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Developmentally Based Approach to the Classification of Infant and Early Childhood Disorders

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(Introduction prepared by Stanley Greenspan and Serena Wieder)

Diagnostic classification approaches often operate on a number of levels, including descriptions of (1) patterns and symptoms, (2) functional adaptive and maladaptive processes (often related to symptoms), and (3) etiological pathways and mechanisms. Classification approaches based more on functional processes and etiological pathways offer potential guidance for interventions and future research. Classification involving meaningful subgroups that capture the unique developmental profiles of individual children also may be especially useful in guiding intervention and research. In fact, when planning interventions for disorders involving many functional components (e.g., language, motor, and social), it is critical that the intervention be based on each child's developmental profile.

For most complex developmental disorders, however, there are no definitive, etiological based diagnostic tests. Furthermore, no category can completely capture each child's unique pattern. Diagnosis is, therefore, an approximation, at best. Nonetheless, a diagnostic classification system can facilitate research and be useful for various

administrative purposes. Such a system is most helpful when it is based not only on symptoms, but also on functional developmental processes and, when possible, etiological mechanisms.

Descriptive symptom- and process-oriented diagnoses for infancy and early childhood disorders fit into three general categories. These categories are: *interactive disorders*, which include problems related to infant-caregiver patterns; *regulatory disorders*, which include constitutional and maturational deficits; and *disorders of relating and communicating*, which include disorders stemming from multiproblem or multisystem pervasive developmental difficulties (Greenspan, 1992). All the DC 0-3 disorders, as well as most of the DMS-IV infant and early childhood mental health disorders, fall within these three categories.

The Diagnostic Classification 0-3, developed by the Diagnostic Classification Task Force established by ZERO TO THREE, the National Center for Infants, Toddlers, and Families, incorporates all three general categories (DC 0-3, 1994). This multidisciplinary

task force met for almost 8 years to develop a systematic, developmentally based approach to the classification of mental health and developmental difficulties emerging during a child's first 4 years of life.

INTERACTIVE DISORDERS

Interactive disorders are characterized by a particular child-caregiver interaction or by the way the child perceives and experiences his emotional world (Greenspan, 1992). With difficulties that are a part of the infant-caregiver interaction pattern, there are only minimal contributions, if any, from constitutional-maturational differences. There are no significant irregularities, delays, or dysfunctions in core areas of functioning, such as motor, sensory, language, and cognition. In other words, the primary difficulty is in the interactions between the child and the caregiver.

The caregiver's own personality, fantasies, and intentions; the child's own emerging organization of experience; and the way these come together through the interactions form the basis for understanding the nature of the difficulty and for devising an intervention. Symptoms in this category include anxiety, fears, behavioral control problems, and sleeping and eating difficulties. Because interactive disorders involve symptoms stemming from interactive patterns, this category also includes situational reactions of a transient nature, such as a child's response to a mother returning to work. It also includes certain responses to trauma when the response does not involve multiple aspects of development.

For the interactive disorders, the primary diagnosis may include:

- Traumatic stress disorder
- Disorders of affect
- Anxiety disorders
- Mood disorders: prolonged bereavement/grief reaction and depression

- Mixed disorder of emotional expressiveness
- Childhood gender identity disorder
- Reactive attachment deprivation/maltreatment disorder
- Adjustment disorders

REGULATORY DISORDERS

Regulatory disorders involve infants and young children who have significant and clearly demonstrable constitutional and maturational deficits (Greenspan, 1989, 1992). Regulatory disorders also have an interactive component. In this type of disorder, sensory over- or underreactivity, sensory processing, or muscle tone and motor-planning difficulties, as well as the child-caregiver interaction, the caregiver's personality and fantasies, and the family dynamics contribute to the problem. These disorders include attentional and behavioral problems, such as irritability, aggression, distractibility, poor frustration tolerance, tantrums, and sleeping and eating difficulties.

The regulatory disorders include four types:

- Hypersensitive: fearful and cautious
- Underreactive: (a) withdrawn, self-absorbed, and difficult to engage, and (b) underreactive, stimulus craving
- Hypersensitive: defiant, negative, and stubborn
- Inattentive and disorganized, with poor motor planning

In addition, sleep behavior and eating behavior disorders, so common in the early years, are included as separate classifications when there are no known sensory reactivity or sensory processing difficulties.

It may be argued that all infants and children have unique constitutional and maturational variations, including children with interactive disorders, when the focus is

on the infant-caregiver interaction. The distinction for the regulatory disorders, however, is that constitutional and maturational factors are not just present as individual differences, but are a *significant* part of the child's problem. Therefore, for regulatory disorders, a clinician wants to understand individual differences as more than just part of the nature of the infant-caregiver interaction patterns. A clinician wants to make the constitutional and maturational factors a major focus in their own right, alongside the interaction patterns and the family dynamics. Here, where possible, a clinician will need to utilize intervention strategies that help the infant strengthen or organize in a more adaptive way her constitutional and maturational variations. The clinician will also seek to understand how the infant's constitutional and maturational variations are a stimulus for the parents' particular fantasies, and how the infant's constitutional and maturational variations bring out certain maladaptive personality dynamics in the caregivers, parents, or family as a unit.

DISORDERS OF RELATING AND COMMUNICATING

The third category of disorders involves problems in multiple aspects of a child's development, including social relationships and language and cognitive, motor, and sensory functioning. This category includes multisystem developmental disorders (MSDD) and the DSM-IV category of pervasive developmental disorders (PDD) (i.e., ASD). The main distinction between MSDD and PDD is that children with MSDD reveal capacities or potential for engagement and closeness in relating but may show difficulties in relating and communicating *secondary* to sensory processing, regulatory, and motor-planning difficulties. These children are quite responsive

to comprehensive intervention and become relatively quickly engaged and interactive.

Before describing this third group of disorders, it is important to note that another type of disorder that involves multiple aspects of development can occur when an environmental stress or trauma leads to a global disruption in multiple areas of functioning. For example, when an infant evidences a failure-to-thrive syndrome, the infant's motor, cognitive, language, affective, and physical growth may slow down or cease altogether. Persistent types of neglect or abuse may produce a similar global disruption in functioning.

