

# The Zero to Three Diagnostic System: A Framework for Considering Emotional and Behavioral Problems in Young Children

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*Abstract.* The expansion of early childhood services has brought increasing recognition of the need to address mental health disorders in young children. The transactional perspective of developmental psychopathology is the basis for review of diagnostic frameworks for young children. The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) is discussed in light of developmental and contextual factors that characterize emotional and behavioral problems in infants, toddlers, and preschool-age children. The Diagnostic and Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood (DC:0-3) system, developed by Zero to Three: The National Center for Clinical Infant Programs, is introduced as an alternative framework offering developmentally appropriate diagnoses and incorporating aspects of family functioning. Research using the DC:0-3 diagnostic system is reviewed, followed by a discussion of applications of this framework for school psychologists working in early childhood programs.

Early childhood services have grown dramatically within the past two decades, reflecting a convergence of several societal forces. Since the passage of P.L. 95-457 in 1986, states have been mandated to develop special education services for infants, toddlers, and preschoolers with disabilities. Longitudinal research demonstrating the benefits of prevention programs, such as Head Start (see Ramey & Ramey, 1998), has prompted many states to offer preschool programs for children from impoverished or at-risk backgrounds (Ripple, Gilliam, Chanana, & Zigler, 1999). With this expansion of early childhood services has come a growing need for skilled mental

health professionals who can provide meaningful assessments and appropriate interventions.

This article will address mental health needs in early childhood programs, and will briefly review a developmental perspective for understanding mental health disorders in young children. The utility of existing diagnostic frameworks, including the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994), for conceptualizing the mental health problems of young children will be presented. An alternative system, the *Diagnostic Classification of Mental Health and Developmental Disorders of In-*

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*fancy and Early Childhood* (Zero to Three: National Center for Clinical Infant Programs, 1994), will be introduced, followed by a review of supporting research and discussion of the benefits and limitations of this system.

### **Mental Health Issues in Early Childhood Programs**

Working to promote the mental health of children has long been seen as a primary role for school psychologists, and recent publications have stressed the need for increased efforts to meet these needs not only within schools, but also through work with families and community systems (see Nastasi, 1998; O'Day, 2000). Mental health services are critical at the earliest ages, when prevention and intervention programs may have the greatest potential to reduce the incidence and the severity of mental health disorders.

### **Prevalence of Behavioral Problems**

Briggs-Gowan and Carter (1998) cite prevalence rates of 5–35% for parent and teacher identification of preschoolers with problematic social and emotional functioning; this range is similar to the range reported for school-age children. Elevated levels of difficult infant and toddler behaviors (e.g., unresponsiveness, negative emotionality, resistance, defiance) have been related to higher scores on measures of behavior problems during early school years (Lavigne et al., 1998), during middle childhood and adolescence (Olson, Bates, Sandy, & Lanthier, 2000), and even to mental health disorders in adulthood (Caspi, Moffitt, Newman, & Silva, 1996).

Several recent surveys have documented a high rate of problem behaviors among preschool children with developmental delays, exceeding levels within the typical population (Riccio, Ross, Boan, & Houston, 1998; Wingenfeld, Heindselman, Daniels, Edwards, & Lee, 1997). For example, the co-occurrence of communication disorders with emotional and behavioral problems has been estimated at 50–60% (Prizant, Wetherby, & Roberts, 2000). Webster-Stratton (1997) observed that mental health services often target older chil-

dren and teenagers; preschool intervention programs often target cognitive, language, and motor delays, and may neglect primary social and emotional issues that trouble young children.

### **A Developmental Perspective on Child Psychopathology**

The study of developmental psychopathology has spurred research on the origins of childhood mental disorders, and has offered a model of risk and resilience guiding efforts to improve outcomes for young children (Rutter & Sroufe, 2000; Shonkoff & Phillips, 2000; Sroufe, 1997; Zeanah, Boris, & Scheeringa, 1997). Developmental psychopathology incorporates a transactional formulation (Sameroff & Fiese, 2000) that considers innate child-based characteristics (e.g., biological and temperamental factors), the child-rearing environment (e.g., parental characteristics, cultural factors), and the interface between innate and environmental factors. Healthy patterns of growth and adaptation, or conversely, maladaptive patterns leading to psychopathology, are the result of ongoing exchanges that occur within child-caregiver relationships. Development is thus viewed as a dynamic, bidirectional process wherein child characteristics (“nature”) both influence, and are influenced by, the child-rearing context (“nurture”). Interventions designed to decrease risk factors and strengthen protective factors can thus be targeted at the child, the child-rearing environment, or the relationship itself (Sameroff & Fiese, 2000; Zeanah et al., 1997).

