

Cued Speech as a Practical Approach to Teaching Spanish to Deaf and Hard-of-Hearing Foreign Language Students

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Introduction

Teaching foreign languages to students who are deaf presents considerable challenges. Traditional grammar/translation approaches can be implemented through extensive use of visual media. Fingerspelling can be used to demonstrate the orthographic form of the language and illustrate how Spanish is spelled. Interpreters may be able to convey information conceptually through American Sign Language (ASL). However, the acquisition of conversational skills and development of phonological knowledge of the language through the direct method, i.e., the ability to hear, speechread and/or speak the language, presents more difficulties. Since the main purpose of Cued Speech (CS) is to develop language, it can be used as a tool when teaching Spanish as a foreign language using the direct (spoken) method in conjunction with written information. Cued Speech allows deaf and hard-of-hearing students access to the spoken language regardless of their hearing discrimination abilities. This segment will describe an approach to Spanish foreign language instruction that incorporates CS, a method of making spoken language accessible through vision.

Cued Speech makes any spoken language clear through vision alone. The user may manually produce an unambiguous phonological message through the use of a cue in one of the designated locations near the face accompanied by the natural lip movements of the spoken language. Research indicates that the use of cues systematically improves the reception of spoken messages for those familiar with the system (English: Nicholls & Ling, 1982, Quenin, 1992; French: Périer, Charlier, Hage & Alegria, 1987). In addition, words derived from CS have properties that allow for the identification of written words from their orthographic representations when encountered for the first time (Alegria, DeJean, Capouillez, & Leybaert, 1989).

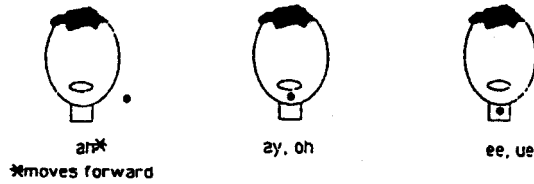
CS shows how words sound, not how they are spelled. Cues can also show how words are pronounced. For example, the "u" vowel in "mucho" is not pronounced like the "u" in the English word "much". "Llama" begins with the "y" consonant, not the "l". In addition, the inclusion of cues systematically improves the perception of the spoken message as phonemes within visemes are disambiguated by handshape (ex. p, b, m). Cued Speech allows the user to manually produce as well as receive an unambiguous phonological message. It provides an accurate means of verbal communication for facilitating the reception and expression of the Spanish language for deaf students. Cues can also be used to help students understand one another in class and can be used and understood without voice, if preferred.

Preparation

The Spanish cue system - La Palabra Complementada (LPC)- the Spanish version of Cued Speech developed by Dr. Orin Cornett, was adapted slightly for use in the Spanish language lab of the Beginning Spanish course. The five vowels of spoken Spanish were cued in the three locations utilized in LPC. (Since there are fewer vowels in Spanish than in spoken English, fewer vowel locations are necessary.) Consonant groups in LPC are much like those of American English Cued Speech except for a phoneme that does not appear in English, the trilled /r/. The eight handshapes (HS) and respective consonant groups of LPC were used with the exception of /ñ/, which is cued in LPC with HS 2. This phoneme was cued as a combination of /n/ and /y/ as it is in English for ease of cueing production by the instructors, who were experienced in American English cueing prior to the onset of this project, and to facilitate reception and pronunciation by students. The system of cues used is shown in Figure 1.

Material preparation for the lab hour and supplemental lab homework began prior to the onset of instruction. Modifications were necessary in order to allow the deaf and hard-of-hearing students access to the audio cassette materials provided by the publisher. Since the majority of students could not auditorally discriminate the instructions and stimuli presented on these cassettes, the pronunciation and grammar activities were modified. For example, live classroom presentation/practice was substituted for traditional lab drills (pronunciation, verb conjugation, grammar rules, etc.); recorded lab instructions and stimuli were provided in writing; and "listening" comprehension activities were presented live.

