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Book Reviews

The Childhood Autism Rating Scale (CARS). *Eric Schopler, Robert J. Reichler, and Barbara Rochen Renner.* Los Angeles, Western Psychological Services, 1988, v + 20 pp. $17.50 (paper).

The Childhood Autism Rating Scale (CARS), developed by Schopler and his associates at the University of North Carolina at Chapel Hill, was designed to identify autistic children and differentiate them from normal children and developmentally disabled children without autism. It consists of 15 scales that rate various aspects of behavior, including relating to people, imitation, emotional response, body and object use, sensory response, verbal and nonverbal communication, and activity level. The ratings are based on observations of the child's responses to various structured activities and situations related to each scale, with the child's age taken into account. The CARS yields a total score in ranges indicating normal functioning, mild to moderate autism, and severe autism.

The CARS manual presents background information, advantages of the CARS, rationale for the 15 scales, evaluation of psychometric properties, and instructions for administration and interpretation. The psychometric properties, including standardization, reliability, and validity, are the major focus of this review.

The current norms for the CARS are based on over 1,500 developmentally disabled children from North Carolina. The procedure for using the CARS is clearly described in the manual with objective scoring criteria presented for each scale on the rating sheet. Thus, the resulting score is derived from a standardized procedure and compared to norms based on a substantial sample.

Based on scores from two independent ratings of 280 cases, the average interrater reliability coefficient for the 15 scales was .71, with a high of .93 on Relating to People and a low of .55 on Level and Consistency of Intellectual Response. Test-retest reliability was assessed by comparing two sets of total scores, obtained about 1 year apart, from 91 cases. The obtained correlation was .88, and the mean scores for the two testings did not differ significantly.

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Criterion-related validity was tested by comparing total CARS scores with clinical ratings and with independent clinical assessments by a child psychiatrist and child psychologist. The obtained correlations were .84 with clinical ratings and .80 with assessments of the psychiatrist and psychologist. In a study not mentioned in the manual, Teal and Wiebe (1986) found that the CARS had a 100% accuracy rate, as compared to 90 to 95.7% for two other scales, in differentiating autistic and nonautistic retarded children.

The manual reports that CARS ratings obtained under different conditions (i.e., parent interview, classroom observation, and case history review) showed good agreement with initial CARS ratings, indicating consistency in scores obtained from diverse sources and in different situations. The CARS ratings of autism experts showed 92% agreement with ratings of the same diagnostic session by other less-experienced diagnosticians (e.g., medical students, pediatric residents, special educators) who had been given only a brief introduction to the CARS.

The CARS appears to have appropriate content validity since the scale items represent consensual features from several of the most commonly cited definitions and criteria for autism. Construct validity, although not addressed directly in the manual, is implicit in the use of this consensual conception of autism. Moreover, a coefficient alpha of .94 reported as a measure of internal consistency reliability can also be taken as a reflection of construct validity, since it suggests that the scale is measuring a unitary syndrome rather than unrelated aspects of behavior.

The CARS appears to be a carefully developed, psychometrically sound, practical instrument that can be used in different settings by different types of professionals in the classification of autism. In a recent article (Morgan, 1988), this reviewer found the CARS to be the strongest of five commonly used scales with regard to demonstrated psychometric properties. More discriminant validity studies are needed to assess the ability of the CARS to distinguish autism from other pervasive developmental disorders and related childhood disorders, such as developmental language disorders. Cross-validation studies that confirm diagnostic results with independent samples are also needed. Nevertheless, the CARS represents a well-tested tool that should prove quite useful to practitioners who need a reliable objective procedure for the diagnosis of autism and to researchers who need a consistent basis for classifying of autistic individuals for scientific study.

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Aspects of Autism: Biological Research. *Lorna Wing* (Editor). London: Royal College of Psychiatrists and National Autistic Society, 1988, 120 pp., £7.50.

This is the proceedings of a conference, organized by the National Autistic Society of Great Britain and held at the University of Kent in 1987. Wing's preface, which deals with the definition of autism, demonstrates that after four decades of research, the debate on diagnosis continues unabated. Wing continues to emphasize the concept of "autistic continuum" which includes people of all intelligence levels who are socially impaired. This is a broader concept of autism than that defined by Kanner. Wing's definition no doubt would net more individuals into the category of autism, and hence increases the likelihood of heterogeneous etiologies. With such an understanding, the conference planners carefully arranged ten papers that attempted to offer some explanation of the causes of autism.

Two of the ten papers present clinical and psychological facts and speculate concerning the underlying neuropathologies. The book also contains reports of new, creative research approaches and raises many hypothetical questions about possible biological etiologies for autism, such as endogenous opioids, intrauterine cytomegalovirus plus autoantibodies, serotonin imbalance, aberrant peptide metabolism, and various genetic conditions. So far, a clear relationship between etiology or etiologies and autism has not yet been established. As long as the debate on the definition of autism remains, the search for such a relationship is likely to continue.

Overall, this is a seminal work by a group of outstanding clinical researchers and scholars of autism. It represents a model and standard for thoughtful research into some of the cardinal biological features of autism. The topics covered in this book are generally thought-provoking, insightful, and of value to both researchers and clinicians interested in autism. However, two other important aspects of biological research, histopathological and neuroradiological, were not included in the conference. There are current data suggesting pathological involvement of the cerebellum, amygdala, and hippocampus in autism.

The paper describing "evolutionary history of human social behavior" (p. 102) is interesting but helps very little, if any, to further our understanding of what causes autism. In the first chapter Wing comments that, "It is interesting and useful to speculate on the possible neurological pathology, so long as the ideas are regarded as hypotheses only, until validated by solid evidence" (p. 9). "Evolutionary history of human social behavior" is a subject that can never be validated by solid evidence.

A shortcoming of the book is that the conference's discussions were not included in the book. Insightful research ideas and additional evidence are often put forward in discussion sessions and strongly warrant inclusion.

I give the text high praise. Readers without training in neurobiology may find themselves struggling to comprehend the meanings of these research findings. Nonetheless, because of its scholarly and insightful approach, this book will make a useful contribution in expanding the reader's knowledge of possible biological etiologies of autism.

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