In addition, it is important to distinguish how regulatory disorders differ from MSDD or PDD. Regulatory disorders involve processing capacities but do not derail overall relating and communicating, whereas MSDD or PDD do. Developmental disorders also involve regulatory difficulties in terms of significant constitutional and maturational variations. Disorders of relating and communicating often involve difficulties in the interactive patterns and caregiver and family dynamics. Even with the most flexible and adaptive parents, the infant or young child's developmental challenges, which combine regulatory problems and significant delays and dysfunctions, create difficulties in the infant-caregiver interaction or in the family dynamics. The nature of the challenge the child presents, and the lack of expectable feedback due to language, sensory modulation, visual-spatial, and motor processing difficulties, almost always places a significant stress on the interaction patterns and the family dynamics. Most families and most caregivers seem prepared for certain types of communication patterns with their infants and young children. When these biologically expectable interaction patterns are not forthcoming, special approaches are often needed.

The degree of the family contribution will vary considerably depending on the infant or child and the family's or caregiver's pre-existing patterns. Interventions must, therefore, focus simultaneously on the family dynamics, infant-caregiver interaction patterns, the child's regulatory patterns, and the child's developmental delays and dysfunctions in core areas, such as motor, language, cognition, and sensory functions.

In summary, the three types of disorders are (1) interactive, (2) regulatory, and (3) problems in relating and communicating, including MSDD and PDD. The *DC-0-3* Classification Task Force is currently conducting reliability and validity studies of this classification system. (For further discussions of evaluation/diagnostic challenges and related intervention strategies, see *DC-0-3*, 1994; Greenspan, 1992; Greenspan & Salmon, 1995; Greenspan & Wieder, 1998). The next section of this chapter proposes an expanded conceptualization for the third category: problems in relating and communicating, including MSDD and PDD.

CLASSIFICATION APPROACHES FOR DISORDERS OF RELATING AND COMMUNICATING

A number of challenges confront efforts to classify complex developmental disorders that derail a child's ability to relate to others, to communicate, and to think. Each child tends to have a unique functional profile. Often, the differences in functional profiles are greater than the similarities that are the basis for children sharing a diagnosis. Furthermore, children from different diagnostic groups may have similar functional profiles.

When these observations are coupled with the lack of a clearly identified etiological pathway for many complex developmental disorders, including ASD, there is an apparent

need to look again at classification approaches for complex developmental disorders. Two directions for improving classification need to be explored. One is to take a step back and describe complex developmental disorders in terms of early verifiable neurological and observable characteristics and refrain from going beyond biological and clinical data. The other is to explore descriptions of clinical subtypes based on functional profiles and responses to intervention. The next two sections explore both of these avenues: first, by looking at a very broad designation of neurodevelopmental disorders and, second, by examining clinical categories based on functional developmental profiles.

Classification of Neurodevelopmental Disorders

(Prepared by Andrew W. Zimmerman, M.D.)

The main objective of a practical and functional classification of neurodevelopmental disorders as a common ground for communication among different disciplines should be to help differentiate how these disorders lend themselves to rehabilitation, to the facilitation of developmental processes, and to medical evaluations and treatments. It is equally important that classification should flexibly incorporate the rapidly expanding knowledge of the genetics and neurobiology of these disorders.

Time-dependency in the evolution of neurodevelopmental disorders frequently distinguishes them with respect to their clinical and biological characteristics as well as to their responsiveness to therapies. Time is, therefore, a critical element in development, to which other variables relate in type and degree. Normal brain development depends on complex synergistic interactions among multiple genes, cell types, and their functions that follow sequential time-dependent patterns. Physical and environmental

inputs are also essential for normal brain development and are likely to be synergistic with cellular activities during critical time periods. Physical changes may occur within the normally developing brain as a result of defined insults that occur at specific times (e.g., prenatal strokes, perinatal asphyxia, and infections). Genetic abnormalities may have variable expression over time (e.g., Down syndrome, autism, and Tay-Sachs disease). Sensory or emotional deprivations may themselves lead to cellular abnormalities undermining the individual child's inherent plasticity and capacity for repair in the developing nervous system.

This classification of neurodevelopmental disorders includes three types: static, static-dyssynergic and progressive. Some disorders, such as the epilepsies, mental retardation, and autistic disorders, may be included in more than one group.

Static Disorders

(not moving or progressing)

Static disorders include cerebral palsy and other static encephalopathies. These disorders result from specific insults to the developing central nervous system, usually before or around the time of a child's birth. Symptoms are non-progressive in that patients do not deteriorate. Development may be delayed but follows expected patterns and responses to therapies. Congenital anomalies (e.g., spina bifida, hydrocephalus) may fluctuate due to changing symptoms but are usually static with respect to development. Uncomplicated or medically controlled epilepsy remains static with respect to development (i.e., it progresses sequentially over time). Many forms of idiopathic mental retardation (of unknown cause) remain static, although the co-occurrence of epilepsy or a psychiatric disorder may transiently make patients appear to be "progressive." Genetic syndromes may be "static" if their developmental progress remains stable over time.

Static-Dyssynergic Disorders

(dys=abnormal; synergy=to work together)

This group includes ASD (autism and PDD). These disorders vary widely among individuals with respect to symptoms, course, and responses to therapies. As with static disorders, patients with static-dyssynergic disorders also do not deteriorate, despite limited periods of regression. Children with these disorders, however, show signs of atypical development (dyssynergy) among brain networks or abnormal synaptic development by age 3. Many families (40%-60%) report language and social regression in children between 18 and 24 months of age. Development of the disorders fluctuates over time and may progress unevenly within and among areas such as language and socialization. Although these disorders are multigenic (i.e., associated with several or more abnormal genes), other "single gene" (chromosomal) disorders (e.g., Down syndrome or fragile X syndrome) or "static" disorders (e.g., congenital rubella) also may be associated with autistic symptoms that evolve over time. Specific subtypes of autism (e.g., a hypothesized bipolar subtype) may receive further clinical and genetic definition and treatment in the future.