The transactional model of developmental psychopathology is firmly rooted in research on the emergence of childhood emotional and behavioral disorders. For example, the literature on disruptive disorders has identified difficult temperament as a child-related contributor to aggression and noncompliance (Shaw, Owens, Giovannelli, & Winslow, 2001; Wakschlag & Keenan, 2001; Webster-Stratton, 1997), along with the family-related factors of violence (Shaw et al., 2001) and parental mental illness (Seifer et al., 1996). Furthermore, maternal negativity, expressed in high ratings of child behavior problems and observed in parent-child interactions, is well documented

as a relationship-based predictor of disruptive behaviors (Olson et al., 2000; Shaw et al., 2001; Stormont, 1998; Wakschlag & Keenan, 2001), and is associated with later emergence of conduct disorders (Constantino, 1992; Webster-Stratton, 1997).

The research on the origins of childhood depression further illustrates the process by which contextual factors shape child characteristics. Luby (2000) reported consistent research linking maternal depression with infant behaviors such as sad facial expressions, reduced activity level, and difficult temperament (expressed as irritability and poor response to soothing). Research described by Cicchetti and Toth (1998) documented the perpetuation of infant depressive states (i.e., young children who reflect maternal sadness in turn elicit depressive affect and reduced activity, even from strangers). The longitudinal pathway for childhood depression can therefore be explained as an interactive sequence wherein the young child fails to learn how to modulate attention and arousal, and to understand a variety of human emotions.

### **Diagnostic Frameworks for Early Childhood Mental Health Practice**

The contextual, transactional perspective of developmental psychopathology has illuminated our understanding of the emergence and evolution of mental disorders. Diagnostic systems to guide assessment and intervention will be discussed in light of these principles.

### **Assessment for Educational Classification**

Establishing disability definitions to determine eligibility for special education services is the diagnostic framework typically used by school psychologists (Kamphaus, Reynolds, & Imperato-McCammon, 1999). Within early childhood services, federal special education laws allow states to use the generic classification of *developmental delay* as an eligibility category for infants and toddlers (P.L. 94-457) and for preschool-age children (P.L. 102-119, the 1991 revision of IDEA). The federal criteria for developmental delay refer to eligibility based on delays in five domains

of functioning (physical, cognitive, communication, adaptive, and social or emotional development). This generic classification may render a child eligible for services without resorting to premature usage of disability categories (Division for Early Childhood, 1996).

Despite the benefits of noncategorical eligibility provided by the developmental delay classification, children whose disabilities are primarily in the emotional and behavioral domains may be overlooked in eligibility-driven assessments (Piotrkowski, Collins, Knitzer, & Robinson, 1994; Webster-Stratton, 1997). Conducting assessments to render only an eligibility decision based on degree of developmental delay generally has resulted in an emphasis on cognitive, language, and motor assessment, due to the availability of measures to assess these functions. The assessment of social and emotional functions is more difficult to quantify using a standard of delay, and thus is de-emphasized, and perhaps even ignored (DelCarmen-Wiggins & Carter, 2001).

### **Assessment for Diagnosis of Mental Disorders**

The most commonly used mental health diagnostic framework is the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV), published by the American Psychiatric Association (1994, 2000). Although school-based services are largely driven by the special education classification system, many school psychologists refer to the DSM-IV to communicate more effectively with mental health providers in health care and community settings, and to plan and coordinate treatments (House, 2002; Kamphaus et al., 1999). The potential benefits and drawbacks of using the DSM-IV for practitioners working in child and school settings have been discussed by numerous researchers (Achenbach & McConaughy, 1996; Gresham, 1999; Kratochwill & McGovern, 1996; McBurnett, 1996; Power & DuPaul, 1996; Kamphaus, Reynolds, & Imperato-McCammon, 1999); a full review is beyond the scope of this article.

Research investigating the assessment and treatment of mental health disorders in infancy and early childhood has increasingly relied upon the DSM system (e.g., Cicchetti &

Toth, 1998; Lavigne et al., 1998; Lyons-Ruth, Zeanah, & Benoit, 1996; Wakschlag & Keenan, 2001). Among early childhood disorders, diagnostic criteria for autism and pervasive developmental disorder have been well researched, leading to conclusions (Klin, Lang, Cicchetti, & Volkmar, 2000; Stone et al., 1999) that the DSM-IV criteria can reliably guide clinicians in making these diagnoses even in children under 3 years of age. Yet, aside from the autism spectrum disorders, the validity of the DSM categorical model has been challenged by a number of infant mental health researchers (Keith & Campbell, 2000; Mayes, 1999; Wakschlag & Keenan, 2001; Zeanah, Boris, & Scheeringa, 1997). Primary objections are the failure of the diagnostic system to incorporate developmentally sensitive constructs and parameters, and to address parental and home variables pivotal to emotional dysfunction in young children.