Spanish Cued Speech: Vowels



Consonant Handshapes

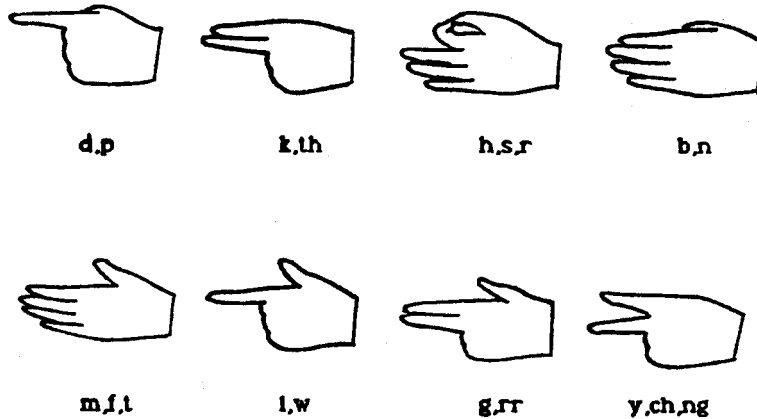


Figure 1

To assess students' foreign language backgrounds, a Beginning Spanish Inventory (Appendix A) was developed. From this, students' self-ratings of their knowledge of English, Spanish and other languages in spoken, written and signed forms were collected. Information on the students' prior foreign language instruction was also obtained.

At the first regular Spanish class meeting, we met with the group to explain the purpose of the lab and to describe activities. A rationale for CS use in the lab was presented. Concepts presented initially to students were:

1. Cues are a tool to make speechreading of spoken Spanish more accurate.
2. CS shows us how words are pronounced, not how they are spelled.
3. Cues can be used for expressive communication, with or without voice.
4. CS has been used by students who are deaf for foreign language instruction in other colleges and high school programs. (Diamant, J., 1972)

To illustrate why CS was being incorporated into the lab, the following activity was designed. The ASL sign for "home" was compared to the printed and spoken English word. Since this foreign language class was designed to teach spoken and written Spanish, as opposed to Spanish sign language, the same ASL sign "home" was used for the printed and spoken Spanish word "casa". The word "casa" was then cued to demonstrate the phonological representation of the Spanish word emphasizing the use of CS to provide an accurate means of facilitating the reception and expression of the Spanish language for deaf students.

Instructors

As part of the credit-bearing course, students attended four hours of Spanish instruction each week. This course was taught by an NTID professor with several years' experience teaching college-level Spanish to hearing students at RIT, as well as several years' experience teaching English to NTID students. In addition, a one-hour Spanish Language Lab was required to enhance students' reception and expression of spoken and written Spanish. During a portion of the lab hour, Spanish cues were taught by an NTID speech language pathologist who is also a certified Cued Speech instructor. Supplemental language lab activities were taught by an NTID audiologist with intermediate-level Spanish skills, English cueing skills and several years' experience teaching aural rehabilitation to post-secondary deaf students. Lab homework was corrected by the Spanish Lab instructors. Performance in the Spanish Lab constituted 20% of each student's final grade.

Students

During academic year 1994-95, a total of 29 deaf and hard of-hearing students were enrolled in Beginning Spanish I, II and III. (Fall Quarter -16, Winter Quarter - 6, Spring Quarter - 7). Five students from the original sixteen completed all three quarters. One student enrolled in Winter Quarter, and an additional one added in the Spring Quarter. All students were required to attend the supplemental Spanish Language Lab.

