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OTHER SSW TESTS - VARIATIONS ON A THEME by Floyd Rudmin, McGill Univ., Montreal

The SSW test was first described in the literature in 1962 (5). Since then, the SSW test has been copied to varying degrees in a number of other countries. These tests with sample items are listed below.

English Dialects
- -American (5)
  up-stairs/down-town
- -Indian (2)
  (not available)
- -English (12)
  cream-bun/high-tea

Turkish (7)
  kara-kedi/mavi-deniz

Hebrew (8)
  erav-shabat/yeled-tov

Japanese (10)
  kata-kana/migi-ashi

Portuguese (1)
  porta-mala/uma-luva

Danish (4)
  land-skab/vogn-mand

Spanish (3)
  cafe-negro/nino-blanco

French (9)
  casse-noix/serre-tete

Most of these versions were developed with some degree of consultation with Katz. However, the Indian English, the English English, and the Danish versions were developed independently, with the author's model - the general descriptions of the SSW in the literature. Thus all of the SSW versions share characteristics in general, and those involving Katz have common recording and alignment techniques.

Number of Items:
All versions use 40 or 50 items. This allows enough items to sample patient response and item variance and not be too long. Also, score per item per ear is easy (5% & 4% respectively).

Alternating Ear First:
Items begin alternately in one ear and then the other. With the Danish test the total presentations per ear are balanced, but the alternation is random. Thus, 3 items in a row might come to one ear, then 2 to the other ear.

Carrier Phrase:
A carrier phrase precedes each item in the leading channel.

Word Selection:
Since the SSW is designed to be easy for normals and to be resistant to peripheral hearing loss, common, easy, redundant words are used. English has spondaic words, but other languages must use substitutes. These may be multisyllabic, if suitable for the language. Japanese, for example, has about 100 possible syllables and thus few monosyllabic words.

Most importantly, the presentation to each ear is linguistically viable as either a single unit or as two separated units, depending on the perceptual ability of the subject. In English, up, upstairs, and stairs are all viable linguistically.

Foil Items:
The non-competing items can be combined to form another viable unit. In the 'English' example, this is cream-tea. Foil items encourage errors for patients disrupted by the dichotic competition.

Intra-Spondee Pause:
When recording words to make an SSW, Katz recommends leaving a pause between the two halves of each spondee. On the EC recording, the median intra-spondee pause is 370 msec (11). This makes the alignment task easier. Also, this leaves auditory processing time before and after the dichotic competition which may be important for all but auditory reception lesion patients. (See 'Spelunking' in this issue.)

Dichotic Alignment:
The EC recording was aligned dichotically by a perceptual technique (11). Alignment is repeatedly adjusted until a native-speaker judge perceives an over-all gestalt simultaneity for the competing items. Most SSW tapes follow this design. The Japanese (10) and French (9) versions were made by aligning the duration centers of the competing words. The Katz ED tape (6), one French tape (9), and perhaps the independent tapes have word onset alignment.

(Refs for this article - see p5)

SPELUNKING THE SSW

Floyd Rudmin
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This is a brief report of a first exploration of SSW deep structure using factor analysis. For the novice data spelunker, what you need to begin this exciting type of recreation is a) a reasonable factor analysis computer program, b) an unreasonably large number of variables in your data set, and c) a reasonable computer account. In this instance, we are using a) the SPSS Factor program, type PA1 with default selection and rotation criteria, b) data on each of the 80 SSW EC spondaic words for 31 variables, and c) $9.29 Canadian.

Before we begin, novice spelunkers should be warned that factor analysis has many of the dangers of gambling addiction. It is possible to come back broke and discouraged. Others, after equally long trips, are still eager for a little more data and one more rotation. In this instance, we came back after one run to make this report.

Essentially, factor analysis is a set of techniques for exploring data and identifying possible underlying variables (factors) that may account for the variances and intercorrelations in a larger mass of measured variables. There are many arbitrary subjective decisions to be made. There are no unique or best solutions.

