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## **Autism Spectrum Conditions from a Piagetian Perspective: A Case Study**

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**ABSTRACT** - Developmental history, clinical observations and test data of a 15 year old male with ostensive autism spectrum disorder were compared to a theory of typical cognitive development of Jean Piaget. The comparison suggested conflation with certain Piagetian constructs, leading to a developmental arrest hypothesis. Implications, including possible therapeutic interventions for high functioning autism, were discussed.

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**A**utism is a neuroanatomical, behavioral, social, and developmental disorder. An effulgent understanding of autism will require both parallel and integrated progress in each and all of these areas of inquiry. Moreover, an integrated multidisciplinary explanation of autism must account for the wide variation in symptomatology both nomothetically and idiographically, the so-called autism spectrum.

Developmental research on autism has yielded data indicating that there are age-related changes in symptom expression (McGovern & Sigman, 2005). Obviously, classifying an individual with autism implies symptoms that vary from those of the normally developing child. There have been limited comparisons of autistic development with theory and facts related to a theory of normal cognitive development.

Jean Piaget, perhaps more than any other theorist, has provided concepts and principles that guide understanding of developmental cognitive change (Genovese, 2003). These changes occur in a particular sequence and at predictable ages that have been documented across cultures; some of these cognitive milestones even appear lawful in non-human primate species (Brainerd, 1978). Comparing cognitive symptoms of autism to Piaget's notions

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of cognitive change would place symptomatology in a developmental context and may be enlightening as to possible therapeutic implications. Prior research and theorizing in this domain has been limited basically to Piagetian sensorimotor functions (e.g., Sigman & Ungerer, 1981) and categorization (Ungerer & Sigman, 1987). Of note however, over twenty years ago Morgan (1986) suggested a linkage between a Piagetian sequence of cognitive development and autism with perceptual functions following a normal pattern and operative (rational, conceptual) intelligence following a more atypical pattern. Subsequently, there has been only sporadic interest in a possible connection between Piagetian theory and autism spectrum disorders.

No studies have been reported using a case study approach in the investigation of a possible confluence between Piagetian notions and cognitive development in autism. This methodology has the advantage of providing a more detailed context for exposition of clinical problems than the nomothetic, group research strategies. It can also be argued that the case report includes information of greater practical interest and significance to clinicians (see Howard, 1993). The participant in our study has a rich personal developmental history in relation to presenting clinical features; the intensive study of the individual can reveal nuances and phenomena that are concealed or lost when data are collapsed across participants in group comparison investigations. These "unique particulars" may be a conduit to an eventual understanding more generally how persons with symptoms of autistic spectrum disorder can differ from one another (see Silverstein, 1988).

## **Background**

The client is a 15 year old male. His history is replete with social interaction and communication deficits in the context of unimpaired intelligence. Despite a language delay (see below) he was diagnosed with Asperger syndrome. However, an ostensive delusional system led some mental health professionals to question the autism spectrum classification and consider the possibility of a schizophrenia diagnosis.

### *History and clinical observations*

The pregnancy was remarkable for 48 hours of bleeding that occurred during the first trimester. The client was born at seven pounds, five ounces, six weeks premature. The infant was limp with no movement and barely squeaked in the place of breathing or crying. He had a blue appearance and received oxygen for low blood sugar level. He was jaundiced and had a complicating intestinal infection. The mother did not ingest licit or illicit drugs during pregnancy nor was there exposure to other possible teratogens. Psychomotor development was delayed in a number of areas but he did walk at 13 months of age. Subsequently, the patient had a series of ear infections with tubes inserted at six years old. His biological mother indicated he did not utter his first words until 30 months of

age. He had a strong family history of Attention Deficit Hyperactivity Disorder (ADHD), learning disabilities, and autism spectrum disorder. The client's initial diagnosis was ADHD at the age of three; he began psychostimulant medication at four years of age. He was later diagnosed with Asperger syndrome at age nine and was assigned that appellation thereafter by several treatment professionals. At age 14, and approximately six feet tall and 200 pounds, the patient began to evince conduct problems: Difficulties in the inhibition of impulses (touching females inappropriately), repetitive, maladaptive habits (excessive use of computer games, excessive eating that included rummaging through trash cans to find discarded food), and aggressiveness (pulling hair, kicking, hitting, throwing and breaking objects, yelling and swearing) He also became increasingly enmeshed in an "other world" fantasy life. As this deportment escalated, concerns were expressed that the "other world" might represent a thought disorder and that schizophrenia had been misdiagnosed as Asperger syndrome.

