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# REPORTS

1. Active and Inquisitive
2. Mental Retardation and the SSW

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## AN ACTIVE, INQUISITIVE LITTLE BOY: A CASE STUDY

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Robbie, a 6-year, 6-month-old kindergartner was referred by his school for a CAP evaluation. His teacher listed his receptive language age as about one year below his age level and his expressive language to be 6 months below average. He was felt to have a visual perception problem and to have poor handwriting. His speech pathologist reported his auditory processing problems to include auditory memory, auditory discrimination and that he has a general listening deficit. Auditory discrimination was considered to be only at the 5-year level (one-and-one-half years below his age level).

Specifically, Robbie's parents reported that he has difficulty paying attention to instructions, has listening inaccuracies and is easily distracted. They also indicated that he often says Huh? and What? Although, this sounds like the experience of most parents, they went on to report that he becomes highly frustrated and distracted if he is unsuccessful at a task. There was no indication that he had organizational problems, but it was reported that he is left handed.

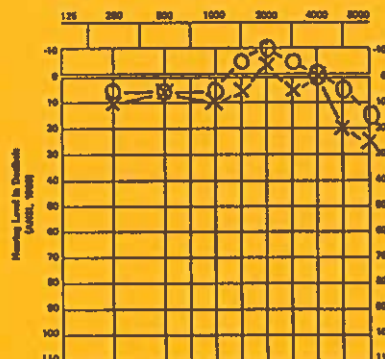
One of the common problems that we see in those tested for CAPD is a history of middle ear pathology. Robbie was reported to have episodes of otitis media when he was young, but

his parents did not think that there were too many of them, especially when compared with their other child. He was also said to have allergies in the Spring. (This is almost a given in Central New Jersey, where people are reported to have "just the regular allergies".)

It was interesting to observe Robbie's performance on the day he was tested. While waiting for the evaluation and during breaks in testing, he was busy "investigating" all the equipment. Being told not to touch things did not seem to make any difference. As the testing proceeded, he became engrossed with a spot of paint on the test booth wall.

### Test Findings

Robbie's audiogram (Figure 1) shows his hearing to be within normal limits in both the low frequencies and speech frequencies, however, his thresholds in the high frequencies in the left ear were slightly reduced. The tympanogram in the left ear was -100mm H<sub>2</sub>O.



The central test battery that was suggested by Katz was administered to the child. The tests included recorded discrimination in quiet (Hirsh W-22s) and discrimination with ipsilateral speech spectrum noise (+10 S/N), for each ear, the SSW, Phonemic Synthesis (PS) and also the CES test (which is optional).

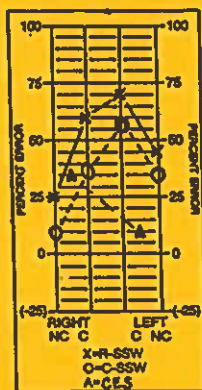
Robbie's discrimination in both quiet and noise were poorer than expected for his age. Interestingly, he substituted the vowel /o/ for the liquid /l/. His scores were:

D I S C R I M I N A T I O N  
QUIET      NOISE      DIFFERENCE

RE	80%	44%	36%
LE	88%	40%	48%

On the SSW test Robbie's scores were outside of normal limits for 3 of the 4 C-SSW Conditions (see Figure 2). The extreme limits of normal for a 6-year-old are:

	RNC	RC	LC	LNC
Limits:	10	30	47	10
Robbie:	10	38	58	33



Robbie had only 3 scoreable reversals because of the large number of errors that he displayed. Often the child would repeat only the second spondee of the item. He had many quick (Q) responses, and smushes (sm) were also seen.

Although Robbie was in kindergarten (not 1st grade), he was administered the standard PS test (DLM). It would not be fair to compare his results to the norms for first graders, but it is interesting to note that he had only 5 items correct and that quantitatively he displayed significant behaviors. He had quick responses (as on the SSW test), omitted several initial consonants, had some non-fused responses (giving individual sounds but not the fused word), and substituted the sound /o/ for /l/ (as he had on the discrimination tests). He also gave the word "skoat" for 5 of the last 9 items on the PS test.

