CENTRE FOR AUTISM

MIDDLETOWN

Educational Assessment

Research Bulletin Issue No. 2

Supporting the promotion of excellence throughout Northern Ireland and Ireland
in the education of children and young people with autism spectrum disorders.

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RESEARCH BULLETIN ISSUE NO. 2

This is the second Research Bulletin produced by Middletown Centre for Autism and focuses on the area of "Educational Assessment". Copies of the Winter 2009 Bulletin on the subject of "Transition" are available from the Centre.

The aim of the Research Bulletin is to provide accessible summaries of relevant peer-reviewed research articles and literature reviews for education staff working with children and young people with autism spectrum disorders (ASD).

This Bulletin examines the area of "Educational Assessment" and contains summaries and implications for practice based on seven articles from peer-reviewed journals written over the period 2004-2009.

The Bulletin commences with an interview with Dr Brenda Smith-Myles. Dr Brenda Smith-Myles is Associate Professor in the Department of Special Education at the University of Kansas, where she co-directs a graduate program in ASD. She has written numerous articles and books, including Asperger Syndrome and Difficult Moments: Practical Solutions for Tantrums, Rage and Meltdowns and Asperger Syndrome and Adolescence: Practical Solutions for School Success, which was the winner of the Autism Society of America's outstanding literary work in 2002.

Please note that the views represented in this document do not necessarily reflect the views of Middletown Centre for Autism. Reviewers have, where possible, used the original language of the article which may differ from UK and Ireland usage and the usage of a range of terminologies for ASD.

Interview with Dr Brenda Smith-Myles

1. Is there a particular screening tool which has proven to be consistently accurate in predicting a diagnostic outcome with regard to ASD? If not what are the difficulties?

Accurate screening and diagnosis/identification requires collecting and assimilating data from a variety of sources using multiple methods by professionals from a variety of disciplines, including psychology, speech and language therapy, occupational therapy, education and so forth. As with all data, the information collected must subsequently be interpreted. Experienced clinicians never rely strictly on a screening or diagnostic instrument. While assessment tools can provide valuable information, no tool interprets itself.

The term diagnostic instrument is misleading because no single instrument constitutes a sufficient basis for a diagnostic decision. In practice, there is no distinct line where screening ends and diagnostic assessment begins. I am a great believer in transdisciplinary assessment and clinical judgment, and like to use direct observation in multiple environments when that is an option.

2. What steps could be taken to ensure that a screening test for cognitive ability for children with ASD would provide accurate results in terms of the child's true learning potential?

There is little research on formal cognitive measures for individuals with ASD. Formal cognitive assessments may not yield valuable information for assessing current level of functioning and needs for interventions. In addition, students with ASD may not be able to generalize skills from the classroom setting to the testing environment, or the manner in which the information is being assessed may prohibit the child from demonstrating mastery of skills. For example, if the student has learned to perform a task in one way with a certain prompt and the assessment asks for it in a different way, the student may not be able to demonstrate knowledge of the skill. In addition, it is important to consider the many aspects of cognition and ensure that they are assessed. Collecting data in the environments in which the child functions is often a better indicator of the child's cognitive skills. As such, informal classroom data provides information about how the student functions on a daily basis. Analysing formal and informal data to determine patterns of skills and learning is a key component of assessment. Informal data from the classroom may be more valuable than information gathered in a contrived one-on-one selling when determining a suitable intervention for a student with ASD.

3. In general have you found any specific trends or discrepancies in the results of the cognitive abilities of children with ASD?

I think that it is extremely difficult to identify the cognitive abilities of children with ASD especially when they are young or have not been provided with appropriate interventions.

In addition, many people when assessing cognitive abilities tend to look only at IQ and we know that cognition goes beyond IQ. Generally, it seems that the cognitive abilities of many of our students is underestimated because their unique response and learning styles do not match particular assessment measures or even specific questions on a tool. When children are "higher-functioning", professionals who do not have a keen understanding of this end of the spectrum tend to think that IQ tells the entire story about a particular student. The behaviours of children and youth with ASD are often misidentified by these professionals as purposeful because they are "smart enough to know better".

4. How can we adapt standardised assessments which are not ASD specific to better suit children with ASD?

This is an excellent question. First, it is essential to identify why a particular standardised assessment is necessary. What information will it yield that will help in planning an elective program for a child with ASD? If it is determined that a particular assessment is necessary, I would recommend looking for one that is "autism friendly". If such a measure does not exist, the next step is to evaluate the measure to identify whether it is structured in a format that meets the learning styles of the student with ASD. In many cases, this may mean creating visual supports, rewording questions, changing response format, for example. Such modifications would not allow you to interpret the assessment using the standardised norms, which should cause the assessment team to question whether a standardised measure is needed..

5. Can visual symbols and structure be used to help their understanding of a particular task in a standardised assessment or does this contaminate the validity of the assessment outcome?

Unless a standardized test allows for presentation in alternate modes, adding or modifying instructions will mean that you cannot interpret the scores using the provided norms. It is permissible to "test the limits" during assessment, but it is important that this be disclosed in any verbal or written report..

6. In your opinion, how influential are schools and families on children's behaviour? What immediately comes to mind as common positive factors in teaching and parenting?

I think that schools and families are in a position to greatly influence the behaviour of children with ASD. They can teach appropriate social behaviour, expectations, the hidden curriculum, self-regulation, problem-solving, how to navigate the environment, executive function skills, self-advocacy, and so forth. Instruction, modelling, prompts and positive reinforcement are all powerful means of influencing a child's behaviour. These supports can be strengthened when educational professionals and family members communicate and collaborate.

7. You have been involved in developing the Texas Autism Resource Guide for Elective Teaching manual (TARGET). What are the main recommendations of TARGET? What good practice should all professionals be mindful of?

TARGET was designed to provide high quality information on characteristics, assessment and interventions in a format that is easily accessible by educational professionals and families. It provides a range of helpful information over three main sections:

i. Educational Implications of ASD

The Educational Implications section outlines the characteristics of students with ASD and how these have an impact upon learning.

ii. Evaluation in ASD

The Evaluation in ASD section provides information on 13 areas of assessment ranging from screening to transition and vocational assessment. Each measure is described in a brief paragraph with supplemental information presented in a table. Each table identifies: (a) the measure, (b) age range, (c) method of administration, (d) approximate time to administer, (e) subscales and (f) where the measure can be obtained. Research on each tool is also presented in this section, including: (a) the citation, (b) participant ages, (c) sample size, (d) area addressed (i.e. reliability, validity) and outcomes.

iii. Interventions in ASD

In the Interventions in ASD section each intervention/strategy begins with a table that indicates: (a) the verbal skills required for the intervention (nonverbal, mixed and verbal), (b) grade levels, (c) cognitive level ("classic" or high functioning) and (d) areas addressed (academic/pre-academic, adaptive behaviour/daily living, and so forth). Then, in narrative format, the intervention is described in the following manner: (a) brief introduction, (b) description, (c) steps, (d) brief example and (e) summary. A table then describes the number of studies conducted using the intervention, the age range of participants, areas addressed and outcome. Additional research detail is presented. Finally references and resources are included for each intervention.