This pilot program was offered to deaf and hard-of-hearing students in both associate degree programs at NTID (one of the colleges of RIT) and to students in baccalaureate degree programs at other colleges of RIT. Students were engaged in a variety of majors; approximately 50% in baccalaureate programs and 50% in associate degree programs. Of the 23 students who completed the Beginning Spanish Inventory (Appendix A), 21 rated their ability to read, write or speak/sign Spanish as either "a little" or "not at all". Twenty-two of these students rated their ability to read, write or speak/sign English as "very well" or "well". Seventeen students indicated an ability to read, write, or speak/sign one or more of the following languages: ASL (15); BSL (1); French (4); Italian (3); Hebrew (2); Arabic (1); Latin (1); Russian (1); German (1). Six students indicated that they did not know any "other" foreign languages.

The majority of students enrolled in Beginning Spanish had no prior exposure to American Cued Speech. Two students indicated some exposure to CS, but were not proficient users of the system.

Procedures

Structure of Cued Speech Lab

The sequence of introduction of vowel locations and consonant handshapes (Lab #'s 2 - 7) is listed below. This sequence was chosen to allow for cueing key vocabulary words, to demonstrate the use of cues to enhance speechreading, and to cover the system efficiently in the short amount of time allotted.

Vowels: /a/, /e/ in isolation and with the consonant /l/ for articles "la" and "el" /o/, /u/, /a/ "hola" (example of vocabulary)

Consonants: /s/, /n/ "sí", "no"; /h/, /r/ "ojos", "rojo", "eres"

Consonants: /m/, /b/, /p/ (viseme group to demonstrate the utility of CS for improving speechreading.) "mama", "papa", "habla", "bien"

Consonants: /t/, /d/ and blends. "hasta", "adios", "radio", "está", "nosotros", "hombre", "Es la una."

Consonants: /k/, /g/ "¿Que tal?", "como", "gracias", "tocamus", "Guénica", /y/, /ny/ "llama", "caballa", "sello", "niño", "mañana", "señor"

Consonants: /t/, /th/ "chica", "muchacho", "puedo", "nada", "todo", "queda", /rr/, /w/ "bueno", "cuatro", "buenas tardes"

Lab #8 emphasized differences in Spanish spelling/pronunciation; i.e., "viaja" is pronounced in some Spanish-speaking countries as "¿bee-ay-ha?". "El apellido" is pronounced el-ah-pay-yee-tho. Two examples of cueing activities, CS Bingo and cuescript representations of Spanish vocabulary words, appear in Appendix B.

The original intent was to cover the entire CS system in the first quarter (10 weeks). However, due to time constraints, the last three consonant lessons were not covered completely until the second quarter of the program. Therefore, at the time of the post-test at the end of the first quarter, students had had only cursory exposure to some of the phonemes represented.

Structure of Spanish Language Lab

Supplemental linguistic and phonologic instruction was developed and presented during lab using the course textbook, workbook and lab workbook as guides. (Jarvis, A. & Lebrede, R., 1994) The following list of activities provides a sampling of the generated lab activities:

Pronunciation of the Spanish Alphabet (Appendix C)

Vowel Pronunciation (A-ah, E-ay, I-ee, O-oh, U-ue)

Digit pronunciation (0 - 1000)

digit 11

name – "once"

pronunciation - "ohn say"

Consonant Pronunciation

Linking - short sentences

Vocabulary review

Grammar: Parts of speech, verb conjugation, verb tenses.

Comprehension exercises: Students would see a dialogue spoken/cued by the lab instructors and then answer questions about it.

Intonation practice to mark declarative, interrogative, imperative statements.

correct pronunciation for each of the practice words. Misarticulations were addressed using cues as the tool for modelling correct pronunciation. To demonstrate stress in words, "forceful" cues were used. For example, in the Spanish number /ohn-say/, the first syllable receives extra force to show stress.

Assessment/Results

Prior to the start of the pilot lab, a 90-item v-c-v syllable test was developed (Bement/Quenin, 1994) to measure the reception of spoken Spanish. One list was recorded with cues, speechreading and sound. A reordered list was recorded without cues. The test was videotaped in a television studio using a certified Cued Speech Transliterator experienced in transliterating Spanish as the "talent". In this test, each Spanish consonant (p, k, t, d, th, g, h, b, y, r, rr, s, ch, f, m, n, ny, w, l) occurs once with each Spanish vowel (ah, oh, ee, ue, ay). (Appendix D) Students were instructed to first circle the correct vowel (from the choice of five) and then write the consonant in the space provided on the answer sheet.

