

## Case Study – The Listening Program®

### Havah, Age 8, Attention Deficit Disorder

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Name: Havah  
Gender: Female  
Chronological Age: 8 years  
Clinical Diagnoses: Attention Deficit Disorder

### BACKGROUND INFORMATION

Havah was born at term weighing 6 lbs. 1 oz. The pregnancy was complicated by decreased fetal movement. Several ultrasounds were ordered but no intervention was required. Havah's mother Deborah also experienced pre-eclampsia and hemorrhaged post delivery. Apgars are unknown but Havah was released from the hospital with her mother. She is the second child. Her sister Aviva is two years older and is gifted. Deborah was concerned early on that Havah did not turn toward sound, however at the 3-4 month well baby check, the pediatrician only recommended increasing sound stimulation by banging a pot over her crib! At some point in the first year Havah did have a BAER (Brain Stem Auditory Evoked Response) test, which was completely normal. She was a quiet baby who was content to entertain herself and did not demand much attention. As Havah grew she continued to be a quiet child, but no one paid much attention.

In first grade Havah began to speak in full sentences after a drama coach advised Deborah that doing so would surely improve her speech. Deborah then asked her teacher to encourage her. She had difficulty learning to read and performed poorly on visual motor tasks. An ocular exam in February 2001 indicated probable dyslexia. Visual acuity, convergence, and depth perception were all normal. In the latter half of first grade, Havah was diagnosed with Attention Deficit Disorder, ADD. At the time of referral to an occupational therapist towards the end of second grade, she was receiving vision therapy from the Optometric Center of Los Angeles. She was doing the Computerized Binocular Home Vision Therapy System from Bernell. She was also in a resource class for reading at school. Havah's teachers felt she was an "underachiever." She had been on a trial of the drug Ritalin for ADD, but it was not tolerated well and had been discontinued.

Havah was evaluated at Kaiser Woodland Hills in May 2002 by occupational therapy with The Beery Developmental Test of Visual-Motor Integration. The results indicated below age level skills with a raw score = 9, age equivalent = 5 years 6 months, and standard score = 78 which is the 7<sup>th</sup> percentile for 7-6 to 7-8 year olds. Havah's handwriting and coloring skills were immature for her age. She tended to rush and had difficulty staying between the lines. She was unable to complete a seven-piece inset puzzle or copy a step cube design. She was overwhelmed by bright lights and noisy environments. Havah also craved spinning and swinging. Occupational therapy was initiated at Woodland Hills for visual motor integration treatment and handwriting training.

In July of 2002 Havah was referred to Kaiser Sunset for further evaluation of her sensory processing issues, in particular her auditory processing. She was assessed using the TAPS (Test of Auditory Processing Skills), the Sensory Profile by Dunn, and clinical observation. Havah's mother reported Havah had difficulty following verbal directions at school and home and seemed not to understand simple requests. Her responses to questions were sometimes bizarre. Her affect was often flat or sullen. Havah was able to balance on either foot for 20 seconds and was able to ride a bike, but could not skip or perform smooth, rapid, alternating movements for hopscotch. She displayed minimal post rotary nystagmus and had decreased graphesthesia.

Havah's scores on the TAPS are listed below in the pre and post TLP area. Please note that while her overall Auditory Perceptual Quotient of 105 placed her in the 62% for her age, she did score below her chronological age on 3 subtests. Also it is important to note that this test is given under ideal conditions: in a quiet room with no distractions. It is not, therefore, an accurate predictor of auditory functioning within a classroom or other noisy environment. It is also important to add that while Havah scored in the 79% for Auditory Interpretation of Directions which gave her an age equivalency of 9-9 years, she was not able to execute a simple three step command in the clinic, requiring repetition of the directions at each step. It was not clear to me at the time of her initial evaluation whether this was secondary to auditory processing issues and attention, motor planning problems, or some combination. Over time it was apparent that it was a combination of multi-system dysfunction.

The Sensory Profile by Winnie Dunn is a lengthy questionnaire which is completed by the family or primary caregiver, with clarification and input from the examiner as needed. Havah scored in the probable difference and definite difference range for all areas of sensory processing, sensory modulation, and behavioral and emotional responses, except in the area of Modulation of Visual Input Affecting Emotional Responses and Activity Level, where she scored in the range of Typical Performance. She also scored in the Definite Difference Range on all aspects of the factor summary except she scored in the range of typical performance for Sensory Sensitivity and Sedentary Behaviors. Of particular interest for this case study are her scores for Auditory Processing: 17/ 40 (8-25 is the range for Definite Difference) and Vestibular Processing: 26/ 55 (14- 44 is the range for Definite Difference).