Conclusion

The main recommendation is that it is essential to understand characteristics, evaluation and interventions when assessing and/or teaching children and young people with ASD. However, because each individual with ASD is unique, it is important to understand that selection of measures and interventions must be matched to the individual. Regarding evidence-based interventions, an evidence-based practice (EBP) is best determined by collecting data on an individual student using a particular intervention. As you know, when you have seen one child with ASD, you have seen one child with ASD. It is essential that the terms EBP and individual with ASD be considered together. What is an EBP for one student may not be effective for another student.

Academic Achievement Profiles of Children with High Functioning Autism and Asperger Syndrome: A Review of Literature

Research Aims

The aim of this literature review is to provide a synopsis of the relevant research and review literature pertaining to the academic achievement of those students diagnosed with High Functioning Autism (HFA) and Asperger Syndrome (AS). The review also aimed to determine whether there is a common academic achievement profile amongst those with HFA/AS and addresses the good practice already used in schools.

Research Method

Researchers reviewed Five studies in the area of academic profiles in children with HFA/AS published between 1994 and 2008. All participants had an IQ of greater than 70.

Research Findings

The review derived from a range of five research studies (Dickerson, Mayes, & Calhoun, 2003a; Dickerson, Mayes, & Calhoun, 2003b; Dickerson, Mayes, & Calhoun, 2008; Goldstein, Minshew, & Siegel, 1994; Griswold, Barnhill, Smith-Myles, Hagiwara, & Simpson, 2002; and Minshew, Goldstein, Taylor, & Siegel, 1994) found that students with HFA/AS experience difficulties in the areas of comprehension, written expression, handwriting skills, linguistically complex materials, complex processing and problem solving. These led to difficulties in reading, writing and mathematics, and seemed only to appear when teaching and learning strategies changed from rote to an abstract process.

Implications for Practice
(by the authors)

Reading

Students with HFA/AS experienced difficulties when the delivery of material changed focus from reading as a means of decoding to comprehension of what was read, as this increased the need to focus on abstract concepts. Inference and cause and effect were areas of difficulty.

Writing

Graphomotor skills, coordination and fine motor skills had a negative impact on handwriting. Written expression was found to be dependent on level of organisation and joint attention issues, which have been clearly seen to cause difficulty for students with HFA/AS due to their difficulty with executive function.

Mathematics

Multiple step computations caused difficulty for students. This again was attributed to organisation levels and attention issues. There also appears to be a direct link between the difficulties found with reading and extraction of the relevant information needed to solve complex mathematical problems.

All five studies recognised that students with HFA/AS share an academic profile in the above three subject areas, which must impact on the mode of delivery and classroom practice in the subject areas. The practitioner must recognise and remember the individuality of each student and how HFA/AS affects his/her learning, with cognisance being given to the difficulties in each

subject and how it may adversely affect success in another. Thus, the need to respect the holistic development of each student is reinforced with the need to produce, refer to and maintain student development portfolios. Practitioners and parents are encouraged to work collaboratively with information and advice being freely available to ensure that expectation is consistent with student performance and projected maturation.

The researchers recognised that further research is needed in this area. In particular they identified HFA/AS specific interventions and assessment as needing further exploration and investigation. In order to gauge effectiveness particularly when schoolwork moves from the concrete to the abstract level of instruction and expectation, as this may affect post secondary education and employment. These criteria levels of competencies and understanding can influence successful holistic development and maturation.

Full Reference
Schaefer-Whitby, P.J. & Mancil, G.R. (2009). Academic Achievement Profiles of Children with High Functioning Autism and Asperger Syndrome: A Review of Literature. *Education and Training in Developmental Disabilities*, 44(4), 551-560.

Environmental Fit: A model for assessing and treating problem behaviour associated with curriculum difficulties in children with Autism Spectrum Disorders

RESEARCH AIM

- To investigate the validity of the hypothesis that if there are differences between a student's ability and curricular demands, there may be an increased likelihood of problematic behaviour.
- To ascertain if by evaluating a child's overall competency level through standardized testing and identifying the specific curricular demands that a child is unable to complete, their ability can be better matched to the curricular demands of that environment.
- To explore whether the redesign of the task may help to produce higher levels of success. This may contribute to a reduction in subsequent problem behaviour.
- To examine what makes so many contexts aversive (an assessment issue) for children with ASD and how these antecedent events can be changed (an intervention issue).

RESEARCH METHOD

- The context for problem behaviour can be seen as an interaction between the curricular demands and the problem behaviour.
- Six children with a diagnosis of Autism Spectrum Disorders were selected from general education classrooms.
- Children were aged 4 years 8 months to 13 years and 4 months.
- Full scale IQ ranging from 76 to 125 with evidence of poor motor or academic standardized scores. One child had "elevated problem behaviours".
- The session locations were chosen by the parents and were completed either in school or at home.

TABLE 2.1 Participants' Characteristics

Domain of Competency	Name	Age (a)	Diagnosis	Full Scale IQ	Standardized Score for Domain of Competency	Total Problem Behaviour (h)
Motor	Hailey	5.6	Autistic Disorder	103 b	83 f	6.0
	Julie	5.7	Autistic Disorder	76 c	77 f	7.0
	Matthew	4.8	Asperger Syndrome	118 c	72 f	4.7
Academic	Amy	13.4	Autistic Disorder	104 d	80 g	3.0
	David	9.4	Asperger Syndrome	125 e	84 g	5.0
	Aaron	11.5	Autistic Disorder	89 d	74 g	5.6

a. Years and months

b. Stanford Binet Intelligence scale

c. Wechsler Preschool and Primary scale for children

d. Wechsler Intelligence scale for children

e. Woodcock Johnson Psychoeducational Battery

f. The Beery-Buktenica Test of Visual Motor Integration

g. Test of written language

h. Problem behaviour ratings are obtained from three items using a 7 point Likert-type scale completed by the teacher regarding the severity, the degree of danger posed to self or others and the disruptiveness of problem behaviour to the setting.

7 = severe 4 = moderate 1 = mild*

* Scores were averaged across items to create a total problem score.

The study was conducted in 5 stages:

Stage 1: Identify Relevant Context (Motor or Academic Task)

- The purpose of this stage was to identify a difficult motor and academic task. These were chosen in consultation with the Occupational Therapist, school psychologist, teacher and parent.
- All tasks chosen were those that the child experienced in his/her typical daily routine.
- The first 3 participants were given a motor task (involving handwriting). Participants 4 to 6 were given an academic task (essay writing).