Example: apa (ah-pah)

Vowel ah oh ee ue ay Consonant p.

Pretest: When the Spanish Syllable Test was administered at the beginning of the first quarter of instruction, 13 out of 17 students obtained cuereading scores and speechreading scores that differed by only five percent or less. The remaining four students achieved lower scores when cues were present.

Post-test: After approximately eight hours of lab instruction (less than 4 hours of cue instruction), a post-test was administered to 15 of the 17 students. After an introduction to most of the Spanish Cued Speech system in the lab setting, ten students showed at least a 5% or greater gain with cues. The range of difference was -2% to +52%. Additionally, four students showed a 5% gain or greater in the speech reading-only condition. (See Table 1)

Results showed an average gain of 9.9% of cuereading over speechreading-only scores. The highest level of performance was 52% greater with cues than without. The trend was for students with low-to-mid-range English speechreading ability as measured by CHABA Everyday sentences to demonstrate greater improvement with the addition of cues. Some students who had high English speechreading scores and/or discrimination abilities improvement with the addition of cues. Some students who had high English speechreading scores and/or discrimination abilities found the addition of cues to be distracting. Results were obtained after a maximum of eight 20-minute periods of instruction. Many students were not in attendance at all lab sessions. Only half of each lab session was devoted to Cued Speech instruction and practice; i.e., students had less than four hours of actual exposure to CS at this point.

Table 1 First quarter Spanish syllabus test results

Student #	POST-TEST %		PRETEST %	
	SR	CR	SR	CR
1	64.4	65.0	73.0	79.4
2	82.8	71.1	79.4	84.4
3	41.7	36.1	33.3	38.9
4	67.8	67.8	65.6	81.7
5	61.1	61.7	56.7	66.1
6	82.8	87.2	84.4	84.4
7	67.2	80.0	68.3	82.8
8	37.2	35.6	24.4	22.8
9	80.0	84.4	77.2	85.6
10	37.8	37.2	39.4	45.0
11	35.0	39.4	34.4	86.1
12	57.2	58.3	68.9	68.9
13	72.2	76.1	85.0	86.7
14	60.6	65.0	NA	85.6
15	36.7	42.8	41.7	40.0

During the second quarter of the pilot project, the remaining consonant cues were introduced. A 20-item Spanish Word Test was developed and administered "live" by the CS instructor during the last lab hour of this quarter. (Appendix E) The words for this forced-choice test were chosen from vocabulary introduced in the Beginning Spanish I and II curriculum. Foils were selected based on their visual similarity to the target words. One list was presented with cues and one list without. Students were instructed to circle the word presented.

Example: target -- pollo
foils -- bolso, mayo, moño

Five out of six students completed the Spanish Word Test. Differences in cuereading versus speechreading scores ranged from -5% to +25%. The student who showed a decline in performance with the addition of cues also showed a decline of 8.4% in speechreading, as well as expressed the most reluctance to learn/use the Spanish cue system. (Table 2)

Table 2 Second quarter Spanish word test results

Original Student #	Speechreading %	Cuereading %	Difference %
1	75	85	10
3	45	40	-5
4	55	75	20
7	65	80	15
14	65	90	25

At the end of the third quarter, five out of seven students took a revised version of the Spanish Syllable Test. Thirty test items were selected in each condition (with and without cues) from the original list of 90 items in order to reduce testing time and to encourage students to complete the test. Inspection of the results indicated that the 30-item test was comparable to the 90-item test.

