NEWSLETTER

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TOO OLD FOR THE SSW?

What a shame to deprive someone of listening to Jack Katz whisper "upstairs-downtown" dichotically or wonder about the forgive-milkman caper. And all this because an individual is over 60! Hasn't anyone heard of grey power?

Up until now, SSW users throughout the world have looked cautiously at SSW results in the elderly. We know that HL increases with age and that the elderly show greater hearing problems than the pure tone audiogram implies. A 'central aging' effect has been shown when speech materials are varied from soft to loud. Other data have pointed to a low frequency SNHL which ear marks a central component in this group. Finally, research has indicated that hearing aids are not the best bet when an older person has central signs. So, why not the SSW? Doesn't it tell us many things from cochlea to cortex?

The material contained in this edition of the NEWSLETTER capsulizes the thinking of a few SSW-ites working with the over 60 area. We trust you will enjoy this short trip to the "Golden Age" SSW. (dja)

SSW PERFORMANCE IN THE ELDERLY: A Preliminary Report

Dennis Arnst
San Francisco, California

The variability in C-SSW results obtained in the elderly has been noted. The data presented here are part of a larger study in progress at the VA Med. Ctr. in San Francisco.

80-Pts who had passed their 60th birthday were evaluated with the SSW using standard procedures. The mean RE/LE PTA (N) for each decade was: 6th-(43) 29.4/30.2; 7th-(21) 38.7/39.9; 8th-(16) 47.0/42.6. Mean RE/LE WDS for each decade was: 6th-96.0/81.8; 7th-74.2/74.7; 8th-67.6/68.4. The classic decrease in PTA and WDS re: age was evident.

Total errors on the SSW increased with age. The most errors were made in the 8th decade. On the average, RE < LE by 5 errors in the 6th & 7th decades; the RE > LE by 2 errors in the 8th decade. Mean C-SSW (SD) is shown in Table 1.

TABLE 1

DECADE	$\bar{X}$ R-SSW (SD) RE	LE
6th	6.9 (15.9)	12.7 (16.6)
7th	4.8 (15.2)	13.6 (21.7)
8th	28.1 (18.9)	25.6 (11.8)

The SD for C-SSW scores appears to be fairly constant across ages. The RE C-SSW was less than the LE score for 6th & 7th decades; for the 8th decade RE & LE C-SSW scores were equal.

Response Bias was consistent across age groups. About 35% of all Ss showed Ear Effects; significant Ear Effects tended to be LH. About 50% showed Order Effects; significant Order Effects tended to be LH. Most Ss made no reversals. The lack of significant reversals increased with age--6th decade 67% vs 8th decade 94%. In general Response Bias was not a characteristic of these groups' performance.

Finally, 72% of the 6th decade group obtained a combined TEC of O/N/Mi; 28% were accounted for by a Mo/S. 12% of the 8th decade group obtained a O/N/Mi category; 88% were Mo/S.

It appears that the C-SSW scores increase with age in the over 60 population. Whether or not the variability differs from a younger group with SNHL needs to be assessed. Also, the general category of C-SSW on TEC Analysis suggests more central involvement. This factor may parallel the Central Aging effect noted with PI functions.

CASE STUDY: Left hemisphere cerebral hemorrhage in a 65-year old male

Mike Shirinian
Palo Alto, California

This 65 year old male was evaluated following complaint of sudden onset of hearing loss coincident with weakness in his R-hand. He also had confusion and difficulty with speech communication. Pt. reported no previous medical disturbances. No problem with headaches, strokes, weakness, or difficulty with dexterity.

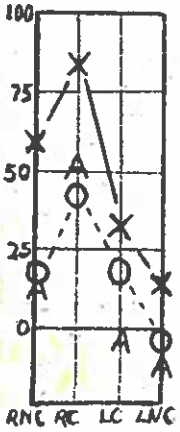
NEURO. EXAM: Pt. had difficulty with complex commands, but was aware of time and his location. Paraphasia was noted in that he would talk circumferentially around questions. Irrelevant material was often incorporated into his responses. Facial sensation was decreased on the right side; visual field testing raised some question about Pt.'s use of right visual space. Pt. showed paresis of the R-arm; grip was weak. Strength in Pt.'s right leg was excellent. Decreased response to pin-prick, touch, and tactile recognition were noted on the right. Romberg test was negative.

AUDIO. RESULTS: PTA -- RE: 10dB; LE: 7dB with pure tone thresholds at .25-8K as follows:
RE: 5, 5, 5, 20, 45, 60
LE: 10, 0, 5, 15, 45, 55
No air-bone gap noted. Type A tympanograms bi-laterally; ART were not remarkable.
PI-PB functions were -

	50dB	70dB	90dB
RE:	56%	48%	20%
LE:	84%	72%	56%

BERA results showed normal absolute wave V latencies (R=5.82 msec; L=5.84 msec). Inter-wave latencies were normal bilaterally.

