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# REPORTS

SPANISH LANGUAGE VERSION OF  
THE SSW TEST

Vol. 16 No. 3

August 1994

## AN UPDATE ON THE SPANISH LANGUAGE VERSION OF THE SSW TEST

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The Spanish Language Version of the Staggered Spondaic Word (SLV-SSW) test was described in the May, 1991 issue of SSW REPORTS. The SLV-SSW was patterned quite closely after the the American EC test in the hope that it would show similar performance characteristics to that of the standard American list EC. The preliminary work of Soto-Ramos, Windham and Katz (1992) demonstrated that adult native Spanish speakers had mean scores and standard deviations that were almost identical to those of American adults on the EC list (based on the data from the Combined National Sample, 1985).

Another important finding was that there did not seem to be regional influences on the data. Although, the speaker on the new test was from Chile, both Chileans and non Chileans from Spanish speaking countries had identical performance on the test. We cannot assume that the same would be true for children from the various countries, but these data do suggest that the two versions appear to be quite similar.

Despite the similarities of the two versions of the SSW test we must keep in mind that the SLV words have twice the number of syllables as the EC words. The Spanish language does not have comparable compound words made of two one-syllable words, as we do in English. Therefore, it was necessary to make the test out of two, two-syllable combinations. The first item of the SLV can be contrasted with the EC's item "upstairs, downtown". See Figure 1.

	Temporal Sequence		
	1	2	3
Right Ear	perro	gordo	
Left Ear		libro	viejo

Figure 1. The first item of the SLV-SSW test. As in the American test the words are common (dog fat, book old, or to translate into English fat dog, old book). However, there are two syllables to each of the Spanish words. The "available word" was also built into the SLV. When the two competing words are missed, a reasonable response can still be given (old dog)

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From 1991 and 1993, 120 normal children and 16 with specific learning disabilities were tested in Chile. The purpose of this research was to (1) determine the normative values on the SLV-SSW for Chilean Spanish speaking children aged 7 to 12 years, and (2) compare these results with those obtained in the SSW National Sample in the United States and Canada (list EC).

## SUBJECTS

One hundred and twenty normal-control children, aged 7 to 12 years, were divided into 6 age groups of 20 subjects each. Half of the children in each age group were males and half females.

The children were pupils at an elementary school which is connected with the Metropolitan University of Educational Sciences in Santiago, Chile. Teachers selected children whom they felt did not show speech, language, reading, writing or learning disabilities in general school subjects and who did not have behavior problems.

The mean age for each group was as follows : Age-7= 7 years, 7 months; age-8 = 8 years, 4 months; age-9 = 9 years, 5 months; age-10 = 10 years, 4 months; age-11 = 11 years, 5 months and age-12 = 12 years, 5 months.

All the subjects were tested for puretone thresholds, word discrimination and the SLV-SSW. The 120 selected children showed hearing levels within the normal limits and word discrimination of at least of 92 % in each ear. In addition, the parents of the children answered a questionnaire to rule out significant health problems and otologic or neurologic disorders that might be related to central auditory disfunction or learning disabilities.

## EQUIPMENT

A calibrated Beltone audiometer, model 200 C, was used to administer the puretone stimuli, recorded word discrimination materials and the SLV-SSW. A JVC, model TD-W103, was utilized to play the word discrimination and SLV-SSW tapes.

## PROCEDURES

Twenty-five words were presented for word discrimination testing to each ear at 40 dB SL, based on the average threshold at 500 Hz, 1000 Hz and 2000 Hz, using bisyllabic Spanish words, B List from Auditec of St. Louis. The SLV-SSW (Auditec) materials were delivered at 50 dB SL for each ear, above the 3-frequency average.

The administration, scoring and interpretation of the test followed the procedures used for the American test as closely as possible. The results were based on the same calculations except as noted in the text.

## DATA ANALYSIS

R-SSW and C-SSW scores were obtained for each of the 120 normal control children based on the 8 CNs and the word discrimination scores for each ear using the CIR-SSW computer program (Katz et al., 1988)<sup>1</sup>. Means and standard deviations (SD) were determined for the four SSW condition scores (both R-SSW and C-SSW). In addition, values were obtained for the Responses Biases (Ear Effect, Order Effect, Reversals and Type A pattern). The normal limits were established using plus one SD and compared with the American norms for each age group. The analyses for significant findings was performed using computational programs designed for this purpose in the Department of Communicative Disorders and Sciences (Katz, Johnson, Soto-Ramos, 1994).

## RESULTS

The following R-SSW and C-SSW results were obtained R-SSW for the control subjects using 1 standard deviation above the mean as normal limits in order to compare the SLV-SSW with the American EC list. The R-SSW scores are shown in Table 1 and the C-SSW in Table 2.