**Developmental appropriateness of the DSM-IV.** Although the current version of the DSM does provide some diagnoses specific to infants, toddlers, and preschoolers (e.g., reactive attachment disorder), the system generally does not incorporate constructs and criteria that characterize mental health disorders in young children. First, the symptoms listed for the DSM-IV diagnoses that are indicative of pathology in older children or adults often overlap with normal behavioral patterns for infants, toddlers, or preschoolers. For example, tantrums and negativism are common behaviors for toddlers, so that determining a level of severity for a diagnosis of oppositional defiant disorder (ODD) is difficult (Stormont, 1998). Next, the rapid growth in young children's development of emotional expression and frequent changes in behavior patterns make it difficult to apply DSM-IV criteria for chronicity of disturbance (e.g., presence of symptoms for at least 6 months for ODD; Luby, 2000; Zeanah et al., 1997). Furthermore, young children's limited capacities for verbalization and abstract thinking preclude the verbal expressions of stress and anxiety that characterize diagnoses such as depression or anxiety disorders. Alternative signs of maladaptive coping (e.g., behavioral regression or

expression of distress through play), which are more common among very young children, are not sufficiently represented in the DSM (Mayes, 1999).

#### **Failure to address contextual factors.**

Research on the early origins of mental disorders has verified that home and family characteristics, parenting approaches, and parent-child interactions contribute greatly to successful adjustment (Carlson et al., 1999; Shonkoff & Phillips, 2000) and to the development of psychopathology (Cicchetti & Toth, 1998; Olson et al., 2000; Shaw et al., 2001). Despite the presence of a multi-axial system to document environmental stressors, the DSM-IV has a primary focus on the identified patient. Therefore, contextual factors pivotal to understanding derailment of healthy adaptive functioning for young children (e.g., victim of child abuse, parent-child relational problem) are not incorporated as primary components of the clinical picture (Jensen & Hoagwood, 1997). In contrast, transactional research, which has characterized the field of developmental psychopathology, recognizes the contributions of contextual factors, such as stressful parent-child interactions. This model delineates risk factors for later psychopathology in the child, and identifies potential targets for prevention efforts (Jensen & Hoagwood, 1997; Zeanah et al., 1997). In sum, a meaningful diagnostic system for early childhood mental health disorders must be based on developmentally relevant symptoms of emotional and behavioral problems in infants, toddlers, and preschoolers; must emphasize the young child within the family system; and must offer functional parameters for evaluation, which lead to meaningful interventions.

#### **The Zero to Three Diagnostic System**

*The Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood* (hereafter referred to as DC: 0-3) is an alternative to the DSM system for defining mental health disorders in young children. The DC: 0-3 is the product of a task force organized by Zero to Three: National Center for Clinical Infant Programs (NCCIP), an interdisciplinary organization of

**Table 1**  
**Comparison of Multi-Axial Mental Health Diagnostic Systems**

Axis	DC: 0-3	DSM-IV
Axis I	<p>Primary Diagnosis</p> <p>Primary mental health diagnoses specific to infants and young children.</p>	<p>Clinical Disorders and Other Conditions</p> <p>Principal diagnoses and problems that are the focus of treatment (V codes).</p>
Axis II	<p>Relationship Disorder Classification</p> <p>Identifies disorders in relationships between child and caregiver.</p>	<p>Personality Disorders and Mental Retardation</p>
Axis III	<p>Medical and Developmental Disorders and Conditions</p> <p>Includes physical, mental health, and/or developmental diagnoses.</p>	<p>General Medical Conditions</p> <p>Includes any significant physical disorders and medical conditions.</p>
Axis IV	<p>Psychosocial Stressors</p> <p>Considers stressors influencing emotional functioning in infancy and early childhood.</p>	<p>Psychosocial and Other Environmental Problems</p> <p>Considers problems affecting the diagnosis, treatment, and prognosis of mental disorders.</p>
Axis V	<p>Functional Emotional Developmental Level</p> <p>Rating of the young child's expression of affects, cognitions, and interactions.</p>	<p>Global Assessment of Functioning</p> <p>Rating of overall psychological, social, and occupational functioning.</p>

professionals from the fields of infant development and mental health. In 1994, the DC: 0-3 was published with the goals of providing a tool for organizing observations and impressions of young children's emotional functioning, assisting clinicians in assessing and developing interventions, enhancing communications among researchers and clinicians, and spurring further study of infant and early childhood mental health disorders (Zero to Three: NCCIP, 1994). The DC: 0-3 is designed to complement existing medical and developmental frameworks, and therefore has incorporated key aspects of the DSM model, while replacing some constructs and diagnoses with more developmentally sensitive parameters. Greenspan and Weider (1994) describe the system as provisional, presuming that diagnoses will change as research on mental health disorders in early childhood expands our knowledge base.

