Developmental Pathways To and From Autism: The Role of Emotions in the Core Deficit in Autistic Spectrum Disorders-- The Affect Diathesis Hypothesis

Stanley I. Greenspan, M.D.

As is well known, autism is a complex developmental disorder involving delays and dysfunctions in social interaction, language, and a range of emotional, cognitive, motor, and sensory capacities. Empathy, creative, and abstract reflective thinking (including making inferences), reading emotional signals, and engaging in reciprocal (back-and-forth) emotional interactions are generally believed to be particularly difficult for individuals with this disorder. Many professionals believe these capacities are beyond the reach of individuals with autism, even if they make the maximum progress possible in an intensive therapeutic program. We will demonstrate, however, that this belief is incorrect. Understanding the role of emotional signaling in the developmental pathways associated with autistic spectrum disorders suggests strategies that can lead to levels of creative and reflective thinking and empathy thought unattainable.

Before looking at these developmental pathways, however, we will present a brief overview of autistic spectrum disorders.

Autism and Autistic Spectrum Disorders: A Brief Overview

While there are no definitive national data, a variety of studies estimate that the rate for autism is 2 to 4 per 1,000 and for autistic spectrum disorders, higher. In some locations, however, the rates are at the higher end of this range. For example, in the Brick Township study, conducted by the CDC, the rate was 1 per 250 for autism and approximately 1 per 150 for autistic spectrum disorders. In comparison to these current estimates, the rates 10 to 15 years ago were considerably lower. While they tended to vary a great deal by the study conducted, the most widely cited rate 10 to 15 years ago was 1 per 2,000 to 2,500 for autism. Estimates from 10 to 15 years ago are not as readily available for autistic spectrum disorders. While some believe these increasing rates are due to better identification and diagnosis, many investigators believe there is an alarming increase in autism and autistic spectrum disorders.

Current research suggests there may be multiple factors involved in the pathways leading to ASD. Therefore, it may be useful to consider a cumulative risk model. There is a great deal of research supporting genetic influences. Genetic factors and prenatal developmental processes are likely predispose a child or create vulnerabilities to prenatal and postnatal challenges. These challenges may include infectious illnesses, toxic substances (e.g., lead, methylmercury, PCBs, organophosphates, nicotine, and endocrine disrupters such as Dioxin), and factors that precipitate active autoimmunity in genetically predisposed children (e.g., viral infections, vaccines, allergies, etc.). While not causative, clinical observations suggest postnatal factors may also include experiential or physical stress as a contributor to some of the observed behavioral patterns. For example, children with biologically-based, severe, sensory hyper- or hyposensitivities, motor planning, and auditory processing problems will tend to be more likely to withdraw from relationships and become perseverative and self-stimulatory in a noisy and chaotic setting. Research should focus on cumulative risk models and explore the mechanisms of action among different etiological, and precipitating, intensifying, and/or ameliorating factors.

The clinical features of autistic spectrum disorders are best understood in terms of primary and secondary features. The primary features involve deficits in the capacity to engage in reciprocal interactions involving emotional signals, motor gestures, and vocalizations; difficulty in maintaining continuing social exchanges to solve problems; as well as challenges in the ability to process auditory, visual-spatial, and other sensory input and plan and sequence actions. The secondary features involve the well-known language, cognitive, and social problems, as well as tendencies toward perseveration and self-stimulation. The secondary features, however, derive from the more primary impairments and are often intensified by inappropriate or inadequate interventions and improved by appropriate interventions and individually tailored family and educational environments. Each child's profile will differ, based on his or her unique pattern strengths and weaknesses. In order to better understand causes and improve interventions, research should focus on improved methods to identify individual patterns and describe and classify clinical subtypes. Without adequate understanding of clinical subtypes, important findings may be missed because they are related to a heterogeneous population.

With this brief overview, let's look at new insights into the role of affect signaling in the developmental pathway leading to autism and the implications of these insights for improved intervention programs which include new clinical approaches to support creative and reflective thinking.

Developmental Pathways Involved in Autistic Spectrum Disorders: The Affect Diathesis Hypothesis

As discussed in the earlier chapters of this work, affective exchanges influence such basic capacities as the formation of relationships, self esteem, and impulse control. As indicated, recent studies suggest that emotional interaction in infancy and early childhood also influences cognitive and language capacities. For example, higher quality infant and child care, including emotionally sensitive caregiving, is associated with stronger cognitive, language, and emotional and social development (NICHD, 1998, 1999, 2000; Vandell & Wolfe, 2000; Peisner-Feinberg, et al., 1999). Risk factors that undermine caregiver and family emotional functioning are associated with compromises to intellectual functioning (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1986; Sameroff, Seifer, Baldwin, & Baldwin, 1993). A large empirical base, neurological research looking at brain lesions interfering with emotional regulation, explorations of the types of thinking that are part of skillful social interactions (i.e., emotional intelligence), and concepts of multiple intelligences have further increased interest in the role of emotions (Shonkoff & Phillips, 2000; Damasio, 1994; Goleman, 1995; Gardner, 1983) .

In spite of increasing research on and greater interest in the role of emotions in human development, however, as we discussed earlier, there has not been sufficient understanding of how emotions exert their influence (i.e., the way in which emotional interactions affect intelligence and related cognitive, language, and social and self-regulation capacities).

Also, as discussed in *The Growth of the Mind* (Greenspan, 1997), we presented the first part of a theory of the process through which emotional interactions influence intelligence. This theory suggested that affective interactions emerge earlier than the sensorimotor schemes postulated by Piaget (1962) and that they are the most primary probes we use to double-code and, thereby, understand, conceptualize, and reflect on our experiences with the world.

In this chapter, we further develop this theory. We examine the critical role of various types of deficits in the expectable diathesis (i.e., spread) of early affective interactions in the pathways leading to autistic phenomena, related developmental and emotional problems, and deficits in, as well as mastery of self-regulation, communication, language, the construction of a sense of reality, and creative and reflective thinking.

Among the many symptoms of autism, it is well established that language, cognitive, and social deficits are prominent. These compromises can be conceptualized as a series of functional developmental deficits {Greenspan & Wieder 1999 299 /id}. The pattern of these deficits provide clues regarding a core psychological mechanism that may express the neurological differences characterizing autistic spectrum disorders. When children with autism are compared to children without autism, and level of intelligence, as measured with IQ tests, is controlled for, there are a number of autism-specific functional developmental deficits. These include deficits in the ability for empathy and seeing the world from another person's perspective in both physical and emotional contexts (theory of mind) (Baron-Cohen, 1994); higher-level abstract thinking, including making inferences (Minshew & Goldstein, 1998); and shared attention, including social referencing and problem-solving (Mundy, Sigman, & Kasari, 1990). In addition, deficits in the capacities for affective reciprocity (Baranek, 1999; Dawson & Galpert, 1990; Lewy & Dawson, 1992; Osterling & Dawson, 1994; Tanguay, 1999; Tanguay, Robertson, & Derrick, 1998) and functional (pragmatic) language (Wetherby & Prizant, 1993) also appear specific to autism.

As we looked at these functional deficits, we began asking if these functional developmental deficits might stem from a common pathway? As we reviewed our clinical work with infants and children with biological and environmental challenges and without challenges, we have found that the capacities for empathy, psychological mindedness, abstract thinking, social problem-solving, functional language, and affective reciprocity all stem from the infant's ability to connect affect or intent to motor planning capacities and emerging symbols

(Greenspan, 1979, 1989, 1997a). Relative deficits in this core capacity, we found, led to problems in higher-level emotional and intellectual processes. The core psychological deficit in autism, we reasoned, may, therefore, involve an inability to connect affect (i.e., intent) to motor planning and sequencing capacities and symbol formation. We further hypothesized that biological differences (genetic and developmental) associated with autistic spectrum disorders may express themselves through the derailing of this one psychological process, which, in turn, leads to the symptoms and cognitive, language, social, and motor deficits seen in autism. In other words, this psychological process may constitute our important intermediary mental organization that stands between the biological factors and the manifest symptoms associated with ASD.

As discussed earlier, a child's capacity to connect affect to motor planning and emerging symbols becomes relatively apparent between 9 and 18 months of age as the infant shifts from simple patterns of engagement and reciprocity to complex chains of affective reciprocity that involve a continuous flow of co-regulated emotional exchanges and problem-solving interactions. Consider a 14-month-old child who takes his father by the hand and pulls him to the toy area, points to the shelf, and motions for a toy. As Dad picks him up, and he reaches for and gets the toy, he nods, smiles, and bubbles with pleasure. For this complex, problem-solving social interaction to occur, the infant needs to have an emotional desire or wish (i.e., intent or affective interest) that indicates what he wants. The infant then needs to connect his desire or affective interest to an action plan (i.e., a plan to get his toy). The direction-giving affects and the action plan together enable the child to create a pattern of meaningful, social, problem-solving interactions. Without this connection between affect and action plans, complex interactive problem-solving patterns are not possible. Action plans without affective direction or meaning tend to become repetitive (perseverative), aimless, or self-stimulatory, which is what is observed when there is a deficit in this core capacity.

For example, the affect signaling system (i.e., the intent or desire), in part, tells the motor system what it needs to do. It's hard for a child to get beyond simple motor patterns if the child doesn't have a sense of direction or purpose mediated by affect or intent. As indicated, simple patterns played out repetitively might well occur in place of the complex goal-directed patterns, and the capacity for complex social and motor patterns may be undermined. As we created high states of motivation to help children learn to use their motor actions purposefully, affectively cue, and connect with others, we saw their motor planning improve. Under states of high motivation, a child who was capable of only repetition could embark on a two-step sequence. For example, a child obviously wanted to go out the door and was vacillating between touching it repetitively and aimless spinning around near it. When the caregiver pointed to the handle of the door motioning to open and close it or pointed to the window as an alternate exit, the child was able to quickly begin gesturing toward the doorknob, as if to say, "Hey, open the door." When his affect was intense enough, he would go from a repetitive touching pattern to a more purposeful, two-step-touch and gesture to the doorknob. If the affect got too intense and became overwhelming, however, a tantrum might ensue.

In addition to providing direction and meaning for motor actions, as we described earlier, the capacity for complex affect signaling enables the child to separate perception from action, tame catastrophic affects, and use freestanding images as a basis for creating symbols. As the ability to form symbols emerges, the child needs to further connect her inner affects (intent) to symbols to create meaningful ideas, such as those involved in functional language, imagination, and creative and logical thought. The meaningful use of symbols usually emerges from earlier and continuing meaningful (affect-mediated) problem-solving interactions that enable a toddler to understand the patterns in her world and eventually use symbols to convey these patterns in thought and dialogue. Without affective connections, symbols like action plans are used in a repetitive (perseverative) manner (e.g., scripting, echolalia).

The capacity to connect affect to action plans and symbols is part of a larger transformation of affect. As discussed earlier, the infant goes from global and/or catastrophic affective patterns (in the early months of life) to reciprocal ones. The capacity for engaging in a continuous flow of reciprocal affective interactions enables the child to modulate mood and behavior, functional preverbal and verbal communication, and thinking. It also enables more flexible scanning of the environment. The child gets feedback from what he sees and, based on that feedback, explores further. There is, therefore, integrated, modulated visual-spatial and motor functioning. However, when the capacity for reciprocal affective exchanges has not developed, intense global emotions push for discharge, leading to vigilant or overly focused or highly distractible visual-motor patterns. In contrast, long chains of reciprocal interaction support back-and-forth exploration of the environment and, therefore, flexible, broad, integrated perceptual patterns.

In facilitating back-and-forth interaction with the environment, the capacity for reciprocal interaction also facilitates associative learning. Associative learning (building up a reservoir of related experiences, thoughts, feelings, and behaviors which give range and depth to one's personality, inner life, and adaptive responses) is necessary for healthy mental growth. Its absence leads to rigid, mechanical feelings, thinking, and behavior patterns, as are often seen in autistic spectrum disorders.

Reciprocal, affective interactions and affectively-guided problem-solving interactions and symbols are necessary for the unique capacities research has shown to distinguish individuals with autism from individuals without autism (as outlined earlier). Social reciprocity depends on affect guiding interactive social behavior. Shared attention, which includes social referencing and shared problem-solving, depends on affect guiding shared social problem-solving and explorations. Empathy and theory of mind capacities (see Chapter ___) depend on the ability to understand both one's own affects or feelings and another person's affects or feelings and to project oneself into the other person's mindset. This complex emotional and cognitive task begins with the ability to exchange affect signals with another person and, through these exchanges, emotionally sense one's own intent and the other person's intent (a sense of "self" in interaction with "another"). Similarly, higher-level abstract thinking skills, such as making inferences, depend on the ability to generate new ideas from one's own affective experiences and then reflect on and categorize them (See Chapter 2 and Greenspan, 1997a).