The client was then referred to the authors for a multidisciplinary evaluation (clinical child psychology, psychiatry, clinical neuropsychology) for the purpose of diagnostic clarification. Both the parents and the client signed an informed consent document delineating risks and benefits of the evaluation and gave permission for submitting the collected information for possible publication. Specifications were made regarding the handling of confidential information and maintenance of the client's anonymity.

The client was observed to see people as "things," "objects." He showed no interest in the activities of others; he did not share his possessions unless specifically directed to do so; he literally had no friends. He acted confused by nonverbal social cues and the use of humor; he ended conversations by abruptly walking away. He was found to be bright for "bookish" kinds of things with poor eye contact, motor-coordination problems and an utter lack of social skills. He was found lacking in the ability to take another's point of view or to hypothesize about their internal states. He had a tendency to particularize; to look at others on separate occasions as if they were different people. He was unable to see anything in the abstract. He was obsessed with comics and games. The comics were actually complicated maze-like games that he, himself created. His moods were irritable and generally restricted; he would become highly animated when frustrated, raising his voice and hitting his head with his hands. His words were enunciated slowly and laboriously with impaired articulation and prosody. The dysfluency took the form of improper accent on certain syllables, incorrect phrasing of words in a series, pacing of the speed of word sequences, with a stammering quality to the uttered phrases. Communication through writing was superior to that of speaking. His greatest communication deficiencies were in expressive language. He tended to think in pictures; he would prefer to communicate in pictures rather than words although he had exceedingly poor graphomotor skills. He walked with a long, stiff-legged stride that was very

rapid; he never walked parallel with someone else; he always walked ahead with alacrity.

### Test Findings

A battery of psychological and neuropsychological tests was administered. He performed in the above average range on the Wechsler Intelligence Scale for Children III (WISC-III; Wechsler, 1991) (Full Scale IQ = 116), with above average performance on verbal measures (Verbal IQ = 110), and superior performance on nonverbal measures (Performance IQ = 120). His Index scores in order of magnitude were: Perceptual Organization (132), Freedom from Distractibility (112), Verbal Comprehension (107), and Processing Speed (104).

Data from the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984) indicated ratings in the impaired range with particular difficulties in establishing and maintaining relationships with peers. He also demonstrated an inability to coordinate and generalize across tasks. For example, he was unable to set a table unless provided with separate, sequenced instructions to place each individual item on the table; that is, instructions had to be given for arranging plates, then knives, then forks, then spoons. This is in accord with data from the psychological assessment indicating the client is deficient in his ability to synthesize or abstract information across multiple experiences. This suggests "weak central coherence," in which information is processed in a segmental or piecemeal fashion (Happé & Frith, 1996). This is also consistent with Baron-Cohen's notion of "systemizing" (Golan & Baron-Cohen, 2006). Nevertheless, and interestingly, *within* certain intelligence tasks comprising the Perceptual Organization factor of the WISC-III, he showed elevated capacities for analysis, synthesis, logical reasoning, and concept formation.

The client's attentional abilities were intact; his memory functions were commensurate with measured general intelligence. In the domain of language, he was significantly impaired in pragmatics, referring to the social aspects of linguistic functioning, including nonverbal communication, contextual issues, message repair (awareness of communication breakdown; consideration of listener needs), and appropriate pausing. Receptive language skills were in the superior range; expressive language (e.g., expressions of intent) was in the average range. These communication problems may represent impairment in "theory of mind," a complicated notion that refers in part to the individual's inability to understand mental states in others, together with self-absorption, lack of empathy, and perspective-taking deficiencies (Baron-Cohen, 1995; Frith, 1997).

Overall, he evinced executive function difficulties in inhibition and shifting, in changing focus from one mindset to another, resulting in trying the same wrong approach to problem-solving repeatedly despite negative feedback about its efficacy. He also showed deficits in regulating behavior across tasks and settings. Most importantly, his performance deteriorated precipitously when

asked to perform broad tasks for which very limited structure was provided (elaborated below).

