

REPORT OF NEUROPSYCHOLOGICAL AND EDUCATIONAL TESTING, AND SCHOOL OBSERVATION

Client: AO
Age: 9 years 8 months
Birth Date: 07/28/2000
Grade: 4
School:
Test Dates: 03/11/2010, 03/13/2010
Examiner: Dr. Laurie Cestnick

Reason for Referral:

AO has special learning, social and behavioral needs given an autistic profile. Language expression, pragmatics, social skills, gross motor skills and reading comprehension were reported as problematic. Testing and school observations were requested to determine how to best teach and work with AO to optimize her learning potential and educational experience.

TESTS ADMINISTERED

Review of Records; Full day School Observation; Wechsler Intelligence Scale for Children IV Integrated (WISC IV Integrated): Block Design, Block Design Multiple Choice, Similarities, Digit Span Forward, Digit Span Backward, Picture Concepts, Coding, Vocabulary, Vocabulary Multiple Choice, Picture Vocabulary Multiple Choice, Letter-number Sequencing, Matrix Reasoning, Comprehension, Symbol Search, Cancellation Tasks (random and ordered); Delis Kaplan Executive Function System (D-KEFS): Verbal Fluency Letters, Verbal Fluency Categories, Verbal Fluency Category Switching, Color-word Interference Test Color Naming, Color-word Interference Test Word Reading, Color-word Interference Test Inhibition, Color-word Interference Test Inhibition/Switching, Twenty Questions, TOWER; NEPSY: Design Copying, Phonological Processing Parts 1 and 2, Memory for Faces Immediate and Delayed, Memory for Names Immediate and Delayed, Narrative Memory, Speeded Naming, Visual Attention Simple and Complex (cats and faces respectively), Listening Comprehension, Arrows, Graphmotor Tasks (car, motorcycle), Finger Tapping Repetitions, Finger Tapping Sequencing; Interstimulus Visual and Auditory Continuous Performance Test (IVA CPT) 3 administrations with varied methods to rule out difficulty understanding instructions and fine motor response problems; Wechsler Individual Achievement Test (WIAT II): Math Reasoning, Numerical Operations, Spelling, Written Expression, Oral Expression, Listening Comprehension; Woodcock Reading Mastery Test Revised Form H (WRMT-R, Form H): Visual-auditory Learning, Word Identification, Word Attack, Word Comprehension, Passage Comprehension; Peabody Picture Vocabulary Test IIIA (PPVT IIIA).

BACKGROUND HISTORY

Birth and Early Development

AO's birth was reported as free from complications, with some jaundice. Most skills were reportedly delayed, including speech, fine and gross motor abilities. Eye contact was poor from infancy and flags for a Pervasive Developmental Disorder were documented by professionals as early as 2 years of age. At 23 months, she was said to be developed similarly to a child 11-19 months of age (social-emotional, fine-motor, receptive language, and self-care skills). She has always been large for age. Since the age of 2 years, she would often squint when making eye contact with others. Hand flapping was present from the age of 2 years. She has always been reportedly sweet and playful. AO would often hit her head on objects and continued to do this for many years, particularly when frustrated. Difficulties in developmental areas persisted to the present day. At the age of 2 years, autism scales showed only mild to moderate probability of autism. As she got older, a primary diagnosis of autism emerged.

AO recently started zipping coats and can dress herself. AO still experiences difficulty with fastening buttons and similar fasteners. She learned shapes, colors and letters at a much faster rate than other skills. She still has difficulty understanding coins and money. Social skills have always been delayed, but have been improving in particular within the past year at school. Drawing has always been and continues to be very difficult for AO. Some separation anxiety was reported in earlier years, but this stopped when she started school since she loves going to school. AO showed a left hand preference as a toddler that has persisted to the present day. No additional developmental history was reported.

Medical

No serious injuries or illnesses were reported. AO did contract the flu at 3 years of age and was hospitalized for a few days, and an endoscopy was conducted when she was 4 years of age. AO has and continues to show symptoms of constipation for which laxatives are given to counteract the problem. Visual difficulties include accommodative esotropia/amblyopia. AO's last visual exam was one year ago in the spring of 2009. No hearing problems were reported nor was the date of her last exam. AO currently takes polyethylene glycol which reportedly lends to her feeling more relaxed and reducing head-banging behavior. She also takes fluoxetine (prozac), fluoride, and lansoprazole dr (prevacid). Dr. ___ prescribed fluoride, Dr. ___ prescribed polyethylene glycol and lansoprazole, and ___ (MS, RN, CS) gives the fluoxetine prescription. No additional medical information was reported.

Family

AO lives at home in South Hadley, MA, with her parents. English is spoken in the home. She has three older half-sisters, _____. AO's parents both attended college. Her mother works as support staff and her father works as a plumber at steam fitter. Attention Deficit Disorder and depression run on the paternal line (half-sisters). No additional learning, behavioral, social or emotional concerns were reported on either paternal or maternal lines.

Academic

AO was evaluated by her school in 2006 and 2009. Given difficulty with oral expression, it has been hard for professionals to decipher what her knowledge base is. Educational testing was

completed by her school, and a speech and language evaluation was completed by the Skinner Speech and Hearing Clinic. AO started preschool at 3 years of age. She has had a formal I.E.P. since 2003 and has carried one to the present day. AO receives daily speech, occupational therapy, sensory integration, and special education services for reading, math and writing, at the Mosier Elementary School, in South Hadley, MA. ___ is the appropriate contact person for details regarding her school work, as is ___ (SPED Director) who has worked very closely with AO on her reading skills as well as works for the school board in South Hadley.

Prior Evaluations

AO was evaluated by her school at various times between March and May of 2009. Her reading was said to have improved from first grade comprehension level to a second grade comprehension level (she was in grade 3 at that time). She was said to have become more consistent in her answering of comprehension questions and learned to answer multiple choice questions. In math, she reportedly learned to carry in addition, skip counting to solve math problems, was becoming more independent utilizing a ruler and learned to count the value of a group of coins. She also reportedly progressed in her ability to tell time. In writing, she was reported as using capitalized letters at the start of sentences throughout most of her writing, as well as using periods for statements and question marks for questions. She had reportedly not yet grasped the concept of exclamation marks. It was reportedly challenging for her to write a story from beginning to end without a visual organizer, i.e. picture sequences or graphic organizers. She reportedly would benefit from tasks being broken down into steps and required repetition to acquire new skills. She was said to benefit from predictable and consistent daily routines. Her flexibility in regard to changes in her schedule reportedly improved.

A speech and language evaluation during this same time (spring 2009) indicated “steady gains in her language development since her last evaluation ..improvements noted in her understanding of spatial, quantitative and qualitative concepts ..and responds to yes/no WH-questions consistently. Expressive language was reportedly her greatest area of weakness. She reportedly still chose to use single words or language scripts to communicate and required encouragement to speak in sentences. Her pragmatic progress was said to have improved most greatly with improved communication with peers (e.g. spending time with peers at lunch/recess, and had a few playdates with classmates as well as attended a Friday afternoon after school social group with peers).

The spring 2009 evaluations by her school led to the following recommendations:

- Increase reading service time with the special education teacher from 3-25 minute sessions to 40 minutes sessions, five days per week
- Continue with writing services 30 minutes per day four days per week
- Continue math services 30 minutes per day three days per week in general classroom, and 30 minutes two days per week in the Star Room (one-on-one)
- Educational therapy assistant for support and safety all throughout her day
- Maintain consistent/predictable routines

- continue using visual supports (e.g. social stories, schedules/calendars)
- Continue sensory integration
- Daily communication between parents and school with communication binder.
- Shorten social-stories used to 3-4 sentences in length
- Quiet learning environments
- Provide AO adequate time to retrieve/organize her language when responding to questions
- Roly play and comic strips to improve socialization and conversational skills

Social and Emotional

Self-esteem in regard to academic, athletic, social and familial relations were all reported as low by her parents. Her parents reported further that it is difficult to ascertain her self-esteem in these areas given communication difficulties. AO's social skills are improving, e.g. reaching out to other children to ask their names (AO reportedly would not have done this prior to this year, demonstrating improvements in social engagement/skills). AO's peers at school are reportedly supportive in that they have not demonstrated bullying behavior, talk with AO, and reach out to her to sit with her during lunch hour.

OBSERVATIONS FROM TESTING

AO presented as happy, delightful, giggly and often restless throughout testing. She required constant sensory breaks to move about, stretch, and laugh/giggle, and had to hold an object in her hand to pull on and bite/chew to assist focus. She wanted to do well and worked hard on all tasks. When tasks were difficult for AO she would sometimes say "All done" to encourage the examiner to move on to the next subtest or question. Working memory was notably compromised and AO demonstrated use of a good strategy to say "Say again" whenever the information had been forgotten by her. She said "Say again" very often (on most tasks). It was essential to repeat instructions multiple times, and better to 'show her' the instructions through 'doing'. AO often did not comprehend much beyond a few words due to working memory overload and being distracted by her own need to move about/rock etc. (e.g. tapping table to get her energy out which would lead to not hearing words/instructions presented to her). The IVA CPT was very difficult for AO who had a hard time holding on to the mouse consistently due to a need to fall back into her chair to rock. She also had a difficult time simply responding to all stimuli and would look away from the screen a lot. After three attempts to complete the IVA CPT on different days and with varied methods to control for not understanding instructions and not being able to effectively use the computer mouse, results were rendered problematic and the test was no longer administered. AO was reportedly much happier than usual during the testing days, as well as on the day of the school observation. This was taken by persons who know her well to possibly suggest that she was excited about the attention and assistance for her. During testing, she would repeat to the examiner on occasion "Laurie school meeting for AO.". AO worked hard on all tasks and results are considered reliable and valid from which to draw diagnostic and prognostic conclusions.

TEST RESULTS

SCHOOL OBSERVATION

A school observation was requested to determine if her needs are being, and to consider options to enhance her learning experience at school.

The following were observed: regular classroom (AO's writing with her aids, snack time, student presentations), transitions, occupational therapy, sensory integration, science and the math room. Teaching methods, group dynamics, peer relations, AO's behaviors and technologies used were observed.

Personal Aid

AO's personal aid, Becky, is outstanding and imperative to her learning and attention in all classes and transitions between classes. AO and Becky have a very close and respectful relationship that is based upon trust acquired over many years of working together. AO sometimes refers to Becky as 'mom'. Becky assisted AO with her writing in the regular class, science in the regular class, was available during her O.T., and worked directly with AO for sensory integration and math (one-on-one). They worked one-on-one on a writing assignment while in the regular classroom. During science, Becky helped AO follow along with the lecture and in class assignments.

Occupational Therapy and Sensory Integration

Occupational therapy and sensory integration were very tailored to AO's needs and as well as successful. On the particular day of the observation, AO's O.T. services consisted of stringing beads together and writing/crossing out on the white board to work on fine motor skills as well as throwing/bouncing and catching balls. It was stated that her bead stringing in particular had improved dramatically from having difficulty linking two beads together, to stringing enough for a necklace-sized string. During breaks, she utilized the swing in the O.T. room and enjoyed swinging as high as she could. Sensory integration was particularly enjoyable for AO who lit up as she and Becky worked on dance steps to music (challenging but very enjoyable for her), e.g. listening to the words "step forward, step back, side .." and attempting to repeat these steps to the music. AO's aids and teachers reported that she appeared particularly happy on the day of the observation and the swing was particularly useful at helping her get her energy out in order to sit still in subsequent classes (science and math). At times, AO would lunge toward her O.T. teacher as if to give her a hug or tap her and her teacher would state, "What would you like AO? Use your words." AO would then try to use her words to explain what she wanted.

