Classification of Child and Adolescent Psychopathology

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This review will consider some of the major issues in the classification of child and adolescent psychopathology. The central issue will be the value of classification systems in child and adolescent psychopathology research. Some comment will also be made on the value of the existing classifications in clinical practice.

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Historical and General Issues in the Classification of Child and Adolescent Psychopathology

The history of classification of mental disorders has very early origins (Cantwell & Baker, 1988; Mattison & Hooper, 1992). The DSM's used in the United States grew out of the 1840 census. Early symptoms were subsequently modified and expanded in the 1880 census culminating in the 1917 National Commission on Mental Hygiene. During World War II, an expanded manual was prepared to deal with psychiatric problems in patients who were in military service and in the Veteran's Administration health care system. ICD 6 (International Classification of Diseases, 6th edition) was the first formal diagnostic version to include mental disorders. DSM I published in 1952, consisted of 106 categories (APA, 1952). DSM II was published in 1968 (APA, 1968). DSM-III-R was meant to be a minor tinkering correction to occur midstream between publication of DSM III in 1980 and DSM IV in 1994 (APA, 1980, 1994). The minor tinkering turned out to be much more of a major modification. DSM-III-R was published in 1987 (APA, 1987) and consisted of 292 categories described in 567 pages. DSM IV published in 1994 consists of 407 number of categories described in 688 pages. Both DSM I and ICD 8 (WHO, 1967) contained a large number of disorders of adult life but very few descriptions of child psychiatric pathology. The first system to focus extensively on the classification of child psychiatric disorders was the developmental profile based on psychoanalytic concepts described by Anna Freud in 1965 (Freud, 1965). The group for the advancement of psychiatry in 1966 published the document "Psychopathological Disorders in Childhood: Theoretical Considerations and a Proposed Classification," Research Report #62 (Group for the Advancement of Psychiatry, 1966). This classification system was developed by a large committee, most of whom were psychoanalytically oriented. While the document was described as descriptive in nature, it is clear that the categorization was developed primarily with psychoanalytic thinking in mind. A major effort prior to the publication of ICD 9 in 1978 (WHO, 1978) were field trials undertaken to assess the current status of classification of child and adolescent psychopathology. Unfortunately, these field trials showed little agreement among child psychiatrists regarding theoretical conceptualization of child and adolescent psychopathology. However, Rutter and his colleagues in, 1969 (Rutter et al., 1969) suggested that these field trials revealed that child psychiatrists were able to agree fairly well on categories of child and adolescent psychopathology that were phenomenologically described and were rather broad categories, such as those between disruptive behavior disorders or externalizing disorders and those that were emotional disorders or internalizing disorders. There have been many objections to psychiatric classification in general and to child psychiatric classification in particular (Szasz, 1961, 1978; Hobbs, 1975). Some of the objections are based on the assumption that classification of psychopathology lacks any substance or meaning and produces harmful effects including social deprivation and social stigma. However, it is now recognized that the so called harmful effects of classification of psychopathology result from abuse of the system and not from the classification system per se. There is general agreement among most psychiatrists that the disadvantages of classification are greatly outweighed by the numerous advantages of having a valid and reliable classification system of child and adolescent psychopathology (Weiner, 1982; Kendell, 1975). A major advance in the classification of adult psychopathology was the publication of the Feighner criteria (Feighner et al., 1972). This set of criteria summarized the pioneering work of the Washington University Department of Psychiatry led by Eli Robins and Samuel B. Guze. The publication of the Feighner criteria and subsequent criteria such as the Research Diagnostic Criteria (RDC) has led to the generally accepted view among researchers that classification...
needs to be based on phenomenology rather than on theories of etiology that lack a sufficient empirical basis. It has been shown in field trials that psychiatrists, and child psychiatrists in particular, may disagree on theoretical concepts, but can agree on phenomenologic description. DSM III was the first official classification scheme to adopt the approach suggested by the Feighner criteria. ICD 10 has adopted a very similar format as have DSM-III-R and DSM IV. ICD 10, however, has separate criteria for research and clinical work whereas DSM IV does not. There is a significant benefit for research purposes in having diagnostic criteria that are used across research studies.