The data in this study come largely from an earlier study by Katz, Harder, & Lohnes reported at the Chicago ASHA meeting (1978). Additional variables were added and the data was entered spondee by spondee, rather than item by item. There are roughly three classes of variables:

a) Subject Variables

Numbers of errors for:

-Normals	(N=40)
-Bilat. Cochlears	(N=24)
-Uni. Cochlears	(N=9)
-Aud. Recpt. Cases	(N=7)
-Non-Aud. Recpt.	(N=13)
-Mental Retarded	(N=37)
-Retrocochlears	(N=13)
-Aged	(N=8)
-Learn. Disabled	(N=23)

b) Alignment Variables

Msec measurements by two techniques (T1 & T2) of the tendencies of the competing monosyllables of the first spondee to lead the CM of the 2nd spondee at the following junctures:

- -Word Onset (T1 & T2)
- -Word Offset (T1 & T2)
- -Word Center (T1 & T2)
- -Sonorancy Onset (T1)
- -Sonorancy Offset (T1)
- -Sonorancy Center (T1)

c) Speech Processing Variables

- -Spondee Order (1st, 2nd)
- -Spondee Familiarity (I)
- -CM Familiarity
- -NCM Familiarity
- -Spondee Familiarity (II)
- -Isolated CM WDS Error
- -Isolated CM WDS Non-confidence Ratings
- -Isolated CM WDS Error and Rating Interaction
- -Semantic Linkage of the First and Last NCMs (I & II)
- -Intra-spondee Pause (T1)
- -CM Word Duration (T1 & T2)

The results of the analysis are 10 factors with no intercorrelations among themselves, and accounting for 80% of the total variance in the data. The factors with % of variance accounted for and possible interpretations follow:

1. (20%) Patient classifications, except Aud. Recpt.
2. (11%) Word offset and word center asynchrony.
3. (11%) CM discriminability.
4. (9%) Word onset asychrony.
5. (7%) CM duration.
6. (6%) Sonorancy offset and center asynchrony.
7. (5%) Tendency of the first NCM to be in the response.
8. (5%) Word familiarity.
9. (4%) Sonorancy onset asynchrony.
10. (3%) Pause duration and Aud. Recpt. patients. The common characteristic may be processing time.

A number of interesting facets of the data are displayed here. First, AR cases are making errors for reasons quite different from the others. Secondly, word alignment and sonorancy alignment may function independently. Thirdly, onset effects may be independent of offset and center effects. Fourthly, its neat the way the speech processing variables package themselves independently.

I hope that this first exploration excites some would-be spelunkers and some arm-chair hypothesizers. We're going down again soon, and would welcome comments, any new variables, or suggestions for a favorite rotation.

INPUT OUTPUT REVERSALS

At recent workshops I have mentioned that reversals are often due to an input problem(improperly coded). There are probably output reversals as well(improper decoding). You can check on this by asking the person to repeat as if you hadn't heard his response. (cont. pg. 3)

The Influence of Socio-Economic Status, Dialect, and Educational Background on the SSW Test - M. Towson, Wayne State University, Detroit, Michigan

In a recent study to evaluate response bias as a function of age, Towson (1979), made an interesting discovery. Black subjects did not perform as well as white subjects. The majority of Black subjects were from low socioeconomic groups (S-E), and had little formal education. The white subjects in the study were college educated, and from middle-upper S-E groups. However, two of the Black subjects from middle S-E groups with graduate degrees performed as well as their white counterparts. On the basis of the finding, it was hypothesized that educational background, dialect, and S-E status (and not race), influenced SSW performance. Therefore a statistical analysis was performed to test the hypothesis, although S-E status was not controlled.

Method - In Towson's study, four groups of successive age decades (from 20-59 years) were recruited from the Ohio State University campus area, and the greater Columbus, Ohio area. The subjects had hearing sensitivities of 20 dBHL at 250 through 8000 Hz, and negative otological and neurological histories. All subjects were given a basic audiological evaluation, consisting of pure tone measurements (air and bone conduction) for octave frequencies at 250 through 8000 Hz. Taped SRT, word discrimination, SSW (list EC) tests were administered.