Data from the Minnesota Multiphasic Personality Inventory-Adolescent (MMPI-A; Butcher, et al., 1992) allowed a possible window to the internal world of the client. The valid MMPI-A profile, completed in only 26 minutes, suggested an individual who feels alienated from others, who thinks of himself as being misunderstood, who distrusts and is suspicious of others, and hence avoids being around people. He also endorsed items suggesting bizarre experiences, apparently related to his fantasy life (delineated below).

### **Piagetian perspective**

The client displayed social, communication, and cognitive deficits characteristic of persons with autism spectrum disorders. His construction (cognitive representations) of his interpersonal world seemed replete with persons and events that are threatening if not repulsive. In Piagetian terms, he has developed a schema (thought structure) into which social events are assimilated with distortion such that the social world is rationalized as a threatening place to inhabit (see Piaget, 1950; Phillips, 1969).

It can be argued that lags in development or pathology of brain structures have produced this distorted cognitive social schema. Pathology of the Amygdala found in autism spectrum disorders for example may relate to misperceived danger and the tendency to mistrust and avoid others. Dysfunctions of the Superior Temporal Sulcus may affect misattributions of hostile intent from others. Thus the schema that guides social behaviors may have been constructed on the basis of distortions from pathological neuroanatomical structures (Pelphrey, Adolphs, & Morris, 2004).

From a Piagetian viewpoint, a cognitive schema is accommodated as brain maturational factors interact with socially-generated information, especially as the result of social transactions with peers. Conflicts and arguments as well as more prosocial interactions, force the child to re-examine thought structures in which assimilation predominates until eventually thinking becomes more flexible and adaptive. In autism, brain pathology may interact with inadequate social learning opportunities (as the child isolates him or herself) to produce social and communication dysfunctions. According to parental reports and professional observations, the patient showed no interest in the activities of others; he did not share his possessions unless specifically directed to do so. He did not respond positively to the good fortune of others; he did not refrain from doing or saying things that might hurt or embarrass other people; he did not initiate conversation on topics that might be of interest to peers. He was confused by nonverbal cues and the use of humor and he ended conversations by abruptly walking away. He simply did not interact; he literally had no friends.

### **Developmental Arrest Hypothesis**

In Piaget's theory, abnormal development refers to an arrest or fixation, a failure to progress through the hypothesized stages of cognitive growth. It can also relate to a progression through cognitive stages at a rate that is slower than normal (see Wenar, 1982).

It is posited that the patient has developed cognitively to the extent that he has acquired certain logical mental operations (logical reasoning processes) and commensurate knowledge leading to above average to superior measured intelligence. He is limited however, in only being able to apply his logical operations with the aid of environmental inputs. This is congruent with the cognitive limitations of the Piaget's concrete operational stage, characteristic of the average 7 to 11 year old child (Piaget & Inhelder, 1969). He cannot divorce himself from outside stimuli and still think and reason logically at a comparatively elevated level. When the patient was asked in the psychological testing to write an essay, he was tacitly required to generate thoughts and put those thoughts into words. Under such conditions, without the opportunity to rely on concrete objects or environmental stimuli, he began hitting himself in the head with his fist, exclaiming that he was unable even to begin the task. With encouragement, and the suggestion to consider the meaning of each word in the written essay instructions, he was eventually able to generate a single sentence concretely related to the task instructions. Nevertheless, the client's superior score on the Perceptual Organization Index of the WISC III, compared to average functioning on the other indexes (above), supports the hypothesis that the client can apply higher order cognitive processes when sufficient environmental structure is provided. Perceptual Organization includes the ability to interpret and organize visual stimuli, and to apply reasoning processes thereto. With adequate environmental structure, the detail-oriented, piecemeal mental processing can apparently be superceded with logical, abstract mental operations, characteristic of Piaget's concrete operational stage of cognitive development.