However, it has been pointed elsewhere there are some significant weaknesses in the existent systems—both DSM IV and ICD 10 (Cantwell & Rutter, 1994; Cantwell, 1988; Cantwell & Baker, 1988; Cromwell, Blashfield & Strauss, 1975). The first one concerns the relationship of the diagnostic process to diagnostic classification. There has been only a very limited operation of the diagnostic criteria which specifies which diagnostic instrument is used, what informants are used, and how a rating for presence and severity of the criteria is made absolutely explicit. Thus, one may specify that a certain number and type of symptoms need to be present for a particular diagnosis to be made. Without using the diagnostic process to make the diagnosis using the specific diagnostic criteria the value of the use diagnostic criteria may be suspect.

Since DSM IV and ICD 10 have not used theory as a basis for classification, this has lead at times to the erroneous assumption that cross sectional phenomenology is the sole basis for diagnosis without regard to natural history, biological correlates, psychosocial correlates, familiality, response to treatment and other concepts (Cantwell & Rutter, 1994). Describing diagnostic criteria on a phenomenological basis is not enough for the diagnostic categories to be valid and useful for research. Such diagnoses must differ in areas other than clinical phenomenology. It is clear that individual diagnoses in ICD 10 and DSM IV differ widely in the availability of research evidence to substantiate their external validity. Few psychiatric disorders of childhood and adolescence are fully validated using criteria suggested by Cantwell and others (Cantwell & Rutter, 1994).

Conceptual Issues in the Classification of Child and Adolescent Psychopathology

Some of the important conceptual issues in child and adolescent classification include: (1) whether a dimensional or categorical approach is more appropriate, (2) whether child and adolescent psychopathological disorders can be conceptualized as being quantitatively or qualitatively different from normal, (3) whether categories described in classification schemes such as DSM IV and ICD 10 can be considered to be discrete entities, (4) how is comorbidity handled by a particular system?, (5) how are “subthreshold” clinical conditions considered? (Cantwell & Rutter, 1994).

The distinction between a categorical and a dimensional approach has been discussed by others (Achenbach & Edelbrock, 1978; Quay, 1983; Klein & Riso, 1994; Grayson, 1987; Cantwell & Rutter, 1994). The major official classification systems in use (DSM IV and ICD 10) are categorical in nature. The patient meets or does not meet criteria for a disorder. These categorical classification schemes have a number of advantages over dimensional approaches. A patient is given a diagnosis described by a single term which allows one to summarize a variety of clinical concepts in a discrete fashion to other individuals. In addition, our clinical decisions in child psychiatry are generally based on categorical concepts. Stimulants are given to children with an Attention Deficit Disorder (ADD) diagnosis. Neuroleptics are given to those with a schizophrenic diagnosis. Dimensional approaches such as those developed by Achenbach (Achenbach, 1985) are unlikely to lead to the discovery and description of very rare disorders such as autism. Advantages of the dimensional systems include the ability to describe multiple symptom patterns (anxiety, depression, aggression) present in a particular individual. Dimensional systems are usually more statistically reliable. Categorical diagnoses are at times made on the basis of arbitrary cut off points regarding number and type of symptoms.

Multiple statistical techniques have been used to determine whether psychiatric disorders show continuity or discontinuity with normality. As discussed in Cantwell and Rutter (1994), there are a variety of problems with the statistical approaches that have been used. In addition, the presence of dimensional traits such as a “depressive”, “anxiety”, or “conduct” factor does not rule out the possibility that there are distinct categorical disorders such Major Depressive Disorder, Generalized Anxiety Disorder and Conduct Disorder that are biologically and clinically discontinuous with the more “normal” dimensional factors. Discreteness in medicine often assumes that medical conditions are completely discrete from each other and from normality. When a specific single cause can be described for a particular disorder then it is likely that this disorder can be considered discrete in this fashion. However, many diseases in medicine (e.g. hypertension) are multifactorial in nature and may in fact not be that discrete. There is no a priori reason to expect that depression, ADD, and anxiety disorders will necessarily be totally discrete from one another and from normality. What may be more crucial for child psychiatry is whether or not various clinical conditions have a biological outcome, psychosocial outcome, or other correlates that differentiate the conditions from each other and from normality.