Technologies and Tools used for Learning

The use of beanbag chairs in the regular classroom, O.T. room and math tutoring room were very useful for AO who frequented them often, usually head first. She enjoyed lying in the chairs and turning away from stimuli in the rooms by burying her head in the chairs. These were wonderful for AO. Problems noted were difficulty completing personal work in the classroom while other

things were going on. The use of the computer in the regular classroom to assist AO with her writing was very useful and important, particularly given documented findings that she types with far greater ease than she writes/prints. Balls, swings, beads, white boards and music were all used in O.T. and sensory integration. No hands-on learning aids were used in science.

Writing/Reading in/and her Regular Classroom

AO was seated in the regular classroom that was full of noise and distractions. She sat at a computer facing the wall while circle activities/presentations were going on. It would have been wonderful if AO could have participated in the circle by watching her classmates present. Instead, she was working on a different writing project that had been given to her while there was commotion and then later presentations by her classmates. During snack time, she was notably disturbed by the sights and sounds of various juice boxes and soda cans, leading to a covering of her eyes, and removing herself from her seat to bury her face in the beanbag chair. Becky created a cardboard divider to place on her desk for her to eat behind, and this worked very well. Becky sat at her desk and finished her snacks without being exposed to stimuli that she was bothered by. There was no direct contact or communication between AO and her teacher at any time during the class. Students in the class engaged Sarah by speaking to her or handing things to her.

Lunch/Recess

AO has her own table that she sits at during lunch break, and each day new children are invited to her table with the assistance of her aid, Becky. Becky informed that many children would like to sit at AO's table and look forward to it. At recess, AO is instructed to communicate with and/or engage with peers through play or conversation before she returns to her academic schedule. These efforts are encouraging social interactions.

Science

AO and Becky both sat at a group table during Science that took place after lunch. AO sat still at the table quietly for the entire session. The class that day involved each student looking through a copy of the same book about salmon and asking questions and/or making statements about pictures in the book. AO did not appear to be very engaged in this class. She did not reach out to look through the book on her own and did not engage in any conversation. Becky would turn the book for her at times, but AO did not appear to be engaged. It is difficult to ascertain to what degree she actually took information in from that class. Becky stated that she often wonders what she is or is not absorbing in that class. The students had taken out drawings that they had done from the prior class to denote stages of fish development. Since AO has extreme difficulty drawing even the most simple designs, there were essentially 'scribbles' in each box where other students had pictures. She clearly could not ascertain what she had drawn the class prior, nor could anyone else for that matter. Students were asked to continue to color and draw their pictures of fish development, although AO did not do this since it was not a useful task for her, so she sat and waited until others were done. There was no direct communication between AO and her teacher at any time during the class. Students at AO's table periodically advised her

directly or spoke to/about her in the 3rd person to Becky who was sitting beside AO, i.e. “Can AO do this?” and “Does she like this?”

Math

AO’s math assistant was not available during the observation period as she had gone home earlier that day for a medical leave day.

Transitioning

Becky was available to assist AO in transitioning from each class to the next as well as to/from lunch and recess. Without this assistance, AO would find it very difficult to transition and get situated in subsequent classes or activities. AO did not seem upset or anxious from these transitions that Becky guided her through.

NEUROPSYCHOLOGICAL

Intelligence

AO was administered fourteen subtests of the Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV) from which her composite scores are derived. The Full Scale IQ (FSIQ) is derived from a combination of ten subtest scores and is considered the most representative estimate of global intellectual functioning.

Scale	Sum of Scaled Scores	Composite Score	Percentile Rank	Confidence Interval	Qualitative Description
Verbal Comprehension (VCI)	10	61	0.5	57-70	Extremely Low
Perceptual Reasoning (PRI)	14	67	1	62-77	Extremely Low
Working Memory (WMI)	6	59	0.3	55-70	Extremely Low
Processing Speed (PSI)	10	73	4	67-85	Borderline
Full Scale (FSIQ)	40	57	0.2	53-63	Extremely Low

AO’s general cognitive ability is within the Extremely Low range of intellectual functioning, as measured by the FSIQ. Her overall thinking and reasoning abilities exceed those of approximately 0.2% of children her age (FSIQ = 57; 95% confidence interval = 53-63). AO may experience great difficulty in keeping up with her peers in a wide variety of situations that require age-appropriate thinking and reasoning abilities. Her ability to think with words is comparable to her ability to reason without the use of words. Both AO's verbal and nonverbal reasoning abilities are in the Extremely Low range. She performed slightly better on nonverbal than on verbal reasoning tasks, but there is no significant meaningful difference between AO's ability to reason with and without the use of words. As will be seen later in this report, executive function skills are particularly weak making it difficult for AO to process complex information for problem-solving.

AO's verbal reasoning abilities as measured by the Verbal Comprehension Index are in the Extremely Low range and above those of only 0.5% of her peers (VCI = 61; 95% confidence interval = 57-70). The Verbal Comprehension Index is designed to measure verbal reasoning and concept formation. See the Language section of this report for more detailed information.

AO's nonverbal reasoning abilities as measured by the Perceptual Reasoning Index are in the Extremely Low range and above those of only 1% of her peers (PRI = 67; 95% confidence interval = 62-77). The Perceptual Reasoning Index is designed to measure fluid reasoning in the perceptual domain with tasks that primarily assess nonverbal fluid reasoning and perceptual organization abilities. See the Visual-spatial section of this report for more detailed information.

AO's ability to sustain attention, concentrate, and exert mental control is in the Extremely Low range. She performed better than approximately 0.3% of her age-mates in this area (Working Memory Index = 59; 95% confidence interval 55-70). See the Working Memory section of this report for more detailed information.

AO's ability in processing simple or routine visual material without making errors is in the Borderline range when compared to her peers. She performed better than approximately 4% of her peers on the processing speed tasks (Processing Speed Index = 73; 95% confidence interval 67-85). See the Sensorimotor and Processing Speed section of this report for more information.

Language

AO's verbal reasoning abilities as measured by the Verbal Comprehension Index are in the Extremely Low range and above those of only 0.5% of her peers (VCI = 61; 95% confidence interval = 57-70). The Verbal Comprehension Index is designed to measure verbal reasoning and concept formation. AO performance on the verbal subtests presents a diverse set of verbal abilities, performing much better on some verbal skills than others.

Subtest	Raw Score	Scaled Score	Percentile Rank
Similarities	12	7	16
Vocabulary	10	2	0.4
Comprehension	4	1	0.1
(Information)	12	7	16
(Word Reasoning)	7	5	5

AO performed in the low average to below average range on the Similarities and Information subtests. The Similarities task required that she only respond with one or more words to indicate what two words had in common, e.g. 'poet and painter' answer = artists. When oral expression does not require integrating many words, AO performs better. She also performed in the low to below average range on the Information subtest indicating a strength in understanding of factual information from the world around her, e.g. utilizing calendars and basic world knowledge.

In order to investigate AO’s ability to reason with verbal information and demonstrate her store of verbal knowledge, she was administered two process-oriented verbal multiple-choice subtests. These multiple-choice subtests are designed to reduce the demand on free recall and verbal expression, while measuring the same core trait as its counterpart. In other words, to determine if the Vocabulary score was weak due to weak oral expression as opposed to not knowing what most of the words meant, different forms of the Vocabulary test were administered, such as a language and visual (picture) based ‘mutliple choice’ subtests.

Process Score	Raw Score	Scaled Score	Percentile Rank
Vocabulary Multiple Choice (VCMC)	12	1	0.1
Picture Vocabulary Multiple Choice (PVMC)	14	4	2

Results indicated equally weak performance on these subtests as well. The language-based multiple choice format of the vocabulary test was difficult for AO due to limited working memory and visual attention (she would often choose the last answer given due to forgetting the first choices, and did not readily use the written guide with the choices in front of her despite reminders to do so). The picture-based multiple choice subtest also proved to be difficult for AO due to a tendency to choose pictures from the bottom of the page (C or D, as opposed to A or B above), and a greater tendency to choose the last one given (D). Despite attempts to first have her focus on each picture before the word was given, as well as after the word was given, her answer would ‘default’ to one of the last two items.

As can be seen from the below table, there were no significant differences between any of the vocabulary tests.

Subtest/Process Score	Scaled Score 1	Scaled Score 2	Diff.	Critical Value	Sig. Diff. Y/N	Base Rate
VC - VCMC	2	1	1	3.05	N	41.8%
VC - PVMC	2	4	-2	3.09	N	23.8%
VCMC - PVMC	1	4	-3	3.34	N	14.7%

Her performance on the multiple-choice version of the Vocabulary subtest was well below that of her peers (Vocabulary Multiple-Choice = 1). This subtest required AO to choose from a list of options the one that best defines a word presented in text and read aloud. Her performance suggests that she has not have acquired an age appropriate level of general word knowledge. Presentation of items in a multiple-choice format, did not significantly improve AO’s verbal performance.

Her performance on the pictorial or visual multiple-choice version of the Vocabulary subtest was also well below that of her peers (Picture Vocabulary Multiple-Choice = 4). This subtest required her to choose from four pictures the one that best represents a given verbal concept. Her performance suggests that she has not acquired an age appropriate level of general word knowledge or has difficulty relating pictorial or visual information to verbal concepts. Providing

visual cues did not significantly enhance her word knowledge performance. AO is better able to demonstrate her word knowledge when presented with pictorial representations (Picture Vocabulary Multiple Choice = 4), rather than written-word definitions (Vocabulary Multiple Choice = 1). Still, care must be given to ensure that she appropriately attends to all pictorial items before making a choice, and she must be reminded of the word she is seeking as she is studying the pictures. In addition, her overall performance on these tasks is below her peers, suggesting she has not likely acquired an age appropriate level of general word knowledge, yet providing visual cues improves performance compared to providing verbal/written cues. This weak vocabulary knowledge impacts upon comprehension.

Subtests of the NEPSY II were also administered to further examine language-based skills. The Comprehension of Instructions subtest was administered to examine listening comprehension, and the Phonological Processing subtest was administered to examine lower-level language skills.

Language				
Score Name	Raw Scores	Scaled Scores	Percentile Ranks (%)	Classification
Comprehension of Instructions Total Score	10	1	0.1	Well Below Expected Level
Phonological Processing Total Score	28	5	5	Below Expected Level

Results indicated well below average Comprehension of Instructions, and below average Phonological Processing. Results can be seen in above and below tables.

Scaled Scores																			
Score Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Comprehension of Instructions Total Score	+																		
Phonological Processing Total Score					+														

These findings indicate that AO requires extremely brief verbal instructions to comprehend what is being asked of her. She also benefits from direct physical instructions (showing) as opposed to any verbal form of instructions. Phonological Processing scores indicated difficulty parsing words into individual sounds parts. Next, visual-spatial skills were examined.

Visual-spatial

AO's nonverbal reasoning abilities as measured by the Perceptual Reasoning Index are in the Extremely Low range and above those of only 1% of her peers (PRI = 67; 95% confidence interval = 62-77). The Perceptual Reasoning Index is designed to measure fluid reasoning in the perceptual domain with tasks that primarily assess nonverbal fluid reasoning and perceptual organization abilities. AO's performance on the perceptual reasoning subtests contributing to the PRI is somewhat variable, although the magnitude of this difference in performance is not unusual among children her age. Examination of AO's performance on individual subtests provides additional information regarding her specific nonverbal abilities.