TABLE 1  
R-SSW SCORES: MEANS, STANDARD DEVIATIONS, AND NORMAL LIMITS (USING 1 SD POORER THAN THE MEAN)

AGE	R-NC			R-C			L-C			L-NC		
	Mean	S.D.	N.L.	Mean	S.D.	N.L.	Mean	S.D.	N.L.	Mean	S.D.	N.L.
7	1.70	2.67	(4)	7.35	6.02	(13)	11.70	7.48	(19)	2.77	2.79	(6)
8	1.35	2.05	(3)	6.60	3.26	(10)	9.80	5.06	(15)	2.77	2.79	(6)
9	0.67	1.14	(2)	3.10	3.12	(6)	5.50	4.16	(10)	1.87	2.15	(4)
10	0.67	1.14	(2)	2.35	3.60	(6)	5.10	4.26	(9)	1.87	2.15	(4)
11	0.30	0.73	(1)	0.90	1.61	(3)	3.35	4.51	(8)	0.47	1.06	(2)
12	0.00	0.00	(0)	1.00	1.62	(3)	2.40	3.06	(5)	0.47	1.06	(2)

Inspection of Tables 1 and 2 shows a decreasing percentage of errors with age for each of the four SSW conditions. As expected from the EC list, the percentage of errors was greatest for the LC condition, followed by the RC and LNC conditions. The lowest percentage or error was observed in the RNC condition for both the R-SSW and the C-SSW results. It is interesting to

<sup>1</sup> The SSW-CIR program is intended for use with the EC list, however, the calculations for the SLV and the EC are identical, so the computational portion of the program was used to insure accurate calculations.

**TABLE 2**  
**C-SSW SCORES: MEANS, STANDARD DEVIATIONS, AND NORMAL LIMITS (USING 1 SD POORER THAN THE MEAN)**

AGE	R-NC			R-C			L-C			L-NC		
	Mean	S.D.	N.L.	Mean	S.D.	N.L.	Mean	S.D.	N.L.	Mean	S.D.	N.L.
7	-0.75	2.99	(2)	5.75	5.64	(11)	7.30	6.58	(14)	-0.52	4.05	(4)
8	-0.75	2.99	(2)	5.00	4.29	(9)	7.60	5.96	(14)	-0.52	4.05	(4)
9	-1.10	3.21	(2)	1.30	3.55	(5)	3.20	4.41	(8)	-0.22	3.50	(3)
10	-1.15	2.58	(1)	-0.25	4.12	(4)	3.20	4.41	(8)	-0.22	3.50	(3)
11	-1.20	2.62	(1)	-0.5	3.09	(3)	2.65	4.87	(8)	-0.17	1.63	(1)
12	-1.40	2.68	(1)	-0.5	3.09	(3)	1.8	2.72	(5)	-0.17	1.63	(1)

note that the distribution of errors is same as the distribution found on the American National Sample for the SSW test (EC list) with children of the same age.

Response bias criteria with normal limits set at 1 SD poorer than the mean were also established for these children in this study. See Table 3:

Ear Effect (EE) results showed the greater number of errors on the LEF presentation for each age. The results (REF errors minus LEF errors) are presented in Table 3 with negative numbers showing the poorer LEF performance and positive scores indicating poorer REF results. Thus calculation of normal limits for EE L/H and H/L takes this slight imbalance into account. With the Order Effect (OE) data, slightly larger number of errors were observed for the third and fourth words for the ages 7 to 9 (which are shown with negative numbers) and in the first and second words for the ages 10 to 12. These results may be explained by the length of the items (8 syllables) for the SLV-SSW test that have a greater decoding demand for children 7 to 9 years of age compared to older children. A decreasing number of reversals was observed as a function of age. Finally, for Type A pattern, the results demonstrated a decreasing difference between the number of errors on columns F and the next poorest cardinal number.

A comparison of the C-SSW obtained in the American National Sample (C-NS-85) and the Chilean sample is presented in Table 4. A lower percentage of error is seen in the Chilean sample for the four listening conditions for the ages 7 to 11. However, the normal limits were the same for age 12 in both the American and Chilean samples. Two hypotheses might help to explain this finding, a) the 8 syllables of the items SLV-SSW test provide more redundancy to the listener, benefitting those 7 to 11. With increasing proficiency of decoding language, by age 12 both English and Spanish speakers can handle the task easily, b) a second consideration is that the amount of unoverlapped speech of the two competing words is likely to be much greater for the two-syllable words. Performance nears maximum by age 12 years.