The varied timing of brain development, as well as the marked differences among cortical functions and abnormal behaviors, characterizes the dyssynergic disorders. The varied and complex patterns of maldevelopment observed in these patients imply that multiple genes, external causes, and neural pathways may be involved. Behavioral and language therapies for these disorders rely on the assumption that organizing and increasing sensory inputs during critical periods as early as possible, and in individually specific ways, improves outcomes. Outcome studies to date are consistent with this concept, and suggest that plasticity within the developing central

nervous system can be used to modify dysfunctional pathways in these disorders. Possible medical treatments (e.g., corticosteroids, serotonin-modifying agents) may likewise show maximum benefit when started early in the course. Further study of the neurobiology of these disorders is necessary in order to learn how they differ from normal with respect to time sequences in cellular and neurochemical patterns (as well as other factors) in the developing cortex.

Progressive Disorders

(*Med: becoming more severe*)

The genetically determined neurodegenerative diseases (e.g., Tay-Sachs, Leigh's, and metachromatic leukodystrophy) show continuous regression in previously acquired functions due to flaws in critical cellular systems. Persons with these disorders do not improve functionally—but may stabilize and benefit in quality of life—with behavioral and other therapies. In most of the disorders, medical interventions are limited to diagnosis and supportive care or prenatal genetic diagnoses. Rett syndrome is a genetic disorder in girls that is similar to autism, especially its abnormal, but more widespread, development of the fine structure of the cortex (neuropil). Girls with Rett syndrome also show rapid early regression, but then stabilize for long periods. Unlike most children with autism, however, the girls' symptoms can slowly worsen over time.

In conclusion, neurodevelopmental disorders can be classified according to their clinical characteristics with respect to the time course as each evolves. This approach should facilitate therapeutic interventions with individual patients and their families, as well as support research on therapies and outcomes.

Clinical Groups for Non-Progressive Neurodevelopmental Disorders

(*Prepared by Stanley I. Greenspan and Serena Wieder*)

The information needed to begin classifying groups within the two non-progressive neurodevelopmental disorders just described—static and dyssynergic—now exists. In the 5 years since the publication of *Diagnostic Classification 0-3* (DC-0-3, 1994), and the 7 years since Greenspan (1992) proposed multi-system developmental disorders in *Infancy and Early Childhood*, clinicians have collected additional diagnostic, treatment, and outcome data on several hundred more children with severe disorders of relating, communicating, and thinking. This extensive clinical information enables clinicians to divide non-progressive disorders into several broad groups that can capture a child's developmental capacities, such as the degree to which a child can communicate, as well as the child's underlying processing differences (e.g., the child's relative strengths in visual-spatial or auditory processing). Reconceptualization of the existing classification system (including MSDD and PDD), therefore, can incorporate relevant developmental dimensions, including:

- *The child's ability to connect affect* (intent) with sequences of behavior and/or symbols. The affect serves as a signaling system telling the motor system what to do and allows the child to initiate, be spontaneous, and engage in meaningful gestures and symbolic acts.
- *The child's functional developmental level of presymbolic and early symbolic capacities*—the child's ability to engage in complex problem solving through gestures and early expression of ideas.
- *The child's engagement with others*, as evidenced by mutual or shared attention and mutual pleasure.

- *Motor planning*—the child’s ability to initiate action, both imitate or have an idea, plan how to execute it, and then sequence the steps necessary to do or express what he wants or is thinking.
- *Auditory-verbal processing*—memory and comprehension, including receptive understanding (e.g., semantics, reasoning, and logic) and expression (e.g., retrieval and pragmatics).
- *Visual-spatial processing*—memory and comprehension, including part-whole discrimination, organization, tracking, directional stability, time sense, and visual-motor (e.g., construction and sequencing).
- *Sensory reactivity and regulation*—sensory registration, orientation, interpretation, and responding or reacting (under and overreactive or well-modulated) in different sensory modalities.
- *Symbolic thinking and rate of progress*—the rate the child climbs the symbolic ladder to becoming an imaginative, representational, and abstract thinker, the better the rate of progress.

The following section offers a classification of neurodevelopmental disorders of relating, communicating, and thinking, based on a child’s presenting profile and the child’s potential for early response to a comprehensive, developmentally based intervention program. This proposed classification is based on constructing developmental profiles implementing a comprehensive intervention program and following a large number of children and families (Greenspan, 1992; Greenspan & Wieder, 1997, 1998). It is an initial clinical descriptive effort that will hopefully create a framework for further research. It identifies four broad groups, some of which divide into smaller subtypes. Children within each group and subtype are described with respect to the preceding

developmental dimensions. This section includes some case studies to help illustrate the characteristics and responses typical of children within each group.

Group I

Children whose presenting profile places them within this group tend to make very rapid progress, often moving within 2 to 3 years from patterns of perseveration, self-stimulation, and self-absorption to warm, emotionally pleasurable engagement, spontaneous use of language, and abstract levels of symbolic play, with healthy peer relationships and solid academic skills.

The overall group evidences the following identifying criteria, with four subtypes defined by unique patterns of processing differences.

Identifying Criteria

Children within Group I:

- Evidence difficulty connecting affect (or intent) to motor planning and sequencing as well as to symbol formation; therefore, behavior tends to be repetitive, self-stimulatory, fragmented, or lacks clear meaning or purpose.
- Either partially have, or within the first few months of intervention acquire, the ability to engage in preverbal, gestural problem-solving interactions with caregivers (e.g., taking a caregiver by the hand, leading her to the toy room, and showing her the desired toy).
- Either partially have, or within the first few months of intervention acquire, the capacity for warm engagement with positive affect, as evidenced by affectionate behavior with smiles and looks of delights at primary caregivers.
- Possess relatively strong motor planning (e.g., child can sequence three or more motor actions, including sounds or words,

though not at an age appropriate level, such as taking a car in and out of the garage, making car noises, and moving the car around the house).

- Either have, or within the first few months of intervention acquire, solid imitative skills for motor actions and/or sounds and/or words (e.g., can imitate actions, such as “touch your nose” or “touch your head,” as well as simple sounds and words, such as “up” or “go”). The children use this skill to progress, over time, toward early stages of imaginative play.

