

Accessing and Assessing Intelligence in Individuals with Lower Functioning Autism

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Abstract

While standard testing should be included in a comprehensive assessment of non-speaking and lower functioning children and adults with autism, its limitations with persons with severe autism must be recognized. Researchers should be knowledgeable about the limitations of test-based IQ and mental age scores in this population, so that the results of their experiments will be interpreted accordingly. The use of non-standardized approaches to assessment should be encouraged and accepted in the development of educational programs and assignments in classes, to assist in identifying the modifications that need to be made to facilitate initiation and execution of appropriate responses. Individuals with autistic spectrum disorders who are described as "low functioning" have severe behavioural and communication problems which typically result in their being considered "unstable." Yet psychological assessment with standardized tests is often requested to determine their "level of cognitive functioning." Educational settings generally require such assessment for class assignment and programming; funding sources require it for allocation of funds. And researchers use performance on standardized tests to select and describe subjects and to determine appropriate control groups.

This paper will address the issue of autism and testability in assessing intelligence in individuals with low-functioning autism (LFA). In so doing, it will also address the likely covariance of autism and type of cognition. That is, individuals with autism may perceive and/or make sense of the world differently than people who are not autistic. If so, how are we to describe or measure mental functioning that may be very different from our own, with tools that have been created by our kind of thinking for measuring our kind of thought?

There are, without question, some very good reasons to use (or to attempt) standardized testing, and for including it in a comprehensive assessment. I will argue, however, that in both clinical work and research, it is important to understand the limitations of standardized testing in accessing and describing the way an individual with LFA "thinks", and that the search for additional and more valid approaches should be of high priority.

Why Use Standard Tests?

The most common argument in favor of using standardized tests is that the results provide a valid picture of the extent to which the individual can handle the average expectable intellectual demands appropriate for his or her chronological age. The argument would be that it is in our world that the autistic individual must operate, and that the scores obtained give a valid picture of his or her capacity to do so.

Generally, of course, individuals with LFA, by definition, will have already demonstrated significant "functional retardation". It therefore will not come as a surprise that they do not appear able to think and/or perform the way their age-mates do when faced with a sampling of the kinds of demands for thought and performance one must meet to cope with our world. On the other hand, some individuals do respond well to the testing situation, e.g., the presentation of structured tasks that one at a time tap isolated functions, in a quiet, uncluttered setting. Their success in coping with certain testing materials and tasks may help to identify the specific area(s) of functioning in which the individual can respond as required. This then can provide a point of entry for programming; or provide confirmation and/or educate caretakers and clinicians about the individual's strengths. NON-standard administration of standardized tests can be particularly useful, in this regard. With it, one can find out the prompts and cues that might lead to a correct response. The kind of training, or break-down and rearrangement of the stimuli from which the individual benefits, can give some insight into how he or she learns – or, at least, how the individual can be enabled to perform as if he or she thinks the way we do. This qualification is important: in some cases, an individual with autism may be able to give or to learn the correct response, but that response may not have the same meaning or implications, nor reflect the same thought processes, as would a similar response from a non-autistic individual. Thus, with standard tests, and both standard and non-standard administration, we may find out whether the individual can adapt to our world, and whether, and if so, how and with what modifications that individual can learn to do so. In this, however, we would be wise to pay special attention to the modifications that were required, and make inferences about the kind of processing that would have allowed them to be effective. For our goal should be as much about understanding the thinking style of the individual with LFA as about his or her ability to understand and adapt to ours. A valid assessment and understanding of the former, if it could be achieved, might greatly assist us in communicating with the individual,

and in interpreting his or her behaviour. It would help ensure appropriate education, programming, parenting and treatment, and it would help inform us about the fundamental nature of autism, and about the characteristics of its various subtypes.

Why Intelligence Tests May Not Measure "Intelligence" in Individuals with LFA

Autism and testability

Autism will profoundly affect what a person says and does on an intelligence test. The more autistic an individual is, the less likely it is that he or she will appreciate the significance of, or be able to respond as expected, in the testing situation. The more autistic an individual, the less likely it will be that we can gain access to, and to assess, his or her mental processes.