Four of the five students showed some improvement in cuereading over speechreading on the shortened Syllable Test, though the differences were slight (mean = 6.0%). (Table 3) All of these students showed more dramatic gains (10%-25%) on the live Word Test. We could hypothesize that, although the addition of cues contributed to increased ability to identify a target word from a closed set, students had not internalized the system sufficiently to demonstrate great improvement in open-set recognition of nonsense syllables.

Table 3 Third quarter Spanish syllable test results

Original Student #	Uncued (%)		Cued (%)		Total (%)	
	V	C	V	C	SR	CR
3	67	17	63	23	42	42
4	87	43	83	57	65	70
6	77	47	80	50	62	65
7	100	57	100	70	78	85
14	90	80	100	77	85	88

Discussion

Deaf students without prior experience with American Cued Speech can make some use of cues to distinguish among spoken Spanish words. With minimal exposure and experience, even some students with very low English speechreading skills were able to show some gains when cues were added. However, this exposure was not sufficient to make significant gains in open-set syllable recognition.

Diverse comments by the students may be instructive.

"I really enjoyed lab and there are some deaf students planning/thinking of continuing Spanish so I say that it is worth having lab and cue signs to help with pronunciation -- strongly agree: continue lab & sign cue for lipreading."

"The lab was helpful with unit homework, cued speech was too boring for me, I recommend to see lab focus more on practicing grammar and more activities on homework, understand more on the rules/grammar of Spanish."

We feel that, if students are to make maximum use of cues for understanding any spoken language, Cued Speech must be incorporated into all segments of the foreign language instruction process. If it is seen as a peripheral activity, students are unwilling to expend much effort in learning the system, although those that do may make gains in reception.

Another avenue to explore in future foreign language instruction is to invite students to use cues more for expressive purposes. When they are able to understand each other more clearly when endeavoring to convey a spoken message, their motivation for learning may increase.

Recommendations

1. Allot sufficient time for foreign language Cued Speech instruction. Both expressive and receptive learning should be included.
2. Incorporate cues in all components of the foreign language program (class, lab, etc.). All instructors should cue.
3. Explain the purpose for using CS to teach a foreign language. Emphasize that CS does not require the use of audible speech, that only mouth movements are required to accurately convey messages with cues. (All of our students used audible speech when using spoken Spanish, though some preferred voice-off ASL for other classroom communication.)
4. CS instruction should be both analytic and synthetic to provide for internalization and maximal use of the system. Note: Students were anxious to move to word and phrase-level units in lab activities. However, this meant that they were sometimes rehearsing units by rote rather than understanding the phoneme-cue combinations required.
5. Solicit feedback from the learners regularly. Since this was a pilot, we collected feedback quarterly. An evaluation with a rating portion and comment section worked well (Appendix F).
6. Ideally, the application of using CS to teach a foreign language to deaf/hard-of-hearing students, would work best. Only five of our original sixteen took all three quarters of the Beginning Spanish course. The incorporation of cueing Spanish could easily be implemented into a year-long high school foreign language class.

Students in our group were exclusively deaf/hard-of-hearing. The next article will discuss application of CS to teach French with a mainstreamed group of hearing and deaf/hard-of-hearing college students.

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Appendix A

Beginning Spanish Inventory

Rate your English skills:

I am able to read English: (check one answer)

very well well average a little not at all

I am able to write English: (check one answer)

very well well average a little not at all

I am able to speak or sign English: (check one answer)

very well well average a little not at all

Rate your Spanish skills:

I am able to read Spanish (check one answer)

very well well average a little not at all

I am able to write Spanish: (check one answer)

very well well average a little not at all

I am able to speak or sign Spanish: (check one answer)

very well well average a little not at all

Rate your Other Foreign Language skills:

If you know any other foreign languages, please complete this section.

I am able to read _____ : (check one answer)

List names of other foreign languages

very well well average a little not at all

I am able to write _____ : (check one answer)

List names of other foreign languages

very well well average a little not at all

I am able to speak or sign _____ : (check one answer)

List names of other foreign languages

very well well average a little not at all

Information About You

1. Do you know any other foreign language(s)? yes no

If yes, what are they?