In observations of infants and toddlers heading into autistic patterns and in taking careful histories of older children with autism, we noted that children with autistic spectrum patterns did not fully make the transition from simple patterns of engagement and interaction into complex affect-mediated, social problem-solving interactions. They, by and large, did not progress to a continuous flow of back-and-forth, affective, problem-solving interchanges (i.e., a continuous flow of circles of affective communication). Even affectionate children who were repeating a few words or memorizing numbers and letters, who went on to evidence autistic patterns, did not master, for the most part, this early capacity to engage in a continuous flow of affect-mediated, gestural interactions. They were unable to develop empathy and creative and abstract thinking unless they were involved in an intervention program that focused on facilitating affect-mediated interactions.

In a review of the functional developmental profiles of 200 children with autistic spectrum disorders, we observed that most of the children with ASD diagnoses shared this unique processing deficit. Approximately two-thirds of the children who developed autistic spectrum disorders had this unique type of biologically based processing deficit that involved the connection of affect or intent to motor planning and sequencing capacities as well as to emerging symbolic capacities (Greenspan & Wieder, 1997). At the same time, however, the children differed with regard to other processing deficits involving their auditory, motor planning, visual-spatial, and sensory modulation abilities. These differences accounted for the different types and degrees of social, language, motor, and cognitive impairments that accompany the fundamental deficit in engaging in fully purposeful and meaningful social and intellectual interactions.

We have labeled the hypothesis that explores the connection between affect and motor planning and sequencing, as well as other processing capacities, the *affect diathesis hypothesis*. This hypothesis asserts that a child uses his affect to provide intent (i.e., direction) for his actions and meaning for his words. Typically, during the second year of life, a child begins to use his affect to guide intentional problem-solving behavior and, later on, meaningful use of symbols and language. Through many affective problem-solving interactions, the child develops complex social skills and higher-level emotional and intellectual capacities.

Because the unique processing deficit we are proposing as part of the pathway leading to ASD occurs early in life, it can undermine the toddler's capacity to engage in expectable learning interactions essential for many critical emotional and cognitive skills. For example, she may have more difficulty eliciting ordinary expectable interactions from her parents and the people in her immediate environment. She may perplex, confuse, frustrate, and undermine purposeful, interactive communication with even very competent parents. Without appropriate interaction, she may not be able to comprehend the rules of complex social interactions or to develop a sense of self. These may include implicit social functions and social "rules," and developing friendships and a sense of humor, which are learned at an especially rapid rate between 12 and 24 months of age (Bell, 1970; Emde, Biringen, Clyman, & Oppenheim, 1991; Greenspan, 1979, 1997a; Kagan, 1981; Piaget 1981/1954; Werner & Kaplan, 1963; Winnicott, 1931). By the time a child with processing difficulties receives professional attention, her challenging interaction patterns with her caregivers have, therefore, excluded her from important learning interactions and may be intensifying her difficulties. The loss of engagement and intentional, interactive relatedness to key caregivers may cause her to withdraw more idiosyncratically into her own world and become even more aimless and/or repetitive. What later looks like a primary biological deficit may, therefore, be part of a dynamic process through which the child's lack of affective reciprocal interactions has intensified specific, early, biologically-based processing problems and derailed the learning of critical social and intellectual skills.

The capacity for constructing long chains of affective reciprocity may have early roots identifying these may lead to opportunities for the earlier identification of risk patterns. For example, a precursor of the capacity to connect affect to motor planning and symbol formation in the second year of life may be the capacity observed initially in the early months of life for connecting motor actions to interactive, affective rhythms conveyed through facial expressions, vocalizations, or other gestures. For example, babies will move rhythmically to the rhythm of their mother's voice (Condon & Sander, 1974; Condon, 1975). We are currently conducting studies to see if children at risk for autistic spectrum disorders evidence a deficit in their earlier, rhythmic affective-motor patterns. The pathway described in the Affect Diathesis Hypothesis may, therefore, involve a number of developmental levels, each one of which may have implications for early identification and preventive intervention strategies.

When problems are identified early, appropriate professional help can, to varying degrees, teach children and caregivers how to work with the processing (regulatory) dysfunctions, including helping the infant or toddler connect affect to emerging action plans and associated relationship and communication patterns. We have, therefore, found that many children can become capable of forming warm relationships and, to varying degrees, climb the developmental ladder leading to language and thinking capacities. Biologically based processing difficulties, therefore, often contribute to, but are not always decisive in, determining relationship and communication difficulties {Greenspan & Wieder 1997 106 /id}{Greenspan & Wieder 1998 25 /id /d}{Greenspan & Wieder 1999 299 /id /d}.

There are many children who do not evidence autism but have developmental problems in which intentionality or purposeful action is difficult in its own right (e.g., severe motor problems). Such problems result in less practice in using intentional behavior and participating in intentional interactions. These children may, therefore, either have difficulty forming or may secondarily lose their ability to connect intent or affect to motor planning because they are unable to exercise this critical function (i.e., their impaired motor skills make purposeful action difficult). In these circumstances, creating purposeful interactions around any motor skill (e.g., head or tongue movements) may strengthen the affect-motor connection and reduce aimless, repetitive behavior, thereby facilitating problem-solving and thinking. Recent MRI studies suggest that practicing and improving motor skills may enhance the developmental plasticity of neuronal connections (Zimmerman & Gordon, 2000).

Also, as indicated, in our review of 200 cases of autistic spectrum disorders, although many children shared a primary deficit (i.e., connecting affect to processing capacities), their differences in the levels and strengths of developmental functioning in other processing capacities or “component parts” tended to determine symptoms and splinter skills, such as whether a child lined up toys (which requires some motor planning) or just banged them, or scripted TV shows (which requires some auditory memory) or was silent. It was also found that children with relatively stronger component parts tended to make rapid progress once they were helped to connect affect or intent to their other processing capacities. Children with weaker component parts tended to make more gradual progress and required specific therapies, such as speech and occupational therapy in an intensive manner, in order to improve the component part directly, as well as work with the affect-component part connection.

These observations are consistent with recent neuroscience studies suggesting that different processing capacities may compete for cortical access, depending on functional use (Zimmerman & Gordon, 2000). They are also consistent with neuropsychological studies of individuals with autism, but without mental retardation, that show that “within affected domains, impairments consistently involved the most complex tasks dependent on higher-order abilities” (i.e., concept formation, complex memory, complex language, and complex motor abilities) (Minshew & Goldstein, 1998). Higher-level capacities tend to depend more on “meanings” which, in turn, depend on affective interactions with the world. Furthermore, these observations are also consistent with work on the shifts to a more complex central nervous system organization, including hemispheric connections that occur at the end of the first year of life and early part of the second year, just as the ability to engage in affect-mediated chains of social problem solving are on the ascendancy {Benson & Zaidel 1985 500 /id}{Courchesne, Akshoomoff, et al. 1994 501 /id}{Dawson, Warrenburg, et al. 1982 278 /id}{Greenspan 1997 105 /id}{Sperry 1985 508 /id}. Interestingly, many children with autistic spectrum disorders use peripheral vision, rather than central vision, to scan their environment (i.e., they don't look directly at caregivers but seem to look from the side). The neuroanatomy of the visual tracks is such that peripheral vision only requires one hemisphere, the left or right one, to function. Central vision, however, requires both hemispheres to function together (because some of the pathways cross over and others do not). It would be reasonable to explore the hypotheses that problems in integrating the two hemispheres may contribute to autistic spectrum patterns. Integration of the two hemispheres would likely facilitate long chains of reciprocal, affective interaction and integrated central vision and _______________. Work showing that the limbic system and hippocampus is developing and forming cortical connections, at around 1½ years of age, is also consistent with these clinical observations on the increasingly purposeful and meaningful use of affect-mediated actions and ideas in the second year of life {Bauman 2000 397 /id}.

To return to the chart review of 200 cases of children with ASD, in addition to the problem in connecting affect to sequencing, the sequencing ability itself, along with auditory processing and sensory modulating difficulties, was dysfunctional in all the children with autistic spectrum diagnosis. Muscle tone and sequencing was more impaired in the severely affected group with very slow progress than the other groups. They couldn't create a sequence of motor or behavioral patterns and instead repeated patterns. Therefore, it was doubly hard for them to enter into complex social interactions (i.e., they didn't have the behavioral or motor sequencing ability to piece together four- or five-step social gestures—i.e., open and close many circles of communication in a row), and they could not connect intent or direction to their actions to provide purpose or a goal.

The apparent greater difficulty with motor planning in the autistic spectrum disorder and the difficulty this group has in improving in this and other capacities may, in part, be due to the proposed primary difficulty in connecting intent or affect to the capacity for sequencing. It is difficult to engage in or practice a sequence of behavior without intent or affect directing it.

While motor planning, auditory processing, and sensory modulation difficulties are also present in many children with a variety of learning, language, sensory integration, and cognitive disorders, it is being suggested that the inability to connect affect (intent) to sequencing capacities is unique to autistic spectrum disorders and, in part, explains why this disorder is characterized by more pervasive problems (i.e., purposeful planning and sequencing is a critical part of motor, language, social, and cognitive capacities) and greater treatment challenges.

This proposed mechanism, where affect connects motor to (gestural) sequences, also suggests an explanation for the way autistic patterns emerge during early development. Regressions occur in many of the children around 16 to 30 months of age. Ordinarily at this age, children are developing symbolic capacities including complex imitations, pretend play, imagination, and more functional use of language. What would happen, however, if different facets of the central nervous system were developing but the components of the nervous system that connect affect to complex motor sequencing were not forming? The mind is becoming more complex and at the same time, it is operating without a guidance system (i.e., emotional intent). Without affect or intent, motor capacities and islands of symbols may become idiosyncratic and repetitive, as opposed to sequential, purposeful, and goal-directed (e.g., like an athlete who loses his sense of purpose, but his muscles keep moving). Relationships may also become more difficult, as one cannot connect behavior or communication with underlying needs, desires, or affects. Ironically, as the nervous system becomes more complex, it is more and more difficult for it to operate without a guidance system that uses affect or desire.

Particular types of self-stimulatory patterns, such as looking out of the corner of one's eyes (i.e., using peripheral vision rather than central vision—"visual stimming") are also revealing. As we indicated earlier, the anatomy of the visual system has images from peripheral visual fields (i.e., the far left or right) represented in one or the other hemisphere. Images directly in front of the eyes are represented in both hemispheres. Therefore, to look out of the periphery, one needs only intact functioning in one or the other hemisphere. In order to coordinate the images that emerge from focusing directly in front of oneself, one needs to have both hemispheres connected. Having both hemispheres connected may also be required to fully integrate affect with sequencing capacities (i.e., sequencing tends to be more of a left-sided function and affect more related to right-sided functions). If the difficulty with connecting affect to motor sequencing is related to limitations or deficits with interhemispheric connections, this same difficulty might also affect the ability to focus on visual images directly in front of the eyes.

During the first year of life, we have seen that many infants who later evidence autistic patterns, could focus on objects, experience some affection and warmth, and even enter into simple reciprocal interactions. Perhaps they are able to perform these tasks because these basic patterns can be carried out by either side of the brain alone {Benson & Zaidel 1985 500 /id}{Courchesne, Akshoomoff, et al. 1994 501 /id}{Dawson, Warrenburg, et al. 1982 278 /id}{Greenspan 1997 105 /id}{Sperry 1985 508 /id}{Wetherby, Koegel, et al. 1981 509 /id}. Complex, goal-directed, reciprocal, affective patterns, however, may require both sides of the brain working together for optimal functioning, especially during the early years. While children appear able to learn to engage in complex social interactions with only one functioning hemisphere, they may require special learning to do so. As we discussed earlier, it is affective interactions that enable the child to use all his senses, motor, and language abilities together. Emotional interactions may, therefore, be necessary for integrating CNS pathways to form.

Interestingly, this model may also explain why some children make rapid progress and even evidence precocious capacities once their affect connects to other capacities. Perhaps their component parts are developing quite well, but lack the direction and coordination of affect or intent. Other children may have greater deficits in their component parts. For them, connecting affect to the component parts is only a first step that begins a slower pattern of progress. In all likelihood, the central nervous system pathways that connect affect or intent to sequencing capacities—involving motor behavior, verbal symbols, and visual-spatial capacities—involve many different tracks in different parts of the central nervous system. This model would be consistent, in part, with the findings regarding different areas of nervous system functioning that have been implicated in autistic patterns (e.g., sequencing and/or planning areas, motor coordination areas, sensory areas).

The Affect Diathesis Hypothesis should be contrasted with hypotheses that propose a primary deficit in autism is the child's inability to construct a theory of mind, understand or imagine another person's state of mind (i.e., empathize with the feelings of others) {Frith 1993 510 /id}{Baron-Cohen, Frith, et al. 1988 277 /id}{Baron-Cohen, Tager-Flusberg, et al. 1993 511 /id}. The lack of ability for empathy (i.e., putting oneself in someone else's shoes and constructing a theory of mind) may very well be a product of a more primary difficulty in connecting affect to complex behavior and motor patterns and symbols. In our population, the children who made very good progress developed the ability to empathize with and understand the feelings and perspectives of others. They learned to empathize gradually as they became more affectively involved in other people's lives. The children who were unable to become affectively involved with others and develop complex, affectively based communication patterns and who instead relied on scripts or prompts, did not develop the ability to appreciate the emotions of others.