Interpretation and Discussion

Robbie's peripheral hearing was pretty much within normal limits, although the cause of the negative pressure in the left ear or his history of middle ear pathology might account for the deviation in the high frequencies, especially in the left ear.

When I saw this active, inquisitive youngster, I suspected a significant TFM problem and difficulty blocking out distractions (e.g., audiometer dials and the spot on the wall).

Despite the relatively poor WDS in quiet, the drop in word recognition in noise was moderate. This suggests that he has difficulty listening under noisy conditions in normal life situations. On the SSW, only the RNC Condition was within normal limits. This suggests that he has both a Tolerance-Fading Memory (TFM) problem as well as difficulty with Decoding of phonemic information. The lack of an Order or Ear Effect in the presence of so many errors is generally interpreted as a confounding of these signs because of the cancellation of anterior and posterior signs. That is, both TFM and Decoding problems are likely. His (Q) and (sm) responses both support the TFM difficulty (which is often associated with poor motor planning, e.g., poor handwriting).

On the PS test the omission of initial sounds is generally considered a sign of a fading memory. This provides further support for the TFM category which typically shows both the difficulty in noise and a short-term memory problem. The poor PS performance is consistent with the depressed RC and LNC scores in indicating a Decoding problem. In addition, the non-fused responses, the /o/ for /l/ substitution and perseveration on "skoat" were further signs of poor Decoding.

### Recommendations

It was recommended that the family confer with the school speech pathologist who was instrumental in referring Robbie for this evaluation. Such a conference should consider further evaluation by a pediatric occupational therapist and/or a learning consultant. Suggestions to the speech pathologist to aid Robbie in developing better auditory processing skills include:

- a. Phonemic Synthesis training
- b. Auditory discrimination training
- c. Auditory figure-ground training
- d. Auditory memory training

Preferential seating in class and the use of an FM system were also suggested. Hopefully, he will return here following therapy to determine any improvement and whether additional recommendations are warranted.

### Postscript

This was the first request for CAP testing from Robbie's school system. I wonder if they will ever send another child our way again, based on all the problems we found and all of the recommendations we made.

### References

SSW Basic Workshop  
Correspondence with Jack Katz and Paula Smith

## THE USE OF THE SSW TEST WITH THE MENTALLY RETARDED

Jack Katz, Sharon Hadaway & C. Ellery Young

### Introduction

They say that you should only try to get one or two points across in an article. If that's the best thing to do, then perhaps you will pick out the 2 points that you would care to learn from this information. The points are:

1. The mentally retarded population should be considered high risk for CAP dysfunction (CAPD).
2. Don't not test a person for CAPD simply because he or she is mentally retarded (MR).
3. Overall, there is a relationship between measured intelligence (MI), on standardized tests, and the scores on the SSW.
4. While seeming to contradict #3, it is likely that the SSW is measuring primarily CAPD and not intelligence or even vocabulary, in this population.

### Background and Overview

Several people have requested that we run some articles on the use of the SSW with the retarded population. I tried to solicit such articles but none were forthcoming. Therefore, I reached way back in my files to see if any of the old information would be a useful contribution. Although some of the data are 25 years old, I don't think the cobwebs have adversely affected them in any important way. Of course we would all prefer to see some newer information, so if you have any or could collect some, we would run it in SSW REPORTS.

The data are based on two overlapping studies from 1967 at an institution for the retarded. Of course,

please remember that the institutionalized population today is much more severely involved than in those days, so the data might not relate too well to that group of individuals now.

Dr. C. Ellery Young and his student Sharon Hadaway contacted me to participate in her master's thesis dealing with the SSW and institutionalized MR individuals. Ellery was a faculty member at Oklahoma State U. and Sharon worked as an audiologist at a State School for the Mentally Retarded while finishing up her thesis. After her thesis, Sharon collected some data for me to compare the SSW with a picture test of Phonemic Synthesis that I had developed.

Ellery passed away about 10 years ago and Sharon is not listed in the ASHA directory. I am going ahead with this article anyway, as I am sure they would have had no objections.