Results - A two way ANOVA was computed to determine if statistically significant differences were present among the low S-E group and the middle/upper S-E group. The parameters of Ear Effect, Order Effect, Pattern A Effect, total reversals, and total C-SSW scores were evaluated. A transformation to a logarithmic scale was performed to eliminate heterogenity of variance for Ear Effect, Order Effect, total reversals, and total C-SSW scores. Pattern A Effect was seen in only three subjects in the 40-49 year old age group. The results were not different enough among the means to warrant statistical analysis.

F values demonstrated significant differences between the low income and middle/upper income subjects for Ear Effect, Order Effect, and total C-SSW scores at the .02, .01, and .02 levels respectively. For reversals, the differences were not significant.

Discussion - The results of this study do not lend support to the findings of Turner (1966). Turner used seven age groups, ranging from nine to 59 years, in evaluating normal performance on the SSW test. She found no differences due to S-E status, although the majority of Black subjects in their study performed most poorly.

On the basis of the present findings, the SSW test may not be free of S-E, dialect and educational bias. Many poor subjects commented after testing that they were unfamiliar with many test items. The dialectal differences between the General American speaker on the SSW tape and the non-standard English used by many low income people is no doubt a contributing factor to their poor performance on this procedure. Since subjects are not routinely familiarized with all test items before the SSW test is administered, familiarization could be made to reduce the influence of this variable. A version of the SSW test for those patients speaking Black, Appalachian, and other non-standard English dialects may be warranted.

It was not an easy matter to separate out socio-economic status from Black dialect since: 1) the study was not designed to study either of these factors; 2) Most of the Ss in the lower S-E group in this study were Black; and 3) the greatest differences between lower and middle/upper S-E groups were at the older 2 decades where most of the Black Ss were concentrated. Further research is warranted in this area. A study which is set up to study socio-economic level vs. non-standard dialect is in order. In addition, younger vs. older Ss in lower S-E groups could be a factor suggested by the present study.

In/Out Revs. (cont fr p 2)

If he says it reversed again I think that is good evidence that it was probably an input reversal. If he repeats it okay it doesn't mean it was a decoding error.
-jk

ENGLISH VERSION OF THE SSW TEST by R.J. Davis, The University Southampton

1. Normal Subjects

Preliminary studies were made using normal subjects a) to establish a set of criteria to measure abnormal performance, and b) to investigate the effects of factors such as age, short-term memory, IQ, and personality on the SSW test results.

21 normal subjects were used. The age range was 20 to 64. The test consisted of 40 spondee pairs presented at 50 dB SL for each ear.

Results showed that, of the 4 factors mentioned, only age had a significant effect on SSW results. Using stepwise multiple regression, the age effect was significant at the 0.1% level. The estimate from the regression model indicated that a normal patient of 55 years or older would obtain an error score equal to or greater than the 95% confidence interval for normal performance. This result corresponds with the findings using the Katz version of the SSW test (1,4).

2. CANS Disorders

(i) Lower BS disorders: 18 patients were tested. 8 showed abnormal results, 5 monaurally and 3 binaurally.

(ii) MS patients:
10 patients were tested. 6 showed abnormal results, 3 monaurally and 3 binaurally.

(iii) Upper BS lesions:
7 patients were tested. 5 had abnormal results, 3 monaurally and 2 binaurally.

(iv) Temporal lesions:
9 patients were tested. 6 gave abnormal results. 4 showed classical contralateral discrimination loss. 2 had bilateral impairment. 3 patients with cortical lesions not affecting the temporal lobe were also tested. 1 showed a bilateral impairment. The other 2 had normal results.

Discussion

These patients were tested using 3 competing message-type tests: a) the SSW, b) a competing message (CM) test (S) where the response stimulus is routed to one ear whilst the other is given a competing message, and (c) a Simultaneous Dichotic Listening (SDL) test (3,8) involving simultaneous transmission of 3 digits to each ear, both being response stimuli. All tests were carried out at 50 dB SL (re HPL) except in cases where the level exceeded the S's uncomfortable loudness level (ULL).