Additional Characteristics

Children within Group I also display:

- Hypersensitivity to sensation, such as touch and sound. Although the children are often underreactive to movement and, occasionally, to pain, the overall tendency of the children is to be overreactive.
- Relatively strong or weak visual-spatial processing.
- Relatively mild to moderate auditory processing impairment with good progress once intervention begins.
- All the children in this group progress into imaginative play quickly, climbing the symbolic ladder from pretending real life experiences to representational play, and are able to build logical bridges between ideas and become abstract thinkers.

Sequence of Progress

Children within Group I often show rapid improvement in engagement, purposeful gesturing, range of affect expressed, and shared attention with caregivers and, over time, with peers. They also rapidly improve in imitative skills because of their better motor planning abilities, leading to language and imaginative play sequences. During the first year or two of intervention, many of the children become

excited about their emerging language skills and enter a stage of hyper-ideation where they talk about everything, but in a very fragmented (free-associative) manner. Over time, they learn to be more logical as the environment challenges them to build bridges between their ideas. During the early stage of becoming more logical, they tend to continue some preoccupations and perseverative tendencies with special interests, topics of conversation, or playthings (e.g., roads, cars, certain types of visual displays). During this early stage, some children have profile descriptions similar to that of Asperger’s syndrome. However, when interventions emphasize creative interactions and dialogues (e.g., using their interests as a take-off for creative interactions), these children gradually become more spontaneous, flexible, creative, and empathetic. Over time, they progress to higher and higher levels of abstract reasoning and social skills.

Subgroups Patterns Within Group I

There are four different patterns within Group I. Children within these subgroups meet all the basic identifying criteria for the basic group, but display different, unique patterns of processing capacities.

Group I-A: *Relatively strong auditory, visual-spatial and motor-planning capacities, and a tendency toward overreactivity to sensation.*

Children within Group I-A make the most rapid progress. Over time, and possibly by the time they enter school, these children may even evidence precocious academic skills (e.g., abstract thinking, reading, or arithmetic). This subgroup has:

- A tendency toward relatively strong short-term auditory memory and expressive abilities (e.g., may recite the alphabet and numbers, fill in the blanks to songs and stories, and when older, memorize scripts from TV shows or books).

- Relatively strong visual-spatial memory skills (e.g., knows where things are, good sense of direction, good at puzzles, recognizes letters and shapes).
- A tendency to be more reactive to sensation and emotional states, showing more intense joy as well as frustration. These children develop better modulation over time.

Group I-B: *Relatively strong auditory processing but weaker visual-spatial and motor-planning capacities, with a tendency to be underreactive.*

While also making rapid progress, children in this group evidence:

- A tendency to remain more fragmented in their thinking and may have a harder time learning math (especially word problems), interpreting the meaning of what they read, and “seeing the forest for the trees” intellectually and socially.
- Relatively strong short-term auditory memory.
- Relatively weaker visual-spatial memory and processing capacities than children in Group I-A.
- Relatively weaker motor planning abilities than children in Group I-A.
- A tendency to be more underreactive with some sensory hypersensitivity. They have a longer fuse, but also tends to process information more slowly.

Group I-C: *Relatively stronger visual-spatial and motor-planning capacities but weaker auditory processing, and a tendency toward sensory underreactivity.*

Children within Group I-C make solid, consistent progress, but not quite as rapidly as those in Groups I-A and I-B above. They evidence:

- A tendency to take a longer time to progress, especially in learning to use

words, but they can use symbolic toys as a language to express many ideas. Group I-C children do not tend to evidence a dramatic hyper-ideation learning phase since language develops more slowly, but they are able to elaborate and sequence ideas through the use of toys and gestures, aided by their better motor-planning abilities.

- Relatively stronger visual-spatial memory and processing.
- Relatively weaker auditory processing and memory/retrieval.
- A tendency toward sensory underreactivity, but may get more emotional, especially when their weaker auditory processing and poor verbal communication leave them frustrated or frightened.

Group I-D: *Relatively strong auditory, verbal, and visual-spatial memory but relatively weaker verbal and visual-spatial comprehension and motor planning, and a tendency to be overreactive and become overloaded.*

Children in Group I-D tend to make consistent progress with good rote verbal skills, but have a narrower range of ideas. These children do not usually go through the hyper-ideation phase and have a weaker ability for higher-level processing of auditory and visual information. These children have:

- A narrower range of acceptable emotions. Unless the environment can be more soothing and interactive, they tend to be more rigid and anxious.
- Become more easily overloaded without the resources to comprehend and integrate. Consequently, these children resort to constrictions and rigidity and are more anxious and fearful because of their oversensitivity, with more challenges with reality testing. This subtype has many

similarities to what others have described as Asperger's syndrome.

- Both auditory and visual-spatial memory as relative strengths.
- Relatively weaker auditory and visual-spatial comprehension.
- Relatively weaker motor planning.
- A tendency to be more overreactive, especially to unexpected sensation or events, but also to be underreactive in some modalities. They may have reduced muscle tone.

Group I Case Illustration

Two-and-a-half-year-old David presented with self-absorption, perseveration, and self-stimulation, no peer play, and lack of eye contact and pleasure in relating to his parents. During his evaluation, David spent most of his time reciting numbers in a rote sequence, spinning and jumping around aimlessly and randomly, and lining up toys and cars, while making self-stimulatory sounds. David, however, showed strengths in his ability to indicate what he wanted when extremely motivated; occasional displays of affection; the capacity to imitate actions, sounds, and words; and the ability to recognize pictures and shapes.

With a comprehensive program, David quickly became more engaged and began imitating some pretend-oriented sequences. He gradually began using his language purposefully and creatively. He then went through the sequence of progress described previously and, at present, is in a regular school, where he excels in reading and English as well as in math. He has a number of close friends, a sense of humor, and insights into other people's feelings. His remaining challenges are with fine-motor sequencing (penmanship) and his tendency to become somewhat anxious and argumentative when in a competitive situation.

Group II

Children in Group II have greater challenges than those in Group I. They make slower, but consistent, progress with each hurdle requiring a great deal of time-consuming work. Typically, these children can initially engage a little bit, be partially purposeful, and intermittently do some problem solving. However, they take much longer to become consistent, preverbal problem-solvers and to learn to use imitation as a basis for language and imaginative play. When they achieve these milestones, they do not generally go through a stage of hyperideation and rapid learning, but rather move through each new capacity very gradually. Although many children in this group still make progress, most are not able to participate in all the activities of a regular classroom with a large class size, as are the children in Group I. They can benefit, however, from appropriately staffed inclusion or integrated programs, or from special needs language-based classrooms where the other children are interactive and verbal.