In addition, there is recent research suggesting that children with autism tend to employ different perceptual strategies, such as looking at another person's mouth rather than the eyes and have difficulties in reading another person's facial expressions for their emotional content {Schultz, Gauthier, et al. 2000 557 /id}{Klin, Volkmar, et al. 1995 558 /id}. These findings, however, may not suggest a primary deficit, but also may be a developmental consequence of a more primary, earlier deficit. For example, we have found that infants and toddlers who are not able to connect motor planning and affect and, therefore, engage in reciprocal affective gesturing, do not have the experiential foundation for understanding the affect cues of another person. This includes facial expressions, tone of voice, body posture and the like. The successful mastery of comprehending emotional gestures is the product of many months of co-regulated affective interactions between infants and caregivers during the second year of life. Furthermore, infants and toddlers who aren't able to engage in co-regulated affect gesturing are unable to regulate affect and therefore, tend to be overloaded by affective cues. If these children are oversensitive to sensations—as many children at risk for autistic spectrum disorders are—they experience affect in an especially intense manner. The eyes (as compared to the mouth) tend to convey a great deal of affect. Children with these sensitivities may find looking at someone else's eyes too overloading. Therefore, the preference for the mouth over the eyes may, in part, be related to this broader problem with engaging in co-regulated affective interactions and modulating affect.

The Affect Diathesis Hypothesis, therefore, presents a developmental model for understanding autistic spectrum type patterns. Many findings about autism may be better understood in the context of the developmental sequence described above.

These observations suggest direction for further study of the biological mechanisms associated with this syndrome. Can the difficulties with connecting affect to sequencing and other processing capacities be accounted for by certain critical, central nervous system pathways? Looking more closely at the biological systems and pathways forming in the second year of life that are concerned with connecting affect (i.e., intent) to sequencing, other sensory processing, and sensory modulation capacities may be very revealing.

The Lack of Purposeful, Complex Gestures:
An Early Marker for Autistic Spectrum Disorders (ASD)

As indicated, these observations also suggest an early sign that may indicate an infant is at risk for ASD. To determine if the lack of early affect signaling, and especially complex affect gesturing, could serve as an early marker, we also looked at the degree to which children diagnosed with autistic spectrum disorders by age two had the capacity to use reciprocal, affective interactions to negotiate a goal. For example, could a toddler take a caregiver to the door and motion to go outside? This capacity typically emerges between 12 and 16 months of age. If it were not present by two years of age, the delay would be quite significant. One hundred thirty-six children out of 200 (68%) did not evidence this normative, expectable pattern by age two. If we had used a 16-month cut off, the percent of children with ASD who did not evidence the capacity would have been even higher.

To see if the delay in the ability for complex, nonverbal, affective, gestural interactions are characteristic only of children with autistic spectrum disorders or are also characteristic of children with language delays and motor problems, we looked at 110 children who did not have autistic features, but who had auditory processing problems, were overreactive to touch or sound, and evidenced motor planning difficulties. These children are often described as having specific language and motor disorders, regulatory disorders, or sensory integration disorders. Ninety-six percent of these children were able to enter into complex interactive, gestural communication, and social problem-solving strategies prior to age two. Only 4% evidenced difficulties in learning complex, purposeful, affective gesturing. The lack of development of this capacity in the second year of life, therefore, may be a useful early marker for children with autistic spectrum or pervasive developmental-type difficulties. This finding is consistent with other studies which have identified a lack in abilities such as purposeful pointing and pretend play as early markers for ASD {Attwood, Frith, et al. 1988 512 /id}{Baron-Cohen 1994 243 /id}{Baron-Cohen, Cox, et al. 1996 513 /id}.

Onset of Symptoms: Early Onset vs. Later Regression	
Second and Third Year Regression	69%
Gradual Onset in the First Year	31%

Early Developmental Patterns: Ability to Relate	
Completely Lacking in Engagement	5%

Completely Lacking Long Chains of Reciprocal Interaction	100%

Lack of Purposeful, Complex Gesturing as an Early Marker

Autistic Spectrum	68% did not evidence complex gestures prior to two years of age
Nonautistic Language, Motor, and Sensory Dysfunction	4% did not evidence complex gestures prior to two years of age.

Looking at the ability for complex gestures has some advantages over these other suggested "markers," however. Information about it can be elicited with an easy question which could routinely be asked in well-baby and child care. For example, the simple question: "How does Johnny or Susie let you know what he or she wants?" would elicit the relevant information. If a description of some facet of taking a caregiver by the hand and walking to a toy, the door, or to a food area comes up, then the child is capable of complex social, problem-solving, affective gesturing. On the other hand, if it involves just looking in a direction or having tantrums or simply engaging in some repetitive actions, like pulling at the parent without showing the parent what he or she wants to do, it would indicate that this pattern of complex, problem-solving gesturing is not yet present. This capacity for complex gestures is usually present by 14 months of age, a good deal earlier than other proposed markers which have been studied in 18-month-old toddlers. Moreover, children with circumscribed motor problems, such as low muscle tone, often can't point but have a sense of purpose and can use reciprocal affective exchanges to problem-solve. While pointing is a component of complex gesturing, it is not the determining component and is, therefore, likely to be associated with more false positive identification of ASD in comparison to a conceptually more meaningful marker. In addition, the capacity for complex gesturing may have precursors involving the motor and affect systems that could be the bases for even earlier identification of risk patterns. As indicated, we are currently studying early affective and motor rhythmicity and timing as an early marker {Greenspan & Shanker 2002 540 /id} *(waiting for reference)*

The characteristic pattern of children who evidence autistic spectrum disorders, then, is of children who do not develop complex chains of problem-solving reciprocal interactions in the second year even though many can engage with caregivers, use simple gestures, and might have a few words. They often regress in the second or third year with greater self-absorption, avoidance, self-stimulation, and perseveration. Some lose and some retain partial symbolic capacities.

Misconceptions about Autism and ASD: Theory of Mind and Higher Level Thinking Skills

There are a number of important misconceptions about autism and ASD and related conditions. These tend to lead to problems in assessment, diagnosis, and treatment, as well as daily relationships and attitudes. A few of these will be considered. For example, children with autism and without autism are matched on IQ tests and then given theory of mind tasks or other cognitive tasks.

A major research effort has tried to see if the children with and without autism differ on “theory of mind tasks” when they have similar IQs. If they differ, it would suggest that theory of mind tasks distinguish autistic from non-autistic children. But, there is a problem with this approach. IQ tests don’t discriminate well enough between the different uses of ideas and language, such as between pragmatic language or creative and abstract thinking and simply using language to label objects or for rote, memory-based problems. Therefore, even though the groups have similar IQs, they may not be the same in terms of their intelligence. Their intelligence patterns may be quite different. For example, they may have very different pragmatic language levels and very different abstract reasoning skills. In these studies, we must control for pragmatic language and abstract thinking (i.e., true intelligence), not IQ, if we want to get at the essence root of how certain cognitive capacities, such as those involved in theory of mind tasks, are related to autistic spectrum disorders. In other words, theory of mind capacities may relate more to the level of pragmatic language and abstract thinking than to whether a child does or does not have autism. Only proper control groups can tease out this distinction.

Based on this misconception of what intelligence is, research on theory of mind tasks and other cognitive or perceptual capacities, such as the ability to discriminate facial expressions, tend to be cognitively rather than affectively oriented. For example, asking a child to figure out how another child is feeling in the middle of a power struggle, in heated debate, or in situations that might lead to disappointment or sadness, would get at his ability to understand someone else's true emotions in an emotional context. Figuring out what someone else will see in a room, on the other hand, or identifying pictures of facial expressions are more cognitive and perceptual tasks. These areas of research have led to cognitively oriented interventions. These interventions do not work enough at the level of affective interchanges. The importance of engaging in long chains of reciprocal affect cueing in order to establish a sense of self and a sense of other (through these back-and-forth affect signals) is often overlooked in many of these interventions. The cognitive procedures utilized in such interventions are many steps removed from the affective interchanges that are necessary to establish the compromised capacities.

For example, there has been a great deal of interest in children with autistic spectrum disorder evidencing difficulty in discriminating facial expressions of different emotions. Based on this research, children who have trouble interpreting the emotional expressions of others are "taught" about emotional expressions by looking at pictures of people with different facial expressions or through identifying emotional expressions of others in structured exercises. This conscious cognitive appreciation of a picture, however, is not what's missing. What's missing is the intuitive, almost automatic sense of another person's affect. This is the capacity one uses in appreciating a friend's subtle, emotional state or in working the crowd at a cocktail party. In other words, the understanding of the other person's emotions is experienced very rapidly through a personal, visceral, emotional reaction. In fact, we can often respond to the person's affect before it even consciously registers. Thus, we flirt back, look puzzled or grimace in anger as part of our intuitive, affective response. Once we have experienced, at the intuitive level, the other person's emotional signal, we can also reflect on it in a conscious and deliberate manner. We may say to ourselves, "they look sad" or happy or angry. In making these determinations, however, we are relying on our own affective response, not simply on the other person's facial expression. Also, as indicated, in the ordinary course of events, such as working the crowd at a cocktail party or negotiating peer relationships on the playground, there are many affect signals being exchanged in a brief period of time. If a child or adult consciously tries to figure out each separate one, they will be doomed to failure and confusion. Therefore, the only way to help a child with problems reading affect signals is to provide him or her extra practice in experiencing and reading those signals (i.e., in social situations involving lots of reciprocal, affective interactions, initially with one-on-one caregiver, child, and peer play and gradually in more complex situations). The "practice" needs to involve the personal inner experiences of someone else's affect, as well as one's own, in a series of reciprocal interactions. Similarly, children who have theory of mind problems are often provided with cognitive exercises involving figuring out other people's perspectives, rather than working at the primary level of affective signaling, which is often compromised and at the core of these children's problems.

Some colleagues believe that children with autism or Asperger's Syndrome are not able to learn to feel their own and someone else's affect and, therefore, can only learn to read facial expressions through pictures or perform theory of mind tasks in a conscious, deliberate manner. We have found this assumption not to be correct. With a program focusing on relating and affect cueing, the majority of children made progress in this capacity (Greenspan & Wieder, 1997).

In general, the missing piece in many intervention programs is a lack of understanding of the developmental steps involved in acquiring certain cognitive, social, and emotional skills. By understanding these steps, which often involve transformations of affect, intervention strategies can help the child master the critical foundations for cognitive and social skills.

For example, at the sixth level of emotional transformation, a child builds bridges between affectively meaningful ideas. Establishing reality-testing, a symbolic sense of self, and moving back and forth between fantasy to reality depends on reaching this next level. For example, critical to establishing reality-testing (which is the basis for later abstract thinking) is an affective "me" intending to do something with an affective "other." There has to be an interaction involving affect between the "me" and the "other" to establish a psychological boundary (i.e., an affective sense of what's "me" and an affective sense of what's "outside me"). That boundary doesn't come out of reading books or out of doing puzzles. It comes from interactions involving the exchange of affective gestures and symbols. It comes out of interactions such as "I want this." "No, you can't have it," or "Yes, you can." In addition, these interactions must be part of a continuous flow of back-and-forth affective gestures. Islands of affective interactions followed by self absorption leads to an "in and out" affective probe or rhythm with the external world (reality). A stable sense of reality requires a continuous interactive relationship to the significant "others" in our lives. Abstract and inferential thinking grows from a solid reality boundary.

A stable reality boundary also allows empathy to develop. A child can project a "me" into a "you" and figure out how "you're" feeling to the degree that a child has established a separate sense of "me."

In this context, abstract thinking, empathy and theory of mind tasks are extensions of the stage of building bridges between affective ideas. In addition to affective interactions, the child's individual differences in processing capacities (i.e., visual-spatial processing, motor planning, auditory processing) will contribute to these advanced mental capacities and they have to be taken into account in considering these capacities.

For example, consider the theory of mind task Simon Baron-Cohen {Baron-Cohen, Wheelwright, et al. 2001 572 /id} has described a situation where the child is looking into the basket and the other child has to describe what he's doing. In a task like that, if we show one child a diagram, he'll get it and tell you exactly what the other child is doing. But if we describe it in words to that child (not visually, but auditorially). "Gee, a child is looking in, what is he seeing?" The child won't get it. Another child, however (also with an autistic spectrum disorder), may be just the opposite—stronger with the verbal than the visual. The processing capacity is, therefore, a very important component of a child's ability for, and pattern of, abstract thinking and empathy. Also, if a child has sequencing problems and there are five steps in the problem, the child may get lost simply because of the sequencing challenge, not because of an inability to project himself into someone else's shoes. Therefore, higher levels of abstract thinking, including theory of mind tasks, may occur in certain processing modalities and not other modalities and with regard to certain affect realms and not others.

Distinguishing the Capacity to Engage in Emotional Relationships from the Capacity for Exchanging Affective Signals

Perhaps the biggest misconception about children with ASD relates to their ability to engage in relationships and love others. Many children with autistic spectrum disorder are capable of deeply engaging and forming patterns of warmth, trust, and dependency with a great deal of pleasure and joy. Some of these children will have varying degrees of difficulty, however, in developing ongoing, reciprocal, affective interchanges. Even if they are warmly and deeply engaged, it's especially difficult for some children to develop a continuous flow of reciprocal, affective interactions.