Results from the Lower BS group showed no consistent pattern of abnormality, a result in accordance with previous authors.

In the MS group the pattern of abnormality using these tests was most consistent where the patient had a long history of MS. The SSW test would therefore appear to be of limited value in the early detection of MS.

Using the SSW on patients with Upper BS & Midbrain lesions, about 70% demonstrated abnormal results, although there was no consistent pattern of abnormality. SSW results had some correlation with SDL results. Although the SSW test seems to be fairly sensitive to disorders in this category, results are less conclusive than reported by Katz (6).

With temporal lobe lesions, 66% showed abnormal SSW results. 2/3 of these showed the expected contralateral discrimination loss. Previous studies reported less equivocal patterns of abnormality (6,7,2). This may be explained by the fact that this study did not use patients with surgically confirmed lesions. Again, SSW results correspond well with SDL scores.

In general, this study indicates that the SSW is clinically useful in the detection of disorders of the CANS, but that its value in differential diagnosis is open to doubt. The markedly different patterns of abnormality shown by patients with various categories of CANS disorders, as found by other workers, could not be replicated in this study.

Upcoming Basic Workshops

June 16-18 Kansas City, Mo.
June 26-28 Ruston, La.
Sept. 25-27 Denver, Co.
Oct. 9-11 Sante Fe, NM

For further info please let me know. JK

TAGA CHIGAI GO

If your Japanese is a bit rusty, you might want a translation of our banner. According to Toyoka Rudmin who provided the Japanese characters, they translate to "staggered arrangement word." Close enough.

Dear Ann Slanders...

Dear Ann Slanders: Who would have believed that someone as mature and level headed as Harriet Fishbine would be writing to Ann Slanders.

I tested a man on the SSW. He came up with a mild score so I minced no words and told him he was soft in the brain. He said if anyone had a problem it was me, because he had only been in this country for 10 years and couldn't be expected to handle that stuff as a native American. I told him to mind his own business and not to bother me again until he got some Elmer's to fill up the holes in his brain. What do you make of all this?

- HF IN NO

Dear IN: Please don't think that I am referring to you as "IN" because I think you are insensitive, incompetant or insane. Rather, you are misled, misinformed, and misplaced. Studies have shown that dialect can influence SSW results. Even Black dialect might have an adverse effect. If you give the SSW to someone with an accent, keep in mind that there could well be an adverse effect. If I were you Honey, I'd call the guy and tell him that he may or may not have a brain problem, but he sure has a good audiological sense. Maybe there should be an audiometer in his future.

- Ann Slanders

REVERSAL-EAR EFFECT -- another response bias?

Robert Lukas, Helen Hayes Hospital, W. Haverstraw NY

I have seen a few cases who had reversals dramatically clustered in REF items. As with other response biases, this seems more than coincidence. Although there is no reason to believe that the site-of-lesion differs from that of any other reversal pattern, is this mechanism revealing information about the involved hemisphere?

Examples:
C.P., age 34, normal SSW
8 CN = 0 0 0 0 2 2 0 0
& 7 Rev REF, 0 LEF.

R CVA, age 52.
8 CN = 0 0 1 1 3 6 0 0
& 17 Rev REF, 3 LEF
CES, R=15% L=45%
WDS, R=96% L=100%

Type A & Functional Loss
by J. Katz, Buffalo, NY

SSW Newsletter #4 & 5 indicate functional-looking problems and other behavioral abnormalities may be associated with Type A's (Wieczorek; Protti & Young; Dempsey; Lucker). I tested one pt. who was brain damaged but in addition was thought to be non-organic. Her behavior was peculiar and had a Type A & rev's on SSW.

Recently I tested a 61 yr. old man who volunteered as a subject. All of his results were quite reasonable except for his inability to respond to p.t. threshold testing. Most responses were 40-60 dB on repeated attempts but SRT's were 15dB and he claimed no hearing problem.

The patient had a tumor of the corpus callosum which extended anteriorly into the R & L hemisph. Beware of non-organics/behavior problems with A patterns. It could be a dysfunction in or around the c.c., perhaps in the R-hemisphere. Any comments?

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