SSW NEWSLETTER

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DRUGS AND THE SSW

In clinical practice, audiologists encounter patients who are using or have used drugs. Such drugs may be either prescribed by a physician or drug abuse. This issue will deal with both types of drug use. The purpose of this issue is to alert the clinician about the possible influence of drugs on the results of central auditory tests. The researcher might consider why there was an effect and the implications.

ACUTE EFFECT OF MARIJANE AND BOOZE

by J. Katz & 2 Friends

Two studies were carried out on the acute effects of drugs to see the influence on the SSW. You may have wondered how a person would do on the SSW if bombed. To spare you from getting your friends stoned these results are reported.

A. <u>If you drink, don't SSW</u>. The test was divided in ¼s (10 items ea.). The 1st ¼ was given for baseline. Before ea. of the other ¼s ea. of the 8 S's consumed 2 oz. of gin. Baseline=no errors for the 320 words. After 2 oz=6 errors; 4 oz= 11 errors and after 6 oz= 15 errors. More than double the errors for the LE (facing nondominant hemisphere) than RE. There were 13/19, REF/LEF. If viewed as one person-Ear L/H. Fig. 1 % error for 4 conditions.

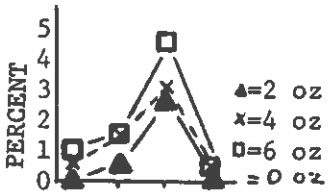

Figure 1.

B. <u>Do pot and SSW mix?</u> One S was given the SSW twice, in 10 item sections. Before ea. of the next 3, ¼s he took 3 deep puffs of pot. The retest was given without further drug ingestion. Baseline= no errors, remaining 3/4= 5% error and the retest= 2% error.

The data were milked a bit by having S indicate which words were hard. There was a marked difference in the "hard" words vs the ones on which he actually erred. There were no hard items on baseline, 3.3% hard words on the rest of the items of the test and <u>7.5%</u> on retest. There was a wide fluctuation across the 8 conditions in a cyclical fashion (when taking hard and error words together).

The 2 studies had some similarities. All errors were in LE as were most of the hard words. Although the 1 smoker had only 6 errors on the 30 items which didn't quite meet the criterion for Ear Effect, the 3/8 for the hard words would be significant (if proper). More "hard" & error words for LEF than REF. Fig. 2 shows similar pattern for booze & pot.

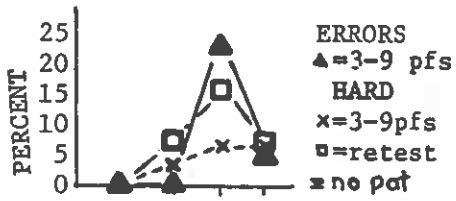

Figure 2.

Interpretation - No firm conclusions can be drawn because of the very small samples but there is a trend for poorer performance and greater felt-difficulty when using marijuana or gin. The LE is particularly affected and the LEF items. The LE effect is more likely to represent a dominance effect than a R-hemisphere problem. Ear L/H could well suggest anterior dysfunction. The first effects of alcohol are known to effect frontal lobe function (altering S's judgement). We even saw evidence of altered judgement with MJ as well as a cyclic wave of difficulty.

While my purpose was to spare you the need to carry out such a study, one must conclude that the results are interesting and deserve further study.

SSW FINDINGS IN CHRONIC ALCOHOLICS - J. Spitzer

As part of a larger investigation of the central processing function of chronic alcoholics (Spitzer and Ventry,1979), 15 veterans were selected from an inpat. detoxification program. To be admitted to this program, a criterion was applied of disruption of social and familial relationships attributed to alcohol abuse, i.e. gamma stage alcoholism(Jellinek,1968). On the basis of interview and chart review, patients were excluded for a positive history of head injury, recent noise exposure, use of ototoxic drugs,addiction to drugs other than alcohol, recent ear infection, or renal disease. In addition, patients were excluded from the study if their electroencephalogram was consistent with focal pathology. The subjects were between the ages of 26-55 years (x=42.7) and had a history of excessive alcohol consumption for at least 10 years. Fifteen non-alcoholic control S's were age-matched to alcoholics; the controls were between the ages of 26 to 53 years(x=42.1). All subjects had hearing for pure tones within normal limits for their age (Glorig and Davis, 1961).