## TREATMENT

The referral for Havah to an occupational therapist read: "7 year old with eye tracking difficulties, fine motor difficulties, poor gross motor skills, and oculomotor deficits. Please consider for sensory integration and coordination therapy." Although no mention was made of auditory processing issues on the referral, this was also an area of great concern to Havah's mother.

Havah was seen 13 times by occupational therapy from July 12, 2002 through May 28, 2003. Parent education and a home program are integral components of all occupational therapy at Kaiser. Havah's home program and clinic sessions incorporated balance activities, midline crossing tasks, right/left awareness, and upper extremity strengthening with visual tracking tasks, saccade training, and shifting visual focus from horizontal to vertical planes. It also included an auditory component, using The Listening Program®.

Our goals were:

Havah will skip using smooth, alternating movements.

Havah will follow a three-step directive without redirection.

Havah will demonstrate smooth saccades and improved ability to switch visual focus from a vertical surface to a horizontal surface.

## PROGRAM IMPLEMENTATION

On July 18, 2002 Havah began listening to the TLP Sensory Integration (SI) Classic CD 1 hour per day, five days per week, for one week over speakers. Thereafter she listened on Sennheiser 500 headphones on a Condensed Schedule of 1 X 30 minutes per day, five days per week, for two weeks. On August 8, Mom reported she had not noticed any improvements while using the SI 1 CD.

We began CD 1 of the TLP Original Kit continuing on the Condensed Schedule. Mom was also concerned that Havah's older sister Aviva, who is in a gifted program at school, might have auditory processing problems. We discussed using a splitter so both girls could do the program simultaneously.

TLP Kit CDs 1-3: Havah announced, "I didn't learn to skip, I could just do it!" Mom returned her first *Changes to Look For* form after week three. Many changes were checked in all areas including: increased singing, more communicative, more energy and sleeping better, improved sense of humor, increased self confidence, and asking more questions. Havah's mom wrote: Affect is brighter, eye contact improved, bright eyes. Is able to hear discrepancies, knows when what she thinks she heard doesn't make sense and asks about it. For example when listening to a story tape Havah asked, "What did he say?" When she was told "Father can you cut my orange?" Havah laughed and said she had heard him say "Father can you cut my arm?" Havah also reported to her mother, "When I touch something hot my ears hurt!"

TLP Kit CDs 4-5: On her *Changes to Look For* form Mom checked improvements in behavior, communication, and physical well being including: more consistent level of energy, more animation and affection, more communication, and better spelling and memory. Mom wrote, "When giving her a spelling pretest Havah said 'When I don't know how to spell a word I look in my mind and I see it there.' This is a breakthrough!!" In the clinic we worked on multistep, multitasking activities. Havah was able to recite our entire "A is for alligator, B is for beaver...." sequence with cueing for the letters after the letter O. She only forgot two of the animals.

TLP Kit CDs 6-7: Mom again has checked many changes now including less right/left confusion, more hugging, and more anger and anxiety. Havah reported that she has been hiding her paperwork so classmates could not see her mistakes. Her pronunciation is improving and she is able to say "International House of Pancakes," rather than just saying "IHOP." Mom also commented, "Havah is more animated but sometimes her actions and verbalizations seem dependent on anger or frustration first - like aphasia in a stroke patient. Havah is angry at her mistakes and that things are difficult for her and take a lot of time-unlike her peers. As she becomes more verbal it is difficult to answer her questions regarding why she is different and unable to do so many things." Havah's mother also noted that Havah seemed to be "seeing her feelings." She wrote, "When Havah was doing homework that was difficult she said, 'Oh, I just had a nightmare that a boy was stuck all over his body and in his nostrils with pencils.' I told her it was an image since she was awake. Havah said she had another 'image and it's worse. Now he has an arm through him.' I said it seemed as though the homework was painful to her and she said yes." Also during this period Havah asked, 'May I read to you?' for the first time."