More fundamental to the understanding of the client's development is that he seems to maintain more pervasively the egocentric orientation of the young child (Piaget's preoperational stage, from 2 to 7 years of age). Reality is what it seems to be; the child forces reality (assimilates) into her or his own way of thinking; faulty perceptions are not corrected by logical mental operations. This involves rigidly applying thought schema and not accommodating those structures of thought consistent with feedback. The patient is unaware of the effects of his own communication on others. The apparent fixation thus precludes "sociocentric" thinking in which the individual can understand and contemplate the perspectives of other people and accommodate or change cognitions to fit the situation and meet interpersonal demands. A person with childhood egocentrism may act aggressively and in other antisocial ways because relationships are not reciprocal and the individual's antisocial actions are not impeded by concerns about pain and distress in others. The preoperational thinking is also

"transductive," dealing with parts rather than wholes, reasoning from particular to particular without fusion (Piaget, 1959). It can be posited that "weak central coherence" and "theory of mind" problems discussed above are part of a general arrest in Piaget's preoperational stage.

The client's escape into the "other world" corresponds to the make believe of the preoperational child, detached from real life situations. Consider his verbatim account of this imaginary world: "I bonded with Lugia; since then he has been my guardian. We have been bonded strongly though we rarely argue. He was the one who saved me when I fell from the hay barn. Don't assume that I am making this up because what no one can see, I can sense. Before he died, I saw that he was not himself. He was pure black and had burning red eyes. He had dark blue-purple eyes and silver skin. He had betrayed me. All he ever wanted from me was power. Lugia attempted to escape after he shot an energy blast at Krystal which (sic) was intended for me. I slew him; I had to. If he had gotten away he would have destroyed the other world. This is the truth. If you find this unbelievable, then you don't know me very well. I have told my story."

## Discussion

There seems to be little debate that the case study approach is valuable and offers needed methodological diversity in psychological research (Pion, Cordray, & Anderson, 1993). However, it should be noted that the intensive study of the individual is accomplished at the expense of reduced external validity, the capability of generalizing findings to other settings and people (Carlsmith, Ellsworth, & Aronson, 1976). Among such problems in a clinical case report is that measured psychological characteristics may combine idiosyncratically in the case participant (see Allport, 1962 for discussion of idiographic or morphogenic issues in personality research). Theoretical inferences from data gathered from a single individual should be made with circumspection.

Criteria for the diagnosis of "Autistic Disorder" from the Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> edition (DSM-IV; American Psychiatric Association, 1994) include (a) qualitative impairment in social interaction, (b) qualitative impairment in communication, and (c) restricted repetitive and stereotyped pattern of behavior, interest, and activity. One distinguishing DSM-IV feature for Asperger disorder is the absence of a clinically significant general delay in language development.

The client's impairments in social interactions, and communication, together with circumscribed interests and activities, would seem to qualify him for inclusion on the autism spectrum continuum. Additionally, he conforms to other empirical data congruent with this classification: Problems in the core areas of central coherence, theory of mind, and executive functions. His above-average to superior intelligence would place him as high functioning; higher performance than verbal intelligence together with a language acquisition delay would argue against an Asperger classification. Additionally, there are data suggesting that



individuals with Asperger syndrome can be demarcated from autistic persons in their desire for social contact (Frith, 2004). Behaviorally, and in terms of responses to self-report inventories, the patient was aloof and socially avoidant. Concerns about possible schizophrenia as an optional or concomitant diagnosis were based mainly on what appear to be changes in autism symptoms that occur with adolescence. What might appear to be a delusional system is not seen as an actual thought disorder in that there is a logical and orderly connection between and among thoughts (see Lainhart, 1999). Moreover, the "other world" is a lifelong, idiosyncratic imaginary story that was increasingly elaborated with age. Autistic disorder (high functioning autism) seems the most reasonable diagnosis.