#### Are MR Cases Considered High Risk for CAPD?

The answer to this question is probably a resounding "yes". As you will see, there were many problems noted on the SSW test in the total group of about 40 subjects. But, we can look at the problem in a different way, as well, and come up with the same answer.

CAPD is associated with central nervous system dysfunction. If we see such a high percentage of learning disabled (LD) individuals with CAPD, we should be surprised if the incidence is any less in the MR population. While the LD cases might show subtle signs of CNS involvement, the MR population often shows hard signs of CNS disorder.

#### Does the Presence of Low IQ Preclude the Use of CAP tests Such as the SSW?

Neither a low IQ nor the presence of related problems, by themselves, prevent the administration of the SSW

test. That is not to say that there aren't special considerations. Let's consider intellectual factors, language factors and speech factors as potential problems in testing a person who is MR.

The person must have enough understanding to sit in a chair and be willing to wear the headphones. In addition to that the individual must be willing to repeat what is heard. In my experience, this has not been too difficult for those people with whom I have worked. Probably the more serious problem is the Affective Behavior (AB). In institutions this is rated along with MI. AB refers to the person's sociability, cooperativeness etc. These factors are probably more important than IQ (at least down to 36 IQ, the lowest one in our sample) in determining whether you will be able to give the SSW.

Sharon Hadaway had tested subjects down to 40 IQ, but she did not have success with two people, one with a 36 IQ and the other with 22. I came to work with her to see if we could do better together. With her ability to work with this population and my knowledge of the SSW, we were able to test the person with the 36 IQ (we did not try to test the person with the 22 IQ, but I have no reason to believe that the 14 IQ point difference would defeat out attempts). Please let me know if any of you have gone below 36 IQ in using the SSW.

The language factor would appear to be a very important one. For example, audiologists are sometimes accused of simply testing language when they do CAP tests. And, poor language skills and limited vocabulary are well known in MR cases. Therefore, we must be concerned about the influence of language impairment. While I am concerned, I am not intimidated or frightened off.

Here's why I'm not in a panic. 1) Some of the best subjects we had were

considered to have extremely poor language abilities and sometimes were told, "unfortunately he is echolalic". Unfortunate for him, perhaps, but not from the standpoint of doing an SSW test. Other than solving the "Are you ready" problem, the echolalic person should be an ideal responder (and they generally were). In fact, echolalia seems to negate the influence of poor language skills. Figure 1 shows the test and retest results for a man with a 40 IQ. Performance was very similar over the 3-month interval.

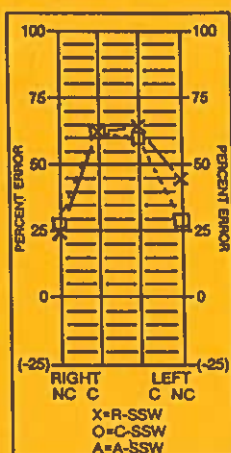


Fig. 1. Test-retest results for a subject with a 40 IQ. He was retested (□) inadvertently 3 months after the initial test (X).

2) Another factor to consider is if we were simply measuring language and vocabulary, why do we not get an SSW-blob instead of an SSW-gram. If it was simply a language test, and all the words pretty much the same, then the silly things we do to challenge auditory processing skills (competing messages etc.) should be of little consequences. That is just not the case. Figure 2 shows the results for the patient with a 36 IQ. His records might have scared us away, but fortunately we went ahead. They indicated he was hyperactive, very moody, hallucinates etc., nevertheless, his SSW appears quite reasonable despite his low IQ, very limited language and these reported behavior problems.

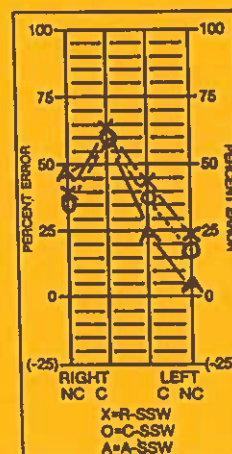


Fig. 2. SSW results for a S with a 36 IQ, the lowest IQ in this study. The SSW results were poor in RE, not explainable as language/IQ deficit.