There are many reasons for this difficulty, including biologically based processing difficulties involving motor planning, visual-spatial processing, auditory processing, or sensory modulation. Motor planning problems, for example, make it hard for the child to sequence and, therefore, engage in a multi-step, affective interactions. Visual-spatial processing difficulties make it hard for the child to construct larger spatial patterns and, therefore, picture and negotiate a multi-step, affective sequence leading to a goal. Sensory reactivity difficulties will also make it hard for children to participate in long chains of reciprocal, affective interactions. They become overwhelmed with catastrophic affects, with short bursts of intense reactions rather than modulated, long chains of interaction. The distinction between the ability to engage and the ability to engage in long chains of affective, reciprocal interactions is especially important for children with autistic spectrum disorders. We hypothesized that children with autistic spectrum disorders have a biologically based deficit in the capacity to connect affect to motor planning and sequencing and, therefore, are unable to enter into long chains of reciprocal, affective interaction. They also often have motor planning, visual-spatial, language processing, and sensory reactivity problems further intensifying this basic difficulty.

Yet, many children with autistic spectrum disorders have, or are capable of relatively quickly forming, patterns of engagement that involve a few circles of back-and-forth affective interchange. They are capable of engaging with pleasure, warmth, and joy. They're, therefore, capable of the earlier levels of affect transformation, involving basic engagement, even though they have difficulty with forming reciprocal affective interchanges. The basic capacity to love, experience intimacy and deep dependency is relatively stronger than generally acknowledged. It is the capacity for reciprocal, affective gesturing (i.e., the ability to negotiate within a loving relationship) that's more problematic.

Many of the children we've worked with start off with the capacity for deep pleasure. They enjoy cuddling, being held, and show joyful smiles when their caregivers engage them in a warm pattern of relating. Other children appear to be more avoidant, self-absorbed, or affectively constricted in terms of showing joy and pleasure. Often these children can be helped to enjoy fundamental relating in a deep and satisfying manner, once we figure out their sensory processing and motor profiles. For example, some of the children are very sensory over reactive and, therefore, uncomfortable with closeness involving touch or high- or low-pitched sounds. When the sensory environment is tailored to their unique profiles, these children begin evidencing enormous pleasure in relating. Children who have difficulty with motor planning become more deeply engaged when their caregivers learn how to position themselves in a way that makes the motor planning challenge simpler. In other words, the child who only has to reach out and hug or is helped to be in pleasurable sensory contact so he can feel where his caregiver is, finds it much easier to reach his goal of closeness with mother and father than the child who has to sustain focus and interest through four or five independent actions in order to reach mother or father.

In our review of 200 cases (Greenspan & Wieder, 1997) of children who received a comprehensive, intensive program of intervention, we found that the first gain the vast majority of children made was in the capacity to engage with warmth and pleasure. The capacity for engaging with warmth and pleasure occurred before gains in language skills, cognitive skills, or motor skills. Engaging appeared to be the aspect of functioning that was the most quickly responsive to the intervention efforts.

The observations that the capacity to engage responds most quickly and that many children diagnosed with autistic spectrum disorders can show a lot of joy and pleasure even before an intervention program has begun suggests a possible misconception about autistic disorders. Often, the capacities for affective reciprocity and affective engagement are believed to be part of the same process and children with autism are, therefore, viewed as less capable of love and intimacy than others. But, affective interactions are fundamentally different from the capacity to form a basic relationship characterized by pleasure and joy and, ultimately, a sense of trust and intimacy.

Many of the children we've been following for over five years (some for over 10 years) evidence patterns of closeness and warmth that are both joyful and deeper, in many respects, than typical children their age are able to show. We have observed that many evidence a great deal of warmth and closeness for their age group. It's not surprising that these children can evidence intimacy because their parents have been spending extraordinary amounts of time with them in a warm and nourishing way that is sensitive to their processing profiles. Children without challenges whose parents are very available also form deep, satisfying patterns of closeness, warmth, and intimacy.

As indicated, historically, however, it has often been thought that children with autistic spectrum disorders have a biologically-based deficit in their ability for warmth and closeness (i.e., the capacity for a deep sense of love). It's been thought that this is part of their difficulty with forming patterns of social interaction. It's been believed that they experience the type "autistic aloneness" that Kanner described in his classic descriptions (Kanner, 1943). Even though many studies have refined Kanner's original observations and different degrees of social relating have been described and incorporated into diagnostic criteria for children with autistic spectrum disorders, nonetheless, the perception persists (and continues to a partial degree even in the most recent DSM IV-R diagnostic criteria) that children with autistic spectrum disorders are less able to engage with depth and warmth and with a deep, abiding sense of love than other children who don't have these developmental challenges.

Our clinical observations would suggest that this common belief is simply incorrect. If we distinguish a child's capacity for deep, joyful relating from the capacity for affective, reciprocal interchanges, it is possible to observe that many children with autistic spectrum disorders are capable of the full range of warmth, love, and closeness. This intimacy is relatively easy to observe in families who focus a great deal on promoting relaxed intimacy by observing spontaneous relating for long periods of time (hours, not minutes) and attending to all the subtle ways the children have of showing their intimacy. In our review of 200 cases, over half the children evidenced a deep rich capacity for intimacy and over 90% showed a continuing growth in this pattern (Greenspan & Wieder, 1997).

One may expectedly raise the question: why do many children with autistic spectrum disorders appear to spend so much time avoiding relationships or with constricted affect or in states of self-absorption? Why don't many show a great deal of obvious pleasure and joy in relating to others? The answer to these two important questions is that children with autistic spectrum disorders who are capable of enormous warmth, joy, and deep relating can withdraw from relationships if the relationships are experienced as aversive or painful or simply not pleasurable. This often happens, not because the children are incapable experiencing joy or because the parents are not extraordinarily loving, but because caregivers are not sufficiently helped to figure out the unique sensory processing profile of the child so that they offer patterns of relating in a way that is pleasurable and deeply satisfying.

Some of the children have sensory processing patterns that are not so challenging and their caregivers find it relatively easy to approach and entice them into warm, nurturing patterns of relating. Other children, however, have complicated sensory patterns where caregivers require assistance. If this assistance is not forthcoming, children can pull away from the very relationships they might otherwise enjoy and seek. In addition, if the children are not helped to progress into reciprocal affective interactions, it's hard for them to negotiate intimacy and, as indicated, they are more likely to experience intense, catastrophic affects.

This distinction between the child's capacity to engage and the child's capacity for affective reciprocal interchanges is being emphasized because it clarifies the misperception about children with autistic spectrum disorders mentioned above, that is, that this group of children somehow loves less deeply or less profoundly than other children. This misperception, as is well known, can easily become the basis for a self-fulfilling prophecy if caregivers are discouraged from trying to find ways to draw their children into deeper patterns of intimacy or if intervention programs are lacking in support for warmth and engagement and, instead, are too mechanical and impersonal. Simply not encouraging caregivers to explore this capacity can be a way of it becoming a prophecy come true.

There are, therefore, two misperceptions that need to be avoided. One is that the children who have a more challenging time learning to relate because of their biological differences, (such as sensitivities to sound or touch or language problems), are unable to learn to relate warmly through the availability of special interactions geared to their unique developmental profiles. The other misperception, equally worrisome, is that if we focus on caregivers constructing special patterns of care that woo their child into relationships, we are somehow suggesting that the lack of certain experiences in children's interactions with their environment is a cause of the problems.

What we're saying, however, is that many children, especially those with autistic spectrum disorders, have biological differences that express themselves in the way the child processes sensations and organizes and plans actions. These biologically based processing differences, which often express genetic and constitutional-maturational differences, can make the expectable milestones of learning to relate, communicate, and think very challenging and, in some cases, possibly even impossible to attain. The caregiving environment, therefore, is not the cause of the child's biological challenge, yet it can be a vital part of the process that helps the child master, to varying degrees, complex developmental capacities that are based on how biological and experiential factors interact. We have found that the caregiving environment can be especially vital in helping children with autistic spectrum disorders learn to engage with greater degrees of warmth and intimacy if their caregiving overtures are tailored to the child's biologically based, individual processing differences. Therefore, while not the cause of the problem, the caregiving environment can be an important component of a comprehensive approach to intervention.

Perhaps the best way to conceptualize the challenges to forming relationships for children with autistic spectrum disorders is as follows. Due to their unique sensory and motor processing profiles, the negotiation of a deep sense of intimacy is a challenging process that is both complex and subtle. It is very easy for children with challenging processing profiles to respond negatively to even simple environmental challenges. Children without these processing challenges often have a more flexible capacity to engage with others. The children with complex processing profiles are extremely sensitive to the subtleties in their environments and can easily regress or form patterns of avoidance, self-absorption, and/or self stimulation. At the same time, however, they can be drawn into wonderfully, deep, and satisfying patterns of closeness and intimacy. Parents are in a unique position because of their long-term relationship to the child. They can often foster this intimacy and engage in long sequences of pleasurable affective interactions. The children's capacity for intimacy, coupled with their processing differences and sensitivities, in fact, suggest a need for intimate, nurturing care that is especially deep, flexible, and persistent.

Misconceptions Regarding Appropriate Interventions

Historically, it has been believed that children with ASD required very structured learning approaches because they couldn't learn through typical types of discovery-oriented, dynamic learning interactions. An important consequence of understanding the significance reciprocal affective interactions, however, relates to revising therapeutic and educational interventions for children with special needs.

As indicated, many children with developmental or emotional problems have difficulties at the fundamental level of back-and-forth affective signaling. Their difficulty may be an inability to engage in or sustain long chains of affective reciprocal interactions generally or to mobilize them in specific processing or emotional areas (e.g., around motor planning, visual-spatial thinking, or feelings of anger or loss).

An appropriate intervention approach must, therefore, work at the level of facilitating reciprocal affective interactions generally and/or specific areas such as language, motor planning, visual-spatial thinking, dealing with anger, etc. The Developmental, Individual-Difference, Relationship-Based model (DIR$_{tm}$, i.e., Floor Time) conceptualizes a comprehensive approach with reciprocal exchanges of affect cues at its foundation (Greenspan, 1992; Greenspan & Wieder, 1998). Many therapies, however, try to help children *without* establishing reciprocal chains of affective interaction generally or in the area where they are missing. For example, many very structured approaches to therapy, such as behavioral approaches for children with autistic spectrum disorders, fail to realize that one of the primary goals for many of the children is to establish the ability for interacting in a continuous reciprocal flow, that is, for entering into these long chains of reciprocal back and forth communicating. In fact, the lack of reciprocal affective interaction itself is one of the key deficits in autistic spectrum disorders and underlies many of the others, such as difficulty with empathy, theory of mind tasks, and abstract inferential thinking. The goals of all interventions for autistic spectrum problems, therefore, needs to involve reciprocal affective interactions to promote abstract and creative thinking, true empathy, flexible peer relationships, and emotional flexibility and spontaneity.

Behavioral and other related interventions, however tend to be a stop-start approach, as, for example, rewarding the child for matching a shape or for repeating a certain sound. Gifted therapists, in spite of the curriculum sometimes enter into continuous flow of affective exchanges with the child. This is usually associated with better progress. Ivar Lovaas, the pioneer who first explored intensive behavioral (ABA – Discrete Trial) approaches for ASD, and I (Greenspan) presented and compared the ABA Discrete Trial approaches and the DIR_{tm} Floor Time approach a number of years ago. We had a chance to discuss the relative strengths of both approaches. At this meeting, Lovaas showed a videotape of himself early in his career working with a child. In the tape, he was entering into a continuous flow of back-and-forth reciprocal communication. He interacted very differently from many of those who carry out his procedures. He was charming and warm and exchanged lots of affect while purporting to offer rewards and punishments. I gently pointed this out to him and he intuitively acknowledged the importance of getting into a relationship with a child where the child feels appreciated, and nurtured. This discussion, however, didn't lead to a fundamental altering of his theoretical position about what he felt was important. Behavioral theory and interactions focus on specific observable behaviors. The procedures used to teach the behaviors involve systematic shaping of the child's behavior with systematic rewards. There is insufficient emphasis on affect and relationships and no emphasis on affect cueing and reciprocal, affective interactions.

While individual therapists may vary in their ___________, warmth, and interactive abilities, affect and building an inner sense of self through affective engagement is not a part of behavioral therapy. In fact, the stop-start approach advocated by formal behavioral theory and procedures often interferes with caregivers or therapists establishing a continuous, reciprocal, affective flow and rhythm. We've seen many children in consultation who have been involved in intensive, 30 + hours/week behavioral (discrete trial) programs. We've also observed children as part of a research program who were involved in intensive 30 + hours of behavioral-discrete trial programs. The children we observed in the research program were described by their therapists and parents as having had very good outcomes.

The patterns we observed are informative and suggest some of the strengths but also some of the weaknesses of behavioral approaches. While there were exceptions the general trend we observed is as follows: some children in these programs learned to use some words and even read and do math, but often could not engage in a pattern of continuous relating and back-and-forth gesturing. They had difficulty with spontaneous conversation. Their behavior was often unregulated and unreciprocal. They can only conform to specific rules under specific circumstances. New situations were difficult. The capacity for creative and abstract thinking and making inferences was very limited.