Problems with comorbidity in child psychopathology have been reviewed by a variety of authors (Nottelmann & Jensen, 1995 Achenbach, 1990, 1991; Caron & Rutter, 1991; Biederman, Newcorn & Sprich, 1991; Carlson, 1986; Cantwell & Rutter, 1994; Rutter, Shaffer & Shepherd, 1975a; Rutter, Shaffer & Sturge, 1975b). Evidence from epidemiologic studies suggest that comorbidity in child and adolescent psychopathology is quite prevalent. Nottleman and Jensen’s review of comorbidity in children and adolescence concentrates primarily on data from epidemiologic studies (Nottelmann & Jensen, 1995). They point out that there are
developmental considerations and methodological issues to take into account and that classification and comorbidity are intimately related. It is possible that comorbidity in many studies may be artificially inflated. Diagnostic criteria for one disorder may not significantly discriminate it from another disorder. Such might be true with depression and anxiety, and ADD and mania which share some symptoms. There may be higher order, broader based patterns (such as externalizing versus internalizing disorders) that may represent more specific single diagnostic entities. Where these higher order disorders are artificially subdivided high patterns of comorbidity result. Thus, it may be that when an overall higher order anxiety disorder is subdivided into multiple anxiety disorders (such as is true of DSM IV and ICD 10) artificial comorbidity among these so called separate anxiety disorders may result. Inappropriate low boundaries between normal variation and pathology can lead to inflated comorbidity. It has been shown in epidemiologic studies that high symptom counts alone lead to high prevalence levels of disorders in the community. Rates are lowered when severity and impairment criteria are added (Weissman, Warner & Fendrich, 1987). The same may be true of comorbidity. Stipulation of severity and impairment may lead to lower prevalence of any particular disorder and lower comorbidities between disorders. Comorbidity may be a problem of the classification system per se when a large number of disorders are broken down into too fine subdivisions that are nonhierarchical and nonexclusionary in nature. Alternatively, comorbidity may reflect a more amorphous early expression of psychopathology in young children that does not begin to crystalize into more definitive psychopathology until later in life. Follow-up data support this idea. General population studies suggest less continuity of disorders from childhood to early adolescence and from early to mid adolescence than from mid to late adolescence (Nottelmann & Jensen, 1995).

Comorbidity is handled quite differently by ICD 10 and DSM IV. ICD 10 makes liberal use of combined categories such as “Hyperkinetic Conduct Disorder” and “Depressive Conduct Disorder”. DSM IV encourages the use of multiple diagnoses when criteria for more than one disorder are met. Implicit in the ICD 10 approach is the notion that there is something unique about the co-occurrence of depression and conduct disorder that justifies a separate diagnosis. The Harrington studies (Harrington et al., in press) support this uniqueness with regard to the longitudinal course of childhood onset depression. There are family data that support the idea that the co-occurrence of conduct disorder and the hyperkinetic syndrome (Attention Deficit Disorder in DSM IV terms) may be a unique syndrome. Follow-up data suggest the same thing. At this point it is not possible to say with certainty which approach is the preferred one. The best approach may differ for different disorders.

The final conceptual issue to be discussed is subthreshold or subsyndromal psychopathology. When categorical diagnostic schemes are used for classification that require the presence of a certain specific set and/or specific number of symptoms there will be individuals who just miss the cut off score. Likewise, when dimensional measures are used that require a cutoff at a certain level to be considered “clinical” there will again be children as well as adults who fail to meet the specified cut off score. The DSM IV field trials of adults identified (Zinbarg et al., 1994) a substantial number of adults both in psychiatric and primary care settings who did not meet standard DSM IV criteria for any of the depressive or anxiety disorders. However, these individuals had a combination of anxiety and depressive symptomatology that caused a significant degree of functional impairment. In the psychiatric sample, about 20% of patients were so identified and in the primary care sample about 8% were identified whose subsyndromal clinical picture caused functional impairment. It has long been thought by many primary care practitioners that subthreshold disorders in the pediatric age range are more common in their practice than DSM or ICD diagnosable psychiatric conditions. Systematic studies by Costello (Costello, 1990) suggest to a large degree that this is true. Her studies also suggest that individuals in primary care and in psychiatric samples who meet specific criteria for one diagnosis may be subsyndromal for other diagnoses. Subsyndromal conditions are associated with functional impairment, although below the level of functional impairment associated with the presence of definite psychiatric disorders diagnosed by standard DSM or ICD 10 criteria. Thus, any research classification scheme must consider subsyndromal disorders. Both DSM IV and ICD 10 do not adequately address this issue. Both primarily use a “not otherwise specified” grab bag category to lump all disorders that do not meet criteria.