TABLE 3

RESPONSE BIAS SCORES: MEANS, STANDARD DEVIATIONS, AND NORMAL LIMITS (USING 1 SD POORER THAN THE MEAN)

AGE	EAR EFFECT			ORDER EFFECT			REVERSALS			TYPE A PATTERN		
	Mean	S.D.	N.L.	Mean	S.D.	N.L.	Mean	S.D.	N.L.	Mean	S.D.	N.L.
7	-1.82	2.90	(-5+1)	-0.56	2.63	(-3+2)	0.87	1.89	(3)	1.2	1.32	(3)
8	-1.82	2.90	(-5+1)	-0.56	2.63	(-3+2)	0.87	1.89	(3)	0.85	1.56	(2)
9	-1.07	2.52	(-4+1)	-0.56	2.63	(-3+2)	0.85	1.81	(3)	0.6	0.99	(2)
10	-1.07	2.52	(-4+1)	0.2	2.14	(-2+2)	0.4	0.74	(1)	0.6	1.17	(2)
11	-0.55	1.94	(-2+1)	0.35	1.98	(-2+2)	0.4	0.74	(1)	0.6	1.17	(2)
12	-0.55	1.94	(-2+1)	0.1	1.21	(-1+1)	0.15	0.36	(1)	0.5	0.94	(1)

TABLE 4

C-SSW DATA: AMERICAN NATIONAL SAMPLE 1985 (C-NS-85) AND CHILEAN NATIVE SPANISH SPEAKERS AGED 7 TO 12. (1 SD)

AGE GRP	R-NC				R-C				L-C				L-NC			
	Amer.		Chilean		Amer.		Chilean.		Amer.		Chilean.		Amer.		Chilean.	
	M	NL	M	NL	M	NL	M	NL	M	NL	M	NL	M	NL	M	NL
7	1	6	-0.75	2	8	15	5.7	11	18	29	7.3	14	1	6	-0.5	4
8	1	5	-0.75	2	6	13	5.0	9	10	18	7.6	14	0	4	-0.5	4
9	1	4	-1.1	2	4	9	1.3	5	8	16	3.2	8	0	3	-0.2	3
10	-1	3	-1.1	1	3	8	-0.25	4	7	14	3.2	8	0	3	-0.2	3
11	-1	2	-1.2	1	1	4	-0.50	3	5	11	2.6	8	-1	3	-0.1	1
12	-1	1	-1.4	1	1	3	-0.50	3	1	5	1.8	5	-1	1	-0.1	1

A comparison of the normal limits for response bias criteria between the American and Chilean norms using one standard deviation is shown on Table 5. The normal limits of the Spanish test are lower for all response biases in all ages groups, except for reversals at age 12 which is the same in both the American and the Chilean results. The differences between the sets of data may be explained by the characteristics of the SLV-SSW test mentioned above.

TABLE 5  
 RESPONSE BIAS CRITERIA - LIMITS OF NORMAL: AMERICAN NATIONAL SAMPLE AND CHILEAN  
 NATIVE SPANISH SPEAKERS 7-12 YEARS (1 SD).

AGE GRP	REVERSALS		ORDER - EFFECT				EAR - EFFECT				TYPE A	
	Amer. #	Chil. #	Americ. H/L	Chilean. L/H	Americ. H/L	Chilean. L/H	Americ. L/H	Chilean. H/L	Americ. L/H	Chilean. H/L	Amer. DIF*	Chilean. DIF*
7	5	3	7	7	2	3	7	5	5	1	5	3
8	4	3	6	6	2	3	7	5	5	1	5	2
9	3	3	6	4	2	3	7	5	4	1	4	2
10	3	1	4	4	2	2	5	5	4	1	4	2
11	3	1	4	4	2	2	5	5	2	1	2	2
12	1	1	4	4	1	1	4	4	2	1	2	1

## DISCUSSION

The present study evaluated 120 Chilean children who were considered to be free of learning and other disabilities. The results were impressive, showing generally better mean scores than on the EC, with smaller SDs. This may be a function of the bisyllabic nature of the Spanish words or perhaps of a more select sample than was used for the C-NS-85 norm.

The mean SLV scores were coherent, in that, they followed a trend of better scores from 7 to 12 years of age. The major differences between the American and SLV-SSW tests were found in the younger children. As noted by Soto-Ramos et al. (1992), performance for adults on the two test was almost identical. Twelve year olds are considered adults in both the SLV and the EC tests. Thus, the previous results are supported. We do not think that the similarities for the two versions of the test for 12 year olds is an error of measurement.

The SLV, as proposed by Soto-Ramos, provides an apparent improvement over the standard SSW norm. The Ear and Order Effects are not cutoff points between normal and LD populations. Rather, they are statistically derived just as the rest of the test. Thus, one can use means, SDs and NL to evaluate cases. It is likely that we will try to use the same approach with the American version.

It is important to mention that the present study is presented here for practical purposes and not just for interest. Unlike the Cockney English, Turkish and Hebrew versions of the SSW, there is a great concentration of Spanish speaking people in the U.S. Thus, it is quite likely that audiologists in the southeast and southwest as well as in certain large cities may find use for the SLV-SSW test (it is available from Auditec of St. Louis). Of course, one must be most careful in using the SLV-SSW without proficiency in the Spanish language.