#### Lower MI Groups have Lower SSW Scores

For a group of 28 subjects categorized by MI level, the SSW results were studied for C-SSW RE, LE and Total scores. Table 1 shows these results.

n	MI GROUP	C-SSW SCORES		
		RE	LE	TOT
4	-1	5.5	3.5	4.5
14	-2	16.6	19.3	18.0
8	-3	29.4	33.4	31.4
2	-4	61.0	40.5	50.8

Table 1, the Corrected SSW results for 28 MR Ss as a function of Measured Intelligence (MI) in SD units below normal.

It can be seen that despite the smaller sample sizes in some cells that the progression of C-SSW scores continues in each ear from MI -1 through -4. Minus-one indicates that IQ was 1 SD below the normal range and -4 represents IQs 4 SDs below normal. An ANOVA for these 28 Ss produced an F-value of 5.7 with  $p = .0043$ . This significant difference suggests that there is a strong relationship between MI and SSW performance. This is not to say that the IQ was responsible for the SSW results. Other hypotheses are

also tenable. One would assume that those with lower IQs, in general, have more brain damage or at least lesions of more important regions. Thus the brain damage that caused the MR could also affect important auditory processing regions. The great diversity of performance within the MI groups, discussed below, strengthens this argument.

**Evidence for Independence of SSW Results from IQ and Language Functions**

While it would be naive to suggest that the SSW results are completely independent of IQ and language, it would appear that the influence in these MR subjects is not too great. Furthermore, any influence they might have exerted did not seem to interfere with our ability to study the CAP functions of these individuals. The correlation between IQ and Total C-SSW score was .637 for 28 of the MR subjects. This correlation was significant at the .01 level of confidence. However, as mentioned before, the strong relationship between IQ and SSW need not be a cause and effect. Rather it is likely that those with the lowest IQ had the most serious

brain involvements and therefore also had the poorest CAPD.

The independence of SSW performance and intelligence can be seen most dramatically by studying subjects with the same IQs to see if they have similar SSW results. Three pairs of subjects will demonstrate this point. Figure 3 shows the results for 2 males whose IQ's were 41. The A-SSW results (looking at the better half of the test), show one S performed normally on the SSW while the other S scored in the severe range. It appears that a 41 IQ is not sufficient to preclude a perfectly normal A-SSW score (his C-SSW was MI and his Order Effect 3/33 was most revealing). His errors seem to be quite specific to the second spondee (just like poor decoders).

Two female Ss had IQ's of 55 (see Fig. 4) Neither of them had significant Ear or Order Effects. Thus C-SSW scores are shown. One had a normal TEC and the other had a severe LC score.

Two Ss had MIs of 60 IQ. One had a severe A-SSW score in the RE and the other had normal results bilaterally.

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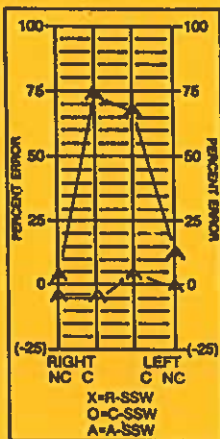


Fig. 3. Results for two men who had IQ's of 41 on standardized tests. One had entirely normal A-SSW scores, the other had g RC and LC Conditions.

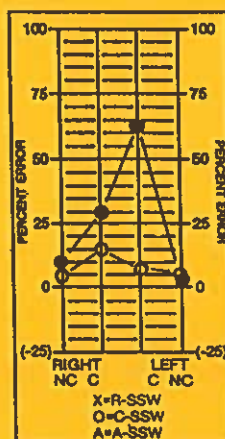


Fig. 4. Results for two women who each had a 55 IQ. One had normal C-SSW scores while the other had a severe score in the LC Condition.

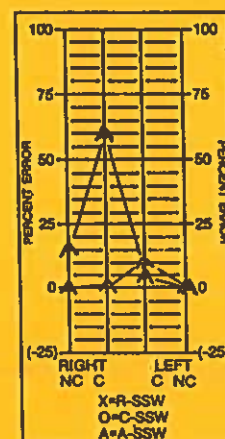


Fig. 5. Results for two men each of whom had a 60 IQ. The A-SSW results show one subject to have a normal TEC and the other a severe RC Condition.