As indicated earlier, a deficit in reciprocal interactions and creative and abstract thinking is a defining characteristic of autistic spectrum disorders {Minshew & Goldstein 2000 398 /id}{Dawson & Galpert 1990 488 /id}{Tanguay, Robertson, et al. 1998 279 /id}. Yet, after years of exclusively very structured behavioral intervention (stop/start), rather than a continuous flow of spontaneous reciprocal interactions, many children using that approach still present as self-absorbed, idiosyncratic and repetitive, even though with the proper cues they can do very concrete and memory-based academic tasks.

When we then work with these children on their ability to interact with affective gestures, starting with simple fun games, and work up to back and forth negotiations (to open the door or to get the juice), we find that many children can move towards a continuous flow of affective interaction. As we engage children in this way, their repetitive, idiosyncratic and unreciprocal behavior begins to change. They begin using their behavior and existing language and thinking skills in a more purposeful creative and abstract manner. For children who begin this work at age 8 or 9, there is lots of catch-up, however. It can take a number of years to help them develop the basic skills for reciprocal affective gesturing that were skipped over. Many children appear to develop these skills more quickly and fully when intervention is begun at younger ages {Greenspan 1992 2 /id}{Greenspan & Wieder 1998 25 /id}. Many children benefit from a balanced program where there is a focus on both spontaneous reciprocal affective interchanges and affect-based, semi structured problem solving activities {Greenspan & Lewis 2002 559 /id}. In our experience the key is that when working on specific goals in a semi structured way, the semi structured activities be set up as a challenge which elicits enthusiastic affect and a continuous flow of back and forth interaction while meeting the challenge. For example, teaching a child to "open" in the context of his trying to open the door to get his favorite toy which has been deliberately placed behind the door.

Misconceptions on the Value or Efficacy of Behavioral Approaches

In spite of these limitations in behavioral approaches, many advocates for these approaches claim high success rates. A close inspection of the research on behavioral intervention outcomes suggests that this is not the case.

Autistic spectrum disorders (ASD) usually involve a wide range of deficits and problems and each child tends to have his own unique pattern of these challenges. Therefore, an appropriate intervention program should have many different components to address each of the deficits or problems and be able to be tailored to the child's unique profile.

The wide range of deficits or problems of children with autistic spectrum disorders includes problems with language, motor planning and sequencing, sensory modulation, and visual-spatial processing. Deficits and problems also include problems interacting with adults and peers, including reciprocal emotional affect cueing; empathy, understanding and reflecting on feelings, creative and reflective thinking, including making inferences; and dealing flexibly with a wide range of social and emotional challenges. In addition, as indicated, each child with an autistic spectrum disorder tends to have his own unique pattern of these challenges as well as strengths. Some children, for example, may be relatively strong on visual-spatial processing and relatively weak on auditory processing and language, while others may show an unusually strong auditory memory, but have a great deal of difficulty with tasks involving visual-spatial problem-solving and/or motor planning. Therefore, while children may share some common features (common tertiary pathways), the pattern of deficits or problems contributing to these shared behaviors may be quite different. In addition, even the symptomatic behaviors may be quite dissimilar within this broad diagnostic category.

As indicated, to address the many different problems or deficits, the intervention program needs to have many different components and the components of the intervention program need to be able to be flexibly tailored to the particular profile of deficits or problems of a particular child and family. For example, often a comprehensive intervention program will need to address deficits or problems in language, motor planning and sequencing, sensory modulation, visual-spatial processing and multiple levels of emotional and social interactions, including relating, reciprocal emotional cueing and interaction, peer relationships, and coping with a range of feelings. It will also need to include family work and support which is critical part of a comprehensive program. More important, however, such a program needs to be flexibly tailored to the unique pattern of strengths and deficits of the particular child and family. Some children will require more of an emphasis on motor planning and visual-spatial processing, while others more of an emphasis on language. Still others, may require an emphasis on the different levels of emotional and social interaction.

There is a great deal of research support for comprehensive programs tailored to the individual needs of particular children and families. For example, a recent report by the National Academy of Sciences (Committee on Educational Interventions for Children with Autism, 2001) indicates that the current best practices would be based on a comprehensive model that can take into account the individual patterns of strengths and weaknesses for a particular child. In addition, there is considerable research support for many of the elements that comprise a comprehensive program, such as speech and language therapy, opportunities for social interaction. In reviewing intervention research, it’s important to look at studies that assess interventions that address specific problems and deficits, such as language and social interaction that comprise the challenges of ASD and are a part of a comprehensive program. There has been a tendency to look mainly at interventions that address the syndrome of ASD as though it’s a unitary entity and not to look sufficiently at the different problems that comprise it. For a review of the research evidence supporting interventions for the different problems that comprise ASD, see Chapter 31 of the Interdisciplinary Council on Developmental and Learning Disorders *Clinical Practice Guidelines* (Tsakiris, 2000).

While, as indicated above, there is considerable support for a comprehensive approach involving a number of components to address the many problem areas that comprise ASD, the tendency to conceptualize ASD as more of a unitary disorder with a “treatment method” persists. The most prominent of these treatment methods has been ABA Discrete Trial (behavioral approaches) as formulated by Ivar Lovaas and his colleagues. Many proponents of ABA approaches have claimed that ABA is the only approach with scientific research supporting it.

A careful review of the research literature, however, suggests that at present, there is no scientific evidence for this claim. In fact, there is no definitive scientific evidence for any one approach. For example, in a recent review by Gernsbacher (Gernsbacher, 2002; Gernsbacher, 2003), she points out that out of 232 articles that reported using behavioral and educational approaches in children with autism, there were five articles that presented a higher level of evidence than the others. These five articles reported on four studies. However, "none of the four studies … used random assignment of children to groups, such as the group receiving intensive behavioral intervention versus the group receiving a comparison intervention."

In addition, Lovaas' original 1987 study also did not include random assignment, excluded children with more severe forms of autism, and only used post treatment IQ scores and public school placement rather than a broad range of outcome measures, as has been recommended. As a consequence of these methodological weaknesses, it's difficult to draw any definitive conclusions from this study.

Similarly, in an article entitled, "Applied Behavior Analysis for Childhood Autism: Does the Emperor Have Clothes?"(Brandsma & Herbert, 2001), James D. Herbert and Lynn Brandsma point out that "programs based on Applied Behavior Analysis (ABA) have become increasingly popular" and that "A number of leading behavior analysts even have claimed that many children with autism can be 'cured' through such programs and, therefore, strongly recommend ABA over alternative interventions." They point out that the existent research literature, however, does not support these claims." Herbert and Brandsma underscore the methodological weaknesses in Lovaas' original study, including non-random assignment to groups, limited outcome measures where “IQ changes could reflect increased compliance with testing rather than true changes in cognitive abilities and school placement that have more to do with parent advocacy and evolving school policies than with actual functional changes.” They further point out that “several important domains of functioning, e.g., social skills, conceptual reasoning skills, were not assessed. In addition, they stress that there are indications that Lovaas’ sample may have included relatively high functioning individuals with good prognoses and, therefore, was unrepresentative of children with autism in general. Most critically, they state that the Lovaas study was not a true experiment as participants were not randomly assigned to groups and the manner in which subjects were assigned to groups raises serious questions about the possibility of selection bias, which are underscored by pre-intervention differences between the experimental and control groups.” They further point out that “even if the Lovaas 1987 study did not have these methodological limitations, it alone would be insufficient as a basis for claiming ABA can result in recovery from autism. Replication of the findings by other independent investigators would be necessary… In this context, they state that it is noteworthy that attempts to replicate Lovaas’ original results have consistently failed to demonstrate the dramatic results he reported (Anderson, Avery D., DiPietro, Edwards.G.L., & Christian, 1987; Birnbauer & Leach, 1993; Sheinkopf & Siegel, 1998). Many others have raised similar concerns as these (Gresham & MacMillan, 1998; Mesibov, 1993; Mundy, 1993; Schopler & Reichler, 1971).”

Gernsbacher, in her report, points out that two years ago the first truly randomized clinical trial for children with Pervasive Developmental Disorder was published by Tristram Smith (Smith, Groen, & Wynn, 2000) (Smith is a close colleague of Lovaas and was a co-author with Lovaas on earlier studies). The Smith study, however, revealed that only 13% of children receiving intensive ABA approaches had very good outcomes (i.e., “two of the 15 intensively treated children met the criteria used by Lovaas 1987 (Lovaas, 1987) and McEachin, et al. 1993 (McEachin, Smith, & Lovaas, 1993) for classifying children as best outcome, namely placement in regular classes without special services and IQ above 85”). Thus, in contrast to Lovaas' reported 47% success rate…Smith's reported 13% success rate on those two outcome measures raises serious questions about the efficacy of this approach. Smith's study is especially important because it is the first true clinical trial (random assignment study) of ABA approaches. In addition, there were no statistically significant differences between the treatment and control group on either of two language scales. (Gernsbacher further points out that although this is reported to be a significant difference in the paper, there was an error in data analysis, which I [Gernsbacher] caught [and Smith concurred]). In addition, there was no statistical difference between treatment and control groups in social/emotional functioning as assessed by the Achenbach Child Behavior Checklist and no significant differences in adaptive functioning assessed by the Vineland Scales of Communication, Daily Living Skills, or Socialization or even as assessed by a composite of those three scales. Within the treatment group, there were no gains in adaptive functioning from intake to follow-up. There were marginally significant differences between treatment and control group on a measure of academic achievement and there were differences between the groups as follow-up on both the Stanford Binet and the Merrill Palmer.

Gernsbacher points out that Smith, et al. should be congratulated for conducting a rigorous comprehensive study that no other intervention has been submitted to. She also points out, however, that given these data, namely that one area of assessment showed a statistically significant effect and that only 13% of the children met the criteria of success outlined by Lovaas, the claims of recovery from autism produced by ABA are quite misleading.

In addition to the limitations of the research evidence for ABA approaches for ASD cited above, it's also important to point out that at present, there have been no comparative studies using a clinical trial design looking at different treatment models. It is not surprising, therefore, that the National Academy of Sciences and other groups call for best practices with a comprehensive program that works with the individual child and his or her family in terms of their unique profile of strengths and weaknesses. In this regard, we have developed a model for a comprehensive program that takes into account the child's developmental capacities, individual motor, sensory, language, and visual-spatial processing differences, and relationship, interactive, and family patterns. This model, which we call the Developmental, Individual-Difference, Relationship-Based model (DIR_{tm}), provides a way of systematically looking at the strengths and weaknesses within a particular child and his or her family and formulating an intervention program tailored to the child's profile. Such a program usually involves a number of different components, such as speech therapy, occupational therapy, special education, and social and emotional interactions. As indicated earlier, there is considerable research evidence for many of the elements in such a program and, at present, the best practice appears to be to address each child's and family's unique profile in a comprehensive and intensive manner (Greenspan & Wieder, 1999; Interdisciplinary Council on Developmental and Learning Disorders Clinical Practice Guidelines Workgroup, 2000; Greenspan, 1992; Greenspan & Wieder, 1998; Greenspan & Wieder, 1997; Greenspan & Wieder, 2001).

Developmental, Individual-Difference, Relationship-Based (DIR_{tm}) Interactive Intervention Model

We have developed a program for children with Autistic Spectrum Disorders and other special needs based on this new understanding of _____ pathways involved in problems of affect and their transformations. In this program, all children receive an intervention approach where all contacts (interactions) with the child throughout the day (at all times, using the "Floor Time" model) include an emphasis on: (1) affects and relationships; (2) the child's developmental level; and (3) individual differences in motor, sensory, affective, cognitive, and language functioning. All children receive a comprehensive range of services (e.g., including speech therapy, occupational therapy, general and/or special education, and Floor Time consultation), and intense Floor Time interaction sessions at home, ranging from two to five hours a day {Greenspan 1992 2 /id}{Greenspan 1992 301 /id}{Greenspan & Wieder 1998 25 /id}. Therapeutic and education services utilize a relationship, individual difference, interactive approach. Also, family patterns, feelings, and coping efforts are addressed continuously {Greenspan 1992 2 /id}. The use of the words *Floor Time* includes the comprehensive model of intervention described above and is identical with developmentally based interactive approaches and relationship, affect-based interventions used at other times.