Subtests	Raw Score	Scaled Score	Percentile Rank
Block Design	4	2	0.4
Picture Concepts	10	5	5
Matrix Reasoning	14	7	16

In order to further investigate AO's non-verbal reasoning ability, she was administered two process oriented perceptual reasoning subtests. AO's performance on the multiple-choice version of the Block Design subtest is well below that of her peers (Block Design Multiple Choice = 1). This subtest required AO to select from four options the one that matches the target design, while ignoring distracters. Her performance suggests that she may have difficulty with visual discrimination and mental construction, making it difficult to distinguish between subtle differences in the presence of distracters. Although she performed somewhat better on manual construction than multiple-choice, the difference is not especially uncommon.

Process Score	Raw Score	Scaled Score	Percentile Rank
Block Design Multiple Choice (BDMC)	1	1	0.1
Elithorn Mazes (EM)	0	4	2

AO's performance on the Elithorn Mazes subtest is below that of her peers (Elithorn Mazes = 4). This subtest required AO to view a series of mazes and draw a path that passes through a specified number of dots en route to the exit within a specified time limit. The designs are created to draw impulsive responders into making incorrect responses because planning skills are emphasized in this test. Her performance suggests that she may not have developed an age appropriate level of scanning ability, visual and motor sequential processing, planning, organization, motor execution, and ability to inhibit impulsive responses.

Visuospatial Processing				
Score Name	Raw Scores	Scaled Scores	Percentile Ranks (%)	Classification
Arrows Total Score	0	1	0.1	Well Below Expected Level

The Arrows subtest of the NEPSY II was also administered to examine AO's ability to determine line angles and orientations of visual stimuli. This task required choosing 2 of 8-12 arrows that were directed at the center of a target (similar to an archery board) and repeating this with subsequent targets. Results indicated a well below average ability to determine line angles and orientations.

Working Memory

AO's ability to sustain attention, concentrate, and exert mental control is in the Extremely Low range. She performed better than approximately 0.3% of her age-mates in this area (Working Memory Index = 59; 95% confidence interval 55-70).

Subtests	Raw Score	Scaled Score	Percentile Rank
Digit Span	9	5	5
Letter-Number Sequencing	0	1	0.1
(Arithmetic)	12	5	5

AO had difficulty with the two tasks that demand mental control, that is, attending and holding information in short-term memory while performing some operation or manipulation with it and then correctly producing the transformed information. (Digit Span scaled score = 5; Letter-Number Sequencing scaled score = 1). AO's difficulty recalling long spans of digits backwards (Longest Digit Span Backwards = 2) is further evidence of weak mental control. This general weakness in attention, concentration, mental control, and short-term auditory memory may impede AO's performance in a variety of academic areas but especially on tasks that require her to solve numerical problems mentally (i.e., without using pencil and paper).

Sensorimotor and Processing Speed

AO's ability in processing simple or routine visual material without making errors is in the Borderline range when compared to her peers. She performed better than approximately 4% of her peers on the processing speed tasks (Processing Speed Index = 73; 95% confidence interval 67-85).

Subtests	Raw Score	Scaled Score	Percentile Rank
Coding (CD)	24	5	5
Symbol Search (SS)	11	5	5
(Cancellation) (CA)	32	4	2

The Cancellation task was performed twice, once with the items in a random fashion across two pages, and the other with the items in a linear fashion (rows across the two pages). AO performed slightly better on the linear/orderly items than on the random one (crossed out more target items when the items were presented in rows; the opposite result generally happens with most persons).

Process Score	Raw Score	Scaled Score	Percentile Rank
Cancellation Random (CAR)	13	4	2
Cancellation Structured (CAS)	19	5	5

She also demonstrated a left-to-right crossing out of items (starte on the left page and crossed items out left-to-right).

Subtests of the NEPSY II were also administered to further examine sensorimotor skills. Results indicated well below average performance on more complicated visual-motor tasks, e.g. Finger Tapping Sequences, and slightly below average performance on simple motor tasks measuring the

speed of bringing the thumb and index finger together in a repetitive manner (Finger Tapping Repetitions).

Scaled Scores

Score Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Fingertip Tapping– Dominant Hand Combined Scaled Score					+															
Fingertip Tapping– Nondominant Hand Combined Scaled Score			+																	
Fingertip Tapping– Repetitions Combined Scaled Score							+													
Fingertip Tapping– Sequences Combined Scaled Score			+																	
Imitating Hand Position Total Score	+																			

Percentile Ranks

Score Name	<2	2-10	11-25	26-75	>75
Fingertip Tapping–Dominant Hand Repetitions Completion Time			+		
Fingertip Tapping–Dominant Hand Sequences Completion Time		+			
Fingertip Tapping–Nondominant Hand Repetitions Completion Time			+		
Fingertip Tapping–Nondominant Hand Sequences Completion Time	+				

Memory and Learning

Subtests of the NEPSY II were administered to examine memory and learning abilities. Results indicated well below average memory for faces, average immediate memory for names, below average delayed memory for names, well below average narrative memory (memory for story information presented verbally/aurally) under cued recall conditions (asking questions) and below average narrative memory with free recall (recalling on her own without questions). Results are displayed in the below table.

Scaled Scores

Score Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Memory for Faces Total Score	+																			
Memory for Faces Delayed Total Score	+																			
Memory for Names Total Score									+											
Memory for Names Delayed Total Score				+																
Memory for Names and Memory for Names							+													

Delayed Total Score																		
Narrative Memory Free and Cued Recall Total Score	+																	
Narrative Memory Free Recall Total Score					+													

These results indicate that AO’s memory for names is an area of strength for her, and high levels of repetition and assimilation of information are required for these memories to remain after a time delay. Results also indicate very weak memory for faces (both upon immediate and delayed recall), and better free recall versus cued recall when recalling story information. It is difficult for AO to articulate what she would like to say with precision, and thus free recall allows her to demonstrate her knowledge of information that is not always relayed when questions are asked of her.

Attention

Attention is very impaired. The IVA CPT was administered. This is a computerized task that removes elements of memory and executive function from the task leaving a very pure attention measure. The instructions are so simple and the stimuli so basic, that the task measures pure ability to attend/respond to stimuli. This task was very difficult for AO. The task was repeated three times on different days and with varied implementations to rule out the possibility that she did not understand the instructions or simply could not respond quickly enough (motor issue). Results indicated that attention is severely compromised. It is very difficult for AO to attend to stimuli given (1) the necessity to move her body, (2) weak listening comprehension, and (3) difficulty focusing/fixating visually. These things get in the way of her ability to attend to stimuli for lengths of time necessary for optimal learning. Allowing her to move and/or incorporate movement into learning, dramatically shortening or eliminating verbal instructions, and assisting her visual attention, will cater to attention weaknesses leading to improved learning. The IVA CPT is described below. Note: no scores were generated for any of the three test administrations, since the task was so difficult for AO that it had to be discontinued each time. Her need to move about was so pronounced upon each administration, that it was difficult for her to sit still and keep her hand on the mouse or on the key in order to respond with button presses. She is quick at button pressing itself, but not in response to items and not in the orderly manner required in the task. Upon multiple rule outs, attention was deemed dramatically impaired.

The IVA CPT (Integrated Visual & Auditory Continuous Performance Test) is a very ‘pure’ test of attention (very easy task eliminating working memory, executive function, and other forms of processing often additionally associated with tasks of attention). It measures responses to 500 intermixed visual and auditory stimuli spaced 1.5 seconds apart. The task is to click the mouse when the stimulus is a visual or auditory "1" and to refrain from clicking when the stimulus is a visual or auditory "2". A correct response is defined as exactly one click to a target stimulus. The individual taking the test must be able to discriminate between 1's and 2's, switch between sensory modalities, and maintain attention for about thirteen minutes. The targets ("1") occur frequently during some sections of the test and rarely during other sections, thus testing attention under conditions of both high and low demand.

Results are normally presented as four primary scales which measure various facets of attention (see graph under IVA CPT in the Appendix). The scales use standard scores (Q scores) to facilitate comparisons between them. An average score is 100, with 15 points representing one standard deviation, similar to IQ scores. In this way, they are documented and discussed much like intelligence scores are, although in the attention domain. It should be noted that Q scores on the IVA CPT may fluctuate from day to day. AO's motivational, emotional or physical state can influence her scores. Although this is so, generally repeating of the test leads to similar scores.

The measures within the IVA CPT will be discussed. The operational definitions of the four primary scales are as follows:

Alertness measures the percentage of correct responses when the demand to respond is infrequent. In other words, many "2's" are presented consecutively (both auditory and visual – mixed) followed by a rare target "1", and reactions to these rare targets are averaged over the course of the test to come up with an 'alertness' score (was the child alert to the change in stimuli from many 2's to a single target 1). Lower quotient scores result from more errors of omission (inattention – not noticing the switch from 2's to a 1). AO did not complete the task on any of the three administrations so scores are not available.

Steadiness is somewhat opposite to alertness in the sense that it is not measuring being alert to the presentation of the target stimulus after multiple presentations of nontarget stimuli (alertness), but it measures the ability to remain attentive to multiple and consecutive presentations of target stimuli. In other words, can AO keep attending/responding to the many target 1's that are being presented consecutively? A low quotient score reflects problems in sustaining attention to these targets. AO did not complete the task on any of the three administrations so scores are not available.

Promptness is defined as the discriminatory reaction time to the targets during the sections when the targets are rare. In other words, how quickly did AO click the mouse button under the 'alertness' conditions (when the 1's were rare and followed multiple presentations of 2's)? A high quotient score reflects quick responses to the rare targets. A low quotient score generally indicates the subject's mental processing speed is impaired (slow response time to targets; slow in pressing the button in response to targets). However, motoric deficits or a cautious attitude may also account for slow response times. AO did not complete the task on any of the three administrations so scores are not available.

Constancy measures how reliable and consistent the promptness score was – in other words, did the time in which it took him to respond to stimuli change from beginning to middle to the end of the test. Sometimes if children get tired this will fluctuate, as an example with slower/fewer responses toward the end of the test, or they may be slow to start, etc. This promptness score is defined as the variability (standard deviation) of an individual's discriminatory reaction time during periods when targets ("1"s) are infrequent/rare. A person with a high quotient score will respond similarly to every trial. This high quotient score demonstrates reliable attentional functioning and self-control. The subject is focused on the task at hand. Low quotient scores indicate that the person's response times are more variable. She may become fatigued over the

course of the test, or be distracted by internal or external conditions. AO did not complete the task on any of the three administrations so scores are not available.

Failure to complete the task with controls for understanding instructions and ability to button press (repeated tasks with pressing mouse button, then pressing key #1 on keyboard, and also helping her press by examiner placing her hand on top of AO's to show her how to respond with mouse clicks or button presses), demonstrated that attention is dramatically impaired.

Executive Function

The Delis Kaplan Executive Function System (D-KEFS) was administered to examine problem-solving and planning abilities, as well as subskills that underlie this processing such as efficiency of word retrieval and attention shifting.

Subtest	Scaled Score	Description
Verbal Fluency Letters	11	Average
Verbal Fluency Categories	15	Superior
Verbal Fluency Category Switching	12	High Average
Color-word Interference Color Naming (speed)	<1	Well Below Average
Color-word Interference Word Reading (speed)	<1	Well Below Average
Color-word Interference Inhibition (speed)	<1	Well Below Average
Color-word Interference Inhibition Switching (speed)	<1	Well Below Average
Twenty Questions	2	Well Below Average
TOWER	3	Well Below Average

Results indicated an average ability to recall words starting with target letters, superior e ability to recall words from given categories (e.g. animal names or boy names), and a high average ability to shift attention from one category to another as required in the category switching word retrieval task. Collective findings indicated word retrieval abilities.

