SSW REPORTS

SSW COLLEGE-AGE LEARNING DISABLED

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SSW RESULTS IN LEARNING DISABLED COLLEGE STUDENTS

Richard S. Saul, Ph.D
Veterans Administration Medical Center, Miami, Florida

Over the past few years a good deal of consideration nas been given to identifying auditory perceptual difficulties in children and adults using the SSW test. The processing characteristics of various test populations could contribute to a better understanding of those groups and the features which help to distinguish them. Katz (1983) points out various reasons why developing a statistical AP norm differs practically and philosophically from the C-SSW/A-SSW approach which is used for adults in site-of-dysfunction evaluations. In order to understand the strenghts and weaknesses of the new C-NS-1985 norm it is necessary to determine its diagnostic efficiency in a variety of populations.

As part of a larger battery of tests (including neuropsychological and educational procedures), the SSW was administered to learning disabled college age students at Southern Illinois University at Carbondale. The data presented here were obtained from 121 individuals who were tested prior to their entrance into a special program for LD college students. They ranged in age from 17 to 26 years with a mean age of 18.5. There were 100 males and 21 females. Table 1 presents the group Raw and Corrected-SSW means and standard deviations (SD).

	R-SSW			
	RNC	RC	LC	RN
M	1.6	2.7	6.3	.8
SD	(1.8)	(5.0)	(7.3)	(1.8)
	C-SSW			
M	.3	1.4	5.8	.2
SD	(2.1)	(5.4)	(8.0)	(2.0)

Table 1: SSW results for 121 LD college age students.

The trend is for slightly poorer performance in the LC Conditions and larger SDs as well.

The results of the LD subjects may be contrasted with comparable data for control subjects in the normative study (42 males and 62 females). Table 2 shows the C-SSW findings for the normal "adult" subjects (12-60 years of age).

	C-SSW			
	RNC	RC	LC	RNC
M	-1	0	1	-1
SD	(2)	(2)	(4)	(2)
NL*	3	4	9	3

* +2 SD point for normal limit

Table 2: SSW results for 104 control subjects used in the National Sample study (C-NS-1985).

The mean scores for the LD subjects is poorer than for the controls for each condition. When using the +2 SD limits, the means for the LD group do not tall outside this range. However, individually 27 of the 121 indi-

viduals exceed the cutofts for at least one Condition (22%). Presumably the use of response bias criteria would increase this hit rate.

This test group is interesting in a number of ways. First, they are certainly a heterogenous LD group. They may suffer from a variety of difficulties in one or more modalities and clearly central auditory testing reflects this heterogeneity. Secondly, these individuals are a highly motivated group, not randomly drawn from a general population of LDs but rather from a population that has succeeded in school through various cognitive and stimulus based compensatory behaviors. It is likely that these compensations influence performance on central tests - especially those tests which provide some opportunity to use a probability approach in responding to the task items.

It should be pointed out that although the purpose here is to compare Condition scores the addition of response bias criteria could increase the hit rate and the insight into the AP disorders. For example, LD individuals may have no errors but may exhibit reversals. This could identify a significant AP problem. The RB data for the individuals in this study are being compiled.

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PERFORMANCE OF COLLEGE-AGE LEARNING DISABLED INDIVIDUALS ON CENTRAL AUDITORY TESTS

Deborah L. Carlson, Ph.D
Southern Illinois University

Richard S. Saul, Ph.D
Veterans Administration Medical Center, Miami, Florida

The use of central auditory tests with learning disabled children is frequently reported in the literature. However, the performance of adolescent and adult learning disabled (LD) individuals on central auditory tests is reported with much less frequency. The following data describe the performance of adult LD undergraduate college students on a battery of behavioral central auditory tests.

Thirty LD individuals ranging in age from 18-6 to 26-5 years (mean = 21 years, 2 months) were evaluated using a battery of central auditory tests. All subjects were undergraduate students at Southern Illinois University at Carbondale (SIU-C). The central auditory battery included both tonal and speech tasks which have been cited in the literature as being sensitive to disorders of various portions of the central auditory nervous system. This central battery was limited to behavioral audiometric procedures: release from masking, midline pure tone localization, ability to fuse verbal information received at the two ears, handle speech stimuli in a background of competing speech, resist temporal distortion of verbal input, sequence items in time and handle speech stimuli received simultaneously at the two ears.

Twenty-five of the thirty young LD adults were identified as having some auditory perceptual difficulty. Failure on any given test was defined as performance outside of the 2 SD limit above the mean performance for a matched group of non-LD college aged adults also attending SIU-C. Of these twenty-five individuals, six failed only one test in the battery. Two of the LD individuals failed 5 tests. No more than thirteen of the twenty five individuals could be identified by a single test. The most sensitive single tests in the identification of these individuals are presented in descending order (i.e., most to least identified) in Table 1.

Use of any of these tests alone would have precipitated a hit rate ranging from only 32% to 52%. However, the use of these five tests in a battery identified 25 individuals or 83% (see Table 2). Another two individuals could have been identified with the addition of the Northwestern University Auditory Test #6 with a

background of four talkers (one of the more infrequently failed tests).