Reliability

For a classification system to be useful for research it must be a reliable system. Researchers of different theoretical persuasions who evaluate a child must be able to make psychiatric diagnoses that are reliable. Thus, if Clinician A sees the patient and makes a diagnosis of Attention Deficit Disorder (ADD) according to a diagnostic scheme, Clinician B evaluating the same child at the same time should make the same diagnosis. In the past 20 years as work proceeded on the development of the DSM and ICD systems, interest in the issue of diagnostic reliability of child and adolescent psychiatric classification has intensified. (Rey, Plapp and Stewart (1989), Cantwell and Rutter (1994)). There is general agreement that most studies show that there is acceptable reliability for major psychiatric disorders (Cantwell & Rutter, 1994).

The creation of structured and semi-structured interviews to be used with parents and children to make specific diagnoses in childhood has led to a series of studies to examine diagnostic reliability (and validity) of the diagnoses. Boyle et al. (1993) evaluated the DICA-R using a test–retest design. Kappas were generally very good in the range of .55–.84. There have been a series of studies using the original DISC and subsequent revisions (presumably improved) (Boyle et al., 1993; Cohen et al., 1987; Fallon & Schwab-Stone, 1994; Jensen et al., 1995; Schwab-Stone et al., 1994; Shaffer et al., 1993; Fisher et
from different sources such as three from a parent, two or not. Nor is it clear that the specified number of symptoms that are needed for the diagnosis can come inattentive, and primarily hyperactive and impulsive.

IV for several subtypes of ADD: combined, primarily diagnostic rules will improve reliability. But this is only true if there are precise rules for how the symptom is determined to be present, rather than just rules for what symptoms need to be present for the diagnosis to be made. For example there is a list of symptoms in DSM IV for several subtypes of ADD: combined, primarily inattentive, and primarily hyperactive and impulsive. The symptoms must be of early onset, persistent over time, and be present in two or more settings. However, there are no precise rules for the researcher to determine whether a symptom is truly present in a particular setting or not. Nor is it clear that the specified number of symptoms that are needed for the diagnosis can come from different sources such as three from a parent, two from a teacher and one from a child (Rutter & Pickles, 1990).

In a major study by Costello (personal communication) using DSM III, the author demonstrated that at an institution known for its attention to psychiatric diagnosis only in a minority of cases did experienced professionals use the data collected in a standardized fashion to make diagnoses according to specific DSM III criteria. Many used a "pattern matching" approach in which the data collected from parents, teachers, child, and others matched what their idea of what a particular diagnosis was.

A recent study of adult psychotic patients as part of the DSM IV field trial demonstrated that despite using specific diagnostic criteria for the various psychotic disorders there was quite a lot of difference in classification or misclassification of patients which arose from variability in the method that the researchers use to assign the diagnostic criteria rather than in the criteria themselves. Although DSM IV criteria were used, four diagnostic procedures were used to determine the presence of the criteria. The four were: a diagnostic instrument developed for the DSM IV field trial, the Royal Park Multi-Diagnostic Instrument for Psychosis, the Munich Diagnostic Checklist, and a consensus diagnosis assigned by a team of clinician researchers who were expert in the use of diagnostic criteria. Levels of per cent agreement ranged from 66 to 76% with misclassification rates of 24–34% when pairs of diagnostic procedures were compared with each other, assuming that one procedure was "correct". This type of misclassification will impede all areas of research of a disorder (i.e. genetics, neurobiological correlates, outcome and treatment (McCory et al., 1995)).

For these reasons and others, it is clear that a statement in a research paper that DSM IV criteria or ICD 10 criteria were used to define the population does not tell the reader that the same diagnoses will be made comparably across research centers. The methods used to determine whether the diagnostic criteria were present or not also need to be specified.