Naming speed tasks were then administered (Color-word Interference tasks). Where the Verbal Fluency tasks required recalling words from memory, the Color-word Interference tasks required recalling/verbalizing words of visual stimuli presented in multiple rows (naming speed). AO achieved in the well below average range on all Color-word Interference tasks indicating extremely poor rapid naming. The Color Naming task measured the speed in which she could name colored squares (blue red or green), the Word Reading task measured the speed in which she could read words of colors (blue, red or green), the Inhibition-switching task measured the speed in which she could state the ink colors of the words red blue or green (ignoring what the words presented said/meant, i.e. 'red', 'green', 'blue', and attending only to the ink colors of these words to verbalize these ink colors as quickly as possible – as in 'red' written in green ink, 'blue' written in red ink, etc.). The Inhibition Switching task was a repeat of the Inhibition task with the added requirement that when a word was presented with a box around it, she was to read the word instead of state the ink color of the word. This task requires inhibiting what the word says in order to focus on ink colors that are inconsistent with the word meanings and is thus

referred to as 'Inhibition' and then switch to reading the word if in a box thus referred to as 'Switching'. These collective findings indicate profound difficulty guiding and shifting focus in order to name visual items, as well as difficulty switching attention between visual stimuli.

AO achieved well below average performance on the Twenty Questions subtest that required thinking/planning ahead and organizing questions in order to ask as few 'yes/no' questions as possible to determine a target item amidst many foils. She also achieved in the well below average range on the TOWER task – a visual-motor task requiring planning ahead in order to determine where to move disks on pegs to make target designs in as few moves as possible.

Overall findings indicate a notable strength in retrieving words, in addition to notable executive function difficulties. Rapid naming of visual items also proved to be a notable area of weakness for AO.

Personal Strengths and Weakness

AO's greatest performance proved to be on the word retrieval tasks where she performed in average to superior ranges. Her highest score proved to be retrieval of categorical information indicating that when information is processed and assimilated according to semantic similarities, e.g. animal names, her retrieval of such information is well beyond her peers (scaled score = 15). AO's performance was significantly better on the Matrix Reasoning subtest than her own mean score as well, indicating another area of strength for her. AO's abilities on the Matrix Reasoning subtest is only slightly below children her age. The Matrix Reasoning subtest required AO to look at an incomplete matrix and select the missing portion from five response options. This subtest assesses fluid visual information processing and abstract reasoning skills; (Matrix Reasoning scaled score = 7). AO also showed good Finger Tapping abilities (see Sensorimotor and Processing speed section of report; scaled score = 7 and 11-25th percentile). Her precocious keyboarding/typing skills are a testament to an extraordinary area of strength for AO (her typing skills are beyond most peers as well as adults in efficiency and accuracy).

AO demonstrated a strength in verbal reasoning with her performance on the Similarities subtest, and a weakness in comprehension with her performance on the Comprehension subtest of the WISC IV. Her performance across these areas differs significantly and suggests that these are the areas of most pronounced strength and weakness, respectively, in AO's profile of verbal reasoning abilities. AO's ability on the Similarities subtest was only slightly below that of children her own age. Her weak performance on the Comprehension subtest was far below that of most children her age, indicating compromised understanding of social rules and behaviors. Most questions in the Comprehension subtest were 'why' questions, which are extremely difficult for AO to answer given executive function difficulties. On the Similarities subtest AO was required to respond orally to a series of word pairs by explaining how the words of each pair are alike. This subtest examines her ability to abstract meaningful concepts and relationships from verbally presented material; (Similarities scaled score = 7). The Comprehension subtest required AO to provide oral solutions to everyday problems and to explain the underlying reasons for certain social rules or concepts. This subtest provides a general measure of verbal reasoning. In particular, this subtest assesses her comprehension of social situations and social judgment as well as her knowledge of conventional standards of social behavior;

(Comprehension scaled score = 1). Her knowledge of basic world/life facts proved to be an area of strength for AO, however (Information subtest scaled score = 7). Executive function skills proved to be one of AO's greatest struggles, with well below average performance on both verbal and nonverbal executive function tasks. It is difficult for her to organize and plan to solve multi-step problems. Oral expression, attention, memory for faces and stories, and comprehension (verbal and nonverbal) were other areas of weakness.

EDUCATIONAL

Achievement subtest scores are observable in the below table, as well as the tables within the Vocabulary and Reading sections of this report (also below). These scores are discussed within this section in detail, within Reading, Math, Oral Language, and Written Language subsections. Performance in these areas is also contrasted with overall cognitive abilities to determine areas of strength and weakness relative to scores expected based upon intelligence/cognitive abilities.

SUBTESTS*	RAW	STD	95% INTERVAL	PR	NCE	S9	AGE EQU	GRADE EQU
Numerical Operations	17	89	79- 99	23	35	4	8:4	3:2
Math Reasoning	16	56	48- 64	0.2	<1	1	6:0	K:8
Spelling	22	87	80- 94	19	32	3	8:0	2:5
Written Expression	26	121	110- 132	92	79	8	13:0	7:8
Listening Comprehension	6	48	35- 61	<0.1	<1	1	4:0	PreK5:1
Oral Expression	9	64	54- 74	1	<1	1	5:8	K:8

Vocabulary

Vocabulary was tested in three different ways to determine if verbal expression, pointing to pictures, and choosing multiple choice sentences (presented both verbally and in sentence form on cards) would alter vocabulary performance.

Subtest	Raw Score	Scaled Score	Percentile Rank
Vocabulary	10	2	0.4
Vocabulary Multiple Choice (VCMC)	12	1	0.1
Picture Vocabulary Multiple Choice (PVMC)	14	4	2

Results indicated well below average performance utilizing each of these methods suggesting well below average vocabulary knowledge. Qualitative observations led to insight regarding using these different methods for testing AO's knowledge base. When asked to offer verbal definitions of words, she struggled in forming proper sentences to explain clearly what it was that she wanted to say, when asked to point to one of four pictures denoting the meaning of a word, she had a tendency not to examine each picture carefully enough in order to make a well-informed decision and had tendencies to examine pictures in a bottom-up fashion and from left-

to-right (bottom pictures first, and picture on the left first, followed by pictures in the top row, left one first). When asked to choose which definition best matched a given word (several answers given verbally and also written in short sentence form on cards in front of her), this was most difficult for AO whose weak working memory (auditory memory) led to tendencies to choose the last item presented to her by default. Attempts to review all answers were often futile, with a desire to choose the last item.

Although the methods were each difficult for AO for different reasons, it was clear that vocabulary itself was low for her age (she did not know the definitions of many words and gave answers sometimes dramatically different from the actual definition).

Reading

AO's reading scores were clearly mixed and demonstrative of hyperlexia in some areas, e.g. precocious sounding-out/decoding skills, and probable in other areas, e.g. comprehension (word and passage level). All reading programs for AO at this this time should emphasize comprehension over all other areas of reading (both word and passage level comprehension). As will be seen from findings below, AO's performance is mixed in various areas of reading. Weak visual-auditory learning adversely impacts reading generally, and led to slow mastery of these skills when younger in particular. Accomodations for weak visual-auditory learning/memory and assistance with comprehension will lend to the greatest gains in reading at this time.

Weak visual attention contributes to weak fluency, as AO's visual attention is dominant toward the bottom of pages as well as the left of pages. She will often fixate on bottom and/or bottom/left items when presented with many items in rows on a page. Visual tracking aids to guide reading will be helpful, e.g. using finger, covering words that are not to be focused on until ready, etc. It is also imperative to discuss with AO the overall concept of stories before beginning them, and offering visual aids to remind her of the "big picture" of stories/information she is reading. She quickly forgets main themes and goals when reading, and thus requires tools to be reminded of these, as well as tools to teach her to determine these herself prior to approaching passage reading, e.g. focusing on, repeating, and writing down titles/headings many times, and/or reading book summaries over repeatedly before beginning a book. Vocabulary for certain words will also enhance comprehension, e.g. 'over', 'under', 'by', 'beside', as will enhancement of executive function abilities in regard to answering 'what' and 'why' questions in particular.

Performance on all reading subtests can be seen graphically in the below tables (percentiles/standard scores), as well as described in detail in the below written sections thereafter.

SUBTEST	PR Range	1	5	25	50	75	95	99
Vis-Aud Learning!	4 - 10		****					
Letter Ident	2 - 5		****					

CLUSTER	PR Range	1	5	25	50	75	95	99											
Word Ident	70 - 81						***												
Word Attack	80 - 92						*****												
Word Comp	9 - 22			*****															
Passage Comp	15 - 24			***															
!-----! <table border="1"> <tr> <td>50</td> <td>60</td> <td>70</td> <td>80</td> <td>90</td> <td>100</td> <td>110</td> <td>120</td> <td>130</td> <td>140</td> <td>150</td> </tr> </table> !-----! <p>STANDARD SCORE (Mean=100, SD=15)</p>									50	60	70	80	90	100	110	120	130	140	150
50	60	70	80	90	100	110	120	130	140	150									
Readiness	2 - 5	****																	
Basic Skills	81 - 90						****												
Reading Comp	13 - 20			***															
Total Reading-FS	45 - 53					**													
!-----! <table border="1"> <tr> <td>50</td> <td>60</td> <td>70</td> <td>80</td> <td>90</td> <td>100</td> <td>110</td> <td>120</td> <td>130</td> <td>140</td> <td>150</td> </tr> </table> !-----! <p>STANDARD SCORE (Mean=100, SD=15)</p>									50	60	70	80	90	100	110	120	130	140	150
50	60	70	80	90	100	110	120	130	140	150									

Total Reading Cluster--Full Scale

The Total Reading Cluster--Full Scale is a broad measure of reading ability useful in comparing a person's overall reading ability with other individuals in the same grade or at the same age. The Total Reading Cluster is a combination of the four reading achievement tests of the WRMT-R battery: Word Identification, Word Attack, Word Comprehension, and Passage Comprehension. AO's standard score is 99 which equals a percentile rank of 48. Her age equivalent is 9 years 6 months and her grade equivalent is 4.1. AO is functioning in the average range when all reading scores are collectively considered. This score of course considers both areas of precocity as well as considerable weakness, rendering an overall average score. It is of course important to consider individual areas of performance for a more detailed picture as to how AO is performing in regard to reading skills. These are discussed below. Note: percentiles are generally more accurate than age or grade equivalencies, and should be focused on more when examining performance on these reading measures.

Readiness Cluster

The Readiness Cluster is composed of the Visual-Auditory Learning and Letter Identification subtests. The Readiness Cluster measures skills useful for beginning reading. AO scored a percentile rank of 4 and a standard score of 73. Her age equivalent is 6 years 8 months and her

grade equivalent is 1.3. AO is functioning in the well below average range. This score is low due to weak visual-auditory learning as well as weak understanding/recognition of script letters (as opposed to printed). These scores can be observed in below Visual-Auditory Learning and Letter Identification subtest sections.

Basic Skills Cluster

The Word Identification and Word Attack subtests are combined to measure basic reading skills. AO had an age equivalent of 11 years 4 months and a grade equivalent of 6.3. Her percentile rank of 86 yields a standard score of 116. AO is functioning in the above average range. Her ability to recognize/decode individual words is beyond her peers. This pattern is often common amongst particularly autistic profiles (hyperlexia in regard to word reading, in the presence of weak comprehension of what one reads). Word Identification (orthographic reading), Word Attack (sounding-out/decoding) and Word Comprehension/Passage Comprehension sections below show a more detailed picture of discrepancies between basic word reading abilities that are precocious, and comprehension that is weak.