Identifying Criteria

Children within Group II:

- Evidence difficulty connecting affect (or intent) to motor planning and sequencing as well as to symbol formation; therefore, their behavior tends to be repetitive, self-stimulatory, fragmented, or lack clear meaning or purpose.
- Can be partially purposeful, often oriented to basic needs, but do not have solid mastery of preverbal, gestural problem-solving capacities (i.e., cannot do 20+ circles of problem-solving interaction and communication in a row).
- Possess an intermittent, but not full, capacity to engage with caregivers. These children initially rely more on sensorimotor

stimulation and, when self-absorbed or avoidant, need to be wooed and pursued.

- Have motor-planning skills that tend to be limited to two or fewer sequential actions (e.g., putting the car in the garage and taking it out, rolling the car toward a single destination).
- Do not yet evidence spontaneous imitative skills, other than perhaps some occasional ability to copy a familiar motor pattern, such as building with blocks, or setting up or drawing a scene that they memorized.
- Possess relatively limited auditory processing capacities, through which they can verbally express what they want better than they can understand what others say. They have a greater reliance on the use of scripts.

Group II children also tend to be characterized by the following, which are not, necessarily, early identifying criteria:

- Mixed reactivity to sensation with a tendency toward being underreactive and self-absorbed and/or underreactive and craving (as well as mixtures of the two), with some children tending to be more reactive.
- Relative degrees of compromise in visual-spatial processing but may have good visual memory and, sooner or later, may learn to read but with weak comprehension skills.

Sequence of Progress

Children within Group II have the capacity to become joyfully engaged, but may require wooing and persistent pursuit. They also have the capacity to move from simple, purposeful gestures to complex problem-solving, preverbal interactions and, eventually, use of imitation as the basis for learning words and becoming involved in pretend play. They learn primarily through what they

see and may get very immersed in videos and books (before being encouraged to do more interactive work). They also may borrow scripts and scenes to begin to embark on symbolic play as well. However, mastery of each of these steps, from engagement to using simple and then complex gestures and on to using words and ideas, tends to be very gradual. Children in this group may evidence a wide range of patterns of progress in the transition from preverbal gesturing to use of ideas. Some children in this group take a long time to progress beyond intermittent need-based, short, verbal phrases. Some of the children who are not able to develop imitative skills readily benefit from more semistructured challenges to imitate actions, sounds, and words. This work, however, must be part of a comprehensive program. As the children in this group develop language, their mastery of each step from creative elaboration to logical discussion is a gradual and time-consuming process. The children in this group can easily become mired in the use of more fragmented, concrete, and early types of logic and have great difficulty—in comparison to the children in Group I—in progressing to more abstract and creative thinking. Some children learn to read before they are fluent and conversant. Peer relationships are both possible and desired, but Group II children develop relationships very gradually in conjunction with advances in their functional thinking capacities. These children benefit from semistructured, sensorimotor games before they move on to symbolic levels in play. Their capacities for experiencing warmth and pleasure with other children often precede their ability to interact and communicate creatively. Nonetheless, with continued work, these children will continue to progress.

Subgroup Patterns Within Group II

Group II divides into two different patterns, both of which meet all the general criteria for the group.

Group II-A: *Relatively strong visual-spatial memory, relatively weak visual processing, auditory processing, and motor-planning capacities, with a tendency toward overreactivity.*

Children within Group II-A are more easily engaged and spontaneous. They tend to have:

- Moderate compromises in auditory processing (very difficult to respond to the words of others) but develop language, retrieve often-used phrases, and borrow fragments of scripts from books and videos, which they use for symbolic play. Although their language develops slowly and tends to be descriptive of what is seen or associative, these children slowly become more logical and able to reason. The children within this subtype also speak more spontaneously, which is related to their more reactive and often demanding nature.
- Moderate compromises in visual-spatial processing (easily lost, poor sense of direction, can't find things), but possess visual memory as a relative strength.
- Moderate compromises in auditory processing.
- Moderate compromises in motor planning.
- More reactivity and to be intermittently sensation seeking.

Group II-B: *Relatively strong visual-spatial memory, while other visual-spatial processing is moderately impaired. Moderate to severe auditory processing and motor-planning problems. Group II-B differs from Group*

II-A in that Group II-B children are underreactive with overreactivity to certain sounds.

Children within Group II-B tend to be more self-absorbed and avoidant, requiring more encouragement to speak. They tend to have:

- Moderate compromises in auditory processing, but they do learn to speak, with greater difficulty in understanding the unpredictable speech of others. They have retrieval difficulties and rely on often-repeated phrases and scripts. The early conversations of these children tend to be short and repetitive.
- More underreactivity. They also tend to be more self-absorbed than children in Group II-A and have to be wooed to respond. They benefit from visual communication strategies, and often learn to read sooner than to speak fluently or spontaneously.
- Moderate compromises in visual-spatial processing (easily lost, poor sense of direction, can't find things) but their visual memory is a relative strength.
- Moderate to severe compromises in auditory processing.
- Moderate to severe difficulties with motor planning and low muscle tone.
- Hypersensitivity and overreactivity to sensation, with some sensation-seeking behavior.

Group II Case Illustration

Three-year-old Joey presented with a great deal of avoidant behavior, always moving away from his caregivers and having only fleeting eye contact. He frequently engaged in very simple perseverative and self-stimulatory behavior, such as rapidly turning the pages of his books or pushing his Thomas[®] train round and round the track. Joey could purposefully reach for his juice or take a block from his parents, but he was not able to negotiate complex

preverbal interactions or, for that matter, imitate sounds or words.