This approach organizes the intervention around the child's affects and relationships in the context of the child's current developmental level, challenges, and individual differences. For example, with a child who is self-absorbed and not relating to others, the first emphasis would be on pulling the child into a greater degree of pleasure in relating rather than focusing on language or symbolic capacities. For a child who is only able to signal, on a need basis, with repetitive pulling or banging, rather than with a variety of nonverbal signals, the first goal would be to expand these simple gestures into a pattern of more complex reciprocal, affective gestures. For example, to expand a child's perseverative fascination with an object (i.e., tapping it), one might put the object on one's head and challenge the child to take it. With the child who is rubbing a spot on the floor, the clinician or parent might put a hand on the floor covering the spot, inspiring a cat-and-mouse game as the child tries to pick up the hand to get back to his favorite spot. Alternatively, a child who is wandering aimlessly around the room might find his mother or father wandering with him but beating him to his favorite spot. To solve this problem, the child might have to constantly try to hurry up to get there first or to go around his mother or father (generating interaction in place of random or seemingly aimless activity). For the child who is already able to sequence their gestures and is beginning to use words, to facilitate the child's elaboration of imaginative ideas, if the child picks up a doll, one might talk for the doll, pretending to be hungry or needing a kiss. In all these examples, the principle is to create circumstances where the child is "wooed" into a developmental trajectory where he or she can master the expectable stages of emotional growth and the related cognitive and language capacities. In this model, one must pull the child into the developmental sequence at the child's current level of functioning and not skip levels to work on splinter skills.

The child's motor, sensory, cognitive, and language profile is taken into account. The underreactive child, for example, is approached with extra energy and wooing, often with more playful obstructive activity than the child who is oversensitive, where the approach is more soothing, gentle, and gradual. At home, parents are asked to spend six to ten 20 to 30 minute sessions per day working on the child's ability for affective based interactions, using the child's individual differences and developmental level as a starting point. The different therapies also use this individual difference-developmental-level model (i.e., floor time model).

The unique features separating this intervention model from other models, such as the behavioral approaches {Lovaas 1987 407 /id} or the TEACCH program (Schopler 1995), is its focus on relationships and affect, developmental level, individual differences, and comprehensiveness. The theoretical rationale for this intervention {Greenspan 1992 2 /id}{Greenspan & Wieder 1998 25 /id} is that the child's symptoms are often secondary to underlying biologically based processing difficulties, including auditory, motor planning, and sensory modulation and processing difficulties. Relationships and affective interactions become derailed secondarily. These secondary disturbances, however, have a large range of possible configurations and are often more rapidly responsive to intervention than the underlying processing dysfunctions. Therefore, the first goal of the intervention is to help the child try to work around the processing difficulties to reestablish affective contact with primary caregivers and begin the process of mastering the presymbolic stages that serve as a basis for language and other higher level symbolic capacities. Specific processing difficulties continue to be treated through speech therapy, occupational therapy, special and early childhood education, and other therapies.

Relationship, affect-based interventions which are based on the child's developmental level and individual differences (in sensory and motor processing) and family patterns should not b e confused with play therapy or psychotherapy, which has historically not proven especially helpful for the majority of children with autistic patterns. Traditional psychotherapeutic efforts tend to engage the child in a type of parallel play where he feels the clinician's warmth and support but is not mobilized into types of interaction likely to lead to growth in the critical areas of development {Greenspan 1992 2 /id}. The Floor Time model, in contrast, mobilizes the child's emerging developmental capacities and is based on the thesis that affective interaction can harness cognitive and emotional growth {Feuerstein, Rand, et al. 1979 529 /id}{Greenspan

1979 27 /id}{Greenspan 1981 9 /id /d}{Greenspan 1997 57 /id /d}{Carew 1980 83 /id}{Klein, Wieder, et al. 1987 530 /id}.

Outcome Patterns Associated with the DIR_{tm} Model

A chart review of 200 cases of children diagnosed with ASD {Greenspan & Wieder 1997 106 /id} enabled us to explore the effectiveness of the DIR_{tm} program. The children's patterns and clinical course were based on an experienced clinician's observations and detailed notes organized according to the categories in the Functional Emotional Assessment Scale {Greenspan 1992 2 /id}{Greenspan, DeGangi, et al. 2001 303 /id}. To describe outcomes, we divided the children's functioning into three broad groups. A "good to outstanding" outcome group included children who, after two or more years of intervention, evidenced joyful relating, simple preverbal gestures with a variety of affect cues (appropriate, reciprocal smiling, frowns, looks of surprise, annoyance, glee, happiness, and the like). They were able to engage in purposeful, organized, and long, problem-solving, interactive sequences (e.g., 50+ circles of spontaneous verbal communication), and states of shared social attention on various social, cognitive, or motor-based tasks. They had the capacity for creative and imaginative use of symbols (e.g., create and participate in pretend play), and the ability to construct bridges between their symbols (i.e., hold a logical, two-way conversation, separate fantasy from reality, and anticipate consequences). Most importantly, in this group, the children's symbolic activity was related to underlying intent and affect, rather than memorized or rote sequences. These children mastered basic ego functions including reality testing, impulse control, organization of thoughts and affects, a differentiated sense of self, and an ability to experience a range of affects, thoughts, ideas, and concerns. They no longer evidenced self-absorption, avoidance, self-stimulation, or perseveration. On the CARS autism rating scale, all the children in this group shifted into the nonautistic range.

Some children in the "good to outstanding" group became precocious in their academic abilities, reading or doing math two or three grade levels above their ages (some perhaps developed their visual-spatial abilities early when auditory processing lagged). Some, even though they had intact basic ego functions, still evidenced auditory or visual—spatial difficulties which were improving. Most of the children in the "good to outstanding" group, even ones with precocious reading or math skills, had some degree of motor planning challenges (e.g., evidenced in fine motor control relating to penmanship or drawing or in complex, gross motor challenges).

A second group made significant gains in their ability to relate and communicate with gestures. They became related to their parents, often seeking them out in a joyful, zestful, and pleasurable manner. Parents commented, "I've discovered a little person inside my child." They could enter into long sequences of purposeful reciprocal affective cueing and interactions (e.g., 30 or more circles of communication). They could also enter into states of shared attention with social, cognitive, and motor problem solving. In this group, however, the children were still having significant challenges in developing their symbolic capacities. Some had some partial ability to use symbols in pretend play and language, but significantly below age levels. For example, in this group many children could engage in concrete pretend play sequences, such as driving a car or feeding a doll, and use words for some simple negotiations of their desires ("I want to go outside" or "I want juice"), but were not yet able to construct long, creative, interactive symbolic sequences (i.e., couldn't have a give-and-take conversation or elaborate in a play sequence an experience they had). This group, therefore, had relatively good mastery of early developmental levels and were only beginning their symbolic capacities. This group, like the first group, no longer evidenced self-absorption, avoidance of relating, self-stimulation or perseveration.

A third group continued to have significant difficulties in both the presymbolic and the symbolic realms. They had significant impairments in their ability to attend, enter into simple and complex sequences of gesturing, and, if they were using some concrete symbols in pretend play when props were available or language when they wanted something, it was coupled with a significant degree of self-absorption, avoidance, self-stimulation, and perseveration. In this group, those who had some symbolic capacity (e.g., to sing songs or do puzzles) were unable to imitate and use these abilities in an interactive, communicative manner. Many in this group were making slow progress in their basic ability to relate with warmth to others, but some evidenced vacillation between gaining and losing capacities.

The outcomes for the children were addressed in two ways: (1) overall, and (2) relative to the severity which they presented at entry. Each will be described below.

One hundred sixteen of the 200 children (58%) were in the "good to outstanding" outcome group, 50 (25%) were in the "medium" outcome group, and 34 (17%) continued to have significant difficulties. Some of the group with significant continuing difficulties were making very slow progress while a subgroup of those with significant difficulties, 8 (4%) of the children, were vacillating or losing capacities.

Floor Time Intervention Outcomes

	n = 200 %
Good to Outstanding	58
Medium	25

Ongoing Difficulties	17

Intervention Outcomes: Severity of Presenting Symptoms

To explore the factors other than the intervention program which might have been associated with outcomes, we looked at the distribution of outcomes and initial ratings on the Childhood Autism Rating Scale (CARS). In the “good to outstanding” group, 20% had 40 or more on the CARS, representing a significant degree of autistic difficulty; 43% had 35 to 40 on the CARS scores, indicating a moderate degree of impairment; 37% had 30 to 35, indicating a mild degree of autistic impairment. In contrast, in the group who continued to have significant difficulties, 70% had scores suggesting a significant degree of impairment, 20% had scores in the moderate range and 10% had scores in the mild range. The medium outcome group showed distributions between these two, with 45% having scores of 40 and above (significant impairment), 38% with 35 to 40, in the moderate range, and 17% in the mild range.

The distribution of the CARS scores suggests that the children with poor outcomes had a more extreme degree of autistic symptomatology and impairment than the group with the good to outstanding outcomes. The group with the medium outcomes was in between the two on the CARS. It appears that the severity of the presenting symptomatology is a factor in the developmental patterns associated with the intervention. In all the outcome groups, however, there was a distribution on the autism rating scale scores. In the good to outstanding outcome group, there were children with mild, moderate, and severe dysfunctions as well as in the other two groups. The single largest group of presenting patterns is in the CARS 35 to 40 in the moderate range. In addition, children who have presented with all different degrees of severity have made good to outstanding progress, medium progress, and continued to have severe difficulties. The degree of impairment in itself, therefore, is not an overriding factor, although likely an important one.

Chart Review of Children Receiving DIR$_{tm}$ Comprehensive Approaches and Traditional Approaches

We had the opportunity to examine the charts of a group of children we saw who had been receiving other interventions and had not yet implemented our recommendations. In order to compare the developmental patterns of children in a comprehensive, developmental, individual-difference, affect-based model of intervention with traditional approaches, therefore, we studied the charts of these 53 additional children whose parents came seeking additional ideas or second opinions regarding their child's intervention programs or diagnosis. They had been diagnosed with pervasive developmental disorder or autism, and for two or more years they had been receiving speech therapy, occupational therapy, and special education approaches or behavioral therapy. These children presented between ages 4 and 10, the same age range we assessed outcomes in the floor time intervention model. Their parents were also college-educated and a self-selected group seeking further evaluation and recommendations. Even though these children had similar diagnoses and comparable family characteristics, the patterns we could see in a comparison with the intensive floor time intervention group should be viewed as very explorative. The lack of comparative intervention studies for autistic spectrum disorders, however, makes such explorations potentially useful.

Thirty-one of the 53 children (58%) evidenced self-absorption, avoidance, and lack of ability to enter into chains of reciprocal interaction. While this subgroup intermittently evidenced some degree of pleasure in their relationships, they were not able to sustain pleasurable interactions. Some, intermittently, had fragmented use of ideation.

Twenty-one of the 53 children (40%) had some symbolic capacities, but with severe limitations. They generally could not use their islands of symbolic activity in a consistently creative and logical manner. For example, there were some concrete abilities to use words for needs, such as getting juice or getting the door open (words like juice or out, open, door). There were also some beginning elements of pretend play, such as feeding the dolly or putting the dolly in the car. However, there was no elaboration on these actions. Occasionally, they could respond to multiple choice questions. Often, however, they would be preoccupied with their own play, babble to themselves, or use ideas in a fragmented manner. They continued to be self-absorbed, self-stimulatory, and perseverative. This subgroup, therefore, tended to operate at a concrete, fragmented level of ideation, rather than an elaborative, creative, and logical one and was not yet consistently engaged.

One of the 53 children (2%) evidenced intact ego or personality functions consistent with the description of the good to outstanding floor time intervention group.

On the CARS, 43% of the traditional services group were in the severe range, 15% in the moderate range, 40% were in the mild range, and 2% no longer qualified for the diagnosis of autism.

Floor Time and Traditional Interventions Comparison Groups

	Floor Time %	Traditional Services %
Good to Outstanding	58	2
Medium	24	40
Continuing Significant Difficulties	17	58

Many children, even with years of intervention, are unable to function beyond the level of fragmented, concrete use of ideation and have significant difficulties in presymbolic relating and gestural interactions {Gillberg & Steffenburg 1987 569 /id}{Kanner 1971 570 /id}{Mesibov, Schopler, et al. 1988 573 /id}{Piven, Harper, et al. 1996 574 /id}{Rumsey, Rapoport, et al. 1985 575 /id}{Rutter, Greenfield, et al. 1967 576 /id}Szatmari, Barolucci, Bremmer, Bond, & Rich, 1989). The comparison group provides a picture of how some children with autistic spectrum diagnoses progress in typical programs. The comparison group, as indicated earlier, may be a self-selected group of children who were not making significant progress. Our impression, however, is that they were similar to children in many programs. Programs that can do significantly better than the above description of children receiving traditional services should be carefully studied to learn more about children's potential for growth and what types of interventions may be most helpful.

A number of the comparison children had been in intensive (over 30 hours per week) behaviorally based programs. While some of these children tended to have some use of ideation, and some academic abilities, they generally remained at the level of the fragmented and concrete use of ideation and were self-absorbed when not engaged in structured tasks {Greenspan & Wieder 1999 299 /id}.

Comparisons of Outcomes of 20 Children with ASD Receiving DIR$_{tm}$ Approaches and Typically Developing Children

Among the children in the good to outstanding group, we studied 20 of the children who had made the most progress. These children were studied in greater depth to understand the types of changes and potential of some children with autistic spectrum diagnoses in an intensive relationship-based intervention program. The Vineland Adaptive Behavior Scales {Sparrow, Balla, et al. 1984 568 /id} and the Functional Emotional Assessment Scale {Greenspan 1992 2 /id}{Greenspan, DeGangi, et al. 2001 303 /id} were applied to 20 cases that had made exceptional progress from the good to outstanding outcome group representing children between 5 and 10 years old (5—5 to 10—7). These twenty children were also compared to a group of similar aged children without any history of developmental problems. The intervention subgroup was selected to include a range of ages: five 5-year-olds, six 6-year-olds, four 7-year-olds, three 8-year-olds, and two 10-year-old boys. These children had all started intervention between 2 and 4 years of age and had received between 2 and 8 years of intervention and/or follow-up consultation. At the time of outcome, all were attending regular schools, enjoyed relationships with friends, and participated in community activities. Many had been assessed for cognitive abilities using standardized tests and were functioning in the superior range.

