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# Generalization of /s/ from English to French as a result of phonological remediation

## *Généralisation de la prononciation du /s/ de l'anglais au français à la suite d'un traitement orthophonique*

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### **Abstract**

French and English speaking children have been observed who have problems with /s/ production in both languages. The purpose of this investigation was to determine if therapy presented in English and directed toward the /s/ production problem in English, would generalize and result in similar changes for /s/ in French. In this investigation all seven children who received a motor based therapy program for /s/, generalized /s/ from English into French on a variety of levels. These findings may be taken to indicate the strength of generalization for certain procedures directed toward remediation of /s/. Information from this investigation is useful in determining services for children with phonology disorders and examining the effect of linguistic differences upon generalization between languages.

### **Abrégé**

*On a observé des enfants qui parlent le français et l'anglais, et qui ont de la difficulté à prononcer le /s/ dans les deux langues, pour déterminer si une thérapie prodiguée en anglais en vue de corriger le problème de prononciation dans cette langue se généraliserait et entraînerait une amélioration comparable en français. Les sept enfants qui ont suivi un programme thérapeutique de type moteur pour le /s/ ont généralisé la prononciation de ce dernier de l'anglais au français à divers niveaux. Ces résultats indiquent la force de la généralisation pour certaines méthodes orthopédagogiques visant à corriger la prononciation du /s/. La présente étude fournit des données utiles pour déterminer les services à offrir aux enfants atteints de troubles phonologiques et examiner l'effet des différences linguistiques sur la généralisation d'une langue à l'autre.*

Bilingual, (who speak both English and French) school-aged children who have difficulties with developing phonology in one language have been observed to have similar problems in developing phonology in the other language which they

speak (McNutt, 1987, 1989). Such bilingual children present a unique opportunity to examine certain linguistic concepts. One important linguistic concept with clinical implications is that of generalization.

Although generalization has been examined across a variety of targets (which differ in phoneme position, levels of therapy, stimuli, words, grammatical parts of speech, complexity and environment) (Bernthal & Bankson, 1993) there has been no published research related to the generalization of speech sounds from one language to another in either bilingual children or adults.

Language generalization is the ability to generalize from one language situation/stimulus to another, and is related to the similarity of the two situations/stimuli (Kamhi, 1988). Therefore, differences between two languages may interfere with generalization from one language to the other.

There are differences between languages which may inhibit the generalization of speech sounds from one language to another within individual speakers. Differences between spoken English and French, which may have negative effects upon development or generalization of speech sounds, may be found at phonemic and phonetic levels (Bergeron, 1984; Malécot, 1974; Shriberg & Kent, 1982), in perception (Eilers, Gavin, & Wilson, 1979), phonemic structure (Dell, 1973; Malécot, 1974), morphemic and grammatical use (Winitz, 1969), frequency of occurrence (Leonard & Ritterman, 1971; Malécot, 1974; Mines, Hanson, & Shoup, 1978), stress patterns (Allen, 1983; MacKay, 1987), syllable envelope (Moser, 1969; Juilland, 1965), and coarticulation (Ladefoged, 1982). Any or all of these differences may effect the development of speech sounds (Ladefoged, 1982) and their generalization from one

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language to another. Additionally, these differences between languages may also relate to practical considerations for the application of therapy and expected outcomes.

The present investigation centred on children who spoke both French and English and who had production errors on /s/. The phoneme /s/ was selected for examination as a phoneme common to both French and English phonologies and frequently in error in children of these languages (Winitz, 1975; Dudley & Delange, 1980; McNutt & Dudley, 1987).

The question addressed in the present investigation was: will therapy directed toward the /s/ production problem in English result in correct production for both English and French. This question has both practical and theoretical import. If corrected speech sounds generalize between languages, remedial services for certain phonemes would not be necessary in both languages for bilingual children. Additionally, the procedures used in this investigation present a novel approach to determining the effect of linguistic factors upon generalization.

## Method

### Subjects

The subjects selected were six children, 7.0 to 8.3 years old, from a rural English-speaking, French-Immersion public school who presented interdental substitutions for /s/ and /z/ and no other problems of speech sound production. All children (a) could respond in French and English to questions about themselves presented in French and English by a bilingual adult, although there was a wide range in language usage by the children, (b) had been screened for normal hearing (ANSI, 1970), were evaluated by teachers and parents as developing normally, were in the appropriate grade for their age, had no oral anomalies or physical anomalies, had not received previous speech therapy and possessed all four incisor teeth during the time period considered, (c) had problems with /s/ production in spontaneous speech in both English and French as observed by teachers and a bilingual assistant, and (d) had 0% correct on the *Screening Deep Test of Articulation* (McDonald, 1968) which would place them below the 6th percentile for /s/ development (McDonald & McDonald, 1974). These figures indicate that speech development for /s/ was not likely to continue as a result of maturation. The children had no other identifiable speech or language problems. One additional child (Deni) who had received prior therapy in English was also included in the project and met the criteria listed above. Information regarding language background for each child is presented in Table 1.