Reading Comprehension Cluster

Combining results from the Word Comprehension and Passage Comprehension subtests, the Reading Comprehension Cluster measures how well an individual understands what he or she reads. AO's standard score is 85 and her percentile rank is 16. She has an age equivalent of 7 years 10 months and a grade equivalent of 2.3. AO is functioning in the below average range.

Subtests

Visual Auditory Learning

This subtest uses symbols to measure an individual's ability to learn new vocabulary. AO's standard score is 78 and her percentile rank is 7. She has an age equivalent of 6 years 4 months and a grade equivalent of 1.1. AO is functioning in the well below average range on this subtest.

Letter Identification

Letter Identification measures an individual's ability to identify the letters of the alphabet when they are presented in many different styles. AO's standard score is 72 and her percentile rank is 3. She has an age equivalent of 7 years and a grade equivalent of 1.5. AO is functioning in the well below average range on this subtest.

Word Identification

Word Identification is primarily a measure of sight-word vocabulary. AO's standard score on this subtest is 111 and her percentile rank is 76. Her age equivalent is 10 years 9 months and her grade equivalent is 5.1. AO is functioning in the above average range on this subtest.

Word Attack

Word Attack uses nonsense words to measure an individual's ability to analyze the form and sound of unknown words, in order to pronounce them. AO scored a percentile rank of 87 and a standard score of 117. Her age equivalent is 14 years 10 months and her grade equivalent is 8.7. AO is functioning in the above average range on this subtest.

Word Comprehension

Word Comprehension measures reading vocabulary at three levels of difficulty in cognitive processing. It is comprised of three subtests--Antonyms, Synonyms, and Analogies. AO's standard score on this test is 84 and her percentile rank is 15. She has an age equivalent of 8 years, and a grade equivalent of 2.5. AO is functioning in the below average range on this subtest.

Passage Comprehension

This test measures an individual's ability to read and understand a short passage by asking that person to supply the missing word. AO scored a percentile rank of 19 and a standard score of 87. Her age equivalent is 7 years 10 months and her grade equivalent is 2.3. AO is functioning in the below average range for this subtest.

Summary of Reading Skills

AO's performance overall is in the average range. She is strongest in Word Identification and Word Attack. She has difficulty in Visual-Auditory Learning, Letter Identification, Word Comprehension, and Passage Comprehension. Services are required to improve reading comprehension via word level (vocabulary, synonyms/antonyms) and passage level ('big picture', integrating ideas, remembering information).

Mathematics

AO's skills in mathematics are diverse and may not be adequately summarized by a single number. She performed much higher on tasks that evaluated her ability to add and subtract one-to three-digit numbers and multiply and divide two-digit numbers (Numerical Operations standard score = 89) than on tasks that required her to understand number, consumer math concepts, geometric measurement, basic graphs, and solve one-step word problems (Math Reasoning standard score = 56). Because of this variability in her performance, the Mathematics Composite standard score (70) is not be an ideal summary of her overall skills in mathematics. AO's skills in Math Reasoning are within the Extremely Low range and better than those of only approximately 0.2% of children her age. Her Numerical Operations subtest score is above that of approximately 23% of her peers, placing these skills in the Low Average range. Numerical Operations involves nonverbal mathematics, whereas Math Reasoning involves a higher level of language-based mathematics, which was much more difficult for AO.

AO's greater performance on Numerical Operations questions relative to Math Reasoning questions indicates the utility of visually/numerically presented questions to assist her learning

and performance. The Numerical Operations subtests involves solving numerical equations on paper, whereas the Math Reasoning subtest requires listening comprehension coupled with utilization of graphs to solve language-based problems. The former is far easier for AO than the latter. This is likely the case due to reduction of working memory requirements in the case of numerically presented questions, and lack of listening comprehension requirements. When possible, short instructions, and high use of visual aids and motor demonstrations will enhance learning and memory for math. AO will benefit most greatly from motor/action-based demonstrations of mathematical concepts.

Oral Language

AO performed in the Extremely Low range in overall language skills, as indicated by her standard score on the Oral Language Composite (48). Her skills in this area exceed those of only approximately <0.1% of students her age. AO performed comparably on tasks that required her to identify the picture that best represents an orally presented descriptor or generate a word that matches the picture (Listening Comprehension standard score = 48) and generate words within a category, describe scenes, and give directions (Oral Expression standard score = 64). This is AO's lowest score from achievement testing indicating very serious oral language concerns. Both listening comprehension and oral expression tasks proved to be difficult for

Written Language

AO was given a computer to assist with her written expression, else her scores would be dramatically lower given difficulty manipulating writing utensils to print. By stark contrast, she is exceptional at typing and thus a computer was used for AO to type her responses. As such, note that the below scores reflect written expression as determined through typing her responses, not writing them.

AO's skills in written language are diverse and may not be adequately summarized by a single number. She performed much higher on tasks that evaluated her ability to generate words within a category, generate sentences to describe visual cues, combine sentences, and compose an organized paragraph (Written Expression standard score = 121) than on tasks that required her to correctly spell verbally presented words (Spelling standard score = 87). Because of this variability in her performance, the Written Language Composite standard score (104) is not an ideal summary of her overall skills in writing. AO's skills in Spelling are within the Low Average range and better than those of only approximately 19% of children her age. Her Written Expression subtest score is above that of approximately 92% of her peers, placing these skills in the Superior range.

AO is very quick at moving her fingers (as demonstrated by the Finger Tapping Repetitions subtest in the Sensorimotor and Processing Speed section of this report) which works to her advantage when expressing herself through typing. Computer keyboards allow her to express her thoughts almost as quickly as they are coming, whereas, the writing process is so laborious that it is difficult for her to even remember what she wants to say before she manages to get it

down on paper. The keyboard is essential to her written expression. Even when typing, however, she often starts out on task but can eventually drift from topic due to a stream of consciousness. AO requires reminders/aids/strategies to remember to refer back to the original question/topic for her writing. Her writing proved to be very interesting. AO wrote what appeared to be like an ‘acting script’, e.g. stating names and then listing what those people were saying, doing, and where they were to move to next. In the middle of one essay she even wrote “now a word from our sponsor” indicating she was viewing her story like she would view a television show or script. She sees images and describes them in her writing. AO can be encouraged to view assignments as scripts, movies or stories. Information can be pooled for her in a way that allows her to see a movie of the information (episodic memory). She would fair well at writing plays/scripts.

Ability versus Achievement

AO's scores on academic tests were compared with her verbal intelligence (61) to determine significant differences between actual and predicted achievement scores.

AO achieved better than anticipated in writing. Her Written Language Composite score (104) is much higher than anticipated for a child with her general cognitive ability (predicted score = 74). The difference is significant suggesting that this is an area of considerable strength for AO. It is important to note that she used a keyboard of a computer. She is very quick at moving her fingers (as demonstrated by the Finger Tapping Repetitions subtest in the Sensorimotor and Processing Speed section of this report) which works to her advantage when expressing herself through typing. Computer keyboards allow her to express her thoughts almost as quickly as they are coming, whereas, the writing process is so laborious that it is difficult for her to even remember what she wants to say before she manages to get it down on paper. AO performed particularly well on tasks that required her to generate words within a category, generate sentences to describe visual cues, combine sentences, and compose an organized paragraph as well as on tasks that assessed her ability to correctly spell verbally presented words. AO achieved a much higher score on the Written Expression subtest (actual score = 121) than expected, based on her overall cognitive ability (predicted score = 76). Similarly, she obtained a higher score on Spelling subtest (actual score = 87) than anticipated (predicted score = 75). These significant differences indicate specific strengths in these skill areas as compared to her overall cognitive ability. AO's performance in Spelling is only in the Low Average range, however, compared to that of her peers.

AO also achieved better than expected on overall reading, given precocious word identification and decoding skills. It is important to note, however, that reading comprehension skills are below average.

Math Reasoning is a particular area of difficulty for AO. Specifically, there is a noteworthy difference between her Math Reasoning subtest score (56) and the level of achievement anticipated for a student with her cognitive ability (predicted score = 73). This significant and highly unusual difference indicates a specific weakness on tasks that required her to understand number, consumer math concepts, geometric measurement, basic graphs, and solve one-step word problems. By contrast, her Numerical Operations abilities were in line with intelligence,

indicating that visual aids assist her learning – particularly in the absence of required listening comprehension or working memory/auditory memory demands.

AO displays difficulty with achievement in oral language. She scored much lower on the Oral Language Composite (actual score = 48) than expected for a child with her general cognitive ability (predicted score = 71). The difference between her actual and predicted scores is significant and highly unusual. Thus, this is an area in which AO may benefit from assistance in helping her further develop her skills. In fact, oral expression abilities are her greatest area of weakness. Both Listening Comprehension (actual standard score = 48) and Oral Expression (actual standard score = 64) are areas of difficulty for AO. The difference between AO's actual and predicted scores on the Listening Comprehension subtest (22 points) is both significant and highly unusual, and indicates a specific weakness in tasks that required her to identify the picture that best represents an orally presented descriptor or generate a word that matches the picture. For the Oral Expression subtests, the discrepancy between her actual and predicted scores (15 points) is also significant, suggesting a specific weakness in tasks that required AO to generate words within a category, describe scenes, and give directions.

AO's weakness in mathematics reasoning tasks is partially related to the poor mental control observed on the WISC-IV (working memory). A weakness in mental control can make it more difficult to hold all of the relevant mathematical concepts in mind while working through the problem. She also had considerable trouble with the Arithmetic subtest on the WISC-IV, which is another mathematics word-problem task and one which must be performed completely mentally and thus requires attention, concentration, short-term memory (as well as knowledge of numerical operations).

SUMMARY

AO has an autistic profile with clear areas of strength and weakness. Her greatest strengths lie in seeing and determining semantic relationships between words, as well as efficiency of word retrieval – particularly categorical information retrieved in single word format. In fact, she achieved in the superior range for word retrieval (retrieving words as efficiently as possible from given categories) and often in the above average range for seeing/determining semantic (meaningful) relationships between word meanings. Using her current vocabulary and knowledge of words, is an excellent way to facilitate the assimilation of new knowledge into current knowledge. Another area of precociousness for AO is her typing ability. She is a phenomenal typist in both speed and accuracy. Her motor memory for letter locations allows her to type faster than most persons are able to type. This profound ability should be used to assist AO's weakest areas of learning, e.g. oral expression. She also showed strengths in Matrix Reasoning (determining patterns and solving puzzles of abstract designs) and Information (knowledge of life facts), as well as Memory for Names.

Testing indicated weak areas to be both verbal and nonverbal comprehension, working memory, attention and executive function abilities which of course lend to compromised comprehension. AO's sensorimotor and processing speed abilities were higher than those in other areas, albeit

below average (borderline). Memory for Faces and Narrative Memory (memory for stories) were areas of weakness for AO (despite an area of strength for her being Memory for Names).

Educational testing revealed precocious decoding/word recognition abilities, and strengths in spelling and written expression (when afforded the opportunity to use a computer keyboard as opposed to manipulate a writing utensil). AO's spelling, albeit a strength, proved to be less than expected for her age. Educational testing showed that her listening comprehension, math reasoning and oral expression skills were low relative to both peers as well as relative to her own general cognitive abilities and areas of weakness for her. These findings show that she is currently not performing to her potential academically. AO performed better on numerical operations versus math reasoning, indicating that nonverbal/visually-presented formulae lend to better comprehension than word problems, even when word problems are assisted with varied tables/graphs.