Validity

While reliability is a necessary prerequisite for any diagnostic classification system to be useful in research, validity is an even more crucial issue. For a classification system to be useful for researchers, the diagnostic categories must have both internal and external validity. External validity has been discussed by a variety of authors (Feighner et al., 1972; Cantwell, 1975; Rutter, 1978; Kendall, 1982; Rutter & Gould, 1985; Cantwell & Rutter, 1994; Andreasen, 1995). In 1970 Robins and Guze (1970) published a very influential article in which they illustrated a model for the validation of psychiatric disorders. Their model consisted of different stages including clinical description, laboratory studies, exclusion criteria, outcome studies, and studies of familial aggregation. This model was expanded upon by Cantwell (1975) for use in children. The Cantwell model includes the stages of clinical phenomenology, psychosocial factors, demographic factors, biological factors, family genetic factors, family environmental factors, natural history, and response to therapeutic intervention. The starting point for clinical research in this model is...
Clinical phenomenology. Various disorders must be described in terms of their core clinical picture and their common associated features. Subtyping of the disorder and comorbidity also must be considered. Both categorical and dimensional ways of describing clinical symptomatology may be used. Factor and cluster analysis of dimensional measures offer alternative and complimentary ways of describing the psychiatric disorders of childhood and adolescence compared to the categorical model used in DSM IV and ICD 10. Once the clinical phenomenology of a disorder has been clearly defined and subtyped meaningful investigations can be undertaken in other stages of the model to provide evidence of internal and external validity of the disorders. Internal validity is discussed below.

The first external validating stage is the study of demographic factors. Once the clinical picture is described then incidence, prevalence, morbidity risk, and lifetime expectancy rates can be generated. The effects of age, gender, social class, ethnicity and culture on the prevalence and manifestations of the disorder can be documented.

External validation of a disorder can be increased by the presence of certain psychosocial factors correlated with a particular clinical picture. This may include factors such as the level of acute and chronic life stress, early childhood experiences such as separation and attachment difficulties, and physical or sexual abuse.

Biological factors correlated with a particular clinical picture may include the presence of definite brain damage and/or brain dysfunction, physical handicaps and disorders, neurological disorders, and laboratory findings from studies in the areas of neurophysiology, neuroendocrinology, biochemistry, neuropharmacology, brain imaging, and neuropsychology.

The external validating stage of family environmental factors might include such dimensions as discipline styles, and other aspects of parent-child interaction.

Types of family genetic studies factors includes family aggregation, adoption, twin, linkage, segregation, gene mapping, and others.

The study of natural history of the disorder would include true prospective, true retrospective, catch up prospective and anterospective studies to explore continuities and discontinuities between childhood, adolescent and adult disorders and the mechanism for these continuities and discontinuities.

The final external stage of the multistage Cantwell model is response to interventions. If certain clinical syndromes respond differentially to the same type of intervention the first assumption might be that the clinically defined syndrome is heterogeneous in nature (Pliszka, 1989). These validation stages are not independent from one another. Information derived from one stage may inform further studies in another stage. Thus, determining that one disorder may run in close family members may identify familial and nonfamilial subtypes of the disorder. This would allow the original group selected on the basis of a definite clinical picture to be subdivided into two smaller groups. If they are truly different from each other then differences should emerge from other stages of the model as well. Andreasen (1995) has recently noted the growing body of literature with adult disorders for differential external validity using a variety of biological measures. At this point, child psychiatry lags behind the study of adult psychopathology in this area.

The past decades have seen a substantial increase in the study of diagnostic validation of child and adolescent psychopathology along the lines described above. However, no disorder can be considered to be fully validated and future changes in classification will likely be determined by future advances particularly in the area of neuroscience.

Future studies may determine that certain diagnostic criteria predict one validating criteria while another set might predict another validating criterion. For example, DSM-III-R criteria for ADHD are “tighter” than DSM IV criteria and identify more children who have significant comorbid oppositional defiant and conduct disorder. Thus, DSM-III-R criteria are likely to produce a group more likely to have a natural history including antisocial spectrum disorders than DSM IV criteria, but for family genetic studies, DSM IV criteria might prove to provide a higher heritability estimate and different patterns of psychopathology in the family members. Neither of the criteria may be “right” for other areas of validation. The accumulation of data in all areas of the validating model described above should lead to revisions in the original criteria and subdivisions of the original clinical sample.