The mean Total corrected SSW results were within the normal category for both groups:-2.73 for the alcoholic sample and -0.13 for the controls. Despite the normal means, 6 of the alcoholics had over-corrected scores. The 0 category has been associated with sensorineural hearing loss or brainstem site-of-lesion (Katz,1977), but, in view of the selection criterion of normal hearing for their age, brainstem site appears more likely. Only one alcoholic subject and none of the controls had a significant Ear Effect.

Further analysis using a Wilcoxon Matched Pairs Signed Rank Test produced a significant result ($p < .05$) reflecting distinctly different SSW performance by alcoholics from non-alcoholic controls.

There are two points which should be underlined on the basis of the this study. First, abnormal performance obtained from a detoxified alcoholic patient may be a reflection of longterm nervous system damage ascribable to the effect of alcohol ingestion combined with vitamin deficiency. It is possible that head injury which is thought to be common among chronic alcoholics, may be an additional influence on central processing. This would interact with the effects of toxicity and/or nutritional deprivation. Second, further investigation is required to delineate the sequelae of drug abuse on auditory processing, including study of other measures of brainstem and cortical function.

Glorig, A. and Davis, H. Age noise and hearing loss. Ann. Otol. Rhinol. Laryngol., 70, 556-571,1961.

Jellinek, E.M. The Disease Concept of Alcoholism. New Haven: Hillhouse Press, 1968.

Katz, J. Personal communication, 1977.

Spitzer, J and Ventry, I.M. Central auditory dysfunction among chronic alcoholics. Arch. Otolaryngol., in press.

LETTER TO EDITOR

Hi,
Thanks so much for the super SSW newsletter. I wouldn't think of missing out on any more issues so here's my $5.00.

L.A.

A CHILD TAKING PHENOBARBITOL by R. Keith

This 12 year old boy was referred to our clinic with a history of mild seizure disorders. The chief complaint at the time of the visit was of a 3 mo. history of dizziness, lasting up to 2 hrs. and a floating or spinning sensation. It was not related to position or motion.

Pediatric work up indicated that he was on medication between the ages of 1 and 3 for his "jerky" movements. The medication was discontinued when the movements went away. EEG indicated non-focal dysrhythmia. Diagnosis was a probable convulsive disorder, and the recommendation was that he be placed on Phenobarbitol and that he return for follow-up observation.

Educationally, he was placed in an EMR class because he had had learning difficulties, however, was learning well and he was ready to be assigned to a regular classroom. The teacher was primarily concerned about his recent seizure activity. He was in good health at the time of the visit.

Audiometric results:

SSW Scores

	Pre-Med 3/4/77	During-Med 8/30/77
T	16 - Mo	10 - Mi
E	24 - Mo	10 - N
C	30 - Mo	15 - N

Pure tone audiogram was normal, as was his speech discrimination in quiet. The SSW test was administered and the results dated 3/4/77 are shown. At the time, we considered the SSW results to be abnormal and

PHENOBARBITOL (Continued)

requested that the child be returned for retesting.

After being placed on medication, he returned to the clinic and the SSW (during medication) dated 8/30/77 is shown. Results indicate a striking change in the SSW scores that raises a number of questions. The first is whether a child with a seizure disorder and abnormal central auditory test findings may improve both his seizure activity and his central auditory processing abilities with Phenobarbitol. The second question that should be considered is whether the result is simply due to the maturation that may have occured in 5 months between tests. Finally, whether the test/retest reliability of the SSW is sufficient to assure repeatability of the findings. This interesting case indicates the need for further investigation into the central auditory processing ability of children who may be on medication for control of seizure activity or other behavior problems. It also poses a need for additional systematic research on the test/retest reliability of the SSW and all other tests of central auditory ability.

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ADVANCED WORKSHOP
WORCESTER, MASS.
March 14 & 15, 1980

Contact: Steve Fournier
Audiology
University of
Massachusetts
Medical Center
55 Lake Ave.North
Worcester, MA01605

ALCOHOLIC CASE STUDY
by J. Spitzer

O.B., a 44 year old black male, was admitted to the alcohol detoxification program of a VA hospital. He stated that he consumed ½ quart of wine plus beer each day. This interfered with his daily functioning and employment (he had not worked regularly for 1 yr). O.B. took his first drink at 14 years of age. His chronic alcohol habit seriously interfered with social activity for the past 21 yrs. He had had an auto accident, reportedly without skull trauma. Otologic neurologic exam, as well as an EEG, were deemed unremarkable.