SSW TEST RESULTS:
8 CN's (REF) were -
11 17 3 1 5 11 16 13
Response Bias was -
EAR 32/45 LH
ORDER 54/33 HL
REVERSALS 1
TEC for C-SSW = Mo
TEC for A-SSW = O-Mo



RADIOLOGIC RESULTS:
CT scan showed a 3.5 cm diameter abnormality in the region of L-posterior frontal lobe near the insula. This was associated with displacement of the pineal from L to R for a distance of 5mm.

DIAGNOSIS:
Hypertensive cerebrovascular disease with cerebral hemorrhage in the L-hemisphere.

ED. NOTE: The significant point here is that no abnormalities were revealed with the traditional test battery. SSW results, especially the Response Bias highlighted the central aspect of this Pt.'s problem even though he exceeded the upper age limit of the norms.

A RECENCY EFFECT IN LD CHILDREN

Robert Lukas
W. Haverstraw, New York

The inattention and immature patterns on the SSW test are frequently seen in LD children. Presumably, they lack the integrity or motivation to repeat both of the competing words. (Katz & Illmer, 1972)

Sometimes the child makes most of his errors on the 1st spondee regardless of which ear it's in. When the totals are combined, this produces a symmetrical inattention/immature pattern. In such cases, the resultant pattern would reflect an Order Effect possibly associated with a disorder of short-term memory. When adjusted for the Order Effect, the scores improve considerably. Interestingly, these children have been labeled by non speech/hearing people as having "Auditory Perceptual Deficits."

Forty-seven LD children were given the SSW test. 19 (40%) had bilateral peaks and of these, 6 (32%) had a recency effect (O H/L). It would be interesting to see whether these children had similar problems in their schoolwork. The observation of this type of Order Effect in cases with bilateral peaks should encourage the audiologist to examine SSW results beyond a glance at the SSW-gram and to seek out the so-called "internal dynamics."

Following are 3 illustrative cases. The reader is encouraged to plot not only C-SSW, but also REF and LEF performance separately.
(Cont. pg. 4, col. 3)

PREDICTION OF HEARING HANDICAP WITH THE SSW TEST

Michael Brunt
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The Hearing Handicap Scale (HHS) (2) has been used as a self-assessment of communication problems arising from hearing loss (1, 3, 4). Since the auditory problems of the elderly have been shown to involve more than the cochlea (5) and since the SSW samples a greater portion of the auditory system than routine speech discrimination test, the present study was designed to examine the performance on the SSW as it relates to hearing handicap of the elderly as measured on the HSS.

METHOD: 26 Ss (12 males; 14 females) ages 57-90 ($\bar{X}$ =71.7) years participated in the study. Ss with known history of CNS disorders or conductive HL were excluded.

Tests were administered to all Ss in the same order--HHS, PTΘ, SRT, WDS & SSW--according to standard clinical methods. The HHS was scored in %-age--the greater the %-age, the greater the perceived handicap. SSW results were analyzed using the R-SSW scores so that overall changes in the entire auditory system could be correlated with HSS. Thus, the C-SSW was not determined.

RESULTS & DISCUSSION: HL in all Ss was bilateral, high frequency, sensorineural ($\bar{X}$/SD: RE=29.96/12.23; LE=29.81/12.75). As expected, SRTs were in close agreement with PTAs. WDS results were ($\bar{X}$/SD): RE=83.69/16.41; LE=89.08/10.94. Since HHS results are reported in terms of 'better ear' performance, data were computed reflecting both 'better ear (BE)' performance and 'poorer ear (PE)' performance.

Scores on the HHS ranged from 0-64% ($\bar{X}$=31.08; SD=18.58). These results were compared to the Schow and Tannahill data (4). The mean for this group placed it in the 'slight handicap' category. Of the 26 Ss, 8 fell in the 'no handicap' category (0-20%); 9 in the 'slight handicap' range (21-40%); 9 in the 'mild-mod.' handicap category (41-70%). Thus, 18 of the 26 Ss demonstrated some handicap as measured by the HHS.

Table 1 shows the $\bar{X}$ & SDs for the 7 R-SSW scores.

TABLE 1

R-SSW	$\bar{X}$	SD
R-NC	12.9	10.8
R-C	23.1	14.6
L-C	24.1	17.6
L-NC	14.3	15.6
RE	18.1	12.1
LE	19.2	16.1
Total	18.8	18.0

Pearson product-moment correlations were computed between HHS and PTA, SRT, WDS, & SSW for the better ear as well as the poorer ear. Results are shown in Table 2.