Stage 2: Conduct Task Analysis

- The purpose of this stage was to conduct a task analysis for the selected motor and academic tasks. This involved evaluating performance on how the child behaved when completing each stage of the task, so that the specific steps that needed to be targeted for environmental modification could be identified. Task analyses were conducted twice for each participant. This was done to compute the stability of responding and to find out the average percentage of steps completed correctly.

Stage 3: Baseline

- The purpose of this stage was to test the hypotheses that presenting a child with a task in which curricular demands exceeded their competency level the following would occur:
  a) More incidents of problematic behaviour.
  b) A large number of sessions would end due to problem behaviour.
  c) A high rate of minor problem behaviour in continuing sessions.
  d) A low percentage of task steps would be completed correctly.
  e) Negative affect.

Stage 4: Intervention

- The purpose of this stage was to test the hypotheses that modifying the task so that it no longer exceeded the child's competency level would result in:
  a) Less incidents of problem behaviour.
  b) A reduced number of sessions terminated due to problematic behaviour.
  c) A lower rate of minor problem behaviour in unfinished sessions.
  d) An increase in the percentage of task steps completed correctly.
  e) Improved affect.
- By identifying those steps in the task analyses conducted in stage 2 that the child either did not attempt or did not correctly complete, specific problematic steps were targeted to facilitate the child's successful completion of the task.

Stage 5: Ancillary Post-test Measures

- The purpose of this stage was to obtain social validity data.
- The social validity measure of the dependent variable (problem behaviour) was completed by the interventionists after the final session of stage 3 (baseline) and then again at the end of stage 4 (intervention) to assess perceived changes in the dependent variable (problem behaviour).

RESEARCH FINDINGS

All participants showed an increase from baseline to intervention in the percentage of task steps they completed correctly and independently. By the final stage of intervention, all participants completed their tasks without the use of the environmental modification techniques. Therefore, by the end of intervention, the participants' competency met the curricular demands of the environment without the need for continued environmental modification techniques. Teachers reported that the intervention strategy provided an organisation and consistency in writing that the students did not previously have. Anecdotal reports from teachers of the children in the motor task domain indicated an increase in academic task completion and/or improvement in quality of classroom life.

When curricular modifications were made the following changes were noted:

a) A decrease in the level of problem behaviour.

b) An increase in the percentage of task steps completed correctly.

c) Improved affect.

- Overall adults who worked with the children reported ease with intervention techniques. This indicates that a child can be successful when placed in the correct modified environment.
- Challenging activities or demands do not need to be avoided by individuals with skill deficits; rather accommodation can be put in place to facilitate success and independence within the activity.
- An environmental fit model suggests that even though an individual may have deficient skills in a given domain of functioning, whatever skills they have may prove adequate as long as the environment is redesigned, so that their skills are now a good match for the newly modified environment.
- A good environmental fit can result in an immediate reduction in problem behaviour and can increase independent task completion. In addition, through continuous monitoring of the child's progress, interventions can be built that bring about an increase in skills.

IMPLICATIONS FOR PRACTICE
(by the authors)

- It should be noted that the concept of poor environmental fit is just one explanation for problem behaviour that emerged for participants when the performance demands of their environment exceeded their competency level.
- Results of the present investigation do not conclusively determine the function of the behaviour.
- It should be noted that irrespective of the function of problem behaviour, results indicate that enhanced environmental fit (modifying curricular demands to the child's competency level) was associated with reduced problem behaviour.
- Ongoing assessment is critical to successfully developing environmental modifications that are responsive to the individual's competency level.
- Future focus should not only be on assessing the wider context for problem behaviour but also on assessing the specific function of problem behaviour so that interventions may be further refined.
- It is imperative that social validity continues to be prioritised. This study was conducted in natural venues by natural intervention agents within natural routines, all features of progressive best practice according to Carr et al. (1999).
- More scrutiny is required regarding the fidelity of the interventions provided by natural intervention agents and the possible effect of changing maintaining variables within these natural contexts.
- It is important to recognise that a multidimensional approach built on an environmental fit model has potential for enhancing quality of life for people with serious disabilities.

Full Reference
Blakeley-Smith, A., Carr, E.G., Cale, S.I. & Owen-DeSchryver, J.S. (2009). Environmental Fit: A Model for Assessing and Treating Problem Behavior Associated with Curriculum Difficulties in Children with Autism Spectrum Disorders. *Focus on Autism and Other Developmental Disabilities*, 24(3), 131-145.

The Usefulness of the Revised Psychoeducational Profile for the Assessment of Preschool Children with Pervasive Developmental Disorders

RESEARCH AIMS
The authors aimed to assess and distinguish differences between preschool children with Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) and children with autism in reference to their developmental and behavioural levels.

RESEARCH METHOD
A sample of 46 preschool children with suspected autism spectrum disorders (21 autism and 25 PDD-NOS) were included in the study. They were tested by trained professionals, with experience of working with children with autism, using a bakery of assessments and were diagnosed by the same physician, also with a specialism in autism. In the case of the Revised Psychoeducational Profile (PEP-R) assessment, the developmental and behavioural scale means were analysed with a t-test for independent samples to evaluate and discern the differences between the two diagnostic groups.

RESEARCH FINDINGS
Comparison of the developmental profiles in the two groups revealed that in children diagnosed with autism each developmental area was more delayed than in children diagnosed with PDD-NOS. Imitation, cognitive performance and cognitive verbal domains were most delayed in both groups. More developed domains in both groups were perception, fine motor and eye-hand coordination. The cognitive performance domain had the largest number of emerging scores for both groups, though it was one of the most impaired areas in the developmental profile.

IMPLICATIONS FOR PRACTICE
(by the authors)

- A PEP-R may give the teacher or clinician an accurate picture of the child's developmental and behavioural patterns, and provide a baseline for an educational plan.
- The PEP-R is an effective assessment of preschool children with pervasive developmental disorders (PDDs) and can assist clinicians in identifying the differences between diagnostic groups.
- The cognitive performance domain may be the area with the greatest developmental potential in younger children with PDDs.
- The PEP-R may provide helpful data on children previously deemed untestable.

Full Reference
Portoghese, C., Buttiglione, M., Pavone, F., Lozito, V., De Giacomo, A., Martinelli, D. & Margari, L. (2009). The Usefulness of the Revised Psychoeducational Profile for the Assessment of Preschool Children with Pervasive Developmental Disorders. *Autism*, 13(2), 179-191.

*Middletown Centre for Autism provides training in the PEP-R.

A Comprehensive Model for Assessing the Unique Characteristics of Children with Autism

RESEARCH AIM

Assessment options for autism are reviewed and presented in the context of recent research and a comprehensive, multidisciplinary assessment model. This includes three levels, which gives progressive data from a subjective to a more objective perspective. The complexities of autism necessitate a systematic and comprehensive assessment approach to reduce errors in decisions relating to eligibility and treatment.