Oral expression is weak due to difficulty organizing thoughts as well as not knowing/understanding particular words necessary for speaking in grammatically correct ways. As an example, AO does not understand many prepositions or pronouns in either speaking or writing, indicating that she is not aware of the meanings of these words and how to use/organize them into grammatically correct sentences. Executive function skills are also an area of tremendous weakness for AO. In fact, oral expression and executive function skills are her weakest areas. Problematic working memory lends to general difficulties with learning. AO has a very good memory for names, although memory for faces is weak, as is memory for story information. Repetition and mnemonics for memory and learning are essential.

Recommendations for optimal learning of academic information were created by taking into consideration AO's tremendous strengths in word retrieval, seeing/determining relationships between words, memory for names, nonverbal reasoning abilities, and motor memory particularly in regard to finger positioning and tapping (as in the Finger Tapping Repetitions task, and evident precocious typing/keyboarding skills), and applying these to the learning of information in academic areas that require the most work. These recommendations are listed in the below Recommendations section.

AO proved to be a very motivated, happy and delightful young lady who loves learning. She has the spirit required to make the most out of her circumstances. Although executive functioning, attention and oral expression abilities are of greatest concern, AO's many strengths and the implementation of learning tools and environments that cater to these strengths, will lend to great strides in her learning and academic/social successes. AO has received wonderful support from the staff at her school as well as staff from the school board and assistants brought into the school. The outcomes in AO's life are to be commended by a wonderful group effort. Even greater things are expected from AO and her school environment with the implementation of recommendations catering to her strengths. She is currently not living up to her potential in several academic areas, but this will likely change soon with the implementation of enhanced programs. Recommendations are offered below.

DSM IV Diagnoses

299.00

Autistic Disorder

(with criteria met for M.R. and Learning Disorder NOS; learning struggles include executive function, oral expression, attention, comprehension, memory for faces and story information; strengths lie in categorical word retrieval and seeing/determining relationships between words, finger tapping / keyboarding, information about the world/society, matrix reasoning, memory for names, attitude and motivation)

RECOMMENDATIONS

SCHOOL

Teachers and Assistants

- Special education advisor should have weekly contact with teachers to know what tools should be created that week to assist AO in classroom and homework assignments.
- Once the special education advisor is aware of material and assignments coming up for the week, she/he should be available to help assist in
 - the creation of alternative learning tools for the same class material as her peers, e.g.
 - In science class rather than have her draw scribbles denoting developmental stages of a fish (since her drawing abilities are seriously compromised and she can not distinguish one drawing from the next), have her place pictures in a certain order and paste them to denote the stages of fish development.
 - a timeline for completion so presentations and learning is in sync with the class, e.g.
 - An example for her regular (home) classroom: as students are writing and presenting book reports, adjust AO's assignment so she is learning the same principles as her classmates and completing them in the same timely manner so she is able to participate in the presentation circle with her peers.
- Teachers should reach out to AO at least 1-2 times per class even if just to acknowledge her, and preferably to ensure that tools are being used appropriately so she is attending and learning.
- As stated, it is best for AO to have as similar curriculum and task requirements to peers as possible, although when working on a curriculum that is far removed from the class, it is best to allow AO to have her own quiet working environment for minimal distractions and optimal learning.
- Teachers should be coached on how to engage with AO and include her in task discussions without making her or others feel anxious.

- Continue the journal that is going home explaining what is due, what was done, and what needs to be done for assignment completion.
- Continue to use cardboard divider for desk during snack when necessary.

Classrooms

- Continue to have bean bag chairs in all classrooms for sensory breaks.
- Have desks with 'swing bars' on the bottom so AO can swing her feet as she is working to reduce the need for motor/sensory breaks and enhance learning time.
- AO's curriculum should be equal to those of her classmates, although approached with tools and strategies that cater to her learning level and style. She should thus be present in her regular classrooms much of the time, but when it is the case that she must work on something very different from the class at large, it is important for her to have her own quiet room with her teaching assistants. As an example, it was difficult for AO to concentrate on writing in her regular classroom when her peers were doing presentations in the same room. It would be ideal if she was prepared to participate in the group presentations with her own work. In absence of that, it would have been better if she could have been in a quiet room with her assistant to finish her work without distractions and vice versa.

School Psychologist/Counselor

- School psychologist/counselor should continue to talk to AO's classmates to explain her great strengths and unique learning needs to continue to facilitate empathy, patience and positive peer relations.
- Psychologist should coach student, teachers and assistants to speak directly to AO instead of in the 3rd person. Becky can encourage this as it is happening. Encouragement should be given to use as few words as possible when asking AO questions.
- Work on desensitizing to frequent sights and sounds during snack time, e.g. juice boxes, soda cans, to ease coping and level behavioral reactions to peers during snack and lunch times.
- Work on social skills as described below.

Social Skills

- Face Say computer software program (www.facesay.com)
- Social Skill Builder, e.g. 'school rules' (www.socialskillbuilder.com)
- Continue with encouraging peer relations at lunch time with children rotating to eat at her lunch table.

- Encourage children to ask her questions directly using short sentences and repeating these after about a 10 second delay.
- Encourage AO to ‘read emotions from faces of peers’ during her lunch hour. Her peers can ask her to guess what they are thinking or feeling based upon their facial expressions.

Methods for Learning

General

- Computer technology when possible (e.g. <http://www.youtube.com/RocknLearn>)
- Short and concise instructions (working memory weakness)
- Hands-on showing as much as possible
- Motor memory as much as possible, e.g. a ‘location’ for a concept, and touching ‘concept’ areas’ in required sequences.
- Visual aids to reduce load on working memory
- Visual aids to assist with focusing/tracking (tendency is to focus on the bottom of stimuli/page/rows, and to the left)
- Review ‘big picture’ of class material prior to class (preferably day/night before as well as just before each class)
- Use computerized note taking sheets with summaries of class material, and boxes/places for her to take notes as the class is in session (via laptop)
- Use music and rhythm to assist learning when possible, e.g. beats/patterns/songs/dance.

Vocabulary

- Teaching assistants can begin to make lists of AO’s vocabulary words so these can be used to assimilate the learning of new words/information with words that she is already most familiar with. Keeping a word bank of words that AO is familiar with and utilizing these to explain new concepts will be a very important aspect of her learning. Word banks can begin to be generated from AO’s writing assignments.
- Vocabulary can be assisted with PixWriter and similar programs as discussed in the below Reading section.

Reading Comprehension

Word and Passage Level Comprehension

Word Level

- Purchase and use a program such as PixWriter for all reading materials required by the school. Assitants/teachers can transcribe school reading materials using the PixWriter software so there are pictures for every word in the stories or textbooks/chapters (pictures appear above each word that is typed and these same pictures repeat themselves

whenever those words are used). Repetition of these pictures associated with words encourages linking meaning with the words; reading comprehension is improved through the evoking of pictures in memory associated with words. If textbooks for upcoming school years are known well in advance, textbooks can be transcribed during the summer prior to the start of that school year. 888-433-5303 to order PixWriter.

- Work on prepositions (over, under, through, in, above, below, etc.) through showing pictures associated with such words. PixWriter can be used to practice prepositions.
- Create synonym and antonym lists of words already in AO's vocabulary, utilizing the PixWriter.
- Slater software has hundreds of stories with pictures for each word made with Picture It software (similar to PixWriter but they are already available for use so no transcribing ahead of time is required).

Passage Level

- Work on 'big picture', integrating ideas/concepts, and remembering information.
- Work on comprehension of nonfiction (more literal) and then move to fiction as nonfiction comprehension improves.
- Teach 'story schemas', e.g. all stories have characters, a moral lesson, a beginning, and end, etc. Stories also have 'who', 'what', 'where', 'when', and 'why'. Show these parts via pictures with a few words under them in a timeline and have AO feel and rehearse the parts of the timeline. Have her look for the parts of the story schemas in her own readings.
- Teaching assistants can generate pictures and words of main characters, themes and events within stories or textbooks/chapters that are to be read, and AO can match the pictures with the appropriate words before starting to read the story or textbook/chapter. By using words that emphasize themes/events/characters/concepts prior to reading, she will have a schema and vocabulary knowledge to assimilate new information to as she reads. Picture It by Slater Software can make it easier for teachers/teaching assistants to generate these, if desired.
- Guide visual attention with use of finger and/or paper to fixate on current word and current line of passage.
- Repetition. Read the same stories over again and review and add to comprehension questions and answers as understanding increases.
- Assist with 'what' and 'why' questions in particular, that are extremely difficult for AO given the high level of executive functioning required for such questions, as well as working memory components to consider many facts/concepts. If teachers/assistants are

successful at helping AO to know how to answer ‘what’ and ‘why’ questions in particular, her executive functioning abilities will be dramatically improved in many areas of her life. All of the ‘W’ questions can be worked on: who, what, where, when, and why, when reviewing story information.

- Use ready-made pictures in computer software that AO can ‘select’ to create a cartoon timeline of events. PixWriter might also be of use here for generating pictures to help her remember.

Math

Hands-on Math Learning

Work on fractions, percentages, decimals and telling time

Fractions, percentages and money

- Use balls, paper plates, and money-coins to demonstrate concepts of fractions and percents, e.g. 100% of ball/plate = \$1.00 (100% of dollar), 50% of ball/plate (cut in half) = \$.50 (half of a dollar), 25% of ball = \$.25 of a dollar (1/4 of dollar; 4 quarters = dollar, 4 pieces of ball/plate = full ball/plate or 100%).
- Have AO ‘feel’ the sizes and textures of coins and associate those with locations and motor memory, e.g. in order from least amount of money to largest amount of money:
 - in order, tape a penny, nickel, dime, quarter, and dollar bill on a piece of paper
 - have AO feel the sizes and textures of each coin as she closes her eyes
 - then have AO place pennies, nickels, dimes, quarters and dollars on the table and have AO place them under those taped to the paper
 - as AO starts to understand percent and fractions as above, begin then to have her place the number of pennies, nickels, dimes and quarters that equal one dollar under each of the coins taped to the paper, e.g. 100 pennies, 20 nickels, 10 dimes
 - once that is mastered, work on what collection of coins can make up $\frac{1}{4}$ or 25% (e.g. two dimes and a nickel = \$.25 which is $\frac{1}{4}$ of a dollar), $\frac{1}{2}$ or 50% and 1 or 100% of a dollar
 - use the paper plate/ball analogies along side of teaching the above (e.g. \$.25 = $\frac{1}{4}$ or 25% of dollar ; $\frac{1}{4}$ or 25% of plate/ball)
- “Touch Math” by Innovative Learning Concepts Inc. 1-800-888-9191
- “Hands on Math” by Frances Thompson
- Kidspiration (<http://www.inspiration.com/Kidspiration>)
- <http://www.netrover.com/~kingskid/Math/math.htm>

- Use music and rhythm to assist learning when possible, i.e. to learn how to tell time, Telling time: Bats Around the Clock by Kathi Appelt

Oral and Written Language (forming complete sentences)

Visual/motor application to sentence formation

- Oral expression is weak due to difficulty organizing thoughts as well as not knowing/understanding particular words necessary for speaking in grammatically correct ways. As an example, AO does not understand many prepositions or pronouns whether speaking or writing, indicating that she is not aware of the meanings of these words and how to use/organize them into grammatically correct sentences. Using her profound motor/finger memory for locations, as well as superior ability to see/determine relationships between words, her oral expression can be assisted. An example of this, would be drawing 6 boxes on a page for 6 word sentences (two rows of three boxes each on top of each other). Going from left-to-right, starting at the top row, write a list of potential “starter words” for sentences (e.g. ‘The’, ‘Her’, ‘It’), followed by the second box having “nouns” (e.g. ‘book’, ‘park’, ‘person’), the third box having verbs (e.g. ‘lied’, ‘jumped’, ‘wrote’), etc. AO can choose one word from each box to create a sentence and repeat this process to create many different sentences while learning how to organize words for proper sentences. Many different types of sentences can be created with different pages having another 6 boxes with different kinds of words within them (e.g. words to ask a question, make a statement, respond to a question, etc.). Repetition of these will allow AO to learn all of the ‘parts’ of sentences and how words are organized. AO can be taught to point to each box as she goes left to right, and takes a word from each box that will eventually create a sentence when she is done. As she generates sentences for herself in speech or her own writing, she can imagine touching each box left-to-right in the top row and then the bottom row to choose appropriate words to make complete sentences. The ‘location’ of the boxes will be an important part of her memory process, so touching them and repeating the order of word-types over and over again will assist learning/memory. Words in each box should be typed using PixWriter.