TEST	# of those identified
Pitch Pattern Sequence (PPS)	13
Binaural Fusion (BF)	12
Staggered Spondaic Word Test (SSW)*	10
Dichotic CV's (CV)	9
Time compressed speech NU-6 (TC)	8

*analysis of 4 Conditions only

Table 1: Number of individuals who failed the central auditory tests.

TEST(S)	# IDENTIFIED
SSW	10
SSW PPS	18
SSW PPS CV	21
SSW PPS CV TC	22
SSW PPS CV TV BF	23
SSW PPS CV TV BF FT*	25

*FT = NU-6 word lists presented in a background of four-talker complex (+6dB S/N)

Table 2: Number of individuals identified based on test battery approach.

Those tests that were failed less frequently from the least effective were pure tone, spondee Masking Level Difference, Dichotic Digits (simultaneously aligned), Binaural Median Plane Localization, and the NU-6 four-talker tasks.

Examination of these data reveal several themes. Most prevelent is the support of the long advocated test battery approach to standard audiometric as well as central auditory testing. It is likely that various procedures tap different auditory processes/combinations of processes as well as being sensitive to cortical and/or subcortical deviations. Interestingly, the relative effectiveness of a test battery is not necessarily increased with the addition of each test in the battery (refer to table 2). Secondly, we note a variety of auditory perceptual behaviors among these adults with LD. The extent to which these behaviors impair or create deficits is uncertain. The fact that these individuals have successfully completed high school and have been admitted to and are attending college would suggest that compensatory strategies have been developed. Finally, it is noted that the central auditory dysfunction most frequently noted for this group of individuals was characterized by difficulties in: discriminating pitch, utilizing information presented to the two ears in a complementary mode and resisting temporal distortions of speech.

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** NEW SSW WORKSHOP MANUAL **
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A new manual has been developed for use at SSW Workshops. It is an expanded and completely updated version of the 1979 Workshop manual.

Almost every section has been expanded, with particular emphasis on CAP evaluations. New information from 100 site-of-lesion cases has been added.

If you have already attended a 3 day SSW workshop and would like to get the new manual, please send a check for $14.00 to J. Katz (CDS Dept., SUNYAB, 109 Park Hall, Buffalo, NY 14260).

REPORT OF A PATIENT WITH SEIZURE DISORDER

Aimee Kay
Miami Children's Hospital,
Miami, Florida

T.G., age 26, was admitted to Miami Children's hospital for a complete evaluation of his long standing seizure disorder. According to his medical record, he reportedly began to have grand mal seizures at the age of 6. T.G. subsequently underwent surgery at age 11 in an attempt to remove the epileptogenic foci in the right temporo-frontal region.

Following surgery, the grand mal seizures were reportedly reduced to a rate of one to two occurences per month with continued anti-convulsant therapy in multiple combinations. Four months prior to the current hospital admission he developed "drop seizure attacks" in which he would fall during his seizure. These drop seizures were not controlable with anti-convulsant therapy.

During the hospital stay, his EEG showed "high voltage spikes" in the posterior frontal and anterior temporal areas on the right side. The CT scan also showed involvement of the right hemishpere. Dichotic audiological testing was requested as another source of data in localizing the involved hemisphere prior to repeat neurosurgery.

Audiological testing revealed hearing sensitivity and middle ear function to be within the normal range bilaterally. Special tests were not consistent with retrocochlear pathology. The Auditory Brainstem Response studies were within normal limits for both the right and left sided stimulation. The SSW test showed a mild TEC score with decreased left ear performance suggestive of NAR involvement (see Table 1).

C-SSW			
RNC	RC	LC	LNC
2	5	38	8

Table 1. C-SSW Condition scores.

Qualitatively, the Order high/low (15/6) and the large number of reversals (9) suggest involvement anterior to Heschl's gyrus in the temporo-frontal area. The CES test showed decreased performance bilaterally. The SSW test results suggest right hemisphere involvement with additional impariment of the auditory commissural pathways. The SSI-CCM test showed decreased left ear performance indicating right temporal involvement.

Despite the fact that the SSW shows only a mild score for the left ear (NAR), the depressed scores on the CES and left ear SSI-CCM tests combine to support the impression of right hemisphere involvement. As mentioned above, the bilaterally depressed scores on the CES test suggest additional involvement of commissural pathways making interhemispheric transfer of information difficult. The patient and his parents were counselled regarding the implications of a central auditory processing disorder, and were given appropriate recommendations for management of the problems.

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CASE STUDY
A VERY BRIGHT COLLEGE STUDENT

Jack Katz

A very bright college student was referred because of apparent phonemic discrimination problems. The referral of CG was from a psychologist who felt that his client had exceptional intellect and superb visual skills that he used effectively to compensate for his auditory limitations.