RESEARCH METHOD

The researchers used a three level assessment model to help verify eligibility, plan individualised instruction and monitor progress. They reviewed all assessments relevant to autism published in the United States. Standardised tests were evaluated by considering the size of the sample used, the dates for data collection and the similarity of demographic characteristics of the normative sample to U.S. census data.

RESEARCH FINDINGS

The three levels are described below:

Level 1: Records Review and Interviews

The information gleaned at this level is typically subjective. When compared to the data from Levels 2 and 3, it can be biased and general. As parents and teachers are most knowledgeable about the child their views can provide information which could be missed at Level 2 and Level 3 assessments.

Level 2: Rating Scales

Rating scales yield more specific and objective data than Level 1 because they are usually precisely defined. In spite of this, there are limitations including the rater's bias and tendencies to avoid extreme ratings. The authors advise against using rating scales independently, but in conjunction with Level 1 and Level 3 assessments.

Level 3: Direct Assessment

This involves both observation in the natural environment and direct interaction between the child and the examiner. The authors recommend collecting data for at least four observations in several settings to see potential trends. For problem behaviours, data from observation or functional analysis can be used to plan interventions and monitor progress. Table 4.1 displays the technical adequacy of autism measures.

TABLE 4.1 Technical Adequacy of Autism Measures

Test or Rating Scale	Methods	Description	Purpose	Reliability	Validity
Assessment of Basic Language & Learning Skills-Revised (ABLLS-R; Partington, 2006)	Observation, direct testing or parent or teacher report	Information for 25 areas, including functional language, classroom behaviour, and social interaction	Planning instruction and monitoring progress	No data	Extensive rationale for the importance of skills tested
Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore & Risi, 2003)	Direct testing	Communication and social interaction are assessed, restrictive and repetitive behaviours are documented in semi-structured activities	Primarily diagnosis	Internal consistency and stability low, interrater high with extensive training	Limited; specificity and sensitivity good, but compared with a similar measure
Autism Screening Instrument for Educational Planning-Third Edition (ASIEP-3; Krug, Arick & Almond, 2008)	Rating scale	Narrow-band rating scale completed by caregivers or teachers	Aids in eligibility verification	Internal consistency and stability good, but stability based on small samples	Content and criterion-related adequate, discriminant limited
Children's Autism Rating Scale (CARS; Schopler, Reichler & Renner, 1988)	Observation, interview, records review	Narrow-band rating scale completed by caregivers or teachers	Aids in eligibility verification	Based on 1980 data, internal consistency, test-retest, and interrater adequate	Only criterion-related reported
Clinical Assessment of Behaviour (CAB; Bracken & Keith, 2004)	Rating scale	Broad-band rating scale completed by caregivers or teachers	Aids in eligibility verification	Internal consistency and stability strong for most results. Interrater addressed	Content, concurrent and discriminant adequate
Gilliam Autism Rating Scale (GARS-2; Gilliam, 2006)	Rating scale	Narrow-band rating scale completed by caregivers or teachers	Aids in eligibility verification	Internal consistency and stability good; no interrater data	Content, criterion-related and discriminant adequate
Psychoeducational Profile-Third Edition (PEP-3; Schopler, Lansing, Reichler, & Marcus, 2005)	Direct interaction	Performance, maladaptive, and caregiver sections; based on TEACCH program	Eligibility verification and some data for instructional planning	High internal consistency and stability for performance, no data on maladaptive	Content, concurrent and construct adequate

The authors note that cognitive assessment is one of the best predictors of outcome for autism and recommend the use of cognitive measures which do not require speech, as many students with autism are non-verbal. Table 4.2 shows the cognitive options that do not require speech.

TABLE 4.2 Cognitive Options That Do Not Require Speech

Test	Authors (Year)	Age Range
Bayley Scales of Infant Development–Third Edition	Bayley (2006)	1-42 months
Cognitive Abilities Scale–Second Edition	Bradley-Johnson & Johnson (2001)	3-47 months
Comprehensive Test of Nonverbal Intelligence	Hammill, Pearson, & Wiederholt (1997)	6-89 years
Leiter International Performance Scale–Revised	Roid (1997)	2-20 years
Merrill-Palmer Scales–Revised	Roid & Sampers (2004)	Birth-72 months
Pictorial Test of Intelligence–Second Edition	French (2001)	3-8 years
Primary Test of Nonverbal Intelligence	Ehrler & McGhee (2008)	3-12 years
Test of Nonverbal Intelligence–Third Edition	Brown, Sherbenou, & Johnson (1997)	6-89 years
Universal Nonverbal Intelligence Test	Bracken & McCallum (1998)	5-17 years