**Table 1. Listed are the subject's name, age, language spoken by the father and mother at home, the home language, and the language used at school.**

	Age	Father	Mother	Home language	School language
Jean	7.9	French	French	French	Both before schooling
Steph	7.9	English	English	English	French Immersion
Judie	7.0	French	French	French	Both before schooling
Joe	7.4	French	English	French	French Immersion
Maud	7.6	French	English	French	Both before schooling
Mel	8.3	French	English	French	K,1 & 2-French 3-English
Deni	7.9	French	English	English	Both before schooling

### Procedure

Prior to therapy, children periodically completed a 30-word repetition task which evaluated both French and English productions of /s/. The task contained 10 tokens which were word initial, 10 tokens which were intervocalic, and 10 tokens which were word final (see Appendix A). Words were presented by a bilingual adult and tasks in French were completed first. A further evaluation, "TALK," was done with children when they reached the 100% level on the word lists to determine whether /s/ was used in spontaneous conversation (Diedrich & Bangs, 1980). Reliability between the volunteer and the author in scoring the word repetition task for those items in English for five selected live evaluations was 97%. All children followed a remedial program which combined modification of another sound (Van Riper, 1972) and a modified sensory-motor program (McDonald, 1964). This combination program was developed for the correction of /s/ disorders (Appendix B) and was administered weekly, in English, in a varying number of 20-minute sessions during the school year by a volunteer.

## Results

Individual data is shown in Table 2. All children in the program showed an increase in the number of correct productions of /s/ for repetitions of both English and French words. Three of the children had consistently higher scores for correct /s/ in French than in English. Three children had comparable scores for words in both languages, while one had higher scores on English words. The three children who achieved 100% correct /s/ production on word lists in both French and English also used /s/ at the 100% level in casual conversation in both French and English.

**Table 2. Individual subject information for the number of months between evaluations, the percent correct for the 30-item repetition task for both French and English words, and the percent correct in conversation (TALK).**

	Months between measures	English % correct	French % correct	English Talk	French Talk
Jean	0	0	0		
	1	0	0		
	2	27	0		
	2	63	60		
	6	83	87		
Steph	0	0	0		
	1	0	0		
	4	100	100	100	100
Judie	0	0	0		
	1	0	0		
	3	0	0		
	3	43	90		
Joe	0	0	0		
	1	0	0		
	3	0	0		
	3	23	10		
Maud	0	0	0		
	1	0	0		
	1	0	0		
	1	0	0		
	1	63	100		
	2	100	100	100	100
Mel	0	0	0		
	1	0	0		
	2	50	77		
	3	97	100		
	6	100	100	100	100
Deni		60	57		
	1	63	65		
	1	66	71		
	1	75	81		
	1	80	77		
	1	83	82		
	1	83	80		

## Discussion

Acquisition of /s/ through practice with English words and instruction in English clearly generalized into production of imitated words in French. Surprisingly, three of the children (Judie, Maud, & Mel) achieved higher scores, earlier, in French than in English. For three children who reached 100% on repetition of word lists, the use of /s/ also generalized into spontaneous conversation in both English and French.

One might surmise that the languages of the parents, or language spoken in the home, would have an effect upon generalization due to the amount of increased stimulation/practice which the child would receive in that language. Two children, Jean and Judie, came from Francophone homes where both parents were French speaking. The influence of the home language appears unclear, as Judie achieved higher scores, sooner, in French than in English, while Jean used /s/ correctly at the same levels in both English and French words. Two children also came from homes where parents spoke English (Steph and Deni). Both children used /s/ correctly at the same levels in both English and French, showing no effect of home language. Maud and Mel both spoke French at home, and both achieved higher scores, earlier, in French than in English. In some cases it would appear that the individual patterns of the children were related to the language generally spoken at home, but in other cases no relationship could be discerned between generalization and language spoken at home or by the parents.

## Research Implications and Suggestions

For correct /s/ production to generalize from English into French, a list of linguistic obstacles was surmounted. In addition to generalization from one language to another, generalization took place within differing syllable positions, different words, different parts of speech, and into conversation. The production-based remedial procedures, both in the establishment and generalization of some speech sounds from one language to another, appear highly effective in achieving a linguistic change. This, in one way, supports the use of motor components in remedial procedures for phonological disorders (Saben & Costello Ingham, 1991). However, the present investigation does not compare production therapy with a more linguistically based therapy. The comparison between clinical methods needs further research.

Characteristics of a language could certainly prevent the use of some clinical procedures commonly described as linguistic. For example, for linguistic reasons, therapy contrasting minimal pair real words (Blache, 1989; Fokes, 1982) for /θ/ and /s/ would not be possible in French as /θ/ is not in the French lexicon. It is interesting to speculate how an auditory approach using such contrasts and therapies in English, and without the use of production training, would result in a change in production in another language where such contrasts do not exist.