CG was 20 years old when seen for a hearing and auditory evaluation. His puretone thresholds were perfectly normal, although there was a history of middle ear problems during his childhood. WDS in quiet using the Hirsh W-22s was 100% correct in the right ear and 92% correct in the left.

Three central auditory tests were given. On the SSW CG performed well within normal limits for his age. The 8 CN were: 0 0 2 0 0 1 1 0, and there were no reversals. The only "abnormality" was 5 delayed responses. The delays were particularly curious because there were no errors on the items in which he showed delays. This gave us a tip off that the test was not as easy as his scores would indicate. Delays such as these are usually associated with difficulties in decoding (rather than tolerance or fading memory problems).

On a test of Phonemic Synthesis CG scored 22 correct out of 25 items. This score is not considered normal for an adult (although specific norms are not available). What was so remarkable was that he had 11 delays (4 of which were extremely long delays). In 9 of those cases he eventually came up with the correct answer. This gives strong support to the notion of a phonemic decoding problem.

The final central test was a speech-in-noise task using a +5 S/N for W-22 words. Performance in the right ear was 72% which is very slightly depressed relative to the performance of college students. However, his score in the left ear was only 52% correct in noise (a drop of 40%). This represents a significant (moderate) decrease in performance. Moderate discrimination scores in this level of noise is typically noted in those with phonemic decoding problems.

This case was a good example of how a bright student can beat the SSW and other CAP tests. It is apparent that CG used other skills to compensate for his phonemic difficulties. The most telling sign on the SSW and even more so on the test of Phonemic Synthesis was the delays. Because the delays led to correct responses it strengthens the arguement in favor of a decoding problem that is more promanent than any fading memory disorder. The extra time gave him an opportunity to puzzle out the correct answer when his faulty auditory perception could only offer a vague idea. If he had had a very rapidly fading memory, his pauses would more likely lead to eventual errors.

This case shows the importance of the test battery approach. It is especially important with older and brighter cases who can put forth great effort in defeating the CAP tests. They still behave like CAP/LD individuals because they cannot sustain this type of effort in school or at work where the long hours and demanding intellectual tasks prevent them from compensating on a consistent basis.

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YOUNG VS OLDER LD SUBJECTS

Jack Katz

The preceding articles were most stimulating. They show that while many learning disabled college-age students are identified by the SSW and other central tests, that quite a few pass individual tests. The question is why and can we do anything to improve the hit rate?

Saul and his colleagues have plausible explanations for their findings. 5 possibilities may account for the lower "hit rate" in this group.

1. Physiological maturity increased their auditory skills with the increase in age.

2. They have succeeded in high school reasonably well and therefore are probably more test-wise than the general LD group.

3. Those who aspire to attend college are somewhat atypical LD individuals and probably represent an intellectually more gifted group.

4. Because auditory skills are more important to language and performance in school, perhaps those applying to college have more visual or other disabilities and less of the auditory type that would show up on our tests.

5. They probably do not represent the most severe LD cases and therefore are not the most severe CAP cases either.

We have data that you supplied in the National Sample (1985) and National Sample for Learning Disabled (1986) which can shed light on this question.

Table 1

GROUP	AGE	N	MALES	FEMALES
Normal	5-10	163	88	75
Normal	12-59	104	42	62
LDs	5-10	132	103	29
LDs	11-23	39	26	13

Table 1. Age and sex distribution of normal & LD National Sample subjects.

Table 2 demonstrates that both the normal and LD subjects tend to do better on the SSW after age 10. The normal Ss over 10 years had almost 90% passing the SSW, an improvement of 18% over the younger normals. This was reflected in all three columns at the right. For the LD older group, 85% <u>failed</u> the SSW but the 9% decrease was not even across the factors in the 3

Table 2

GROUP	AGE	ALL NORMAL	SIGNIFICANT BOTH	SIGNIFICANT COND	SIGNIFICANT BIAS
Normal	YNG	71%	7%	9%	10%
Normal	OLD	89%	3%	2%	6%
LDs	YNG	6%	55%	35%	4%
LDs	OLD	15%	59%	15%	10%

Table 2. Percent of cases for subgroups that performed NORMALly or failed on the CONDitions, response BIASes or BOTH.

columns at the right. The number failing both COND and BIAS remained about the same, however, the percentage failing COND alone went down while the percent failing the BIAS portion went up. That is, while about half of the older LDs still fail both aspects, there was a tendency for Condition scores-only to be normal much less of the time than found in younger LDs. The increase in response bias-only failure is of interest. In my experience the latter increase is even greater in the college LDs I've seen.

What to do? It would be well in working with the college-age LD group to use the +1 SD norm for SSW Conditions instead of the typical +2 SD limit. Also, it is even more important to use response bias information for these individuals than for the younger ones.

Table 3
ONE STANDARD DEVIATION "ADULT" NORMS

AGE	C-SSW NORMAL LIMITS RNC	RC	LC	LNC
12-59	1	3	5	1

Table 3. For college-age clients.

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Many thanks to Richard Saul for guest editing this issue. Appreciation to Paula Smith for typing the material and to Robyn Marineau for buisness management.