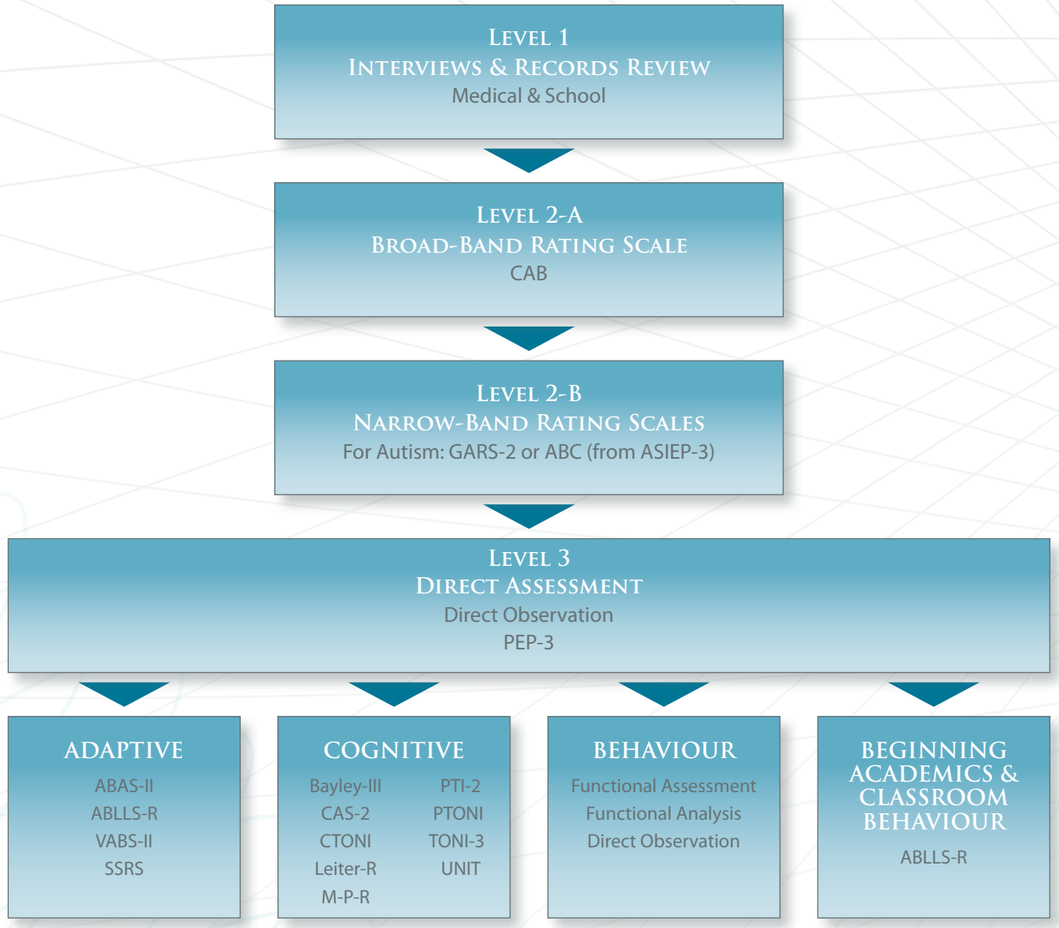
IMPLICATIONS FOR PRACTICE

(by the authors)

- The authors note that in the absence of an obvious presentation of ASD the completion of the three levels of assessment should yield results in which school personnel and parents feel confident in using to verify eligibility, plan instruction and monitor student progress.

Figure 4.1 depicts the model of assessment recommended in this article:

FIGURE 4.1 Model of Assessment



Full Reference

Bradley-Johnson, S., Johnson, C.M. & Vladescu, J.C. (2008). A Comprehensive Model for Assessing the Unique Characteristics of Children with Autism. *Journal of Psychoeducational Assessment*, 26(4), 325-338.

Incorporating Interests and Structure to Improve Participation of a Child with Autism in a Standardised Assessment: A Case Study Analysis

RESEARCH AIMS

The research aimed to explore integrating a child's interests and daily structure into the assessment process in an attempt to assess a child who was previously viewed as "virtually untestable".

The following were judged to be the main impediments to successful assessments:

- The child experiencing difficulty in following verbal instructions;
- The child being unfamiliar with the adult and unfamiliar with the environment;
- Changes in usual routine to participate in assessments;
- Restricted patterns in expressive communication;
- The uneven profile of strengths and abilities in children with ASD.

The research sought to address these issues and document the findings as a case study.

RESEARCH METHOD

The method used was an in depth case study of one child "Anna" who was two years and eight months old at the time of the research. Mother, teacher and researcher identified Anna's preferred activities/interests and current daily routine as part of a preschool group. They integrated her preferred activities into the assessment process. These were:

- Water table with floating toys.
- Puzzle and musical toy table.
- Sensory table with chocolate pudding and shaving foam.

The researcher also modified the assessment room to match the physical structure that Anna was used to in her preschool group. The assessment was conducted in this environment in an attempt to engage Anna in an environment that she was familiar with and with her preferred activities nearby. The assessment process was segmented into four phases. These were:

- Welcome/free play: allows the child to interact informally with the assessor, assessment toys and the assessment environment.
- Opening activity: provides a smooth transition from unstructured play to structured tasks.
- Assessment administration: provides a natural context for the child to exhibit his/her interests and abilities.
- Cleanup/closing activity: facilitates smooth transition onwards from the assessment.

Throughout the session the primary focus was to document how allowing Anna to interact with things of her choice, especially during breaks from testing, would support her ability to maintain cooperation and motivation to participate.

RESEARCH FINDINGS

Integrating Anna's preferred interests and activities and modifying the environment did not impact on the delivery of the assessment. The researcher was able to assess Anna and provide her mother with previously unobtainable information. The assessment was conducted within a framework that was familiar to Anna and this facilitated the collection of information.

IMPLICATIONS FOR PRACTICE
(by the authors)

- An assessment that incorporates familiar play activities and toys is recommended;
- A child offered opportunities to participate in activities that include the kinds of toys he/she is interested in is more likely to demonstrate his/her knowledge and skills, than if he/she were in a traditional adult orientated environment;
- Strategies whether diagnostic or therapeutic need to create opportunities in which choices can be made so that children with autism are free to demonstrate their true potential in all aspects of daily living;
- Professionals should assist caregivers in finding windows of opportunity to emotionally connect with their children.

Full Reference
Vacca, J. J. (2007). Incorporating Interests and Structure to Improve Participation of a Child with Autism in a Standardized Assessment: A Case Study Analysis. *Focus on Autism and Other Developmental Disabilities*, 22(1), 51-59.

Measuring Developmental Progress of Children with Autism Spectrum Disorder on School Entry Using Parent Report

RESEARCH AIM
To investigate the efficacy of the use of parental questionnaire data in augmenting psychometric assessments and individual planning in children with autism.

RESEARCH METHOD
This research was based on a feasibility study to demonstrate the effectiveness of parents completing specific questionnaires which measured development, symptom severity and treatment effectiveness. The information from this study would then be used to inform planning and track development.

125 parents of children who entered dedicated autism primary schools and units in two consecutive years completed three questionnaires. 57 parents completed the same questionnaires one year later. The researchers used the data to examine developmental changes in the children.

RESEARCH FINDINGS
It is crucial for professionals to collect information to monitor the developmental and behavioural progress of children with ASD. There are already a number of different ways that professionals do this. However, data from parents would be valuable additional information.

From the data collected the researchers were able to ascertain that the children's levels of functioning were as expected; specifically that scores were lowest in socialisation, greatest in motor skills, and intermediate in communication and daily living. These results were exactly as the researchers had anticipated and congruent with similar studies.

A key aim of the study was to ascertain if the data collected from parents would be useful in monitoring the progress of the children involved in the research. The results indicate that amongst the 57 children that were tested twice in 11 months, some developmental progress was demonstrated. The 57 children in this group gained on average 10 age equivalent months in communication, and nine age equivalent months in socialisation and daily living skills. These 57 children also demonstrated no changes in symptom severity over the 11 months. The researchers tentatively suggest that the best developmental progress was made by children who had better communication skills at the outset.

IMPLICATIONS FOR PRACTICE
(by the authors)

- It is possible to collect systematic monitoring data on a large cohort of school-age children using parent questionnaires.
- This information can be gleaned at a relatively low cost and could be used to further research the area of education for children with ASD, which is still lacking in many areas.
- Systematic data collection on the developmental progress of children with ASD will provide a useful comparison against which to judge the effectiveness of a range of programmes of intervention.
- There was a relatively low response rate (40%), however, the researchers suggest that if this data collection took place within the school the response rate may increase.
- A diverse range of methodologies need to be employed in order to build an evidence base; collection of data from parent questionnaires could be a valuable part of this process.