The results of an intensive central auditory test battery contained several abnormal findings. Pure-tone thresholds for air- and bone-conducted stimuli were well within normal limits (250-8000 Hz), bilaterally. WDS at 40 dB SL were 88%, bilaterally. A Performance-Intensity function yielded an abnormal Roll-over Index score (Jerger & Jerger, 1971) for the left ear (.56) and a normal score for the right (.33). Tone decay findings (Olsen & Noffsinger, 1974) were negative at 250,2000, and 4000 Hz, bilaterally. High SL SISI (Jerger et al., 1959) were 100% at 250, 2000, and 4000 Hz, in both ears. Acoustic reflexes to contralateral pure-tone stimulation (500, 1000, 2000, 4000 Hz) were within 75-80 dB SL, bilaterally. Sweep-frequency Bekesy threshold tracings were Type I (Jerger, 1960), but with large excursions, in both ears. There was no forward-backward discrepancy in Bekesy tracings for either ear.

O.B.'s performance on the C-SSW was 0 (T = -10; E = -11; C = -12). The patient made many repetition errors during the administration of the SSW, but self-corrected on almost all errors. Performance on the Synthetic Sentence Identification (Jerger, et al., 1968) with ipsilateral competing message (SSI-ICM) was abnormal in both ears, but the SSI-CCM was essentially normal. The final procedure was repetition of 0% and 60% time-compressed CID Everyday Sentences (Davis & Silverman, 1970). At the 60% compression, scores dropped to 60% correct (a decrement of 40%, bilaterally).

The abnormal findings were restricted to the SSW, SSI-ICM, and compressed speech. Both the SSW and SSI-ICM findings point to brainstem pathology, while the compressed speech results are indicative of bilateral cortical dysfunction. The suggestion of co-existent brainstem and cortical dysfunction was not uncommon among a group of chronic alcoholics that were sampled.

BASIC WORKSHOPS

Jacksonville, FL (Jan.7-9,1980)
Contact: William R. Pharo
Audiologist
Speech & Hearing Ctr.
1128 Laura St.
Jacksonville,FL 32206

Richmond, VA (Feb.14-16,1980)
Contact: Frank M. Butts,Director
Sp.Path-Audiol.Services
Medical College of VA
MCV Station
Richmond, VA 23298

DIAGNOSTIC SIGNIFICANCE OF THE TYPE A PATTERN -- by Jay R. Lucker

The SSW has become part of the central auditory test battery for evaluating learning disabled (LD) children. During the SSW workshop, Katz indicated that the Type A pattern has been found in LD children. The Type A is a pattern in which one of the 8 CNs for RC on REF items or LC on LEF items, is twice as great as any other number and by at least 3 points.

When evaluating a child with the SSW, the audiologist may obtain a Type A and associate this with the child's LD. The audiologist should also relate the test results with the youngster's specific academic problems. Too often the clinician is only able to state that the results are consistent with findings noted in other LD children.

For the past 1½ yrs. I have been using the SSW test with LD children. To date, I have found 15 with Type A patterns. In addition, I have found a small number of normal achieving children with Type A's. This finding led me to carefully investigate the relationship between Type A and academic problems.

I became curious when finding the Type A in a child who was functioning above grade level but had spelling problems. The child had been referred to determine whether a subtle central auditory processing problem was responsible for her inability to spell. Her spelling errors were problems with sequencing and especially with "sounding out" the words. The child's written work did not always reflect what she said in sounding-out. The central auditory battery was normal except for the Type A SSW pattern (8 CNs=0220 0600). When I discussed the results with the child's teacher she requested that I test another child with a similar spelling problem (also achieving above grade level). The second child also had a Type A (0000 2500).

I began looking at the learning problems of other children with Type A's. The 15 children ranged in age from 7-5 to 19-4 (M=11-1). All testing was REF. M's & sd for 8 CNs:

A	B	C	D
0.6	1.5	2.7	0.4
(0.8)	(1.6)	(1.8)	(0.6)

E	F	G	H
1.0	8.6	1.4	0.4
(1.3)	(3.2)	(1.4)	(0.6)

Each of the children yielded the poorest score in the LC condition when LEF regardless of handedness (1 child was L-handed). The smallest value for LC was 4 and the smallest difference between it and the next highest score was 3. Spelling was identified as the major learning problem in 11 of the children. Three of the remaining 4 were diagnosed as LD with severe language and reading problems. Their spelling difficulties may have been associated with other learning problems but did not stand out specifically. The 3 children did have reading problems related to phonics and sound-symbol associations. Only one child was not LD. He was diagnosed as emotionally disturbed. It is possible that he too had spelling difficulties which have not been properly diagnosed because of the dominant emotional problem.