Unfortunately, the concept that autism significantly affects testability, is not always kept in mind in both clinical work and research. Rather, it is often taken for granted that the non-speaking and/or non-attentive individual with autism is non-cognitive, non-verbal and unaware, and that the severe behavioural difficulties that may render the individual "untestable", denote lower intelligence. The low scores of these individuals on standard tests of intelligence appear to "confirm" this supposition. In some cases, the suppositions may be true. In many cases, however, people who "know" the autistic individual will suspect, or feel certain that there is much more awareness and thought than the tests have been able to access and reveal. Why is it so hard to know for sure?

Typically, psychological testing is a one-on-one social situation which requires communication and performance. Because the individual with LFA has severe problems in all these aspects of the testing situation (i.e., social, communication, and performance), it is very difficult to know how to interpret both apparent failure (incorrect response, refusal, or failure to attend) and success.

Thus, for example, an item may be "failed" for any number of reasons. The individual: may not have understood the instructions (verbal or non-verbal); may not appreciate that one does something when, or just because, it is requested; may not be motivated by a desire to please; may be confused, or made anxious by successive presentation of tasks that are foreign to his or her natural style of learning and responding; may have the correct skill in his or her repertoire but not connect it with the specific task on which (s)he is required to demonstrate it — i.e., the task, or the need to perform it, may not have meaning for the individual in this particular situation, though in another context, the skill which it requires may be spontaneously demonstrated; may not perceive the task the way we do — for example, the individual's perception of what is salient about the task may be very different from

ours; may be apraxic (unable to initiate or organize certain movements on command); may need verbal cues on tests which are administered non-verbally. (With respect to the latter, it is interesting that many non-speaking autistic individuals have great difficulty understanding the requisite non-verbal administration of the new Leiter Performance Scale, while in some cases, adding verbal instruction greatly enhances their ability to perform the task.)

Examples of problems faced in interpreting poor performance

The following are three examples of the problems faced in interpreting poor performance, in a testing or classroom setting:

Since his entry into our school system two years earlier, a young man never uttered a single word in class, could barely make a scribble, engaged in virtually no adaptive behaviour, hit other students and teachers, and disrobed. He was therefore isolated in a cubicle where, in a one-on-one situation, he was given – all day – pre-pasted pieces of paper to slap onto another sheet to make a "collage". During a home visit, however, he was observed to read aloud, at a fourth grade level; attempt to write his name; and, to clear the table and wash the dishes, independently, when asked to do so. Given a frame in which blocks could be inserted, and asked to match the picture on the top of the block with the picture posted on the frame, directly above the point for insertion, one adolescent boy inserted blocks totally at random, although with apparent interest in the task. Even as simple a match as a colour match (place a red block under a picture of a red square) was failed as he perseveratively placed blocks in the insertion area, in a random manner. Did this mean that the young man could not match colours? In this case, such an interpretation would be premature, and, as it turned out, incorrect. In another matching test, in which matching involved only two-dimensional pictures, he had no difficulty at all performing the task. Possibly, in the earlier test, the salient and compelling feature for the young man had been the neat fit between the block and the frame. Or perhaps, he could not match, or appreciate the demand to match, a three dimensional object to a two-dimensional picture.

Another young man seemed unable to complete a three form formboard (triangle, square and circle), even after much hand-over-hand assistance. He seemed willing to try, and did not resist the hand-over-hand help, but made no progress in learning what to do and how to do it. Over and over again, he attempted to place the wrong forms in the cutout areas. It also seemed that he could not manage the fine motor coordination required to place the form in the formboard. As I turned from him to speak to his teacher, however, I observed the young man, from the corner of my eye, easily complete the puzzle with smooth, competent, precise movements.

Examples of complications in interpreting success

There are complications, as well, in interpreting success. For example, the individual may "know" or have learned the correct response, but not be able to translate the knowledge suggested by that response, into meaningful action in the real world. This is a commonly identified feature of many autistic individuals — the ability, for example, to perform certain mathematical calculations but not apply them to everyday circumstances such as counting concrete items or making change.

Three pictures (a boy picking up a banana, peeling a banana, and eating a banana), are presented in random order, to a non-speaking adolescent, with the instruction to put them in the right order to tell a story. The young man merely collects and stacks the cards. The correct order is then demonstrated. The cards are mixed up again, and placed before the youth, with the instruction to put them in the right order. Again, the young man simply stacks the cards. The demonstration is repeated, this time, labelling each picture and describing the sequence, as follows: "See? Here the boy picks up the banana; then he peels it, then he eats it!" The young man is given another chance. Again, he just stacks the card. Finally, the assessor says, "Jerry, which card is FIRST?" Jerry picks the correct card. "Which card is SECOND?" The correct card is placed down. And finally, "Which card is THIRD?" The remaining card is placed down. Somewhere, Jerry had been taught or had learned the meaning of "first, second and third", in relation to position, and these words could be used to prompt the "correct" response. However, whether, and if so how, Jerry understood the request for sequencing, the notion of sequencing, the meaning of the pictures, etc., remains in question.