Certain aspects of autism spectrum disorder reported here have not been addressed in prior literature. It has been repeatedly noted that persons with autism tend to evince regulated behaviors with reference to the consistency and predictability of the environmental setting (Golan & Baron-Cohen, 2006). Our test data take these observations a step further to suggest that certain higher cognitive functions may remain dormant unless facilitated by palpable environmental stimuli. This is a hallmark of Piaget's concrete operational intelligence, viz., that logical mental operations are only applied in the presence of stimuli that impinge on the sensory organs. If such a finding can be verified with individuals classified as high functioning on the autism dimension, it could account for difficulties encountered in generalization of learning from treatment conditions to other settings (Baron-Cohen, Richler, Bisarya, Gurunathan, & Wheelwright, et. al., 2003). That is, learning of autistic individuals may be specific to stimuli encountered in the initial learning situation alone. Golan and Baron-Cohen (2006) posit that problems in generalization of learning actually result from a cognitive strength in autism, that of *systemizing*, the process of analyzing and constructing systems. Systemizing requires extreme attention to small details in order to understand how a system works; this may also characterize the prepotent "leaning style" of persons with high functioning autism. The individual actually resists grouping stimuli conceptually because of potential loss of information given even minute functional differences between and among specific system elements. Hence there is unlikely to be a conceptual transfer of learning. (Golan & Baron-Cohen, 2006)

The systemizing formulation does support the notion of environmental "stimulus control" in evoking reasoning skills, and in that sense would be consistent with the Piagetian view on concrete operational intelligence. The notion of hypervigilance in attending to and processing information from specific details and avoidance of conceptualization and abstraction would be discordant with Piagetian operational thought. The patient's superior performance on the Perceptual Organization Index of the WISC III suggests that reasoning processes beyond specific details were extant. For example, his highest scale score was on Block Design that involves tangible stimuli that can be seen and handled, and requires analysis, synthesis, inductive reasoning and nonverbal concept

formation (Sattler, 1992). Systemizing and hypervigilance to detail would actually curtail performance on this subscale. This suggests that Baron-Cohen's systemizing propensity can be superseded by abstract reasoning, at least under certain conditions.

The developmental arrest hypothesis proffered includes the possibility of a fluctuation of elements between preoperational and concrete operational processes. Autistic difficulties in recognizing and understand complex emotional and mental states has been attributed to problems in the integration of cross-modal information (voices, faces, context). The preoperational inability to consider two dimensions simultaneously (e.g., failure to conserve) may account for the problem in cross-modal integration. The hypothesized developmental arrest with elements of preoperational cognitive impediments (inability to consider two dimensions at the same time) concatenate with difficulties in the understanding of complicated emotional and mental conditions.

Finally, viewing the patient's cognitive and interpersonal dysfunctions within a Piagetian framework may be the source of hypotheses for future research. It is possible, for example, that the patient is in a state of dynamic change with components of preoperational thought mingling with elements of concrete operations. According to Commons and Richards (2002) such fluctuations among stage elements may be precursors of a stage transition. The patient in this case study might be in a condition of readiness such that a gradual exposure to peer influences in a group therapy modality might facilitate a "decentering" from his own egocentric reality to consider another's point of view and ponder reality from differing perspectives (see De Lisi, 2002). Indeed, there are data indicating an association between reduced symptomatology and involvement with peers among adolescents with autism (McGovern & Sigman, 2005). Such accommodations would also, in theory, reduce fragmented processing of details and produce a more pervasive processing of integrated wholes as the individual transitions to a more cognitively elevated Piagetian stage.

Therapies based on a Piagetian framework would also emphasize behavior first (e.g., rehearsal of social behaviors) and cognitive change second. Persons with high functioning autism would be encouraged to role play an important social skill, or engage in "homework action assignments" followed by mental reflection, analysis, and conceptualization. Actions are sources of knowledge. Neuroanatomical findings related to connections between motor areas of the brain and brain structures involving higher cognitive functions, support this Piagetian-inspired therapeutic modality and may foster cognitive stage progression (see Favre and Bizzine, 1995 for further discussion).

Similarities between Piagetian stage constructs and age-related autistic symptom expression are intriguing but of course, do not constitute corroboration. It is noteworthy that our findings do converge with the earlier work of Morgan (1986). But it obviously remains to be seen whether Piagetian notions and the hypothesized fixation or intermingling of preoperational and concrete operational

cognitive processes will aid in the understanding of autism spectrum disorders. It seems reasonable to assume that persons with higher functioning autism (normal general intelligence) would have recursive and reflective thinking sufficient to benefit from the therapeutic approaches delineated above. The question remains regarding autistic social cognitive schemata, related neuroanatomic anomalies and amenability to Piagetian-based therapeutic interventions.

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