Written Language

Adjust the volume

- Keyboard for note-taking and writing at all times (this will dramatically improve volume and quality of written output).
- Instead of having AO write a complete set of notes, provide a partially completed outline so she can fill in the details under major headings (or provide the details and have AO provide the headings).
- Remove 'neatness' or 'spelling' (or both) as grading criteria for some assignments, or design assignments to be evaluated on specific parts of the writing process.

a rough draft, copy it, and then revise the copy, so that both the rough draft and final product can be evaluated without extra typing.

- Do not count spelling on rough drafts or one-sitting assignments.
- Encourage AO to use a spellchecker and to have someone else proofread her work as well. Speaking spellcheckers are recommended.
- Develop cooperative writing projects where AO can work with other students and take on or share roles such as the 'brainstormer,' 'organizer of information,' 'writer,' 'proofreader,' or 'illustrator.'
- Special education staff and teachers must coordinate to create intermittent deadlines for long-term assignments and assist her in reaching these deadlines. Reward timely completion.

Change the tools

- Give AO chapters/textbooks and completed notes to review that have been transcribed with PixWriter.
- Some textbooks are actually available on tape (limited of course). When possible, utilize these to help review information not written down during class (Sources for this information: Recording for the Blind and Dyslexic Inc., The Talking Book program operated by the National Library Service for the Blind and Physically Handicapped of The Library of Congress)
- Assist learning/memory during note-taking writing using paper of different colors for different classes.
- Use graph paper for math, or turn lined paper sideways, to help with lining up columns of numbers.
- Allow AO to use a laptop as much as possible.

Change the format

- PixWriter reading materials.
- When necessary, offer AO an alternative project such as an oral report or visual project. Establish a rubric to define what you want her to include. For instance, if the original assignment was a 3-page description of one aspect of the Roaring Twenties (record-breaking feats, the Harlem Renaissance, Prohibition, etc) you may want the written assignment to include:
 - A general description of that 'aspect' (with at least two details)
 - Four important people and their accomplishments

- Four important events - when, where, who and why
- Three good things and three bad things about the Roaring Twenties

AO's alternative format can be graded for content, similarly to the original assignment format.

Adjustments to Prior I.E.P. Supports

- Increase reading service time with the special education teacher from 3-25 minute sessions to 40 minutes sessions, five days per week. The focus should of course be on reading comprehension, utilizing both word and passage level comprehension tools such as those discussed in this Recommendations section. Vocabulary knowledge can also be worked on during this time (see Vocabulary and Reading sections within the Recommendations).
- Continue with writing services 30 minutes per day four days per week. Focus on having AO understand what the individual components to sentences are and how to generate complete sentences, utilizing visual-motor strategies outlined in this recommendations section, e.g. 6 boxes with words to choose from in each box demonstrating what types of words are required to put full sentences together (e.g. use of pronouns, prepositions, nouns, adjectives, verbs, etc.). The point to the exercise is for AO to learn how to both speak and write in grammatically correct ways. She currently is not aware as to what certain words mean, are for or how they are used, e.g. prepositions and certain pronouns. Repetition of the same system over and over and over again is what will lend to results. Sentence formation should be the main focus in writing, as well as staying with the "big picture" and incorporating all aspects of schemas for story writing or other forms of writing. It is important to utilize 'feeling/touch', order, and pictures with just 1 or more words under them, for AO to remember what to do to write proper sentence and story structures. Even 'pointing' to boxes that are always displayed in the same format that lets her know she can locate 'x' information from 'x' box, will help her learn and recall the information later.
- Continue math services 30 minutes per day three days per week in general classroom, and 30 minutes two days per week in the Star Room (one-on-one). Hands-on learning for math. Focus on fractions, decimals, percents and time.
- Maintain an educational therapy assistant for support and safety all throughout her day.

- Consider adding an assistant to help transcribe textbooks, instructions and/or reading materials with PixWriter for AO.
- Maintain consistent/predictable routines both in structure of her day, and learning techniques.
- Continue using visual supports (e.g. social stories, schedules/calendars)
- Continue sensory integration
- Daily communication between parents and school with communication binder.
- Shorten social-stories used to 3-4 sentences in length
- Quiet learning environments
- Provide AO adequate time to retrieve/organize her language when responding to questions
- Computerized social skills learning (see social skills section of this report) and integrated work with peers, e.g. guessing their emotions and thoughts from their facial expressions.
- Read full recommendations section for more additions to existing I.E.P.

Other

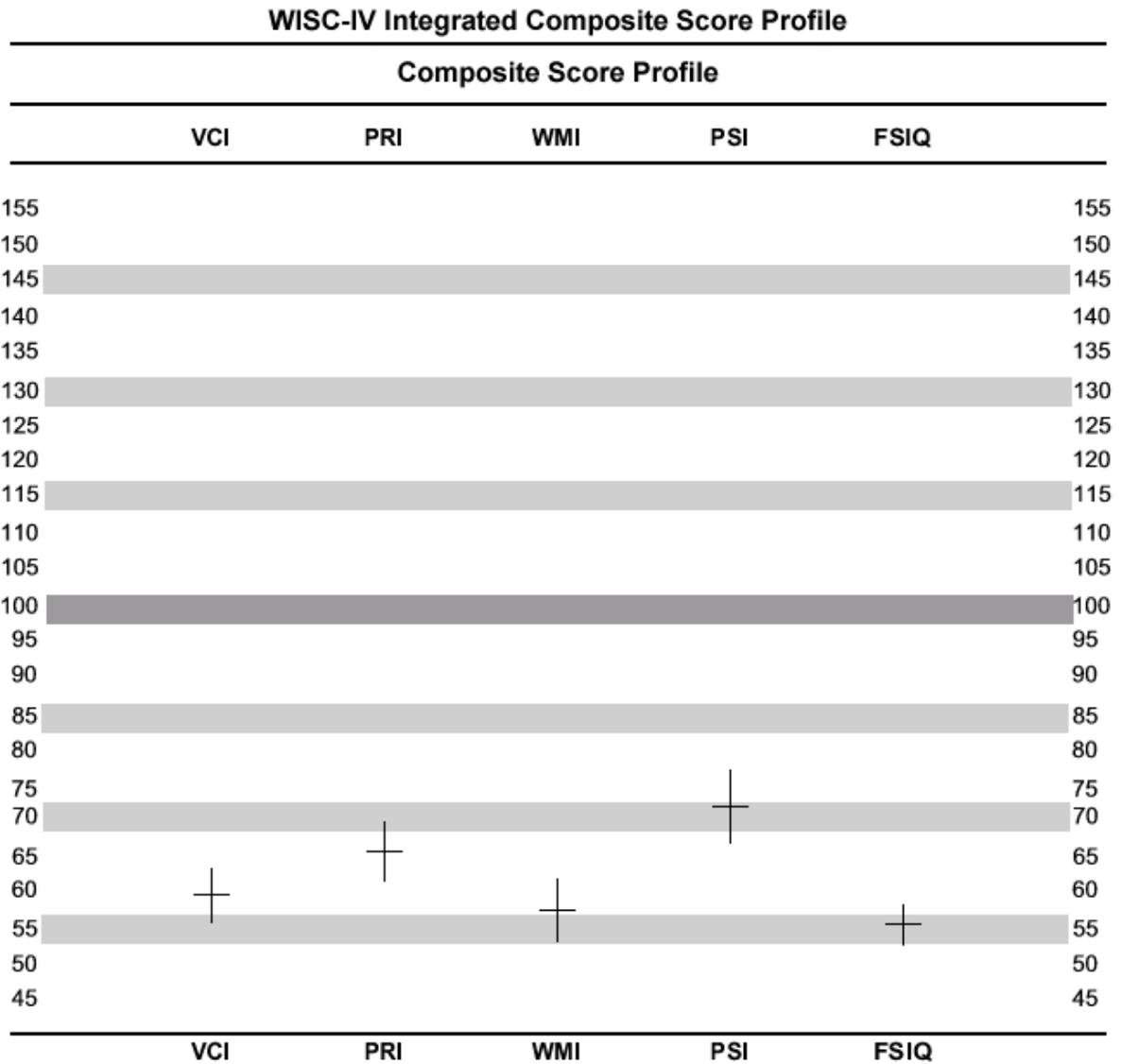
- Hold a school meeting to discuss these findings.
- Consider sharing AO's success story in terms of education and her school environment with the community via media coverage. AO's school is a fine example as to how a child with autism and can be accepted by her peers and school and excell within integrated learning environments.
- Consider medication for attention. Repeat the IVA CPT with medication for attention to see if assists performance. This test is highly sensitive to effects from medication and is a fine tool to determine if medication is working or not at enhancing various facets of attention. A trial of medication for attention is suggested, even if just for a day or few days, to determine if it might be helpful at assisting attention and general learning.

It was a pleasure meeting and working with AO, educational personnel, and her family. I look forward to further assisting AO and her school in any way possible. Please contact me for assistance with the implementation and/or referral of services for any of the above recommendations.

Laurie Cestnick, Ph.D., M.Ed.