Four years after his program began, Joey (6^{1/2}) now shows abilities to relate with real pleasure and joy, use complex gestures to lead his parents places, and describe what he wants in sentences, such as “Give me juice now!” Joey can respond to simple questions (“What do you want to do?” “Play with my trains!”), and have short sequences of back-and-forth communication with four or five exchanges of short phrases. He is also able to engage in early imaginative play, having his action figures fly around the room with great joy and delight. He is not yet able to consistently answer “why” questions. He also is able to play with peers only with some adult involvement and when there is action or a structured game. However, he continues to make progress at a consistent but slow pace. Interestingly, Joey only occasionally displays perseverative, self-stimulatory patterns.

Group III

Children in this group have moderate to severe auditory and visual-spatial processing, with more severe motor planning that impedes purposeful communication and problem solving. They are capable of intermittent problem solving interactions, but cannot sustain their interactions. They are intermittently engaged in purposeful activities, with much self-absorption and/or aimless behavior. It is this “in-and-out” quality, with presymbolic “islands” of problem solving, that characterizes this group. Their islands may involve the use of words, pictures, signs, and other two- to three-step gestures or actions to communicate their basic needs. Some children will use toys as if they were real as long as they are the actors (e.g., they will eat pretend foods or feed a life-size baby doll) but they do not usually represent themselves or others through figures. Some

children with severe oral-motor dyspraxia will not speak more than a few ritualized words, if at all, but they may evidence preverbal communication through a few signs, or picture communication, or through the use of a favorite toy. Some children learn to recognize logos and may read words.

Identifying Criteria

Children within Group III evidence:

- Very intermittent purposefulness at the presymbolic level, which is seen in islands of problem solving. Group III children cannot sustain interactions; that is, they cannot complete more than four or five circles of problem-solving interactions.
- Very intermittent capacity to engage with caregivers, and usually engage as a result of sensorimotor stimulation. These children tend to break off into aimless, self-absorbed, or avoidant behavior.
- Relatively strong auditory processing, which enables them to say a few words or phrases when in need or desiring something. Their receptive language is relatively stronger when it consists of often-used phrases in routines and/or accompanied by visual support and context. Their more severe motor planning, oral-motor and/or visual-spatial challenges make it difficult for them to convey just what they understand receptively.
- Very limited motor planning, with most actions limited to two or three sequential actions that are often repeated again and again. Group III children often seek hand-over-hand assistance for actions.
- Very weak imitation skills. Group III children do not imitate spontaneously and learn only through tremendous repetition.
- Relatively weak visual-spatial processing (e.g., disorganized, poor discrimination, poor searching, easily lost).
- Relatively strong visual memory.

- Mixed reactivity to sensation, with a tendency toward being underreactive and self-absorbed and/or underreactive and craving (as well as mixtures of the two), with some children tending to be more passive and with low muscle tone.

Sequence of Progress

Group III children tend to progress slowly, given the severity of their processing difficulties and their intermittent engagement and problem solving. The key to intervention is to “bring them in” to more sustained pleasurable interactions through persistent pursuit and by playing simple games, such as peek-a-boo, hide and seek, chase, tickling, horsy rides and other sensorimotor fun activities. More consistent engagement will create more motivation and lead to more interactive problem solving. The heightened affect inherent in having a “problem,” such as getting a parent to do more roughhousing, finding a treasured Thomas[®] toy train, or getting more cookies, will motivate the child to process more information or input, be it visual or auditory. For example, the child will learn the sequence needed to get shoes, coat, key, and Mom’s purse in order to go outside. Once engaged, the caregiver’s affect cueing will help the child expand her perceptions as well as sustain her attention to the input. The child’s desire or objections will then motivate her to go beyond her motor-planning constraints and respond in some form. With more sustained engagement and interactions, children in this group also can become more responsive to complex imitation, visual communication strategies, and practiced learning. They can go on to early levels of symbolic play.

Group III Case Illustration

Sarah ran in looking for her Winnie the Pooh and climbed up on the stool in front of the shelves, but she could not move the little

figures in the basket around to search for her beloved character. The next moment, she pulled the basket off the shelf and all the figures fell out. She then looked in the next basket without bothering to look at the fallen figures on the floor. Her mom intervened before Sarah could drop the second basket and offered to help. Sarah echoed, “Help!” and grabbed her mother’s hands and put them in the basket. Her mother had to point to Winnie before Sarah actually saw the figure. Sarah grabbed it and ran off to lie on the couch. Mom then brought Tigger over to say hello. Sarah grabbed Tigger and ran to the other side of the room. She held her figures tightly and turned away when Mom came over again. Mom then took Eeyore and started to sing “Ring around the rosie...” moving her figure up and down. This time, Sarah looked and filled in “down” to “all fall down,” but she then moved rapidly away and went over to the mirror. Sarah’s pattern of flight and avoidance after getting what she wanted, followed by not knowing what to do next, was quite typical.

Sarah’s intervention program began when she was 3 years old. She slowly learned the labels for things she wanted and to protest. She recognized and could express familiar phrases like “come and eat,” “go out,” and “bathtime.” She became quite engaged with sensorimotor play and loved to be swung and tickled. She even began to play imaginatively with toys, first dipping her toes into the water of the play pool and then letting Winnie “jump” in. She began to imitate more words and actions. She also tried to solve problems to get her figures, but only when she was very motivated or very angry, and usually only after energetic sensorimotor play pulled her in. Her expressive language expanded to include more and more phrases indicating what she wanted, but her weak receptive processing made it difficult for her to answer any

questions. She relied on visual and affect cues to understand what was said to her. This transferred to puppet play and even simple role play as a cook or doctor. Sarah's problem solving also progressed very slowly because of her very poor motor planning, but she became more easily engaged and more responsive to semistructured and structured approaches to learning. Between ages 4 and 5, she learned to count and identify colors, and loved to paint and cut with scissors. By age 6^{1/2}, Sarah demonstrated some pre-academic abilities, and was able to read some sight words. She now enjoys being with other children and joins the crowd running around, hiding, and chasing, but she does not yet play interactively, although she has learned the various social rituals, such as greeting, sharing, and protesting. Sarah can also spontaneously communicate "feel happy" with a big smile, and "feel mad" with a frown.