Of the 11 with specific spelling problems, 4 were not labeled LD-only spelling disorders. Their spelling errors were similar to the other 7. There were sequencing problems (e.g., Decmeber/December, balck/black) and sound-symbol association problems in which the children "sounded-out" words correctly but wrote letters unrelated to the sounds they said. The Type A response may be related to difficulties in sound-symbol association in reading. Thus it is hypothesized that the Type A on the SSW is related to sound-symbol association problems which may affect spelling (11 of the 15 children), reading (10 out of 15), or both (7 out of 15).

At the workshops, Katz described 2 dyslexic cases who had Type A's and abnormal EEG's in the temporo-occipital region. It is hypothesized that the temporo-occipital abnormalities or the adjacent temporo-parietal region caused the sound-symbol association problems which led to the spelling and reading difficulties. The Type A pattern appears to reveal those persons with sound-symbol association problems due to a temporo-parietal dysfunction.

I do not wish to mislead the reader into believing that all children with sound-symbol problems have Type A's. I have seen a number of children with

TYPE A (Continued)

similar spelling and reading problems with normal central auditory processing or central auditory processing problems without Type A's. Two children with severe spelling problems related to sequencing and omission of letters had normal central auditory results except for a large number of reversals on the SSW (17 and 19 ea.).

Spelling and reading problems can be caused by numerous factors. The Type A on the SSW seems to be correlated with sound-symbol association problems in which the children have difficulties relating the sounds of the letters to the graphic symbols in reading and spelling. When the Type A is noted, the audiologist can state that there is a high probability of a sound-symbol problem requiring remediation. This difficulty can lead to reading and spelling problems.

USE/MISUSE OF THE SSW TEST

The SSW test has been evolving for the past 19 years. It is far from perfect and when we are correct we usually don't know why the test works as it does. This message is not one of pessimism, only one of caution.

It is far more difficult to be a clinician than a researcher. The researcher often predicts group results while the clinician must deal with individual prediction. The researcher can select his population and eliminate the "oddballs." The clinician has neither of these advantages.

The audiologist is typically testing the most difficult or complex cases that present a dilemma for the referring source. Thus, unusual or multiple lesions and psychological overlays are frequent.

Duane ('77) points out that "...a test is an aid to the clinician but it provides no substitute for informed clinical judgement." It is important, certainly in your early use of the SSW and CES tests to exert considerable caution in reporting your data. While research results might show specific loci of lesion it is well to describe areas like "fronto-temporal region; fronto-parietal area or the auditory reception region."

After you and your referral source gain confidence in your analyses you can narrow down your statements if more specific information is called for.

SSW STUDY GROUP

November 15, 1979

Atlanta, Georgia

From 4 to 7 pm

Marriott Hotel

Tara 2

All are welcome!

VALIDATION STUDY

The first phase of a cross validation study was just completed (by Lorri Wilson, Larry Jacobs and myself). The SSW and CES results were compared to the brain lesions shown by serial CT scan tracings. The neurologist (in a double blind procedure) indicated which of the regions on the SSW brain grid were involved. We looked at C-SSW score, Ear & Order Effects, Type A, and Reversals. In each case the presence of an indicator was better than 80% accurate (84 to 100%). The major problem was the SSW/CES comparisons in identifying the damaged hemisphere. As indicated earlier (May '79 Newsletter; SSW Workshop Manual, 1979) these comparisons can be thrown off by the presence of hearing loss, interhemispheric lesions and Type A patterns. Further research will be undertaken to determine whether modifications in the procedure can be used to improve predictability in such cases.

OBSERVATION

In my opinion Yes-No procedures like STAT and Olsen-Noffsinger tone decay are less useful than Rosenberg, Owens and Carhart procedures in cases of brainstem pathology where subtle differences can reveal the suggestion of a retrocochlear lesion (Morales-Garcia and Hood, 1972). No doubt Yes-No procedures are useful for gross VIII Nerve pathologies.

J. Katz

THE
NATIONAL SAMPLE
NEEDS YOU
YOU NEED THE
NATIONAL SAMPLE

Jaclyn Spitzer was the Guest Editor for this issue.

SSW Newsletter

Jack Katz, Editor
State University of New York at Buffalo
Communicative Disorders and Sciences
4226 Ridge Lea Road
Buffalo, New York 14226
716-831-1605