2. Where did you learn the other foreign language(s)?

from my parents

from High School or other College

Other _____

3. Do your parents speak a foreign language? yes no

If yes, what are they?

Appendix B

Cuereading activities

B	I	N	G	O
poh	la	bah	pay	mah
habla	may	bue	si	bee
pah	pue	hola	no	boh
mue	bien	bay	moh	mama
pee	mas	papa	mee	el

Appendix C

Spanish Alphabet

<u>Letter</u>	<u>Name</u>	<u>Pronunciation</u>	<u>Letter</u>	<u>Name</u>	<u>Pronunciation</u>
a	a	ah	ne	ne	ay-nay
b	be	bay	ñ	eñe	ay nya
c	ce	say	o	o	oh
ch	che	chay	p	pe	pay
d	de	day	q	cu	kue
e	e	ay	r	ere	ay-r(d)ay
f	efe	ayfay	rr	erre	ay-r(d)ay
ge	ge	hay	s	ese	ay-say
h	hache	ah-chay	t	te	tay
i	i	ee	u	u	ue
j	jota	ho-tah	v	ve	(b)ve
k	ka	kah	w	doble ve	do-blay-(b)ve
l	ele	ay-lay	x	equis	ak-kees
ll	elle	ay-yay	y	y griega	ee-gree-ay-gah
m	eme	ay-may	z	zeta	say-tah

Appendix D

Spanish Syllable Test

(Sample of two practice items and the first ten items from List 1)

	<u>Item</u>	<u>Pronunciation</u>	<u>Cue</u>
A.	aba	ah-bah	4s
B.	ofó	oh-foh	5m
1.	ipi	ee-pee	1t
2.	aña	ah-nyah	4-8s
3.	usu	ue-sue	3t
4.	ada	ah-dah	1s
5.	iki	ee-kee	2t
6.	iTHi	ee-THee	2t
7.	awa	ah-wah	1s
8.	efe	ay-fay	5c
9.	eke	ay-kay	2c
10.	ili	ee-lee	6t

Appendix E

Live Speech reading/Cuereading Test (list 1)

_____ Speechreading only _____ Speechreading with cues

Directions: Circle the word you see.

- | | | | | |
|-----|--------|---------|---------|----------|
| 1. | de | to | mi | vez |
| 2. | niña | niñez | talla | dÆa |
| 3. | estç | estar | hasta | hacer |
| 4. | para | padre | pasa | pero |
| 5. | claro | largo | algo | caro |
| 6. | decir | seguir | leer | nacer |
| 7. | salir | cenar | seûal | sellar |
| 8. | pidiù | media | pedir | venir |
| 9. | da | la | tal | tÆa |
| 10. | pagar | pasar | vas a | basar |
| 11. | nada | nadie | dedo | daño |
| 12. | conoce | conoces | conduce | goteaste |
| 13. | bolso | pollo | mayo | moûo |
| 14. | perro | pero | barro | morro |
| 15. | suyo | suya | suyos | suyas |
| 16. | algo | alto | alzo | halago |
| 17. | mÆa | vÆa | paja | paella |
| 18. | tomar | tomate | sumar | toman |
| 19. | comer | come | joven | golpe |
| 20. | padre | pasa | pero | para |

Appendix F

Spanish Lab Evaluation

Directions: Circle your answer.

1. Learning the Spanish cue system was helpful.

strongly agree agree no opinion disagree strongly disagree

2. Practicing pronunciation and grammar in lab was helpful.

strongly agree agree no opinion disagree strongly disagree

3. Having lab once a week was enough

strongly agree agree no opinion disagree strongly disagree

4. Doing the lab homework was helpful.

strongly agree agree no opinion disagree strongly disagree

5. The lab instructors were prepared.

strongly agree agree no opinion disagree strongly disagree

Comments please: (Was the lab helpful, too easy or hard, interesting or boring, confusing?)

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