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The University of Texas at Dallas

Autism Research from Cognitive Brain Science

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More advances have been made in the last decade in understanding Autism and brain than all the years previously due to advances in:

- Early Detection
- Diagnostic specificity
- Treatment development and implementation
- Functional brain imaging – a motion picture of the brain 'learning' and rewiring

1. Autism is unique from other childhood disorders in two major ways:

a. First, the primary deficit in Autism is in **Social** cognition. Social Cognition is defined as the ability to relate and communicate with others and learn from others in constantly changing social contexts.

b. Second, children with Autism often show normal or above normal intellectual functioning when appropriate testing is done.

In contrast, other disorders have the reverse conditions; where intellectual function is lower than social function. For example, children with Downs Syndrome show a remarkable capacity to relate to others emotionally as compared to marked deficits in intellectual function. Because of these distinctions, **effective educational practices in Autism will require very different methods from those that work in other childhood disorders.**

2. Children with Autism CAN learn given specialized intervention for key deficits.

a. "One size fits all" programs do not work because immense variability exists in the degree and type of impairments in Autism.

b. Learning requires innovative approaches that take advantage of the child with Autism's profile of strengths and weaknesses.

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c. Specialized diagnostic measures allow accurate diagnosis of Autism at very young ages.
d. From research, we have identified sensitive measures of core dimensions in social cognitive function in Autism to guide treatment. (The areas that need to be assessed include verbal and nonverbal reasoning, perceiving facial expression, understanding and expressing emotion, interpreting simple and complex emotions of others, knowing and following social rules, and managing emotions to match social context.)
e. Educational programs designed for other disabilities are inappropriate and largely ineffective for Autistic children since they fail to target core deficits. The result is children with Autism tend to be 'trapped' at lower developmental levels rather than trained to achieve higher levels.

3. Brain science reveals that the capacity to "train the brain" in Autism is driven by three principles where stimulation:

- Must be intensive
- Requires massive doses of practice/repetition
- Must be at an appropriate level of complexity to engage the brain. Too much will overwhelm the brain, and too little stimulation will slow or halt further brain development.

Research shows marked anatomical and functional differences in the brains of children with Autism. We can literally now see the differences with advanced brain imaging.

Science reveals that intensive stimulation can "re-wire" the brain and improve behavior in disorders such as Autism.

Over the past years, advances in educational best practices have emerged through focused efforts, i.e., children with Down's syndrome, deafness, and dyslexia.