However, there is a converging body of evidence that the major psychiatric disorders as described in ICD 10 and DSM IV do have a reasonable external degree of diagnostic validity. That is, that the syndromes described by ICD 10 and DSM IV criteria are known to have a differential association with external validating criteria such as those described in the Cantwell model noted above. Epidemiologic studies using modern diagnostic criteria suggest that the prevalence rate of clinically significant psychiatric disorders between the ages of 4 and 17 in the general population is approximately 20% (Nottelmann & Jensen, 1995). Prevalence rates for individual disorders vary greatly and for the same disorder prevalence rates may change with age and gender. The early onset disorders, such as attention deficit disorder, developmental learning and language disorders and pervasive developmental disorders tend to be more common in boys. The one exception to this is Rett's Syndrome which has been described almost exclusively in girls. Disorders such as Obsessive Compulsive Disorder (OCD) and major depression have equal prevalence rates in males and females in the prepubertal age range. Rates of both disorders increase with puberty, but rates increase much more in females. Studies of psychosocial factors suggest that family dysfunction, discord between the parents and child, and family disruption due to death and divorce tend to be associated more with disruptive behavior disorders than with anxiety and mood disorders. This suggests that it is diagnostically meaningful to separate out the broad class of disruptive behavior disorders from that of anxiety and mood disorders. Whether finer distinctions can be made requires further research. Whether there are specific clinical pictures that arise with specific psychosocial factors is not clear at the present time.
Biological correlates have begun to be demonstrated with some degree of specificity in clinical syndromes of adult life such as schizophrenia, OCD and others. The study of biological correlates in child and adolescent disorders however has lagged behind their study in adults (Plante, Swisher & Vance, 1991). Some laboratory measures such as the dexamethasone suppression tests, serum cortisol, sleep EEG recordings have revealed different findings in depression in young children as opposed to depression in adults. This may be due to developmental changes in neurobiology with age. Imaging data are beginning to demonstrate abnormalities in some of the developmental problems seen in young children, but replication with larger numbers are needed before we determine that these are specific to certain disorders. Family aggregation studies and high risk studies do suggest that there is familiality to many of the psychiatric disorders of childhood and adolescence. This is true for schizophrenia, mood disorders and to some degree for the anxiety disorders and the disruptive behavior disorders. Further work in the family genetic area will require more significant numbers of adoption, twin, linkage, segregation, and gene mapping studies. This appears to be a fruitful area for further diagnostic validation of our behaviorally defined syndromes and suggests the possibility of ultimately finding familial and nonfamilial (and possibly genetic and nongenetic) subtypes of a disorder.

Natural history studies of child and adolescent psychopathology do suggest continuities over time in a variety of disorders such as ADD, the Pervasive Developmental Disorders, OCD, and probably in mood disorders as well. (Harrington et al., in press) Less data is available on the other anxiety disorders and some of the other forms of psychopathology described in DSM IV and ICD 10. It is reasonable to initially assume that a disorder which begins early in life, is chronic in nature, persisting into adult life may be quite a different condition from a phenomenologically similar condition that is seen only in childhood with no recurrences, relapses, and no chronicity. If these two types of a phenomenologically similar disorder are truly different, then differences in other areas of the model, such as psychosocial factors, biological factors and others should be discovered.

In the area of specificity of response to treatment there is a trend towards more specific methods of both psychosocial and psychopharmacologic intervention with some disorders in adults. For example, the treatment of depression in adults has been enhanced by receptor studies and the demonstration that certain medications have certain effects at specific receptors. This adds to the specificity of selecting an antidepressant drug in adults. Psychosocial manualized therapies such as cognitive behavioral therapy and interpersonal psychotherapy have been developed for some of the adult psychiatric disorders. This trend is just beginning to be demonstrated with childhood and adolescent disorders (Kazdin, 1983). Again, it makes sense to initially assume that a child with ADD at age 7 who has a dramatically positive response to one of the psychostimulants may have an etiologically different condition than a child with phenomenologically defined ADD who

has an adverse response. Adverse and positive responders then should be found to differ in other areas of the models as well.

In summary, ICD 10 and DSM IV contain many child and adolescent disorders for which there is a satisfactory amount of external validation. These would include ADD, Conduct Disorder, Rett's Syndrome, Autistic Disorder, Tourette's Syndrome, OCD, and Anorexia Nervosa.