### Multi-Axial System

The DC: 0-3 has retained the DSM-IV's use of a multi-axial system to assess various factors affecting diagnosis and treatment (DSM-IV Text Revision; American Psychiatric Association, 2000). The five axes that comprise the DC: 0-3 are Axis I: Primary Diagnosis; Axis II: Relationship Disorder Classification; Axis III: Medical and Developmental Disorders and Conditions; Axis IV: Psychosocial Stressors; and Axis V: Functional Emotional Developmental Level. Table 1 provides a visual comparison of the two diagnostic systems.

**Axis I.** The primary, or Axis I, diagnosis indicates the most prominent features of the child's disorder (Greenspan & Wieder, 1994). Table 2 lists the developmentally anchored DC: 0-3 Axis I and Axis II diagnoses as compared to DSM-IV diagnoses relevant for young children.

**Table 2**  
**Comparison of Axis I and Axis II Mental Health Disorders**  
**Relevant to Early Childhood**

DC: 0-3 Axis I Disorders		DSM-IV Axis I Disorders	
100	Traumatic Stress Disorder	309.81	Posttraumatic Stress Disorder
200	Disorders of Affect		
201	Anxiety Disorders of Infancy and Early Childhood	300.02	Generalized Anxiety Disorder
		309.21	Separation Anxiety Disorder
		313.23	Selective Mutism
202	Mood Disorder: Prolonged Bereavement/Grief Reaction	V62.82	Bereavement
203	Mood Disorder: Depression of Infancy and Early Childhood	296.xx	Major Depressive Disorder
		300.4	Dysthymic Disorder
204	Mixed Disorder of Emotional Expressiveness		
205	Childhood Gender Identity Disorder	302.6	Gender Identity Disorder in Children
206	Reactive Attachment Deprivation/Maltreatment Disorder of Infancy	313.9	Reactive Attachment Disorder of Infancy or Early Childhood
300	Adjustment Disorders	309.xx	Adjustment Disorder
400	Regulatory Disorders		No parallel DSM category
401	Type I: Hypersensitive		
402	Type II: Underreactive		
403	Type III: Motorically Disorganized, Impulsive		
404	Type IV: Other		
500	Sleep Behavior Disorder	307.47	Nightmare Disorder
		307.46	Sleep Terror Disorder
		307.46	Sleepwalking Disorder
		307.46	Parasomnia Not Otherwise Specified
600	Eating Behavior Disorder	307.59	Feeding Disorder of Infancy or Early Childhood
		307.52	Pica
		307.53	Rumination Disorder

(Table 2 continues)

(Table 2 continued)

DC: 0-3 Axis I Disorders		DSM-IV Axis I Disorders	
700	Disorders of Relating and Communicating	Pervasive Developmental Disorders	
	DSM-IV Defined Pervasive Developmental Disorders	299.00	Autistic Disorder
	Multisystem Developmental Disorders	299.80	Rett's Disorder
701	Pattern A: Unrelated with Motor Planning Difficulties	299.10	Childhood Disintegrative Disorder
		299.80	Asperger's Disorders
702	Pattern B: Intermittently Related	299.80	PDD—Not Otherwise Specified
703	Pattern C: Consistently Related with Rigidities		
No parallel DC:0-3 category in Axis I		314.xx	Attention Deficit Hyperactivity Disorder
		312.81	Conduct Disorder: Childhood Onset
		313.81	Oppositional Defiant Disorder
		312.0	Disruptive Behavior Disorder: Not Otherwise Specified
Relationship Disorder Classification		Relational Problems: V Codes	
901	Overinvolved	V61.20	Parent-Child Relational Problem
902	Underinvolved	V61.21	Physical Abuse of Child
903	Anxious/Tense	V61.21	Sexual Abuse of Child
904	Angry/Hostile	V61.21	Neglect of Child
905	Mixed Relationship Disorder		
906	Abusive		
	906a Verbally Abusive		
	906b Physically Abusive		
	906c Sexually Abusive		

*Traumatic stress disorder* lists symptoms displayed by children who have experienced a single stressful event or repeated, chronic traumatic events or stress. Although the disorder is conceptually similar to DSM-IV posttraumatic stress disorder, the manifestations are more reflective of expression in young children.

