Subtypes of Autism by Cluster Analysis

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Multidisciplinary data from 166 children with autistic spectrum disorders were subjected to cluster analysis. Cross-validation between random halves of the sample showed acceptable consistency of the clustering method. Four clinically meaningful subtypes emerged from the analysis. They did not differ in demographic characteristics but did show, on average, distinct differences in behavioral and cognitive areas. Over half of the sample fell into a subtype described as typically autistic with abnormal verbal and nonverbal communication, aloofness, impaired social skills, and sensory disturbances. Another 19% were similarly autistic but with moderate to severe mental handicap. The remaining children formed two subtypes: a high-functioning Asperger-like group who were overactive and aggressive, and a small group who were impaired in social and language skills, had restricted interests, and a family history of learning problems. This study highlights important differences among children with autism and emphasizes relationships between cognitive functioning and subtypes of the disorder.

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It is well known that children with autism form a very heterogeneous group showing a wide range in type, number and severity of social deficits, behavior problems, communication, language and cognitive difficulties, and possible etiological conditions. Progress has been made in attempting to specify and operationalize the essential characteristics necessary for a diagnosis using DSM-III (American Psychiatric Association [APA], 1980) and DSM-III-R (APA, 1987) although up to one third more children now meet the criteria for Autistic Disorder in DSM-III-R than would have for Infantile Autism in DSM-III (Hertzig, Snow, New, & Shapiro, 1990; Spitzer & Siegel, 1990). The present definitions often appear inadequate for a number of children and have been in a state of evolution (Delong & Dwyer, 1988; Factor, Freeman, & Kardach, 1989; Gillberg, 1985; Rutter & Schopler, 1978). Many children with autistic symptoms do not meet the arbitrarily determined number of criteria for a diagnosis of autism and are given diagnoses such as Pervasive Developmental Disorder (PDD), autistic-like, or language-disordered with autistic features. In the recent past, terms such as residual autism, atypical autism or PDD, and even schizoid were applied to similar children. Now, some high-functioning people with autism are described as having Asperger syndrome (Asperger, 1971; Frith, 1991; Szatmari, 1991). Diagnoses may vary with the age of the child with less firm diagnoses given to very young children, and depending on the child’s cognitive level, it may not be clear if the diagnosis is “mental handicap with autistic features” or autism in a low-functioning child. There is broad clinical agreement that these terms describe the same types of children and that the boundaries are “fuzzy” (Waterhouse, Wing, & Fein, 1989). A more useful description may be that of “autistic spectrum disorder” reflecting the range of severity of symptoms in each of the three areas where deficits are significant for autism: reciprocal social interaction, communication, and repetitive or stereotypical interests and behavior (Wing, 1988).

To increase understanding of the disorder it is necessary to study a large group who have a range of autistic features and IQ. In this way, it may be possible to determine how autism is distinct from other pervasive developmental disorders, if high-functioning persons form a distinct subgroup apart from having a higher IQ and if certain autistic behaviors and characteristics go together. Without preclassifying children into a diagnostic category within the autistic spectrum it may be possible to sort out how they are similar and different, and which features are essential for the diagnosis.

There are few studies that attempt to clarify diagnostic issues and to increase understanding of the heterogeneity of the disorder with statistical methods such as factor analysis. Those that have approached the problem