In the clinic Havah demonstrated significantly improved right/left discrimination, despite her reluctance to participate in the activity that began with protestations of "I can't do that!" The game was a visual motor task in which Havah had to read rows of arrows "up, down, left, right" while performing the corresponding gesture with her arms. This task incorporates saccades, ability to maintain visual orientation, right/left discrimination, midline crossing, balance, and motor planning. She was quite pleased with her success, when it was brought to her attention that she had acquired new skills.

TLP Kit CD 8, followed by TLP Speech and Language Classic 1 for one month on the Condensed Schedule: Havah was not seen in clinic from Sept. 25 until Nov. 15 due to my extended illness. Havah's initial comment when asked if she noticed any improvements was, "It is easier to understand my friends." Havah's mother noted a number of breakthroughs in terms of increased reading fluency and being eager to read, increased ability to communicate more complex issues e.g. "You don't have a front license plate. Is that legal?", and improvements in self care. For the first time, Havah was brushing her own hair and putting it in a ponytail. Havah was also making words with the magnetic letters on the refrigerator for the first time rather than just stacking them. Havah reported that completing homework and following verbal directions at school were still difficult.

TLP High Spectrum Classic CD 1 was used from November 15 to December 20 on an Extended Schedule of 1 x 15 minutes per day, five days per week. Havah also was doing one listening session of 20-30 minutes per day 5 days per week of Carulli ST 103 from Samonas. During this period Havah's mother found her listening with the headphones reversed. Havah also started writing with her left hand and felt she did as well with the left. We reviewed her handwriting, right vs. left, and all agreed it was better when done right handed. Havah agreed to keep the headphones oriented correctly. From late December to April 14, 2003 Havah listened to three Samonas recordings. The Carulli CD was selected for one month to promote attention, develop midline awareness and body organization. Classic ST 101, was chosen for one month to help modulate arousal, support attention, and develop temporal-spatial organization. Romantic ST 102 was chosen for two months due to missing her March appointment, to help develop affective range and accurate emotional labeling.

During this time Havah's mother Deborah seemed more anxious about Havah's issues. She had to hire an advocate to help her with the IEP process and expressed frustration with the school and many of the professionals whose help she had sought. Deborah did not complete any written progress reports during this time. Verbally she reported continuing improvements in reading and in visual processing. Havah was now able to complete a 12 piece puzzle independently. She no longer rubbed kisses off. While preparing this case study I contacted Deborah. She had no other insights regarding progress made over these months, but did comment that she preferred the A, B, C modular design of The Listening Program over the Samonas schedule, where random play is used. Also Deborah, who at times listened to the recordings along with her daughters, felt the Carulli from Samonas made her agitated and was too stimulating.

PRE AND POST TESTING

Test of Auditory Processing Skills – TAPS

Pre Test TAPS Results:      Date: 07/12/02      Chronological Age: 7 years-8mos.

<b>TEST RESULTS:</b>							
	Raw Scores	Auditory-Perc. Ages	Standard Scores	Scaled Scores	T Scores	Percentile Ranks	Stanines
<b>Auditory Number Memory</b>							
Forward	28	7-1	97	9	48	42	5
Reversed	7	5-10	92	8	44	30	4
<b>Auditory Sentence Memory</b>	52	8-5	105	11	53	63	6
<b>Auditory Word Memory</b>	19	7-7	100	10	50	50	5
<b>Auditory Interpretation of Directions</b>							
Total correct sentences	22	9-9	112	12	58	79	7
<b>Auditory Word Discrimination</b>							
Total of different responses in D columns	36	12-11	115	13	60	84	7
Total of same responses in S columns _____	19	8-3	106	11	54	66	6
<b>Auditory Processing (thinking and reasoning)</b>							
Sum of Scaled Scores:	74					Percentile Rank: 62	
Auditory Perceptual Quotient:	105					Median Auditory Perceptual Age: 8-5	

Post Test TAPS Results:      Date: 04/14/03      Chronological Age: 8years-5mos.