*Disorders of affect* represent disruptions of the child's affective experiences and expres-

siveness. Included in this category are anxiety disorders, mood disorders, a mixed disorder of emotional expressiveness, childhood gender identity disorder, and reactive attachment disorder.

*Adjustment disorder* is appropriate for mild, temporary disturbances of affect or behavior that are clearly tied to an environmental situation or event and which last no longer

than 4 months. The concept of adjustment disorders parallels DSM-IV, but the symptoms and duration are again more consistent with developmental levels of young children.

*Regulatory disorders* are characterized by difficulty in the regulation of physiological, sensory, attentional, motor, or affective processes, and in organizing a calm, alert, or positive state. Regulatory disorders are conceptualized as a manifestation of temperamental or biological factors, coupled with processing problems (Barton & Robbins, 2000; DelCarmen-Wiggins & Carter, 2001). Four subtypes of regulatory disorder are delineated: hypersensitive, under-reactive, impulsive and motorically disorganized, and other.

*Sleep behavior disorder* and *eating behavior disorder* are considered when dysfunctional patterns for these basic survival processes are the sole presenting problems. Such behavior disorders may result from significant developmental disruptions (e.g., prematurity), from stressed parent-child relationships, or be related to temperamental variations.

*Disorders of relating and communicating* describe children with difficulties regulating and processing physiological, sensory, attentional, motor, cognitive, and affective experiences, which then have an impact on communication and relationships. This combination of difficulties, which falls within the DSM-IV category of Pervasive Developmental Disorder (PDD), represents patterns and behaviors that are relatively enduring. The DC: 0-3 diagnosis of *Multisystem Developmental Disorder* is considered when difficulties with socialization and communication appear to be secondary to processing difficulty, and are more responsive to intervention than in autism or other forms of PDD (Greenspan, 1992; Weider, 1996).

**Axis II.** The second axis, Relationship Disorder Classification, is used to help the clinician assess significant disturbance in the relationship between caregiver and child. The clinician considers three aspects of the relationship: behavioral quality of the interaction (observed in the behaviors of both partners in the dyad), affective tone (emotional tone characterizing the dyad), and psychological in-

volvement (based on parental perceptions of the child). Using data gained through observations and interview, the clinician rates the strength of the relationship using the Parent-Infant Relationship Global Assessment Scale (PIR-GAS), which is a research tool developed by the DC: 0-3 classification task force (Zero to Three: NCCIP, 1994). Ratings range from a rating of 1, for a grossly impaired relationship with the potential for imminent harm to the child, to a rating of 100, representing the most optimal relationship. Ratings on the PIR-GAS that fall below 40 are considered to be disturbed enough to qualify as a relationship disorder. The relationship disorders are grouped by their characteristic qualities: abusive, overinvolved, underinvolved, anxious/tense, angry/hostile, or mixed relationship features.

**Axes III and IV.** The third axis on the DC: 0-3 allows coding of mental health or developmental diagnoses made under other classification systems, such as medical diagnoses. For instance, an infant with a history of prematurity and a current gross motor delay would have both conditions coded here. Axis IV is similar to its DSM-IV counterpart, and is used to identify psychosocial stressors affecting the child's emotional development, ranging from enduring stressors (e.g., poverty or parental illness) to mild or transitional stresses (e.g., moving).

**Axis V.** A generic rating of the child's Functional Emotional Developmental level is available on Axis V. Seven levels of emotional functioning are described, which represent increasingly more sophisticated organization of thoughts, feelings, interactions, and sensory perceptions, and which are observed via the child's expression of emotional ideas and engagement in interactions (Zero to Three: NCCIP, 1994). Ratings are based on observations of the child in play interactions with parents or other significant caregivers, and indicate whether the child displays emotional functioning expected for age and developmental level.

The DC: 0-3 system enables clinicians to organize their observations along the various axes, utilizing developmentally appropri-



ate symptoms and diagnoses. For example, children with a history of prematurity often manifest difficulties in self-regulation (Als, 1997) and processing of sensory and motor information (Maccow, Elias, & Swerdlik, 1997), leading to consideration of a DC: 0-3 Axis I diagnosis of a regulatory disorder. Interaction problems can arise if parents do not successfully interpret the child's regulatory responses and meet these needs adaptively; a disruption of interactions would be considered along Axis II of the DC: 0-3. Many premature children experience associated neurological or medical complications, which would appear on Axis III, as would other developmental delays and conditions identified by specialists within early childhood special education teams (speech and language or occupational and physical therapists). The stressors of hospitalization, separation from family members, and costly medical bills, which accrue during a premature infant's early months, are acknowledged on the Axis IV rating. Finally, Axis V provides a measure of the infant's ability to express and handle emotions, which can be compared to developmental levels for other domains of functioning.