TABLE 2

	BE	PE
PTA	.65*	.68*
SRT	.53*	.49
WDS	-.37	-.29
SSW	.64*	.62*

*p < .01

Correlations (p < .01) can be noted for the SSW & PTA for the BE and PE and the BE on the SRT. The 7 R-SSW scores were also correlated with the HHS (see Table 3). All correlations were significant (p < .01) except for R-C and Total SSW Scores.

TABLE 3

R-NC	R-C	L-C	L-NC
.6218*	.3102	.5454*	.5930*

RE	LE
.6377*	.5869*

Total
.4772

*p < .01

These preliminary results suggest that the SSW test (R-SSW scores) may be a viable predictor of hearing handicap in the elderly. The data suggest that the RE and BE R-SSW scores may have the strongest relationship with the HHS. Administration of the SSW test may be a useful addition to a basic audiologic evaluation. It would have the advantage of providing information on the auditory system as well as serving as a measure of communication skill.

1. Berkowitz, A. et al., Arch. Otol., 93, 25-28 (1971).
2. High, W.S. et al., JSHD, 29, 215-230 (1964).
3. McCartney, J. et al., JAR,16, 51-58 (1976).
4. Schow, R. et al., J. Amer. Aud. Soc., 3, 134-139 (1977).
5. Schucknecht, H. Arch. Otol., 80, 369-382 (1964).

HEARING LOSS AND SSW PERFORMANCE: Preliminary Observations

Dennis Arnst
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The R-SSW has been shown to be highly correlated with the WDS. As a result, the R-SSW reflects both peripheral and central problems. The difference between R-SSW & WDS can be considered to represent CNS dysf. Thus, the C-SSW should be used when evaluating the CANS. But, does the same relationship exist in the elderly? And, does the C-SSW correction account for the HL sufficiently?

The data summarized here are part of the ongoing study at the VA Med. Ctr. in San Francisco. Performance of a young (X age= 40.7) group where compared with an elderly population (X age=83.6). Ss in this study were 26 (56 ears) middle age adults and 16 (32 ears) adults who had passed their 80th birthday.
The 3-frequency PTA and the 5-frequency PTA were calculated for both groups and are shown in Table 1.

TABLE 1

GROUP	3FA-PTA RE	LE
YNG	27.0	28.6
8th	47.0	42.6
	5FA-PTA	
YNG	42.3	42.8
8th	62.2	59.6

By comparing the 3FA and 5FA we see that both groups have a significant HF SN HL. None of the 8th decade Ss had a 3FA<15dB or a 5FA<40dB.

C-SSW results were compared with the 3FA and 5FA. For this analysis, HL was held constant. Figs. 1 & 2 show these results graphically.

Fig. 1

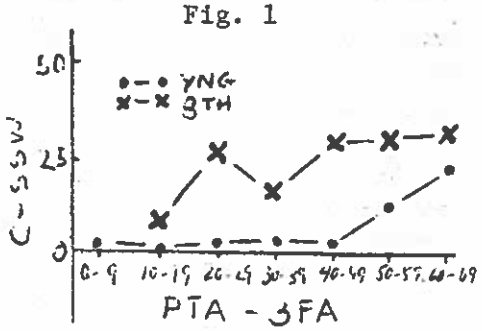
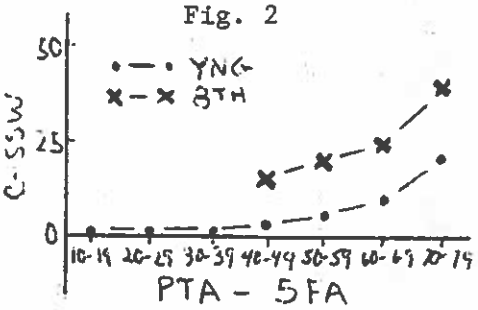


Fig. 2



Several observations can be made from these data:
1) The 8th decade group had C-SSW scores consistently greater than younger Ss across HL.
2) C-SSW scores for the YNG group tended to be consistently low up until 50dB HL for 3FA and 60dB HL for 5FA. A similar increase in C-SSW occurred in the 8th decade group at a higher C-SSW level.
3) Little difference exists in C-SSW performance for the YNG for 3FA or 5FA.
4) Differences in C-SSW scores for the 8th decade group exist when comparing 3FA and 5FA.
5) It appears that HL greater than 50dB HL may have a residual effect on C-SSW scores. The WDS correction for HL 50dB HL may not neutralize the effects of cochlear HL in both YNG and 8th decade groups. HL below this level may be accounted for by the WDS correction procedure in YNG.

