

Chapter 2

State of Current Knowledge Related to Autism

Covering the vast amount of research on autism is beyond the scope of this book. There are texts such as the Handbook of Autism and Pervasive Developmental Disorders (Volkmar, Paul, Klin & Cohen, 2005) and The Neurobiology of Autism (Bauman & Kemper, 2005) which provide a fairly comprehensive overview of what is known and not known about autism. There has been an enormous amount of research related to autism which often leads to unsupported or minimally supported results. We have tried to focus here on research which consistently supports certain conclusions about autism.

There is estimated to be about 10 people diagnosed with Autism for every 10,000 people (Bauman & Kemper, 2005). When associated conditions such as Aspergers Disorder and Pervasive Developmental Disorder- Not Otherwise Specified (PDD-NOS) are included the number is estimated to be about 27.5 people on the spectrum for every 10,000 people (Bauman & Kemper, 2005). More recent surveys have suggested a rate as high as 60 people on the autistic spectrum for every 10,000 people. These estimates would suggest that there are between 220,000 and 483,000 people diagnosed with autism that are under 20 years of age in the United States (Bauman & Kemper, 2005).

Genetic studies related to autism have suggested there is a huge disparity between the co-occurrence of autism in twins with identical genes (monozygotic) and twins whose genes are no more identical than non-twin siblings (dizygotic). Autism occurs 60% of the time in the identical twin of a child with autism. In non-identical twins, Autism only occurs 5% of the time. Non-identical twins are no more alike genetically than non-twin siblings and carry no greater risk. Autism is thought to be 90% genetic and 10%

environmental. This huge difference suggests that autism is the result of multiple genes (Rutter, 2005). The numbers of genes involved is estimated to be between 2 and 10 (Pickles, 2000).

Autism is thought to involve a broader condition that includes non-diagnosable social functioning deficits occurring in 10% to 20% of first degree relatives of a person with autism. This broader expression of autistic symptoms is not associated with mental retardation or epilepsy (Rutter, 2005). Autism is not considered to be one condition. It is thought to be many similar conditions resulting from different combinations of genes (Rutter, 2005). Genetic studies have suggested that Autism is caused by multiple genes that come together to produce different variants of the autistic picture and includes a non-diagnosable form in some first degree relatives.

Autism is found to occur in males more than females and it is estimated that there are 4.3 males for every one female diagnosed with autism. Autism is associated with mental retardation in about 70% of cases (Fombonne, 2005). Approximately 65% of people diagnosed with autism also have anxiety and depression (Lainhart & Folstein, 1994; Klin, Mcpartland, & Volkmar, 2005). The areas of development that are often delayed in young children with autism include problems with nonverbal communication, social skills, verbal communication, selective visual attention to social cues, development of play skills and deficits in imitation and emulation abilities (Chawarska & Volkmar, 2005).

Deficits in imitation are considered to be a primary deficit in autism which can lead to problems in other areas such a play (Rogers, Cook, & Meryl, 2005). In addition

initiating complex behavior in an unstructured setting is considered to be a fundamental deficit (Tsatsanis, 2005).

The symptoms of Autism change as a child experiences the world and learns to adapt in the world. The maturation of their neural and behavioral systems along with new learning experiences and the quality of social reciprocal interaction results in a changing picture of autism as the child matures (Loveland & Tunali-Kotoski, 2005). This changing symptom picture results from the maturation of the nervous system which is achieved through providing a strategically designed enriched environment, the teaching of compensatory strategies to get around neurological deficits, neurological habilitation strategies, and the teaching of adaptive and social skills.

Neurological studies suggest that Autism is a neurological disorder that constrains information processing. More specifically information processing breaks down as information is integrated from different brain regions. Imaging studies have suggested that there is intact functional connectivity between brain regions during simple tasks but that functional connectivity between brain regions breaks down for more complex problem solving, social and language tasks. The neurological abnormality in autism is considered to be pervasive. Social, communication, and information processing tasks require a high degree of integration and are most effected when integration of information processing breaks down. Numerous specific brain regions have been the target of research with mixed results (Minshew, Sweeney, Bauman, & Web, (2005).

Neuro-chemical studies consistently find that there are increased blood levels of serotonin (5-HT) in people with autism (Anderson & Hoshino, 2005). This finding has not led to productive treatment options.

Research on deficits in executive function related to the function of the prefrontal cortex has most consistently supported the idea that mental flexibility including shifting attention and changing mental sets is compromised in people with high functioning autism. Difficulty with mental flexibility predicts problems in social understanding and competence (Ozonoff, South, & Provençal, 2005).

Research has suggested that typically developing children have a preference to orient to the human voice and face. Children with autism do not typically show this preference and are more likely to orient to mechanical non-human sounds and physical objects (Klin, Jones, Schultz, Volkmar, 2005). There is also preliminary research to suggest that children with autism may have basic difficulties with perception-for action (Klin, Jones, Schultz, Volkmar, 2005). This research could also suggest that children with autism may have basic difficulties forming perceptions of the environment. These difficulties could directly lead to problems perceiving faces, human language, and social situations and lead a child to focus attention on information that is less complex such as mechanical sound and physical objects.

Lovaas (1987) found that preschool age children with autism who received intensive behavioral treatment of approximately 40 hours of therapy a week for two years resulted in 47% of the children achieving normal intellectual and educational functioning as compared to only 2% of children with autism who received less intensive therapy. The Lovaas approach has been criticized on the grounds that it is a highly adult directed approach that involves bringing behaviors under tight stimulus control which interferes with the spontaneous use of the behavior (Carr, 1981). It is also suggested that using too much structure and artificial reinforcers will interfere with generalization to the natural

environment (Spradlin & Siegel, 1982). Finally the Lovaas approach has been criticized as not being representative of natural adult-child interactions (Schreibman, Kaneko, & Koegal, 1991). Because of these criticisms naturalistic approaches have been developed. Naturalistic approaches have not demonstrated similar or superior intellectual improvements in children with autism as compared to the Lovaas intensive intervention program (Lovaas, 1987).