### Empirical Support for the DC:03

The DC: 0-3's developmentally appropriate formulations of early childhood disorders have been praised in the literature (DelCarmen-Wiggins & Carter, 2001; Sauter & Franklin, 1998). But to date, empirical support has been garnered for only a few aspects of this system.

**Reliability of diagnoses.** Criticisms have been leveled at the DC: 0-3 system for its lack of precise diagnostic criteria and quantitative symptom levels (DelCarmen-Wiggins & Carter, 2001; DeGangi, Breinbauer, Roosevelt, Porges, & Greenspan, 2000; Eppright, Bradley, & Sanfacon, 1998; Keren, Feldman, & Tyano, 2001), which may reduce the reliability of the resulting diagnostic decisions. Of the limited pool of research studies using the DC:0-3, only one provides direct evidence of satisfactory interclinician reliabilities. Keren et al. (2001) used the DC: 0-3 system to provide diagnoses for 113 infants between the ages of 5

and 35 months who were referred to their community mental health clinic. Referrals were made for child distress (e.g., irritability, aggression), parent distress (e.g., anxiety, feelings of incompetence) or stress within parent-child interactions (e.g., avoidance, intrusiveness). Interrater reliabilities were calculated for a subsample of 15 cases, resulting in high levels of agreement (100% for Axis I diagnoses, 92% for Axis II relationship disorders).

Other studies have found lower levels of interclinician agreement. For example, DeGangi et al. (2000) investigated the reliability of DC: 0-3 diagnostic subtypes for regulatory disorder. Using multiple indicators of regulatory dysfunction, 32 infants were identified for their longitudinal research, but a disappointing 50% interclinician agreement level was reached for the DC: 0-3 regulatory disorder subtypes. In sum, the demonstration of reliable interclinician agreement for DC: 0-3 diagnoses has yet to be established, and therefore will have an impact on the validity of resulting diagnostic decisions.

**Studies of validity.** Initial steps towards validation of the DC: 0-3 system are found in published case studies describing use of the system for children with excessive crying (Maldonado-Duran & Saucedo-Garcia, 1996), and for those with complex emotional and behavior problems resulting from an abusive caregiving relationship (Thomas, 1995).

Moving beyond case studies, the DC:0-3 diagnostic category of regulatory disorders is supported by an emerging body of empirical evidence distinguishing children with these disorders from typical peers (DeGangi & Breinbauer, 1997; DeGangi et al., 2000; DeGangi, DiPietro, Greenspan, & Porges, 1991; DeGangi, Porges, Sickel, & Greenspan, 1993). In their sample of 82 infants (1-24 months), Dunitz, Scheer, Kvas, and Macari (1996) found various symptoms of functional problems (e.g., difficulties with eating, sleeping, or calming) to be subsumed within diagnoses of regulatory disorders. Using the DSM-IV system, these problems had been characterized as oppositional defiant disorder, feeding disorders, and separation anxiety disorders.

The DC: 0-3 Axis II parent-child relationship disorders have been examined through several studies. Minde and Tidmarsh (1997) used play observations and ratings of parental stress in their comparison of DSM and DC: 0-3 diagnoses for 57 children between ages 15-48 months. They found that of the 40% of their sample referred for externalizing problems, only 7% fit DSM-IV disorders of ODD and ADHD. In contrast, when the DC: 0-3 criteria were used, 37% of the sample displayed a regulatory disorder. Moreover, 53% of the sample demonstrated disordered relationships, as characterized using Axis II of DC: 0-3. Thomas and Clark's (1998) study of 64 toddlers and preschoolers referred for disruptive behavior problems resulted in DSM-IV diagnoses of adjustment disorders, ODD, ADHD, or dysthymia for 71% of the sample, contrasted with DC:0-3 system diagnoses of disorders of affect, regulation, and traumatic stress, which were assigned to 94% of their sample. Affective disorders were associated with significantly disordered relationships, whereas traumatic stress disorder and regulatory disorders were associated with lower levels of relationship disturbance. Finally, the Keren et al. (2001) study used the first four DC: 0-3 axes for comprehensive diagnosis of infants and toddlers with behavioral problems. Child-based disorders of eating, sleeping, and adjustment accounted for 73% of their sample. Relational disorders were diagnosed for 83% of the sample; these diagnoses were verified by play and feeding observations, and by home environment ratings, which differentiated the referred children from a control group. High rates of child developmental delay (44%) and of parental stressors (e.g., parental psychopathology, marital conflict) conveyed contextual information on Axes III and IV related to behavioral problems.