A complete discussion of the evidence for external validation of each of these disorders is beyond the scope of this paper. There are recent publications that summarize the current evidence (Rutter, Taylor & Hersov, 1994; Kaplan & Sadock, 1995; Lewis, 1995). However, since ICD 10 and DSM IV are classifications that are used in everyday clinical practice, they include many disorders for which the validation is less well developed. Whether one should start with very broad categories or with more narrowly defined sub categories initially in the development of a classification is a question that has been inadequately researched. It is clear that some of the categories that are included in a beginning classification system are bound to have less external validation than others. But, if they are not included they will not be studied. Thus, the separation of ADD into a primarily hyperactive impulsive type and a primarily inattentive type has been done initially on clinical grounds. If further evidence to show differential validation with external criteria of these two subtypes fails to develop, it may be more appropriate to lump them together in some later classification scheme. DSM IV and ICD 10 probably have a stronger founding in the empirical literature than their predecessors. ICD 10 and DSM IV were developed closely together so that the individual child psychiatric diagnostic criteria for most of the disorders are very similar if not identical. For the preparation of DSM IV extensive literature reviews of individual categories were undertaken to determine how well the individual diagnostic categories and their criteria had empirical validation. Any changes in DSM IV from previous editions (DSM III and DSM-III-R) were made on the basis of research evidence available in the current literature or produced in the many field trials that were carried out before DSM IV was published. (Volkmar et al., 1994) The source books which will be published as a companion to DSM IV detail the research base for the DSM IV categories.

Discussions of validation above has concentrated on external validity. Waldman and colleagues (Waldman et al., 1994, Waldman, Lilienfeld & Lahey, 1994) have discussed internal validity. They view the process of internal validation as the testing of hypotheses regarding the internal structure of a diagnostic entity. Waldman and colleagues discuss internal consistency analyses, factor analysis, cluster analysis and taxometrical analysis, and latent class analysis in the study of internal validity. Questions to be regarded include: how homogeneous or heterogeneous is the clinically defined disorder; is the disorder categorical or dimensional in nature; how many categories or dimensions underlie its diagnostic indicators; what are the boundaries and reactions among its underlying dimensions or categories? Does a particular diagnostic grouping such as
depression have a number of specific subcategories or dimensions in the broader diagnostic category? Is the distinction between major depressive disorder, dysthymic disorder, melancholic depression, psychotic depression, atypical depression, seasonal affective disorder, primary and secondary depression meaningful for research?

Based on their results in the field trials of DSM IV Disruptive Behavior Disorders, (Frick et al., 1994; Lahey et al., 1994, Applegate et al., 1994) they suggest that researchers studying childhood psychopathology need to be more attentive to considerations of construct validity. Among their suggestions include the following: the formulation of specific a priori alternative hypotheses that can be contrasted in terms of their ability to best fit the data; increase the use of latent variable models, a larger number and scope of competing hypotheses; paying greater attention to interval validity as opposed to simply considering external validation of disorders. They suggest that previous studies have concentrated on comparing groups with specific diagnoses that are of unknown internal validity to each other on the external validating factors described above. If internal validity of a diagnostic category is unknown then results of external validating studies are difficult to interpret.

Directions for Future Research

The above review suggests that we have come a long way in the classification of child and adolescent psychopathology. Earlier views included the view that classification of child and adolescent psychopathology held no value for treatment. Later views included classification schemes that were based heavily on theoretical models such as psychoanalysis. These early attempts at classification have been replaced by classification schemes that are considered to be "theoretical". At times this has lead to the erroneous idea that cross sectional phenomenology is the only basis for classification and a lack of appreciation that the phenomenologic criteria must be shown to have internal as well as external validity. Classification of child and adolescent psychopathology is likely to be an evolving process as we collect more data in a variety of areas. We expect advances in several areas including neuroscience (including the study of genetics), neurophysiology and neurochemistry. We expect advances in studies of response to treatment and to arise from the fact that larger populations of children diagnosed by specific criteria will have been available for follow-up over time to look at continuities and discontinuities between childhood, adolescent and adult disorders (Harrington et al., in press). For all of these reasons, DSM V and ICD 11 should have classification schemes that are based on more than cross sectional phenomenology.