Full Reference
Charman, T., Howlin, P., Berry, B. & Prince, E. (2004). Measuring Developmental Progress of Children with Autism Spectrum Disorder on School Entry Using Parent Report. *Autism* 8(1), 89-100.

Planning a Comprehensive Program for Students with Autism Spectrum Disorders Using Evidence-Based Practices

RESEARCH AIMS

The authors aim to provide an overview of the Ziggurat Model (Aspy & Grossman, 2007) and the Comprehensive Autism Planning System (Henry & Myles, 2007). In conjunction, these models allow educational teams to efficiently and effectively determine the needs of the individual with ASD, select interventions that match their individual needs and develop a daily plan that indicates when and by whom the interventions are to be used. The authors also aim to show how the framework can be applied in various settings and highlight that both structured behavioural interventions and supports based on a functional behavioural assessment coupled with collaboration and communication among parents and professionals, can lead to broad-based, comprehensive outcomes.

RESEARCH METHOD

The authors present an explanation of The Ziggurat Model and the Comprehensive Autism Planning System (CAPS), which are based on best practice.

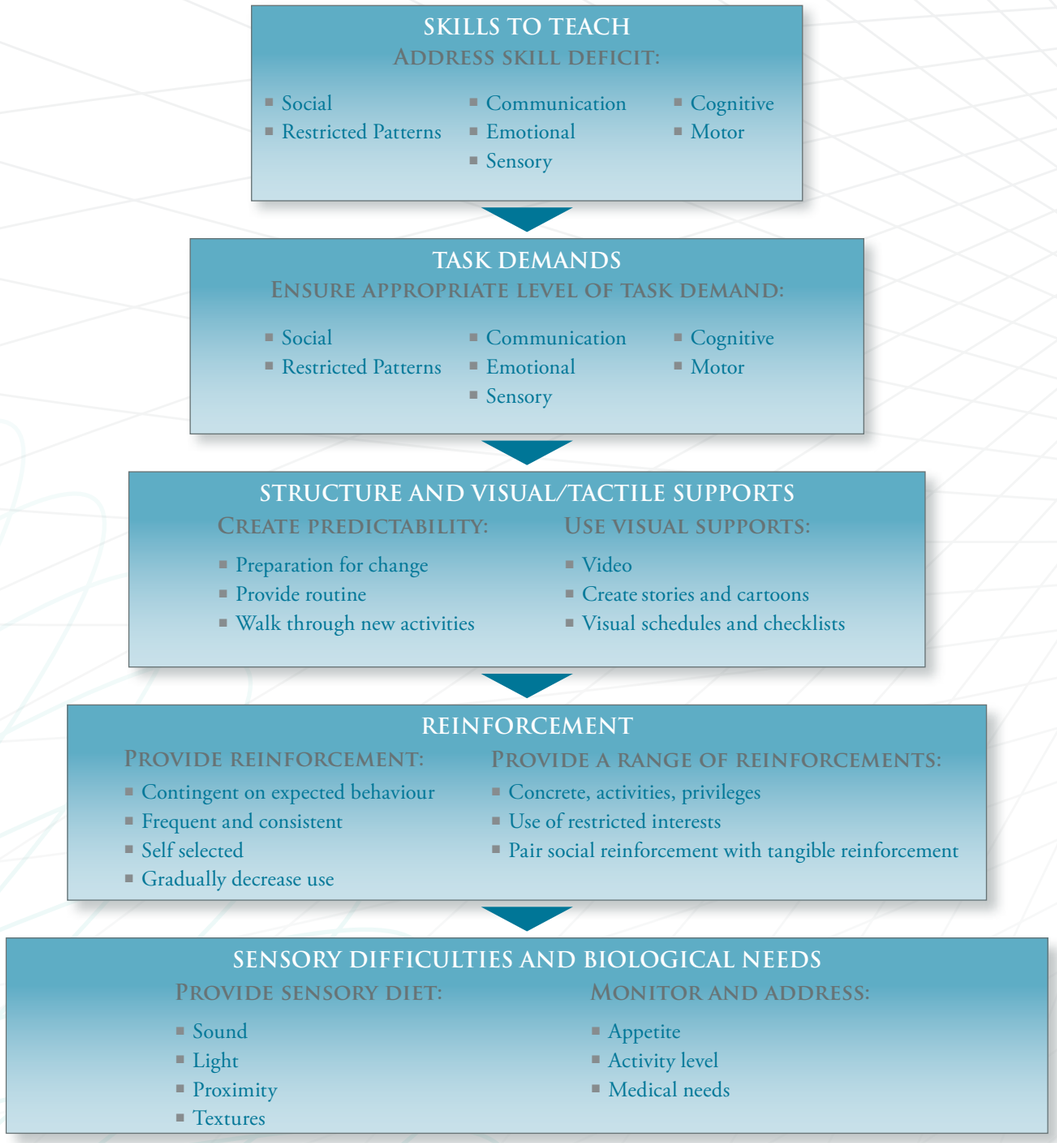
RESEARCH FINDINGS

The Ziggurat Model

The foundation of the Ziggurat Model is a thorough understanding of the individual's needs, in particular, those related to the underlying characteristics of ASD. At the hub is the belief that underlying needs and characteristics of ASD can result in social, emotional and behaviour concerns which need to be addressed. The Ziggurat approach represents a hierarchical system consisting of five levels that must be attended to for an intervention plan to be comprehensive. Each level contributes to the effectiveness of the other levels, meaning that the underlying context of ASD is accounted for which is commonly often overlooked in other intervention plans.

The authors highlight that interventions solely designed to address surface behaviour, without consideration of the underlying ASD, are potentially less effective and less likely to result in sustained behaviour change. A thorough assessment of underlying characteristics helps parents and professionals to plan a programme that takes into account the individual's strengths and needs. Additionally, assessment of underlying characteristics provides insight into which skills should be taught and how to design instruction in order to bring about meaningful and long lasting change. The five levels of the Ziggurat model are illustrated in Figure 7.1 below. The model provides a pathway for assessment and intervention and also the tools to deliver the assessment and plan the intervention. The following section provides a brief overview of the assessment and intervention tools and provides some examples of their use.

FIGURE 7.1 The Five Levels of the Ziggurat Model



The Underlying Characteristics Checklist

The first stage in the Ziggurat model's assessment and intervention process is to complete the Underlying Characteristics Checklist (UCC) illustrated in Figure 7.2. The UCC is an informal assessment designed to identify ASD characteristics for the purpose of intervention and may be completed by parents and teachers, either as a team, or individually.