The limited validity studies available using the DC: 0-3 provide some initial evidence for discrimination between control groups and children with diagnoses of regulatory or relationship disorders. Several studies comparing diagnostic systems resulted in higher percentages of identified children using the DC: 0-3 in comparison to the DSM-IV, suggesting more

comprehensive characterization of emotional and behavioral difficulties in young children. Yet many diagnoses remained unexamined, and firm evidence for validity, such as differentiation of DC: 0-3 from DSM-IV diagnoses by a panel of infant mental health experts, has yet to be established.

### **Benefits for Early Childhood Psychologists**

The DC: 0-3 diagnostic system is still in a preliminary stage of development. However, it has the potential to enrich approaches used by psychologists working with young children, their teachers, and their families in providing early intervention for mental health problems.

First, the DC: 0-3 multi-axial framework offers a comprehensive approach compatible with the multidisciplinary team orientation of early intervention services. Developmental disabilities or delays identified by early childhood intervention team members (e.g., speech and language therapist, occupational therapist) are incorporated within the Axis III developmental and medical assessments, and integrated into some Axis I diagnoses. For example, regulatory disorders are defined as requiring evidence of underlying sensory-motor or processing problems, which are often revealed in communication and motor assessments. Such integrative formulations can guide team members to consider the impact of the child's functioning within one domain on all other aspects of development.

Next, the DC: 0-3 system's incorporation of various contextual factors within the child's caregiving environment is compatible with the emphasis on family involvement that is the hallmark of early childhood programming. P.L. 95-457 mandates that early intervention programs assess family needs and resources, which has often been implemented through empowering families as consumers of services (McLean, Bailey, & Wolery, 1996). Yet mental health professionals working in early childhood settings are invariably faced with cases in which suboptimal family and home environments contribute to the child's behavior problems. In such cases family-centered programming must encompass assess-

ment of family functioning (Paget, 1999) and corresponding interventions may need to be targeted at improving parent-child relationships and coping behaviors, and reducing family stressors (Letourneau, 1997; McLinden & Prasse, 1991). The DC: 0-3 diagnostic system offers developmentally appropriate diagnoses, and a structured format to consider the impact of such family and contextual factors on a child's behaviors. The delineation of Axis I child-based disorders, of Axis II parent-child relationship disorders, and Axis IV environmental and family stressors is congruent with developmental psychopathology's focus on child, environmental, and interactional variables, and can provide directions for development of comprehensive interventions.

The early childhood psychologist's consultative role may also be enhanced by incorporation of elements of the DC: 0-3 framework. Although interventions based on parent-child interactions have been described as the embodiment of family-centered services for infants and toddlers with disabilities (Gilkerson & Stott, 2000), McBride and Peterson (1997) found that early intervention teachers spent the majority of home visits interacting directly with children with disabilities, rather than promoting parent-child interactions. Early intervention teams may benefit from consultation services targeted towards conceptualizing mental health disorders and integrating various aspects of child functioning into a cohesive portrait (Foley & Mowder, 2000), training in observing and assessing interactions (Munson & Odom, 1996), and building skills for supporting family functioning and enhancing parent-child interactions (Barnard, 1997; Gelfand, Teti, Seiner, & Jameson; 1996; McDowell; 1999).

An additional benefit is the potential to enhance communication between service providers and across service systems by building a common diagnostic nomenclature. Inter-agency service provision is a necessity in early intervention work, as P.L. 95-457 allows health and community agencies to organize and provide early services for infants and toddlers, as well as to charge insurers for such services. In the medical and mental health communities,

DSM-IV diagnoses, which are needed to authorize third party payments, have provided the currency for mental health services (House, 2002). Adoption of the DC: 0-3 as a parallel system has the potential to expand current conceptions of mental disorders in young children and thus legitimize a richer array of mental health services.

**Case illustration.** A case example may be helpful in illustrating how the DC: 0-3 system might be applied to enhance early intervention services. Consider 30-month-old Denise, whose evaluation for services eligibility revealed expressive language delays, and maternal reports of whining and clinging behaviors. Home-based teaching by a preschool special educator was initiated to develop expressive communication skills and reduce whining. When the DC: 0-3 diagnostic system was utilized, Denise's whining and irritability appeared to be part of a larger picture of infant depression (Axis I Mood Disorder), in the context of a history of maternal depression (Axis IV Psychosocial Stressor). Observations of mother-child interactions revealed patterns of flat affect and withdrawal consistent with an underinvolved relationship (Axis II disorder). Denise's constricted range of affective expression and limited representative play suggest delays in her functional emotional level (Axis V). Relying on a DSM-IV formulation, Denise's affective expression would not fit diagnostic criteria for dysthymia or major depressive disorder, nor would the DSM-IV capture the cycle of transactions between mother and child that affect emotional and communicative development.