Although the present investigation indicates that correct /s/ production following therapy transfers from English to French, the generalization of other phonemes remains to be examined. Additionally, generalization of other aspects of language should be examined which have a common cogni-

tive base, but different surface structure (i.e., plurals, possessives, gender, interrogative forms).

**Clinical Implications:** In some geographic areas many children are bilingual. With these children, a relationship appears to exist between phoneme errors in one language and phoneme errors in the other language. This investigation has demonstrated that therapy for phonological disorders provided in one language may generalize to a second language.

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## APPENDIX A

### WORD LIST MEASURES FOR TESTING /S/ IN FRENCH AND ENGLISH

Name: \_\_\_\_\_ Date: \_\_\_\_\_

READ EACH WORD AND HAVE THE CHILD REPEAT AFTER YOU. READ ACROSS THE LIST AS NUMBERED. PLACE A MARK IN FRONT OF EACH WORD WHERE THE "S" IS NOT PRODUCED CORRECTLY. DO THE FRENCH WORDS FIRST.

*"REPETEZ LES MOTS SUIVANTS EN FRANCAIS".*

- |             |              |              |
|-------------|--------------|--------------|
| 1. __SA     | 2. __ASSIT   | 3. __AS      |
| 4. __SONT   | 5. __ICI     | 6. __OS      |
| 7. __SOUS   | 8. __AUSSI   | 9. __S       |
| 10. __CENT  | 11. __ESSAI  | 12. __US     |
| 13. __C'EST | 14. __ESSO   | 15. __HISSE  |
| 16. __SI    | 17. __ASSOIT | 18. __HOUSSE |
| 19. __CEUX  | 20. __ASSIET | 21. __ANCE   |
| 22. __SOUPE | 23. __ASSEZ  | 24. __ONCE   |
| 25. __SAINT | 26. __PASSER | 27. __MASSE  |
| 28. __CA    | 29. __TASSER | 30. __MOUSSE |

*"REPEAT THE FOLLOWING WORDS IN ENGLISH".*

- |             |               |             |
|-------------|---------------|-------------|
| 1. __SAY    | 2. __MOUSIE   | 3. __NICE   |
| 4. __SAW    | 5. __ASIDE    | 6. __ICE    |
| 7. __SUE    | 8. __LUCY     | 9. __S      |
| 10. __CENT  | 11. __MESSY   | 12. __US    |
| 13. __SO    | 14. __ESSO    | 15. __HISS  |
| 16. __SEE   | 17. __TOSSING | 18. __HOUSE |
| 19. __SIT   | 20. __ASIDE   | 21. __ANTS  |
| 22. __SOUP  | 23. __BESSY   | 24. __ONCE  |
| 25. __SAINT | 26. __BESIDE  | 27. __MASS  |
| 28. __SUN   | 29. __INSIDE  | 30. __MOOSE |

#### TALK MEASURE

IN A CONVERSATION WITH THE CHILD, COUNT THE "S" AND "Z" SOUNDS UNTIL YOU HAVE 20. COUNT THE NUMBER CORRECT AND THE NUMBER INCORRECT. DO NOT LET THE CHILD KNOW THAT YOU ARE COUNTING. LIST THE NUMBER CORRECT SOUNDS AND THE NUMBER INCORRECT. TO COMPUTE THE PERCENT CORRECT, DIVIDE THE NUMBER CORRECT BY THE TOTAL NUMBER.

NUMBER CORRECT:

NUMBER INCORRECT:

PERCENT CORRECT:

## APPENDIX B

A REMEDIAL PROGRAM FOR /s/ BASED UPON MODIFICATION OF /t/ (Van Riper, 1972) AND THEN INTEGRATED INTO A FACILITATING WORD-PAIR CONTEXT (McDonald, 1964).

EACH STEP IS PRACTISED TO A CRITERION OF 30/30 CORRECT.

1. WHISPER "TA" WITHOUT THE TONGUE TOUCHING THE TEETH.
2. WHISPER A "T" WHICH LASTS A BIT.
3. REPEAT "AW-T\*" (THE "\*" INDICATES PROLONGATION).
4. REPEAT "AWT\*"
5. REPEAT "AWT\*\*\*\*"
6. REPEAT "AWT\*OO"
7. REPEAT "HOT\*OUP"
8. REPEAT "HOTSOU"
9. REPEAT 10 SENTENCES USING "HOTSOU".<sup>1</sup>
10. REPEAT 10 WORDPAIRS —TS— (I.E., "BATSOME").
11. REPEAT 10 SENTENCES USING WORDS FROM 10.
12. REPEAT 10 WORDPAIRS —DS— (I.E., "HADSOME").
13. REPEAT 10 SENTENCES USING WORDS FROM 12.
- 14 - 19. FOLLOW SIMILAR PROCEDURES FOR —NS—, —KS—, —GS—.
20. REPEAT TWO SENTENCES FROM EACH PRACTICE 9 - 19.

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<sup>1</sup> "TH," "Z," OR ANOTHER "S" SHOULD NOT BE USED IN ANY OF THE WORDS OR SENTENCES.