The UCC contains eight areas, the first three relate to the triad of impairments: social skills deficits, communication deficits and rigidity of thought; an additional four areas concern factors that are often related to ASD including: sensory differences, cognitive differences, motor differences and emotional vulnerability; the final underlying area involves medical and other biological features. Based on the results of the UCC, a comprehensive intervention plan is developed that targets ASD characteristics by incorporating each of the five levels of the Ziggurat model (Figure 7.1).

FIGURE 7.2 Underlying Characteristics Checklist

UCC-HF: Underlying Characteristics Checklist-High Functioning

Ruth Aspy Ph.D. and Barry Grossman Ph.D.

Name _____ Date _____ Completed By _____

Follow-Up Date _____ Completed By _____

Instructions For Completing Initial Assessment

The UCC may be completed by an individual, however, the perspective of others who know and/or work with the person of focus is beneficial. Working as a team is optimal. Additionally, the team may include the individual who is the focus of the UCC as developmentally appropriate.

Each item describes behaviours or characteristics that may be exhibited by individuals with autism spectrum disorders. Please place a tick beside ALL items that currently apply to the individual. Use the Notes column to describe the behaviour and characteristics in more detail, provide specific examples or indicate frequency, setting etc.

Projected follow-up date _____

Area	Target	✓	Notes	Follow-up
Communication	1. Makes sounds repeatedly/states words/phrases repeatedly [non-echolalic] (e.g. humming).			
	2. Displays immediate or delayed echolalia (e.g. Reciting lines from movies, repeating another person's questions/statements, repeating sounds).			
	3. Interprets words or conversations literally/has difficulty understanding figurative speech.	✓	*Interrupts, asks inappropriate questions, obsesses on special interests, difficulty understanding others' perspectives & likes/dislikes.*	
	4. Has difficulty with conversation rules (e.g. Interrupts, asks inappropriate questions, poor eye contact, difficulty maintaining conversation).			

Instructions For Follow-up Assessment

Review ticked and un-ticked items. Use the *Notes* column to add further descriptors or to indicate changes. If an item no longer applies, strike through the tick and explain the changes in the follow-up column, as illustrated below.

Area	Target	✓	Notes	Follow-up
Communication	1. Makes sounds repeatedly/states words/phrases repeatedly [non-echolalic] (e.g. humming).			
	2. Displays immediate or delayed echolalia (e.g. Reciting lines from movies, repeating another person's questions/statements, repeating sounds).			
	3. Interprets words or conversations literally/has difficulty understanding figurative speech.	~~✓~~	*Interrupts, asks inappropriate questions, obsesses on special interests, difficulty understanding others' perspectives & likes/dislikes.*	*Now less likely to ask inappropriate questions, however, the other behaviours are still present on a daily basis.*
	4. Has difficulty with conversation rules (e.g. Interrupts, asks inappropriate questions, poor eye contact, difficulty maintaining conversation).			

The second stage of this model is to complete the Individual Strengths and Skills Inventory (ISSI) (Figure 7.3); this is designed to accompany the UCC. The ISSI parallels the first seven areas of the UCC. The purpose of this tool is to ensure that underlying strengths and skills are incorporated in the intervention process. This ensures that students' idiosyncratic skills, which may include their special interest areas, are involved when addressing underlying skills deficits.

FIGURE 7.3 The Individual Strengths and Skills Inventory

The Individual Strengths and Skills Inventory

Ruth Aspy Ph.D. and Barry Grossman Ph.D.

In designing effective intervention plans, it is important to be aware of individual strengths. Please describe strengths in the following areas:

Social	▪ *Initiates interactions with peers* ▪ *Likes to share interests with others* ▪ *Recognizes basic feelings of others when calm*
Behaviour, Interests and Activities	▪ *Committed interest in football statistics*
Communication	▪ *Can converse with peers on a subject of his choice*
Sensory and Biological	▪ *No health concerns - good school attendance*
Cognitive	▪ *Enjoys reading* ▪ *Average IQ score* ▪ *Strong rote memory skills*
Motor	▪ *Handwriting is improving* ▪ *Keen to participate in noncontact sports*
Emotional	▪ *When upset, will remove himself from the situation*

The ABC-Iceberg

The ABC-Iceberg illustrated in Figure 7.4 encompasses a traditional functional behaviour assessment which takes account of the five levels of the Ziggurat Model.

FIGURE 7.4 The ABC-Iceberg

Ziggurat Worksheet

The following stage of assessment in this model is the Ziggurat Worksheet (ZW) (Figure 7.5). This forms the framework on which the Comprehensive Autism Planning System (CAPS) is built. The ZW helps parents and educators avoid overlooking critical areas that impact on the effectiveness of any intervention plan. Each level contributes to the effectiveness of the next, consequently, if all levels are not addressed the intervention will not be as effective and the ultimate goal of skill development will not be realised.

The authors highlight the role of reinforcement within the ZW, as without reinforcement there is no intervention. They propose that it may be necessary to think innovatively about reinforcement for students with ASD (for example, while social situations may be reinforcing for typically developing students, these may be some of the most challenging situations for students with ASD). In addition, the ZW takes account of task demands that go beyond the academic to include social, organisation, sensory and other demands. For the purpose of developing quality interventions, the individual must be able to complete the tasks either independently or with stressing the importance of matching the student's ability to the demands of the task.

Skills to teach sits at the top of the Ziggurat model and represents the main goal of any intervention plan as this involves increasing the independence of students with ASD. Nevertheless, many behavioural improvements may be seen as a direct result of attending to an individual's biological or sensory needs, addressing their need for structure or matching task demands to unique ability. However, this can result in intervention teams overlooking the crucial area of skill acquisition. Yet such a fractional approach to intervention will have negative consequences in the long term because it does not promote autonomy, generalization or growth.

FIGURE 7.5 The Ziggurat Worksheet

A Global areas of concern
B Transfer description(s) of behaviour(s) from ABC-Iceberg
C Three points of intervention: antecedent, during the behaviour and consequence