The Vineland summarizes adaptive behavior in the following three domains: communication (receptive, expressive and written); daily living (personal domestic, and community); and socialization (interpersonal, play and leisure, and coping). All the children were higher than age level in the communication domain with 60% scoring 1 to 2 years higher than chronological age level. The highest scores were obtained in the socialization domain where 95% were higher than age levels in socialization, with 25% more than one year, 40% more than 2 years, and 25% more than 3 years ahead of chronological age. The adaptive behavior composite scores which average all the domains reported above were all above age level except for one case, a child who had significant motor difficulties. Again, 60% of the children scored 2 or more years above age, and 30% between 1 and 2 years beyond age level. None of the children presented maladaptive behavior patterns. Even though the Vineland Adaptive Behavior Scales are limited to the practical and functional aspects of daily living, these findings support the good outcomes found clinically.

Further analyses of this data with regard to outcome age, age at onset of treatment, and initial severity (FEAS and CARS) is underway. Meanwhile, several additional observations are noteworthy. Overall, the longer the child was in treatment and the older the child, the higher his scores relative to his age, suggesting that children continued to function progressively better as they grew older. This was especially true for socialization where 90% of the children received scores 2 to 3 years ahead of age level. Furthermore, of the three domains, socialization was higher than communication and daily living 90% of the time. Typically, children with autistic spectrum diagnoses continue to evidence significant social impairments even when there is some progress in language and cognition. The social skills of the children may reflect the impact of an interactive affect-driven model of intervention where social—emotional goals received emphasis and supported the development of interpersonal, play, and coping skills measured by the Vineland. Also, expressive language abilities were better than receptive abilities in *all* the cases. Daily living was lower than communication 60% of the time, suggesting motor planning difficulties, which would affect daily living. Self-care skills are often more challenging for this population and improved somewhat less relative to the communication and socialization domains.

We also rated the same 20 children on a series of relationship and emotional dimensions using videotaped interactions with caregivers. We compared the intervention group of children with a group of children who had no history of language or emotional challenges and who were functioning both emotionally and intellectually at or above age level. In addition, we compared both the intervention group and the normal comparison group with a group of children who continued to have chronic problems in relating and communicating.

In order to make these comparisons, we used the Functional Emotional Assessment Scale (FEAS) (Greenspan, 1992a; Greenspan & DeGangi, 1997). The FEAS is a clinical rating scale that can be applied to videotaped interactions between infants or children and caregivers. The child is rated on the following dimensions: attention and regulation, engagement, affective reciprocity, complex purposeful interaction chains of behavior, functional, creative and imaginative use of ideas, emotional and thematic range, and logical thinking and problem solving. Raters have been trained to high levels of reliability for each dimension of the scale. The caretaker reliability ranges from .89 to .91 and the child reliability from .90 to .97 (Greenspan & DeGangi, 1997).

There were 20 children in the intervention group, 14 children in the normal comparison group, and 12 children in the continuing difficulties group within the same age range. Each child in each of the groups was videotaped interacting with a caregiver for 15 or more minutes. A reliable judge blind to the identity of the children used the FEAS to score all the videotapes.

The results were as follows. The floor-time intervention group was indistinguishable from the normal control group. Both groups were significantly different from the group with continuing difficulties. Specifically, in the floor-time intervention group, 113 of the 20 children scored 76, the top of the scale. The seven who did not score 76 were all between 70 and 75 (i.e., 73, 73, 74, 75, 70, 71, 72). The mean for the group was 74.8. In the normal comparison group, 12 of the 14 scored 76 at the top of the scale. The two others were 73 and 65. The mean for the group was 74.9. In contrast, of the 13 children in the group with continuing difficulties, seven scored below 20 and six scored below 40, with a mean of 23.7.

In addition, the judge attempted to use subtle observations of the children's affect, voice quality, pattern of articulation, and motor functioning to make an additional clinical judgment and figure out which group the children came from. The judge classified six of the floor-time intervention group as normal comparison group members, while classifying all the continuing difficulty group members correctly.

FEAS Outcomes

	N	MEAN FEAS 76 is optimal %	Range
Floor Time Intervention Group	20	74.8	70—76
Normal Comparison Group	14	74.9	65—76
Continuing Significant Difficulties	12	23.7	<20—40

The findings on the FEAS are consistent with the findings on the Vineland ratings. The FEAS clinical ratings are especially important, however, because they reliably rate such subtle features of personality functioning as quality of intimacy, affect expressiveness and reciprocity, creativity and imagination, and abstract, flexible thinking, as well as problem-solving and reality testing. All these high level personality functions are expected to be relatively permanently impaired even in children with pervasive developmental disorders who make considerable progress in their language and cognitive abilities. A subgroup of children who did exceedingly well in the floor-time intervention program were, therefore, able to obtain interpersonal, communicative, coping, and logical capacities quite similar to peers.

We chose to compare the children who had done very well as a subsample with a normal comparison group to also see if objective measures would validate the capacities these children appear to have mastered. If the children who had done extremely well were comparable to peers without developmental disorders, it would suggest, at a minimum, that some of the children who had an autistic spectrum diagnosis (suggesting chronic, severe impairment) could grow into patterns of healthy emotional, social, and adaptive behavior and that the adaptive behavior could be sustained.

Sequence of Improvement

Children who made progress tended to improve in a certain sequence. First to improve was the child's affect and pleasure in relating. Within the first 3 to 4 months we would usually see greater joy and positive affect, along with more consistent relatedness (e.g., seeking out parents and caregivers). Even children who had been extremely avoidant and self-absorbed would, after parents were playfully obstructive for periods of time, begin going over to their parents and signaling them with a look, smile, or pat on the knee. Some parents worried about being too playfully obstructive. "Won't he get mad at me if I get stuck behind the door?" Ironically, most parents were pleasantly surprised when their child after a while would push them to get stuck behind the door so they could play the same game again. By creating a problem for their child to solve through playful obstruction, their child could "undo" their parents' action. By providing a destination for their child's actions, their child could learn what to do next. This was very important for children who could not initiate and sequence purposeful behavior and interactions because of motor planning difficulties.

It appeared that the children appeared eager for emotional contact, but that initially they couldn't figure out how to achieve their goal. They seemed grateful when their parents had helped them find ways around their processing difficulties and avoidant tendencies to engage in greater social interaction.

Eighty-three percent of the children, which included children who progressed very slowly, initially showed improvement in the range and depth of their engagement and their pleasure and affect. Once engaged, the same 83% made their second gains in greater affective reciprocity. They moved from simple to complex emotional and motor gestures.

Long sequences of reciprocal affective interaction, where children would, for example, open and close 20 or 30 circles of communication in a row, led to the third area of gain—the emergence of functional symbolic capacities. Creative and imaginative symbolic elaboration and the functional use of language always followed presymbolic affect cueing and communication. Many children went through a transitional stage where they used words off of video or book scripts and then became more and more creative with their behaviors and gestures. If we overfocused on the words rather than the gestures and affects, we slowed down progress. Interestingly, children who remained rigid and stereotyped in their gestural interactions were often rigid and stereotyped as they learned words; for example, using scripts and ritualized language. Once a child became more flexible and creative in nonverbal gestural interactions (e.g., with a big smile, trick Dad by hiding the cookie in her hand), she would begin to use symbols more spontaneously and creatively.

As children became more symbolic many went through a stage of hyperideation. They could not stop talking, flitting from one idea to another. It was as though they were excited with their newfound gifts. There was a mixture of fragmented and illogical ideas, islands of pretend, some scripting (e.g., repeating of words heard on TV), as well as words to get needs met. Over time, however, 58% of the children were able to use their emerging symbolic skills both creatively and logically.

Most of the children could express their own ideas much more quickly than they could comprehend the ideas of others. Even children who initially had some understanding of others' language (for example, of simple commands) were still relatively more challenged by their auditory processing of incoming information than by their ability to express ideas. They knew what they wanted to say but inconsistently understood others. Even children who only very slowly were able to use words to express needs and wishes, and had, therefore, better receptive than expressive language, still evidenced greater challenges in understanding others and explaining their intentions. Even when they could tell you what they wanted (e.g., "go out play" and "give me juice") or do pretend play sequences with the dolls hugging and kissing, they would find it difficult to answer the abstract "what," "where," and "why" questions ("What do you want to do next?" or "Where do you want to go?" or "Why do you want to go outside?").

Eventually, with a great deal of interaction and affect-driven dialogues, the ability to abstract and comprehend the ideas of others emerged. Children did not get to this level unless their parents and the therapists focused on rapid, two-way symbolic communication. For example, it wasn't sufficient to listen to a verbal child and repeat what he said. Caregivers had to challenge their child to process incoming ideas (e.g., using affective tone, visual clues, multiple choices, and statements that inspired complex verbal responses to help children deal with more abstract dialogues). It required long back and forth exchanges rather than short, 30-second conversations (e.g., "Oh, you want to go outside? To do what? To play or kick the ball? Which one would be more fun?" etc.). Pretend play where the caregiver became a character who enjoyed verbal interchange was very helpful as well (e.g., "I'm hungry! I need something!").

The 58% of children with good to outstanding outcomes who became creative and logical were able to hold spontaneous, affect- driven, two-way, symbolic communication. As a consequence, they were able to learn to differentiate their internal worlds (Greenspan, 1989, 1992a). Logical thinking, impulse control, and an organized sense of self emerged. For many there were two steps in this process.

First, they learned to hold short creative dialogues that lacked a cohesive integrated capacity for thinking or an organized sense of self (e.g., islands of logical dialogue). Over time they learned to integrate and expand. The islands became continents and a cohesive, integrated sense of self and capacity for logic emerged. As a consequence, their academic abilities also improved as they became more flexible, were able to learn how to use functional logical exchanges, two-way thinking, to solve problems, and work together with others. Their peer relationships also improved but it required a great deal of practice—four or five play dates a week and access to very communicative peers in preschool and school programs. With dynamic, interactive academic learning in a warm, secure, organized setting, many of the creative and logical children developed average to superior academic abilities. In overly structured academic settings for most of their day, however, their academic progress was slower and they tended to remain more rigid, concrete, and rote.

For some children, the augmentative use of pictures, signs, and other symbolic equivalents were very helpful. For a small group of children who were unable to make the transition into the symbolic realm, we added more structured behavioral-oriented techniques as part of a broad, comprehensive program to improve capacities, to imitate gestures and then words. When combined with the dynamic, interactive floor time approaches, these behavioral strategies were more effective than when used alone {Greenspan & Wieder 1999 299 /id}.

Of the 17% of children who continued to have presymbolic difficulties (as well as symbolic), some made gradual, very slow progress, and 4% either showed decreasing abilities or vacillations between some improvement of function and loss of function.

Asperger's Syndrome

Individuals with Asperger's syndrome often have lots of rote language, but have deficits in affective reciprocity, the truly meaningful use of language, and in visual-spatial thinking. One can get the affective reciprocity mobilized by making interactions very compelling. This is a key to working with an adult or older child with Asperger's Syndrome. For example, there was a little boy who was lining up his cars and then having the cars race and giving repetitive judgments about the racing. We kept throwing in new twists to the plot (i.e., adding complexity and affective richness to the equation) by saying things like, "I don't think he deserves a '10'." He would then debate with us and we get very meaningful language with lots of affect.

With children with Asperger's, one should very gradually add affective richness, because these children are (like other autistic spectrum disorders) not likely to invest their thinking processes or their language with enough affect. But this doesn't mean that one simply has them label feelings or look at still pictures with feelings. Some interventions for Asperger's involve looking at pictures of people and then, from still pictures, identify what the "face" is feeling. Social group training may involve coaching these children to say things like, "Hello, how are you? My name is Leo. What's your name?" I don't want to poke fun at those approaches, but they don't go far enough. The core is getting the individual into an affective reciprocal interaction pattern where they can learn to read other people's real affective cues. For these children, the direct link from affect to motor planning and sequencing, which enables one to read someone's cures, is not well established. Therefore, we must create real learning opportunities. One has to probe the external world frequently to understand how another person is feeling. One can't just look at and register it from one probe (i.e., a still picture). One has to do this in a back and forth manner.

What do we do when we want to sample someone's affect? We smile and see if they smile back. If they don't smile back, we look a little sad ourselves to see what they do. We are always testing hypotheses without even thinking about it through the back and forth, affective reciprocity.

The individual with Asperger's needs to learn to do that through one-on-one affectively rich relationships with caregivers, therapists, and peers. Pictures or structured social exercises will not and do not go far enough. Instead of using a movie, one is using a single frame.