RECENCY EFFECT - cont.

1) 7 yr. old male - M.D.: Poor short term memory, word finding probs., hyperactive, 'auditory perceptual tests should be gone into in some detail.' SCHOOL: Disoriented, short attention span, trouble remembering and distinguish between sounds. PSY: Short and long term memory prob., perseveration. PARENT: Question of hearing, attending or processing.

SRT: A.D.=0, A.S.=0
WDS: A.D.=96%, A.S.=100%
8CN = 1 12 3 0 4 9 3 2
4 reversals.

2) 7 yr. old male - M.D.: soft signs, 'particular attn. to audiology as there are suggestions of auditory perceptual deficits...' SCHOOL PSY: Difficulty in aud., vis., and motor areas,... auditory quite serious in discrim. of sounds,memory, and integration with visual areas (sound-symbol integration).

SRT: A.D.=10, A.S.=15
WDS: A.D.=96%, A.S.=96%
8CN = 1 12 9 3 4 15 8 1
1 reversal.

Advanced Workshops

In addition to the one in Worcester, MA. March 14 & 15 (see pg. 3 of last issue) there will be one in Wyoming (August 14 & 15, 1980). Contact: Ben J. Koperski, Supervisor of Clinical Services, Dept. of Speech Pathology and Audiology, Box 3311 University Station, Laramie, Wyoming 82071. (307) 766-6426.

THESIS ABSTRACTS

PROCEDURAL ASPECTS OF THE SSW TEST WITH A GERIATRIC POPULATION

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The performance of a geriatric population was evaluated. The presentation level of the SSW test was adjusted to the level of PB-max. The Ss were 20 individuals between the ages of 60-85 years. None of the Ss had evidence of ME pathology or history of central auditory pathology. Pure tone air conduction thresholds, SRTs, Impedance audiometry, and PI-PB functions were obtained for both ears of each S. Mean HL for each age group is shown in Table 1. It should be noted that the 3-Freq. PTA did not account for high frequency HL in most Ss. The SSW test was presented at both the standard level of 50 dB-SL (re: PTA) and at PB-max as determined by the PI-PB function for each ear. R-SSW and C-SSW results were compared for both presentation levels.

TABLE 1

DECADE	N	3-FREQ PTA X (range) RE	LE
6th	14	15.3 (0-40)	16.0 (0-35)
7th	5	25.0 (5-35)	28.0 (15-35)
8th	1	40.0	35.0

The results of this study showed that presentation level did not effect R-SSW scores. C-SSW scores obtained at the PB-max level with a PB-max WDS correction, reduced variability of the scores. In addition, the following observations were made:

1) SSW performance in this population decreased as peripheral hearing loss increased.
2) Female Ss performed consistently better than male Ss.
3) Performance appeared to be better on the second presentation of the test. (Presentation levels were counter-balanced.)

While interpretation of SSW test results obtained with older patients using the standard procedure may provide an overall estimate of central auditory function, norms should be established for this group. In addition, more consideration should be given to a PB-max based presentation level for this group. Perhaps such an adjustment could better represent the cochlear aspect in the patient with presbycusis.

EVALUATION OF CENTRAL AUDITORY DYSFUNCTION IN TEMPORAL LOBE EPILEPSY

Mardi Todebush
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10 Ss with clinically confirmed temporal lobe epilepsy were evaluated using the SSW and CES tests. All Ss were currently taking Dilantin, usually in combination with another seizure control drug. Of the 6 Ss revealing abnormal SSW results:

-2 had mild C-SSW scores
-5 showed 2-14 Reversals
-4 showed positive SSW/CES indicators

4 Ss had well defined neurologic indicators (eg., EEG, EMI scan)--3 of these Ss displayed SSW performance highly consistent with the localized lesions (NAR). Ss with the least specific neurologic findings tended to show 'normal' SSW results.

CENTRAL AUDITORY DYSFUNCTION IN MULTIPLE SCLEROSIS

David Hicks
Berkeley, California

18 Ss diagnosed by a neurologist as having MS were evaluated with the SSW test and PI/PB and PI/SSI. One-third of the cases studied were identified as having central auditory involvement. The PI functions appeared to show central auditory signs more often than the SSW test. However, the SSW test was more specific in terms of site of dysfunction.

SSW Newsletter

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Dennis Arnst, San Francisco VA Hospital, was the guest editor for this issue of the Newsletter.

Deanne Balutis and Pam Ruchalski were a great help in getting this issue out. Max McCarthy volunteered to help with the books.