A Behaviour/Area of Concern *Social awkwardness*	B For Specific Intervention Plan *"Shuts down" in social situations*	Prioritized UCC Items 1. Mindblindedness 2. Difficulty understanding nonverbal communication 3. Difficulty initiating/ending a conversation 4. Difficulty with conversation rules 5. Difficulty talking about others' interests 6. Inappropriate response to pain, touch and sounds 7. Poor organizational skills. 8. Difficulty managing stress and anxiety	C Tick All That Apply A	B	C
Sensory and Biological Needs	Sensory/Biological Needs Intervention:	1. 15 minutes Quiet Room time, every 30 minutes spent in noisy environment 2. Follow OT prescribed tactile desensitisation programme 3. Participation in <45 minutes of sensory integration therapy per week	✓		✓
	Underlying Characteristics Addressed:	1. Inappropriate response to pain, touch and sound 2. Difficulty managing stress and anxiety 3. Difficulty understanding nonverbal communication			
Reinforcements	Reinforcement Intervention:	1. 10 minutes of PS3 time for 10 minute conversation with a selected peer on a topic of interest to that peer 2. Earn 1 point for each time she helps a class peer or staff, 5 points = choose DVD to watch at end of day (Totals < 5 may be carried over at the end of each day)			✓
	Underlying Characteristics Addressed:	1. Mindblindedness 2. Difficulty understanding nonverbal communication 3. Difficulty initiating/ending a conversation 4. Difficulty with conversation rules 5. Difficulty talking about others' interests			
Structure & Visual/ Tactile Supports	Structure & Visual/ Tactile Support Intervention:	1. Individual visual schedules for packing school bag and lunch box 2. Daily social story work focused on understanding the feelings of other people in various situations	✓		
	Underlying Characteristics Addressed:	1. Poor organisational skills 2. Mindblindedness 3. Difficulty managing stress and anxiety 4. Difficulty understanding nonverbal communication			
Task Demands	Task Demand Intervention:	1. Use of coping cards and visual schedule 2. Use high interest activities to encourage social interactions	✓		
	Underlying Characteristics Addressed:	1. Mindblindedness 2. Difficulty understanding nonverbal communication 3. Difficulty initiating/ending a conversation 4. Difficulty talking about others' interests 5. Difficulty with conversation rules			
Skills to Teach	Skill Intervention:	1. Develop CAPS for each academic setting - provide a copy to teacher 2. Provide speech therapy services to address and develop social language skills	✓	✓	
	Underlying Characteristics Addressed:	1. Mindblindedness 2. Difficulty talking about other's interests 3. Difficulty managing stress and anxiety 4. Difficulty initiating/ending a conversation 5. Difficulty understanding nonverbal communication 6. Difficulty with the rules of conversation			

Planning a Comprehensive Program for Students with Autism Spectrum Disorders Using Evidence-Based Practices CONTINUED

While the ZW allows a team to know that the intervention plan is thorough and targeted, the Comprehensive Autism Planning System (CAPS) (Figure 7.6) provides a structure for implementation. The CAPS presents an overview of a student's daily schedule by time and activity, as well as the supports needed during each class period. All educational professionals who work with the student should be involved in the development of the CAPS in order to identify the supports that a student needs for a particular activity; subsequently, teachers will know which strategy (for example, priming, visual schedule or self-regulation) to use and when. According to the authors, the CAPS is unique in that it clearly delineates what supports are needed for each activity, and also includes space for making notations regarding data collection and how skills are to be generalized to other settings.

FIGURE 7.6 Comprehensive Autism Planning System (partial)

Comprehensive Autism Planning System

Student's Name _____

Activity	Targeted Skills to Teach	Structure/ Modifications	Reinforcement	Sensory Strategies	Communication/ Social Skills	Data Collection	Generalization Plan
Independent Work	Task completion	Task organiser Peer buddies Organisation calendar	Completing homework/ class work (from menu)	Coping cards Ear plugs Stress thermometer	Asking for help	Task organiser	Homework completion
Group Work	Conversation rules	Task organiser Peer buddies Organisation calendar	Completing homework/ Class work (from menu)	Relaxation techniques	Cues for commenting & asking questions Social story about group work	Task organiser	Lunchtime conversation
Tests	Task completion	Task organiser Organisation calendar	Calming techniques Test completion (from menu)	Relaxation techniques Stress thermometer	Cues for commenting & asking questions	Test record	Handing in assignments on time
Lectures	Attention to task	Task organiser Organisation calendar	Appropriate conversation (from menu)	Coping cards Stress thermometer	Conversation cues Cues for commenting & asking questions	Organisation calendar	Listening during group work
Homework	Task completion Materials & supplies needed	Homework checklist (double check with student)	Homework turned in (from menu)	Relaxation techniques Stress thermometer	N/A	Homework handed in on time	Handing in class work on time
PE	Participation in group sports Accepting loss	Social story re. sportsmanship	Participation Accepting loss (use reinforcement menu)	Ear plugs Sensory breaks Stress thermometer	Game statistician Peer buddy	Time spent in class Number of tantrums	Accepting loss in a game at Scouts

A key advantage of the Ziggurat and CAPS (evident from Figures 7.5 & 7.6) is that they provide a safeguard from developing a plan which only addresses surface concerns or from recycling interventions that have been used with other students with ASD without careful consideration of the specific student.

IMPLICATIONS FOR PRACTICE
(by the authors)

- Education professionals should bear in mind that what is "fair" reinforcement for one student, may not be "fair" reinforcement for another.
- Biological factors, including sensory needs, underpin all behaviour. Therefore, it is appropriate that this level is at the foundation of the Ziggurat Model.
- The Ziggurat Model and CAPS can be used as a functional behavioural assessment that links together student core deficits, behaviour and interventions.
- This approach works well within home and school environments, ensuring that a full range of needs are addressed, and that interventions are tied to student characteristics to promote generalized outcomes.
- It can be easy to overlook the top layer of the Ziggurat Model, namely "skills to teach", because much behaviour can be addressed through the lower four levels. Nevertheless, the "skills to teach" level is the ultimate goal of any intervention plan.
- The key strength of this model is in its collaborative nature. As parents and professionals are required to work together to determine individual needs and characteristics through completion of the UCC, match these needs and characteristics to interventions using the ZW, and integrate interventions into the individual's day using the CAPS.

Full Reference
Smith-Myles, B., Grossman, B.G., Aspy, R., Henry, S.A. & Bixler-Coffin, A. (2007). Planning A Comprehensive Program for Students with Autism Spectrum Disorders Using Evidence Based Practices. *Education and Training in Developmental Disabilities*, 42(4), 398-409.

Assessment can range from the teacher's daily observations of a given child to focused psychometric tests which require special training to deliver. The importance of assessment across the levels of application cannot be underestimated.

Accurate assessment is the cornerstone of effective intervention for children and young people with ASD. The articles included in this Bulletin provide evidence for the following good practice in assessment:

- Those delivering the assessment should be cognisant of fundamental difficulties in ASD, for example, difficulties with abstract reasoning;
- The child's environment is a factor in how the child presents and engages with the assessment process;
- There are a number of different levels of assessment that can be applied depending on the requirements of the assessment;
- Using a child's interests is a useful way of engaging a child in the assessment;
- Parental input is integral to the assessment process;
- Comprehensive assessments should be holistic.

The assessments detailed in this Bulletin are not the totality of educational assessments available for professionals to use with children and young people with ASD; however, the implications for practice and good practice points are applicable across settings, children and assessments. Assessment should be holistic, sensitively administered and child centred; those delivering the assessment should be mindful of the individual needs of the child and the child's environment.

We hope that you have found this Research Bulletin informative. We would appreciate if you would take a few minutes to give us feedback by simply clicking on the survey link below.

Survey
for **Educational Assessment**

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