Group IV

Children in this group are characterized by significant challenges in being purposeful, which are related to their very severe motor-planning problems, as well as by significant auditory and visual-spatial processing difficulties. Children in Group IV fall into two subgroups. Both subgroups differ from Group III in that children have more severe challenges in all processing areas, especially motor planning (including oral-motor dyspraxia). As a consequence, children within the Group IV subgroups progress very unevenly, and slowly, having the most difficulty in developing intentional problem-solving patterns, expressive language, and motor planning. Over time, with continuing therapeutic work, they become engaged and partially interactive through gestures and action games.

Group IV-A Identifying Criteria

Children within Group IV-A evidence:

- An intermittent capacity to engage with caregivers. Initially, they tend to be very avoidant, with great difficulty in understanding what others want of them and being purposeful. They wander around aimlessly or lie down passively, with intermittent bursts of sensory-seeking behavior.
- Severe motor planning, which impedes sequences of more than one or two steps. Group IV-A children usually initiate actions to have their basic needs met. They are very dependent on adult actions to obtain what they want, although they are very persistent in communicating their desires through simple and, eventually, more complex gestures.
- Limited imitation abilities, usually restricted to single-step actions, such as pushing, pulling, or throwing an object.
- Relatively strong visual-spatial processing with moderate compromises; stronger visual memory, but weaker organization and visual-motor abilities (easily lost, poor sense of direction, can't find things, poor discrimination).
- Severe auditory processing difficulties. These children may learn some need-based words but rely on visual cues to understand what others say. Some children with more severe oral-motor dyspraxia do not speak but do have a narrow range of meaningful visual symbolic schemas (such as cars or trains) that they may enjoy and use repeatedly. Some children do eventually learn to say or sign some words through much practice and repetition.

Children within Group IV-A also:

- Show a wide range of reactivity. They tend to be primarily over- or underreactive to sensation, with a greater tendency to be avoidant rather than self-absorbed.

- Participate in presymbolic play when toys relating to real life experiences (e.g., baby doll, slide, pool, school bus) are readily in sight and modeled, but do not usually find or organize the toys themselves. (Structure and visual communication strategies are very helpful in learning pre-academic and adaptive skills.) They may learn to enjoy simple puzzles and cause-and-effect toys.
- Evidence symbolic understanding, as shown by their attachments to video and TV figures and their desires for specific books and videos. However, their very poor motor planning impedes purposeful play.

Group IV-A Sequence of Progress

With persistent pursuit, these children can become more engaged, enjoy being around their families, and become better problem solvers to get what they want. Because of severe motor planning difficulties, they do not often initiate purposeful steps, but can readily undo what they do not want and then have difficulty knowing what to do next. They often resort to the repetition of ideas (e.g., simple sequences with favorite toys, such as pushing a toy train on tracks through the tunnel). They may learn words (usually through ritualized phrases), songs, and filling-in-the-blank. Eventually, they retrieve the words for highly desired objects or objections while in high-affect states. Some children show visual-spatial learning on semistructured tasks, such as matching, pointing to pictures, and assembling easy puzzles, but they cannot sequence actions to express ideas independently. They function at a presymbolic level. Other children are unable to retain even repetitive learning, but do best when work focuses on their natural interests (e.g., to go outside, get food, play horsey). Some children with a relatively

strong visual-spatial capacity read logos or words, but their receptive understanding remains highly dependent on visual cues and context. With work on experiencing pleasure and consistent engagement, these children can diminish frustration, self-destruction, and aggression and can increase their adaptation to surroundings and their expectations. Over time, some children evidence unexpected strengths, moving on to presymbolic problem solving and increased rate of learning.

Group IV-A Case Illustration

Harold was able to progress only very slowly to imitating sounds and words, even with an intensive program organized to facilitate imitation. He could say one or two words spontaneously when angry or insistent on getting something, but otherwise he had to be prompted and pushed to speak. Every utterance was extremely difficult for him, and he would sometimes stare at a caregiver's mouth to try and form the same movements. His severe dyspraxia also interfered with his evidencing pretend play, although from the different facial expressions and the gleam in his eye when he engaged in playful interactions with his parents, it appeared he was playing little "tricks." He sometimes held onto toy objects, such as a Nerf® sword or magic wand, and used them in ritualized ways, but he could not use toys to sequence new ideas. He could engage and even initiate sensorimotor interactions during which he expressed pleasure and affection. Although games with his brother had to be orchestrated, he did enjoy running around the schoolyard and the pool with other children.

In the second year of intervention, Harold was able to interact and communicate with three or four back-and-forth exchanges about what he wanted, such as pulling his dad over to the refrigerator and finding the hotdogs. He could even retrieve

a few words at such moments (e.g., “Hotdog” “What else?” “French fries”). Harold became more consistently engaged over time, with islands of presymbolic ability, and he became more aware of what was going on around him. He no longer wandered aimlessly and would pick up trucks to push or select other cause-and-effect toys and simple puzzles. He let others join him but invariably turned the interaction into sensorimotor play, which brought him great pleasure. His pre-academic progress was also very slow, even with lots of structure, repetition, and practice, but he did make progress in learning to complete “work” and self-care.

Group IV-B Identifying Criteria

Children in Group IV-B tend to evidence patterns of regression and/or more overt neurological involvement (e.g., persistent seizures). Children within this subgroup usually begin with enormous challenges and make very limited progress, no progress at all, or vacillate between a little progress and regression. Group IV-B children display:

- Fleeting to intermittent engagement. They tend to have severe processing challenges in all areas and yet, at the same time, can become more engaged and happier and, in learning this, to become partially purposeful in solving problems when they want something.
- Fleeting to intermittent purposeful behavior related to very strong needs. It is hard for this group to progress consistently into complex preverbal problem-solving strategies or into the use of ideas, words, or complex spatial problem solving. During times of progress, their developmental abilities may improve to the level of children in Group IV-A or Group III.
- Severe motor planning difficulties. These children may intermittently use cause-and-effect toys brought to them (e.g., a

simple pop-up toy) but they often only engage in repetitive touching, banging, or self-stimulation. They frequently have severe oral-motor dyspraxia and have little or no imitative ability.

- Extremely limited auditory processing capacity.
- Extremely limited visual-spatial processing.
- A tendency to be underreactive to sensation. These children often evidence low muscle tone and passivity. They may also evidence more overt neurological symptoms.