The Need for Prompts

There is increasing mention in the literature of the effectiveness of prompts in eliciting behaviours which might not otherwise be observed (Bowler & Briskman, 2000; Bowler, Gardiner & Grice, 2000). There is also increasing mention of intentional apraxia, and oral motor apraxia in relation to speech (Prizant, 1996; Seal & Bonvillian, 1997). The observed effectiveness of prompts and cueing suggests that, at least in some instances, a specific capacity may be in the individual's repertoire, whether or not the individual ever would be inclined or able to use it. It will not be activated or observed, unless the means are found to tap, cue, prime or "facilitate" it. Such procedures are not part of standard testing, and will not be credited in a formal score. That the formal score accurately reflects the individual's performance under the testing conditions, is not in dispute. What is in question is whether this gives us an accurate picture of the way the individual is thinking, or might be able to think, and perform, under other conditions.

Developmental versus Deviant Progression

Standard tests are built on a developmental model. Items in IQ tests are arranged in order of increasing difficulty and complexity based on the normal sequence of maturing cognitive development. There is no place or score for deviant development. There is yet to be consensus on the question of whether cognition in autism follows a developmental versus deviant course, and this would be difficult to determine, in any case, because of the testability considerations discussed above. Certainly, however, there is a strong possibility that, in at least some subtypes of autism, cognitive development will be markedly atypical, so that both the successes and the failures of an autistic child in any realm, may not reflect the same thing as the successes and failures in a normal or non-autistic delayed child. When cognitive development is deviant:

- It would not be possible or meaningful to assign a developmental or mental age;
- The apparent developmental level in one area of functioning might not predict developmental levels in others.

Hence, a test that is geared to a particular age range could not be used to gauge the full range of the individual's functioning. One would need to draw items from several tests standardized for different ages. As a result, one cannot supply the standard scores and IQs that are often requested.

Covariance of Autism and Cognition

It is an interesting fact that, in the diagnostic schedules (such as the DSM-IV) most often used for diagnosing autism, there is no mention at all about the nature of the individual's cognitive functioning. That is, one presumably can diagnose autism without considering how the individual thinks. That autism and cognitive functioning may be independent is also implied in the stated preference, by some researchers, for studying only "high functioning autism" (HFA), so as not to "confound" autism with retardation. But is the cognition in HFA really the same, or in all cases the same, as the cognition of individuals who are not autistic (Lincoln, Courchesne, Kilman, Elmasian & Allen, 1988)? Is the apparent retardation in HFA the same as or different than that of the non-autistic individual with mental retardation? (see Janzen, 1996, chapter 2, for review). Might not there be certain subtypes of autism where the quality of cognition is part of what defines the autism? Might not there be different subtypes of autism, defined at least in part by the specific nature and extent of cognitive differences involved? There have been beginning probes on cognitive functioning in autism which promise to advance our understanding of the nature of autism itself and of subtypes of autism (Carpenieri & Morgan, 1994; Gordon, 2000; Lincoln et al., 1988). However, as recently stressed in the literature, because of the many faces of

autism, and the testability issues raised above, intensive observation of individual cases over time, deriving information from a wide variety of different probes, may be necessary to begin to answer these questions (Bryson, Landry & Smith, 1994; Lord, 2000; Park, 1982; Park, 2001; Seal & Bonvillian, 1997; Wolery, 2000). Recent media and scientific attention to Tito Mukhopadhyay, a non-speaking adolescent from India with severe autism, who has nevertheless been able to communicate in writing, is a case in point. This young man's writings appear to give credence to claims that have been made for some time (e.g., by proponents of facilitated communication) that at least some non-speaking autistic individuals have normal intellectual capacities, "trapped" within, which they are unable to reveal because of profound abnormalities in their sensory processing and motor planning (see also Sellin, 1995). Whether or not this is the case for all individuals with autism, however, remains to be determined.

