gives us is a comparison of children who get the standard kindergarten, children who get the standard kindergarten plus parent training, children who get our kindergarten program but no parent training, and a group of children who received both of our treatments. The program lasts for one year. Then we follow the children for two years after they leave the program to determine whether the program has reduced their educational and/or social risks. This process has not been completed, so the results are not yet available.

A fourth project we are involved with tests different family therapies for families with teenagers who have AD/HD in which there is a great deal of conflict. We are actually testing two different family programs: one is a program designed by Dr. Arthur Robin that focuses on problem-solving, communication skills, and changing belief systems; and the other combines Dr. Robin's program with behavior modification training for parents.

Finally, we are conducting some studies on my theory of AD/HD, particularly with regard to sense of time. To conduct these studies, we are using some very simple tests of time estimation and time production. What we are finding so far is that individuals with AD/HD over-estimate the time interval and under-produce it, which tells us that they are perceiving time as moving more slowly than it really does. There are at least two predictions that can be made as a result of these findings. The first is that individuals with AD/HD are always going to be late. For example, if a teacher gives a child twenty minutes to finish his assignment in class, he won't finish it on time because to him, twenty minutes is moving more slowly than it actually is -- he thinks he has more time than he does. Therefore, not being punctual, not meeting deadlines, and that sort of thing all would be predicted for someone whose sense of time is not parallel to real time.

The second prediction is that individuals with AD/HD will get very impatient if they are asked to wait because they will sense that the waiting period lasts longer than it actually does. It can be expected, then, that adults with AD/HD may run red lights and drive on the shoulder of the road to get around a delay in traffic and children with AD/HD may elbow their way to the front of the lunch line and yammer at their teacher, "I'm hungry -- let's get out of here," in an effort to terminate the waiting interval.

I believe the field of ADD research is moving toward several areas. The first of those areas is neuro-imaging and other studies of brain function. As the technology has leap-frogged ahead here to allow us to look at the brain and brain function, I think that we are going to start seeing more studies like Dr. Judy Rapaport's brain imaging study and studies that not only show us the structure of the brain in very fine-grained detail, but also the function of the brain, much like Dr. Alan Zametkin's early studies have done. I believe we will see more sophisticated measures, such as this new functional MRI procedure, which is as good or better than PET scans and does not carry some of the risks that the PET does. I think these will help us to more clearly document the neuro-behavioral nature of AD/HD.

The second area is behavioral genetics. We have seen, just in the last year, three separate reports of possible genes linked to AD/HD. I see this doing several things. The first is that it would certainly allow us to quickly develop a genetic test for the disorder. That would help for diagnostic purposes. We would no longer just be relying on behavior, but would actually have a genetic marker that would help us. Secondly, it may also help us break down the disorder into more homogeneous subgroups; right now, we treat AD/HD as one large group. Third, I think, if we can identify the gene or the genes, we can learn what those genes do in the brain. If we could know what gene is involved with AD/HD, we could actually develop medications that would very explicitly target that function in the nerve cells. Finally, I we will be able to learn much more about which combinations of treatments do and do not benefit individuals with AD/HD. It will be nice to know which of these treatments are really worthwhile, and which are not.

Finally, research has led to the development of several theories on AD/HD. It is encouraging to see this development as it marks a sign of scientific progress. A mature science is a theory-driven science.

Dr. Russell Barkley is Director of Psychology and Professor of Psychiatry and Neurology at the University of Massachusetts Medical Center. He is a clinical practitioner, scientist, and educator who has authored four books and co-edited two others. He has also created four professional videotapes on AD/HD, two of which won the 1992 Golden Apple Award for educational videos.

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