The other piece of the equation is the nonverbal learning problems seen in many individuals with Asperger's—the visual-spatial and motor planning problems. Here, too, affectively rich, interactive visual-spatial thinking exercises can be very helpful.

The current approaches to Asperger's syndrome are too much formed by what is often described as Asperger's type thinking. We need to inject more affect into the interactions. People who have been working Asperger's have made great contributions in understanding the nature of the problem. They have taken the first step in trying to correct the problem, but the first step isn't a complete step. The first step is currently, "Well there is problem with reading affect so show still pictures of affect." That's an advance over what was done before, but we need a moving picture and it has to be a live, human interactive moving picture (i.e., a real affective interaction).

Intensive Intervention and Traditional Intervention Programs

The patterns of improvement described in this chart review and in other intensive intervention programs are quite different from the traditional descriptions of autistic spectrum disorders. Autism has been viewed as a chronic disorder manifesting symptoms into adulthood (e.g., Gillberg & Steffenburg, 1987; Kanner, 1971; Szatmari et al., 1989). Some studies have suggested that selected areas of autistic behavior (Mesibov et al., 1989; Rumsey et al., 1985; Rutter et al., 1967), such as language and social behavior, tend to show more improvement than ritualistic, repetitive behaviors. A recent study (Piven et al., 1996) documents changes from their profiles at age 5 among a group of adolescents and adults. They showed relatively greater improvements in social and language domains than in repetitive—ritualistic behavior. In these studies, however, the vast majority of individuals continued to have significant autistic impairments. Even a small number of individuals who no longer had severe enough symptoms to continue to qualify for a diagnosis of autism retained many autistic traits. These studies suggest that autism is a disorder with chronic features, where limited improvement is possible in certain areas (i.e., communication and social behavior) and less possible in others (i.e., ritualistic—repetitive behavior).

In contrast, the present study of 200 children diagnosed with autistic spectrum disorders suggests that many children are capable of significant overall improvement. In fact, the children in the good to outstanding group ceased evidencing ritualistic behavior and became spontaneous and creative in their communication and relationship patterns. Motor planning, i.e., the ability to sequence behavior, did, however, improve more slowly than language and relationship capacities. It is possible that ritualistic behavior is related to motor planning and sequencing deficits and is intensified when children are under stress because they are unable to use reciprocal affective interactions to regulate and master social relationships as well as physiologic and affective states. The ritualistic behavior itself may be an attempt at regulation.

Therapeutic programs for such severely challenged youngsters have traditionally concentrated on trying to teach them language or selected cognitive skills such as making particular sounds, acting out various social conventions, or imitating certain actions—the sort of isolated actions without context that we call "splinter skills." But even when these children learn to construct sentences, tie their shoes, or bang on drums, their actions usually do not show the joyful spontaneity and zest, flexible problem solving, and emotional openness that should come naturally at their age. We have, for example, observed children with autistic symptoms in intensive behavioral programs (twenty to forty hours a week). Many, when they did speak, tended to exhibit a rote and stereotyped quality in their thinking, though we felt they had the potential for more creative, abstract thought, greater imagination, and closer peer relationships.

The results are very different, though, with a program like the one that revealed the true abilities of Cara, the year-old girl whose mother was concerned that she was developmentally delayed (see introduction). Such a program of emotional cuing, which begins at the point when the child turns away from her parents' smiles and overtures, exploits the role of emotion in normal mental development. It appears more effective in fostering healthy intellectual and emotional patterns than are strategies of direct cognitive stimulation (insert footnote). Using this approach, we have helped a number of children work around specific disabilities by wooing them first into relationships and then into countless emotional exchanges with a caregiver, often beginning with simple facial expressions and gestures.

One such child, whom I will call Tony, came into our program when he was eighteen months old. His parents had spotted something amiss almost as soon as he was born. He had arrived about a month prematurely, weighing only four pounds. Moderate cerebral palsy distorted the movements of his legs and, to a lesser extent, of his arms as well. He passed his first year withdrawn and undemonstrative, barely acknowledging the smiles and coos that were showered on him. Only with a great deal of effort did his gentle, indefatigable mother get him to respond a bit to her touch. He offered in return very few of the glances, giggles, and cuddles that make babies of his age so gloriously engaging. In fact, he hardly tried to communicate at all. His parents became deeply worried.

Approaching eighteen months without beginning to speak, Tony also acted a good year younger than his age. He uttered the odd sound now and then and moved about almost randomly. He crawled rather than walked and seemed to grow more vague and remote with each passing month.

With the specter of autism looming in their minds, his parents took him to one of the East Coast's most respected medical centers for evaluation. A child development expert noted serious social and cognitive deficits on top of his physical impairments. Tony would never function intellectually at better than an JQ of 50. This evaluator also diagnosed "severe pervasive developmental disorder"—in lay language, autism. The news horrified Tony's college-educated parents. Their beloved firstborn son appeared to be condemned to live in a dreaded borderland of incapacity and isolation.

Three years on, this prognosis suggested, Tony would have slipped ever further behind his less challenged age-mates. By that time his impairments would have locked him into a lonely, detached realm of repetitive, stereotyped actions, mental delay, and near exclusion of human relationships. He would be closed out of the world of friendships, learning, and hope for a satisfying future.

But Tony's parents looked further for help. Three and a half years into a program of treatment that focused on affective interactions, Tony, by then nearly five, was a different boy. He played happily with a circle of friends, engaged his parents and teachers in animated discussions, contested his bedtime with vigorous arguments, and asked and answered countless lively questions about why the world works the way it does. He fooled around with his baby brother, kicked a soccer ball with buddies, immersed himself in elaborate fantasy games about heroes and bad guys. In one discussion, which we were able to capture on a videotape documenting Tony's growth from eighteen months of age, he talked about wanting "that toy that Steven has," a smile lurking beneath his smirk. When asked why, he responded, "Because it's fun to play with." Queried further about how Steven would feel about giving up such a prized plaything, Tony answered with a giggle and a growing sheepish grin, "He wouldn't like it. He would be mad." More recently he has shown both his capacity for abstract thought and his appreciation of nuances of human behavior. When, in response to his father's trying to convince him that another child liked him, he commented, "Oh, he's nice to me, but that doesn't mean he wants to hang out with me." Standard JQ testing puts his verbal and cognitive abilities significantly above age expectations. With each passing year—he's now approaching ten—his mental and physical abilities have continued to grow. Though still somewhat hampered in his bodily coordination, he nonetheless generally enjoys the adventures of any little boy on the road to wholesome development.

Most of the autistic children we have worked with have made progress. Many, like Tony, eventually display real creativity and empathy, ultimately passing through the series of developmental stages described in Chapters 2—4. With our help, these children learn to interact with others first by connecting gestures and feelings, then words and feelings. Tony, for example, initiated his very first interaction when his father tried to turn a wheel the opposite way from the way he had been turning it. His look of protest and his defiant spin in the other direction began his enormous journey. Each of these children progresses at his own slower rate and has to work around severe problems in processing sounds, especially words, and often sights as well as touch and movement, but all of those who have made very good progress travel the same road and arrive at the same destination as other children, with the ability to think creatively and interact flexibly.

Working with these children, we found that the basic unit of intelligence is the connection between a feeling or desire and an action or symbol. When a gesture or bit of language is related in some way to the child's feelings or desires—even something as simple as the wish to go outside or to be given a ball—she can learn to use it appropriately and effectively. Until she makes that connection, however, her behavior and communication remain disturbed; indeed, the difficulty in making such connections constitutes a basic element of the disorder.

In therapy, we therefore use each child's own natural intentions and feelings as his or her personal foundation of learning. A boy trying to get out to the playground, for example, might constantly encounter adults pointing in the wrong direction. He eventually has to point in the right direction, or say something sounding like "Out!" in order to get someone to open the door. A girl who loves crashing one toy car into another might come upon an adult pushing a car that would make a dandy target. The hope of a noisy pileup is used to lure her into a cooperative "game" of hit-and-run. Tony's early use of words was often directed at getting his mother and occupational therapist to turn a chair he loved to spin on "more fast."

In another instance we used a child's rather alarming repetitive motion to communicate with her for the first time. This two-year-old girl neither spoke nor made any response to those around her, but would spend hours staring into space, rubbing persistently at a patch of the carpet. We saw in her abnormal repetition, however, not only a symptom of her autism but also a sign of interest and motivation—at least involving that little spot of pile. Perhaps it could serve as an opening wedge for emotional connection and, later, learning.

We had the girl's mother place her hand next to hers, right on the favorite stretch of floor. The child pushed it away, but her mother gently put it back. Again she pushed, again the hand returned. A cat- and-mouse game ensued, and by the third day of this rudimentary interaction, the little girl was smiling while pushing her mother's hand away. From this tiny beginning grew emotional connection, a relationship, and then thoughts and words. From pushing away an obstructing hand to seeking out that hand and then offering flirtatious grins and giggles, the child progressed to using gestures in a reciprocal nonverbal dialogue. When she began repeatedly flinging herself on her mother, the therapist recognized that this behavior gave her sensory pleasure. He instructed the mother to whinny like a horse each time her daughter lunged at her. Soon she was whinnying too, imitating her mother. Before long, she had started making her own sounds and then her own words. The therapist thus helped the mother stretch this sensation into a richer, more complex interaction. Over time, mother and child pretended to be neighing horses, mooing cows, barking dogs. As their imaginary menagerie became more populous, their social and emotional interchange grew more complex. It wasn't long before stuffed bunnies were fighting and hugging. Symbolic play led all the way to language and thought. Today, at age seven, this girl has a range of age-appropriate emotions, warm friendships, and a lively imagination. She argues as well as her lawyer father, and scores in the low superior IQ range. We have worked with a large number of such children and observed many of them make similar progress. In our recent study of over two hundred youngsters with autistic spectrum diagnoses undergoing this type of therapy, we found that between 58 percent and 73 percent have become warm, loving, and communicative (insert footnote 3).

Overview of a Comprehensive, Individualized Approach to Assessment and Intervention

In summary, a comprehensive DIR model for assessment includes a thorough assessment of the primary as well as the secondary clinical features of ASD and other developmental and/or learning disorders. This includes assessments of interactive relationships, emotional functioning, and family factors, as well as language, cognitive, motor, sensory, and physical factors.

The intervention must also be comprehensive and tailored to the individual child and family, because each child's developmental profile is quite unique (in spite of sharing selected common features). The intervention program must address all the elements of the disorder. It must especially address the primary deficits, which include problems in the capacity to engage in reciprocal interactions involving emotional signals, motor gestures and vocalizations; difficulty in maintaining continuing social exchanges to solve problems; and challenges in auditory, visual-spatial, and sensory processing, as well as motor planning and sequencing. Secondary features, involving language, cognitive, and social challenges, should be addressed in the context of an integrated approach, which builds on work with the primary deficits. Whenever possible, biological treatments should also address the fundamental primary deficits. Intensity is an important feature of a comprehensive program. This involves working and/or interacting with the child in a developmentally appropriate manner (i.e., interactions tailored to the child's developmental profile) during most of his waking hours. This is necessary because a child with this disorder is often unable to organize meaningful learning experiences on his own. At present, the vast majority of children with these disorders are not offered sufficiently comprehensive or intensive interventions. Research and demonstration programs should focus on comprehensive, intensive approaches and include comparative studies to determine what will work best for an individual child and family. The approach, however, should share the common features of working with the primary deficits in affective reciprocity and motor and sensory processing and implementing the program in a sufficiently comprehensive and intense manner.

Conclusion

We have explored the role of affect in the core deficit in autism and, in earlier chapters, the development of intelligence and social skills. In a sense, we have come full circle. We have discussed how children with autistic spectrum disorders may uniquely, for biological reasons, miss a critical developmental capacity, the ability to connect affect or intent to motor planning and sequencing capacities and, therefore, have a difficult time engaging in the long reciprocal chains of affective interaction so necessary for creative and abstract thinking and high-level social skills. We have also discussed how these same affective interactions underlie intelligence and social development. To improve assessments and interventions for children with a variety of challenges including autistic spectrum disorders, it is imperative to appreciate the role of affective interchanges in disordered and healthy development. The Developmental, Individual-Difference, Relationship-Based model (DIR) enables us to appreciate the role of affect in development by systematizing its dimensions (i.e., its functional developmental level, individual difference, and interactive relationship patterns) (Greenspan, 1992, 1997b; Greenspan & Wieder, 1997, 1998, 1999).

For More Information:

Greenspan, S.I. & Wieder, S. (1998). *The Child with Special Needs: Intellectual and Emotional Growth*. Reading, MA: Perseus Books.

Interdisciplinary Council on Developmental and Learning Disorders' Clinical Practice Guidelines: Redefining the Standards of Care for Infants, Children, and Families with Special Needs. Bethesda, MD: Interdisciplinary Council on Developmental and Learning Disorders. Available from: http://www.icdl.com.

ICDL Training Videotapes on the DIR Model and FloorTime Techniques with Stanley Greenspan, M.D. and Serena Wieder, Ph.D. [video]. Bethesda, MD: Interdisciplinary Council on Developmental and Learning Disorders. Available from: http://www.icdl.com.