To address the multiple contextual variables at play in this case, a comprehensive intervention plan was needed to address Denise's developmental delays and emotional expression. Insuring that the mother sought treatment for her depression was an immediate priority. In addition, having the teacher address the parent-child interaction in the context of her work was identified as a priority. An additional recommendation was for the psychologist to provide direct services to the family through relationship-based interventions, including inter-

action guidance, parent coaching, and videotape review (Barnard, 1997; McDonough, 2000).

### **Limitations and Directions for Future Research**

The DC: 0-3 framework has a long road ahead to build a foundation of empirical support. Future research efforts must begin with clarification and revision of diagnostic criteria to pave the way for acceptable levels of reliability and validity. Cutpoints demarcating symptom levels exceeding normative patterns of behavior have been established for DSM-IV diagnoses of autism (Klin et al., 2000) and ADHD (McBurnett, 1996), using data from multiple site field studies. Similar field studies are needed to build evidence for the validity of the DC: 0-3 categories in differentiating pathology or risk from typical behavioral expression, and in differentiating between the DC: 0-3 and parallel DSM-IV diagnoses (e.g., disorders of anxiety, affect, or traumatic stress). In addition, longitudinal studies are essential to explore the progression of DC: 0-3 diagnoses to mental health disorders expressed later in childhood. For example, the relationship of regulatory disorders with ADHD in later childhood, or the progression of an Axis II diagnosis of angry-hostile relationship to oppositional defiant disorder, are questions that have yet to be investigated.

As with the DSM system, the DC: 0-3 does not specify assessment procedures for arriving at a diagnosis. Yet a number of structured interview tools and diagnostic rating scales have been developed to assist clinicians in assessing for DSM mental disorders, resulting in higher levels of reliability for diagnostic decisions (Brown, DiNardo, Lehman, & Campbell, 2001; Holzer, Nguyen, & Hirshfeld, 1996; Lavigne et al., 1994; Stone et al., 1999). This development of standardized tools to assess for DC: 0-3 diagnoses would enhance reliability and also serve as a basis for studies to establish validity. The Parent-Child Early Relational Assessment (PCERA), developed by Clark (1999) for clinical use, is an example of a standardized observational protocol that taps DC: 0-3 Axis II relationship constructs of in-

teractions, affects, and parent and child interactive behaviors.

The value of any diagnostic or classification system must ultimately be judged in terms of treatment validity. Evidence for treatment validity of the DSM-IV diagnoses is slowly accruing, as research on mental disorders builds a greater understanding of specific factors contributing to subtypes, etiology, or longitudinal outcomes (Kamphaus et al., 1999). For example, the delineation of anxiety disorders into separate diagnoses has generated research findings to support differential treatments, such as systematic desensitization for phobias or pharmacological treatment for obsessive-compulsive disorder. Other than case studies (Lieberman, Weider, & Fenichel, 1997), to date no studies have reported outcomes based on DC:0-3 diagnostically guided interventions.

Jensen and Hoagwood's (1997) observation that treatments are generally specific to symptoms and contexts, rather than specific to diagnoses, suggests that psychologists still need to draw from a variety of intervention strategies to treat children effectively. Tools such as functional behavior analysis untangle how maladaptive behavior has developed to meet a child's needs or desires, and allow for finely tuned treatments designed to change such behavior patterns. A functional approach can be used as a strategy to analyze problematic sequences of behavioral interactions and develop interventions to change these patterns.

Finally, the DC: 0-3, and indeed every diagnostic system, is primarily devoted to categorizing pathology, rather than cataloguing assets. The unique picture of each child's strengths, whether cognitive, communicative, physical, social, or family-based, must be evaluated and recognized as the foundation for intervention efforts.

### **Conclusion**

The DC: 0-3 system is still in its own infancy as an alternative diagnostic framework, yet the system holds great promise for spurring more developmentally appropriate formulations of mental health diagnoses in young children, and enriching assessment, intervention, and consultation efforts of school psy-

chologists working in early childhood settings. Viewing problems from the contextually anchored framework meshes with the family-centered model for service delivery that characterizes early childhood work, and is consistent with research on developmental psychopathology. The comprehensive DC:0-3 framework offers a transactional lens for viewing the complex shadings of a child's developmental picture, and guiding our vision to services and interventions that can help our youngest learners grow and thrive.

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