Group IV-B Sequence of Progress

With a comprehensive program, these children can become more engaged and happier. Over time, they can learn to be intermittently purposeful, engaged, and involved in preverbal, gestural problem solving, but are unable to develop symbolic capacities. With structure, visual communication strategies, repetition and practice, they can develop basic adaptive skills for home and school. They will often find it difficult to move into complex, preverbal problem solving.

Group IV-B Case Illustration

Margaret had severe perinatal complications and evidenced low muscle tone from shortly after birth. She achieved her motor milestones very slowly, sitting up at 9 months, crawling at 12 months, and walking, with some asymmetry noted, at 17 months. Other than showing some pleasure in cuddling during the first year and some purposeful mouthing towards the end of the first year, she did not progress into consistent, purposeful interaction or complex, preverbal problem solving. At the time of the first visit, she tended to perseverate by rubbing a favorite spot on the carpet and by staring towards the

light, but could smile and show some fleeting pleasure with sensory-based play.

With a comprehensive program, Margaret has progressed slightly. She has become more robustly engaged, with deeper smiles and pleasure, and more purposeful reaching. She engages in some exchange of facial expressions, which she sometimes uses to indicate preferences. At present, however, she has not progressed into complex, behavioral problem-solving interactions. Margaret has recently begun evidencing a seizure disorder, for which she has been placed on medications.

FROM ASSESSMENT TO FEEDBACK TO INTERVENTION

As noted earlier, classification approaches involving meaningful subgroups that capture the unique developmental profiles of individual children may be especially useful in guiding intervention as well as research. Given the approach described in this chapter and throughout this book, it is evident that intervention begins from the moment a parent calls and is asked what his or her concerns are. This approach assumes that every evaluation, assessment, or diagnostic session is an intervention and that parents are partners in this effort. It also assumes that the assessment process has a significant impact on the family and must be conducted sensitively and thoughtfully.

The evaluator needs to consider several factors during the course of the assessment before moving on to diagnosis and planning. How a family experiences the assessment, as well as how they interact with each other and the evaluator during the course of multiple sessions, establishes guidelines for the session when the evaluator will discuss his diagnosis with the family and they must mutually concur on an intervention plan. Factors the evaluator should consider follow.

- *How well did the parents engage with the clinician in the process of the evaluation?* Did the parents initiate the evaluation or did others encourage them to pursue it? Was rapport and trust established? How readily were the problems and family background discussed? What was the response to suggestions, coaching, and other inquiries? What was the family's experience of prior intervention or services?
- *Was the evaluation a therapeutic experience for the family and the child?* Did the evaluation lead to an evolving understanding of the problems, the effects of current environmental factors, and the past and present dynamics? Was there a change in the interaction patterns between family members and with the child? How did the family learn best? In what ways did the family experience the evaluation as helpful? What changes were most evident in the course of the evaluation? Did the parents express ideas about what they wanted to do or their priorities and resources?
- *How does the nature of the difficulties or diagnosis and the prognosis shape the feedback?* Are further medical or developmental assessments indicated? If so, should intervention be delayed until the additional information is obtained, or should parts of the intervention plan proceed?

By the time the family meets with the evaluator to discuss the diagnosis and plan the intervention, a base has been established for moving forward. The evaluator would begin the session by addressing the family's remaining questions and thoughts. The evaluator would then focus the discussion on the Developmental, Individual Differences, Relationship-based (DIR) model elements which were assessed during the evaluation by using the DIR model (see

Chapter 3, this volume). First, the evaluator would present a developmental profile of the child based on functional developmental capacities that highlight the child's strengths as well as challenges. To build agreement, the evaluator would refer to many of the joint observations and rapport shared during the assessment. Second, the evaluator would describe the child's individual differences, outlining the unique ways and relative strengths and weaknesses in the way the child comprehends and regulates sensory input as well as in motor planning and execution. Third, the evaluator would share impressions of the family's relationships and functioning, including the relationships with the child, others in the family, and between the parents, all within the context of the family's culture and environment.

The evaluator and the family are now ready to use the diagnostic feedback to discuss an intervention plan. Every intervention plan must have the parents at the center, both in the interventions they will try to provide their child as well as in the management of the "case," even when they are provided with case management assistance in seeking and coordinating services. The evaluator would begin the discussion with recommendations for an optimal intervention plan. Although the family may be unable to adopt the optimal plan, the plan provides the family with a basis for finding resources, determining priorities, and implementing the best available plan, even if they carry out different interventions in stages. It is important for both the evaluator and the family not to compromise prematurely the interventions that should occur. They must also leave open the possibilities of change and growth in the child, especially if an appropriate, comprehensive intervention plan is put in place.

There are times when an evaluation will turn into ongoing intervention, such as when it is possible for the evaluator to continue

working with the family. At such times, an evaluator may want to deviate from the preceding recommendations, especially when this would protect the trust and emerging relationship with a high-risk or fragile parent. By continuing with a family, the evaluator has the flexibility to modify the intervention plan as indicated, delaying some steps and bringing in other therapists during the early stages of intervention. Transferring a child and family to another therapist, however, will require the evaluator to carefully weigh and time the effect this will have on the family.

After discussing the diagnosis and interventions with the family, the evaluator will have to consider what information should follow, including formal comprehensive reports, specific reports pertaining to obtaining services, and audio or videotape feedback. The range of information provided will vary considerably in different settings and according to what each case may warrant. Families should have access to the reports, and they should be apprised of any issues of confidentiality, including the opportunities for selectively releasing information.

CONCLUSION

This chapter presented a developmentally based approach to classifying infant and early childhood disorders. This classification system uses a multidimensional approach to diagnosis, taking simultaneously into account (1) the developmental level, (2) individual differences in constitutional and maturational factors, and (3) relationships within the family and its environment. Utilizing these developmental dimensions makes it possible to identify clinical subtypes as well as individual development profiles. This chapter described in detail several proposed subtypes. Clinicians and researchers can test and refine these developmental dimensions and

the subtypes as well as use them to guide further investigation. Most important, the functional developmental approach to assessment and diagnosis can enable clinicians to construct intervention plans that are more individualized and appropriate to the needs of each unique child and family. ■

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