<b>TEST RESULTS:</b>							
	Raw Scores	Auditory-Perc. Ages	Standard Scores	Scaled Scores	T Scores	Percentile Ranks	Stanines
<b>Auditory Number Memory</b>							
Forward	36	9-1	104	11	53	61	6
Reversed	14	9-2	104	11	53	61	6
<b>Auditory Sentence Memory</b>	75	11-7	118	14	62	88	7
<b>Auditory Word Memory</b>	23	9-6	105	11	53	63	6
<b>Auditory Interpretation of Directions</b>							
Total correct sentences	9	5-4	85	7	40	16	3
<b>Auditory Word Discrimination</b>							
Total of different responses in D columns	36	12-11	114	13	60	82	7
Total of same responses in S columns _____	32	12-11	133	17	72	99	9
<b>Auditory Processing (thinking and reasoning)</b>							
Sum of Scaled Scores:	82					Percentile Rank: 78	
Auditory Perceptual Quotient:	112					Median Auditory Perceptual Age: 9-6	

The TAPS was re-administered on April 14. Havah improved on all subtests except on Auditory Interpretation of Directions (AID), where she scored considerably lower. The assessment took place in the late afternoon following school. Havah was tired and particularly unhappy and inattentive with this portion of the assessment. Perhaps this is the explanation for her poor performance. She had met all her initial occupational therapy goals and was able to follow a three-step command with ease, requiring no clarification or redirection, and could complete a 20 piece puzzle independently.

On May 15 just the AID was re-administered. Her score was slightly better: 13, which represents a standard score of 92, 30%, 4th stanines, and an auditory perceptual age of 6-8 years, still well below her chronological age, but within the low normal range. Havah has not appeared to lose skills at any point during her therapy course.

## SUMMARY

Deborah wrote on her patient satisfaction questionnaire: "TLP has been a turning point for my daughter in so many ways. My 8 year old daughter could not skip, hop without losing her balance, put together an inset puzzle for a 3-5 year old, bring or carry utensils to the table without dropping them or bending them out of shape, tolerate and enjoy kisses and hugs, say 'have a nice day' on her own, or verbally verify what she had heard. This year my daughter started making words out of the letters on the refrigerator, where she used to only line them up or stack them. Spelling is easier and she is eager to learn new words. She can now skip, hop, carry utensils without dropping them, is more animated, seems happier most days, and is more verbal. Just this morning she said, 'Have a nice day!' without prompting. TLP has been a godsend. My daughter got so much out of it. I can't imagine life without it."

Havah's mother Deborah is a psychiatric nurse. She attended a TLP Authorized Provider Training Course in July 2003 and is now sharing her experience and expertise with other families. She is also home schooling both of her daughters this year.

I would like to thank Havah, her sister Aviva, and mother Deborah for sharing with me their progress, insights, and frustrations, and for allowing me to share their experiences in this case study.

## FOLLOW-UP RECOMMENDATIONS

Havah will repeat TLP Kit CDs 1-8 on the Condensed Schedule of 30 minutes once a day, five days per week, then CDs 5-8 listening two weeks to each CD also on a Condensed Schedule. She will also continue with her visual motor and visual perceptual therapies.

Additional recommendations are:

Have fun! Focus on typical family activities for the summer.

Continue with Brain Gym activities, esp. Cross Crawl, Double Doodle, Brain Hook-ups, and Vision Gym.

Play auditory memory games, "I'm thinking of a..., I'm going to the store to buy..."

Work on visual processing games, puzzles, hidden, pictures, dot-to-dot patterns.

Engage in typical physical activities for her age: swimming, bike riding, Tai Chi.

Her mother is considering a consultation with the National Academy for Child Development, NACD, and home schooling. She will return to occupational therapy for reevaluation in 6 mos.

## DISCUSSION

There has been much discussion over the efficacy of utilizing a sensory integration treatment approach due to the lack of formal, rigorous, scientific studies. There will be much controversy over using auditory treatment approaches such as those developed by Advanced Brain Technologies, ABT, for the same reasons. Havah was involved with a number of therapeutic interventions and her occupational therapy at Kaiser was designed to complement and support her overall sensory processing. It is my belief that the auditory programs provided the key to unlock her visual processing and motor control and allowed her nervous system to grow and mature. In hindsight I would not recommend combining two different programs, Samonas and The Listening Program, as this created confusion for Havah and her mother. In addition, the family preferred the structure of the The Listening Program modular design over the Samonas random play recommendation, and reported that one of the Samonas CDs was too stimulating and made their daughter agitated. In part this combination occurred because Havah's family wished to wait until 2003 before purchasing The Listening Program, when funds would again be available through their medical spending account.

End of Case Study

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