IQ scores and subject selection

Two conclusions may be drawn from the above considerations.

First, autism and testability are not independent. Even if, in some cases of severe autism, cognitive functioning is believed to be similar to that of an individual without autism, it cannot be accessed, and it will not be demonstrated, when attempts are made to tap it by standard assessment practices.

Second, if or when cognition in autism is atypical, and qualitatively different from cognition in non-autistic individuals, then attempts to tap, describe and measure it with tests designed to tap, describe and measure a very different type of cognition, will likely yield results of very questionable validity. It would be something like measuring a line with a thermometer; or measuring temperature with a ruler. The construct and the tool used for measuring it may be incompatible, so that, as when one puts MAC software into an IBM PC, one only gets back a blank screen. If the computer analogy holds, cognitive functioning (and other internal processes) may exist, but in a different format than our own, so that we cannot "read" it.

It appears that researchers often do not appreciate the negative relationship of autism and testability, and the possible covariance of autism and nature of cognitive functioning. Autistic individuals are matched with control subjects on factors (such as mental age, language age, or IQ) that are determined by performance on standardized tests. Then, believed to be controlled, the variables which are presumed to have been measured in the testing are not considered in interpreting the results. However, it is certainly possible that differences in the subject's performance on the experimental task might best be explained by differences in the very variables that presumably had been controlled for – variables, for example, such as cognitive level, and/or language and mental age – because the intelligence, mental age, or language test scores in the two groups may not have measured the same thing or had the same

meaning, in the first place. The recent spate of studies raising alternative interpretations of the findings in theory of mind studies appear to reflect recognition of this fact (Bowler & Briskman, 2000; Hill & Frith, 2003).

Conclusions

Assessment of cognitive function is vital to research, theory, clinical work, education and parenting with respect to individuals with autism. However, the function of assessment must go beyond positioning the individual vis a vis a normative population. It must aim to understand the processes and ways of thinking in carrying out, or failing to carry out various tasks. Towards this end, we must acknowledge the limitations of conventional assessment tools, with individuals with LFA, and utilize both non-standardized administration of tests, and multiple other qualitative and quantitative modes of inquiry and observation. Researchers must be knowledgeable about the limitations of the IQ and mental age measures in this population, so that the results of their experiments will be interpreted accordingly. As well, the question: what are the means by which a valid assessment can be achieved, should be a research priority. Close observation and assessment of individual cases, one by one, over time, will likely assist in developing both a theory of how different people with LFA think and the best practices for cognitive assessment. A valid and comprehensive assessment may be time-consuming, but will bring us closer to understanding and communicating with the individual with LFA. It may also help in determining what needs to be done to enable the individual to make more effective use of his or her distinctive modes of processing and responding to the world.

Discussions at Surrey Place Centre about the issues covered in this paper have led to a research project regarding assessment of intelligence in non-speaking individuals with autism. PhD candidate, Shahar Gindi, is attempting to survey how psychologists in North America go about testing intelligence in this population. If you are interested in participating in this study (it requires completing a questionnaire) please contact Mr. Gindi at Surrey Place Centre (416-925-5141).

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Low-functioning individuals with ASD may need additional individualized supports during the transition into adulthood and low-functioning individuals require additional training and supports (APA, 2013). However, it should not be assumed that individuals with low-functioning ASD have also been diagnosed with Intellectual Disability (Eagle, 2002). Intelligence quotient (IQ) but not the core symptoms have been known to predict outcomes in autism. Besides resource issues in India, assessing IQ in presence of autistic symptoms is challenging in general. In a pilot study, we explored different global indices of development in 30 children with confirmed autism. Higher and lower functioning in what areas? Criteria that surround these labels do not speak to the specific challenges of each child, and may actually undermine the effort that many individuals on the spectrum put forth each day. The late, great Stephen Jay Gould once published a book entitled *The Mismeasure of Man*. The book describes some of the historical problems with IQ tests and measures of intelligence in general. This publication may provide useful background when further considering your question. References

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Children with autism are nearly eight times more likely to suffer from one or more chronic gastrointestinal disorders than are other children. As many as one-third of people with autism have epilepsy (seizure disorder). Studies suggest that schizophrenia affects between 4 and 35 percent of adults with autism. By contrast, schizophrenia affects an estimated 1.1 percent of the general population. Autism-associated health problems extend across the life span – from young children to senior citizens.