Klein and Riso (1994), Garber and Strassberg (1991), Cantwell and Rutter (1994), Waldman and Lahey (1994) and Waldman et al. (1994) have all pointed out that improved statistical techniques will allow for more specific testing of the adequacy of diagnostic criteria and constructs. Waldman and Lahey (1994) and Waldman et al. (1994) suggest that latent variable models will provide information on internal validity issues including whether the diagnostic entities are categorical or dimensional, how many of the diagnostic entities there are within the theoretical construct and what are the boundaries and relationships of these various entities. Latent variable models can also provide information on the diagnostic efficiency of specific signs and symptoms. For example, which symptoms provide the greatest degree of prediction of response to psychosocial and/or psychopharmacological intervention. Which symptom combination provides the greatest agreement with some type of biological correlate or with heritability. Finally these latent variable models can address issues of comorbidity, pervasiveness, and the relationship between normality and pathology. Receiver operator curves (Hsiao et al., 1989) are another statistical technique to decide which set of symptoms provide optimal sensitivity and specificity according to an external validating criteria, such as biological correlates, psychosocial correlates, outcome or response to treatment. As Waldman et al. (1994) point out, much more time, energy, and money will be needed in future studies on data analysis rather than data collection in order for these aims to be achieved. Future classification systems will need to take comorbidity into account and assess the impact of comorbidity on such factors as biological and psychosocial correlates, heritability, outcome, and response to treatment. The development of future classification schemes should be accompanied by a multi method approach to measurement of signs and symptoms of the disorder and a multi-measurement approach to the measurement of impairment and other criteria measures. Field trials of DSM IV used a single method of assessing psychopathology and single measures of impairment (Weissman & Warner, 1982; Cicchetti et al., in press). Developmental aspects of classification of child and adolescent psychopathology will have to be given much greater consideration in future classification systems. DSM and ICD 10 essentially say that diagnostic criteria for schizophrenia, mood disorders, and most of the anxiety disorders are essentially the same across the lifespan—preschool, grade school, adolescence and adult life. It is likely that this is not true for some, if not all of the disorders. Some symptoms may be present throughout the lifespan. Others may be more prevalent at certain age ranges than at others. It may be that the diagnosis of depression, for example, will require certain symptoms to be present throughout the course of the lifespan, but that other symptoms will be present in some areas of the lifespan, but not others. For example, a symptom like guilt is much more likely to be prevalent in individuals who have reached the final stages of cognitive development that it is in a preschool or early grade school aged child. DSM IV and ICD 10 are not particularly useful for classification of the psychopathology of infants and very young children. Nor are they as useful for classifying the psychopathology of children (or adults) with severe mental retardation. There have been recent attempts to create alternative classification systems for both of these groups. But these systems have yet to be systematically studied in any great detail (Zero to Three, 1995; Aman, 1991; American Association on Mental Retardation, 1992).
Issues of categorical vs dimensional classification should be tested directly in future developments of classification systems. It may be that some combination of categorical and dimensional approaches may best handle the problems both of comorbidity and of subsyndromal conditions.

It is likely that changing criteria (ICD 9 to ICD 10 and DSM-III-R to DSM IV) will have an effect on epidemiological studies. The recent series of NIMH studies using the DISC as an interview have used DSM-III-R criteria. The DISC is now being revised for DSM IV criteria. The criterion changes may lead to different population prevalence rates for various disorders.

Wolraich (Wolraich, 1994a,b) has recently completed two epidemiological studies of attention deficit disorder using DSM III, III-R, and IV criteria. One study was in Germany and one was in Tennessee. Teacher information was the sole source of data in both studies. In the German population the prevalence figures for the primarily inattentive subtype, the primarily hyperactive impulse subtype, and the combined subtype were: 9%, 3.9% and 4.8%, respectively.

In the Tennessee population the prevalence figures for the same three subtypes were 4.7%, 3.4% and 4.4%, respectively. The figures in both sites are higher than figures obtained in the same studies using DSM III and DSM III-R criteria. For example, the same German population using DSM III criteria had prevalence rates of 6.4% for ADD with hyperactivity, 3.2% for ADD without hyperactivity and 9.6% total. Using DSM-III-R the prevalence rate for attention deficit hyperactivity disorder was 10.9%. Thus, the application of DSM IV criteria led to a 64% increase in total ADD prevalence rates compared to DSM III and DSM-III-R criteria.

Comparison of the Tennessee and German rates suggest possible cultural, geographical, ethnic differences in prevalence rates. This is a relatively understudied area across cultures with countries and across countries. DSM IV has added a section in the description of each disorder specifically dealing with cultural factors important in each disorder. DSM IV has also added an appendix providing an outline for cultural formulation to address any difficulties that could arise from using DSM IV criteria in a multicultural environment.

It is anticipated that future editions of the DSM and ICD will provide a further advance in the classification of child and adolescent psychopathology. Improvements in classification are in a reciprocal fashion likely to lead to improvements in studies of etiology, outcome, and response to treatment.

References


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