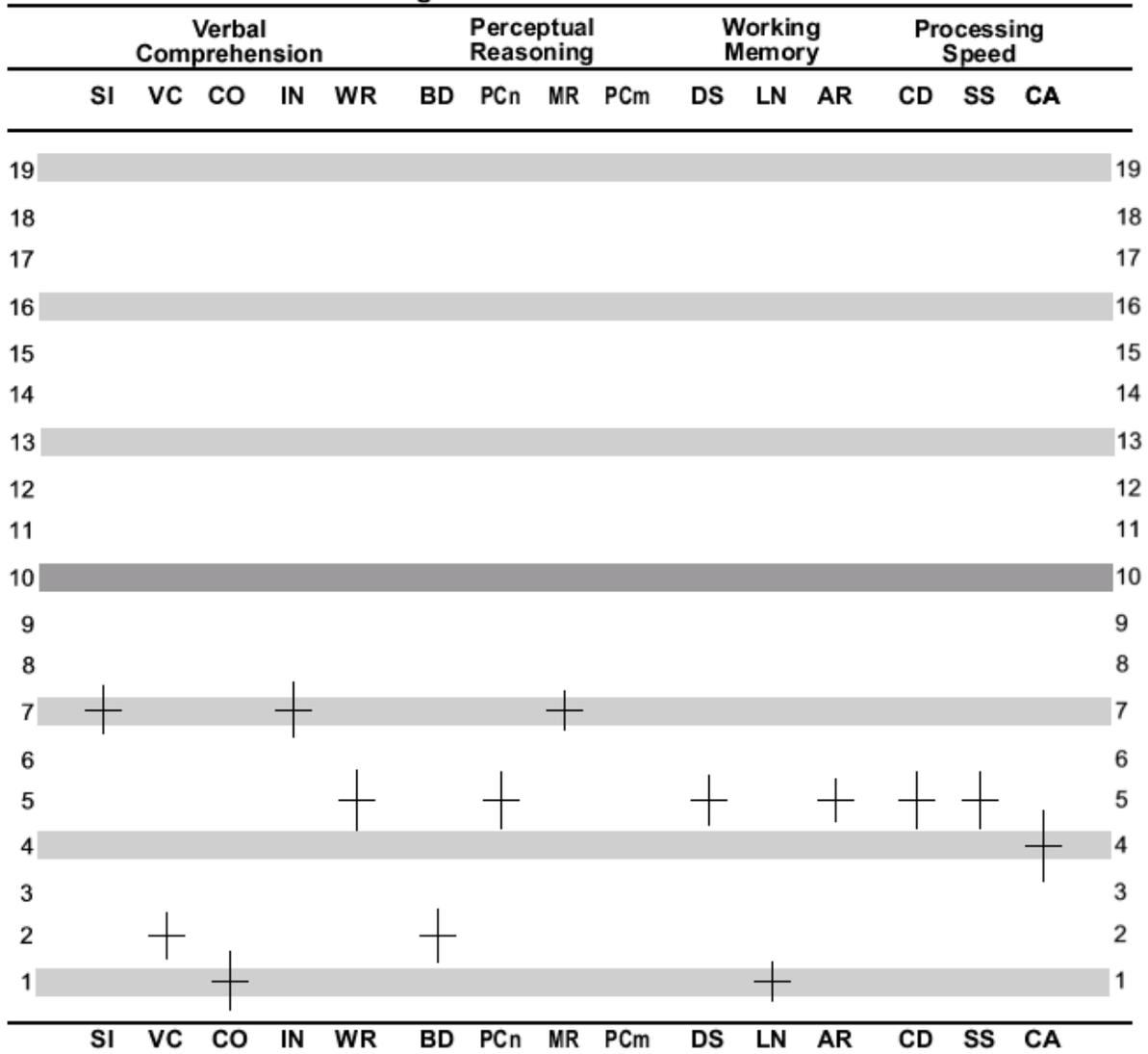
APPENDIX A

Extra tables to help visualize scores from some of the tests administered. All scores and tables are available within the body of this report and are found in various labeled sections.

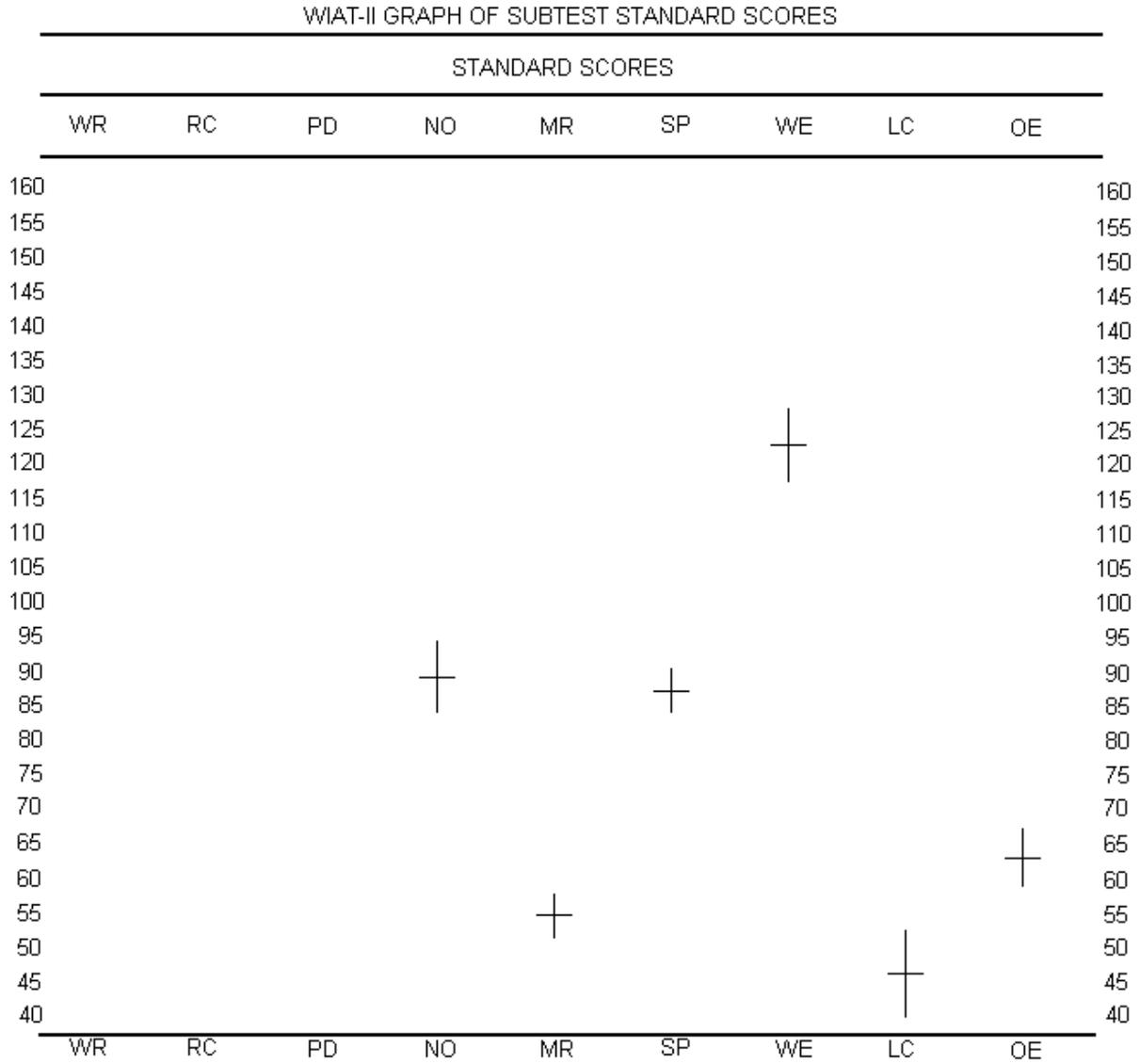


Vertical bar represents the Standard Error of Measurement.

WISC-IV Integrated Subtest Scaled Score Profile



Vertical bar represents the Standard Error of Measurement.



APPENDIX B

Some generalities regarding improving memory are given below for consideration:

1. Medications, drug and alcohol use can have negative impacts upon memory functioning.
2. Exercise and good health are associated with better brain oxygenation and improved speed of learning and recall.
3. Fatigue can interrupt our ability to attend to incoming information as well as to retrieve stored information.
4. The impact of stress and tension on memory abilities should not be underestimated. Feelings of anxiety and/or depression can interrupt your ability to attend to information, store information, and retrieve information.
5. Some medical conditions and the drugs used to treat them can also impact your memory. It is important to ask your physician about ways in which any chronic or acute illnesses you have or medications that you are taking may be affecting your learning.

Strategies for Learning New Information to be Recalled Later:

1. To reduce distractions, which may interfere with processing new information, it is important to choose a quiet, distraction-free environment when learning.
2. Spaced presentations of information and rehearsal will enhance memory better than mass-learning and practice. When learning new information, the earlier in the day that this happens, the more likely you will be able to remember material. Keep memories fresh by going over them periodically and they will stay longer.
3. To help you remember what you read you must read with a purpose. Start by developing questions that you hope to be able to answer at the end of your reading. Review topic headings in your text before reading. Outline information covered in each paragraph. All of these tactics will help you pay attention to the material you are reading and will reduce the need to re-read pages.
4. New memories can interfere with other recently learned information. Therefore, it is best to take breaks between learning different topics (unrelated activities or relaxation).

Strategies to Retain New Information

1. Long-term memory requires a structure or framework so that you can retrieve information later. Organize information for optimal recall later. Separate information into meaningful groups that share common attributes (e.g. learn new computer skills and how to use new computer software at the same time).

2. The deeper you process information the more likely you will be to retrieve the information at a later time. Deep processing involves attaching numerous associations to a piece of information. For example, if you want to remember the meaning of a word you will most likely remember it if you do all the following: (a) look the word up in the dictionary; (b) use the word in conversation; (c) write a poem using the word; and (d) think of puns about the meaning of the word (verbal cues).
3. Use all your senses to enhance storage and retrieval of information. For example, if you have to remember to pick up mustard at the grocery store start by visualizing the mustard bottle (i.e., yellow, round, glass jar) and the spreading of mustard on a sandwich, recall the strong, tart smell of the mustard, and think about its sharp, vinegar flavor (visual/kinesthetic cues).
4. If you would like to improve verbal memory in addition to working with strengths in visual/kinesthetic memory, there are helpful tools to do this as well. To memorize a list put together a sentence in which the first letter of each word represents an item to be remembered. Short, snappy, specific mnemonics are best. For example, if you want to remember the planets in their order of distance from the sun you can use the following sentence to help you remember. "My Very Earnest Mother Just Showed Us Nine Planets" (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto).
5. Turn abstract concepts into solid images to help you remember. Remember a concept by imaging it as a face, object, or symbol. For example, if you are trying to remember what the vocabulary word "ephemeral" (transitory, lasting only a brief time) means, it may be helpful to associate the word with an image of a butterfly because of a butterfly's brief life span. When you hear or see the word it will cause you to imagine a picture of a butterfly and thus trigger your memory for the definition. (visual)
6. When you are trying to remember multiple pieces of information it is best to chunk them into a smaller number of units. For example, phone numbers and social security numbers are chunked into parts (phone # - first three numbers and last four numbers; SS # - first three numbers, middle two numbers, last four numbers). These numbers would be much harder to remember if they were thought of as just one long string of numbers. (verbal)
7. Writing things down can help you remember things. Writing is a form of rehearsal. Writing also allows you to process the information through a other modalities (i.e, vision and fine motor functions). (visual/kinesthetic)
8. Using location can help you remember. Remembering things by where they are placed can be an effective way to trigger memory. For example, remembering that the information at the top of your study note page related to a particular topic can help trigger your memory for that topic. Remembering that your keys are always left hanging by your kitchen door will help you remember your keys each morning (visual).

Strategies to Retrieve Information from Memory

1. Memory is "state dependent". We are apt to remember things when we learn them under the conditions that we are going to have to remember them. If you learned at the computer you will retrieve that information best while at the computer.

2. Use the peg system. Start by using a structure of something you already know (e.g., rooms in your house, parts of your body, or any other series of objects that is fixed in your mind). Now attach new items to be remembered onto this familiar structure. Make the image exaggerated to help you remember. For example, if you are trying to memorize a series of important historical events, image each event associated with a different room of your house (e.g., associate World War II with your bedroom because your bedroom looks messy enough to have been the scene of a war"). Picture in your mind a key event or person from World War II being in your bedroom. When that image is set, imagine the next room in your house and attach the next historical event to that room. Then when you want to recall the information, imagine yourself walking through each room in the house to "pick up" the information. (visual)