

The Language Train

Trial report



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BACKGROUND TO THE LANGUAGE TRAIN SOFTWARE TRIAL

English native-speaking learners of Spanish commonly mispronounce Spanish words. Sounds common in Spanish either do not exist phonemically in English or behave differently, and are replaced by sounds which do exist in English. This is commonly called negative transfer or interference. Learners in primary school identify pronunciation problems as a major obstacle to learning. They repeatedly report that poor pronunciation would lead to their stigmatisation in the event of using their foreign language. The Language Train software is designed to target the problems English-speaking learners of Spanish experience, and to provide practice and training in the auditory discrimination of some of the sounds learners commonly confuse.

The principle is not entirely novel. Auditory training is at the root of the audio-lingual approach to language teaching and minimal pair drilling remains a feature of pronunciation practice in foreign language classes. But the Language Train software adds a degree of control, precision and intensity in this kind of training that the average foreign language teacher could not manage.

This software models two versions of a word in Spanish. One model is correct in its Spanish pronunciation and includes a phonemic distinction particular to Spanish but which is not made in English. The second model is of the same Spanish word but with the Spanish phoneme replaced by a substitute frequently used by English native speakers. The learners hear these two models and then hear a third version of the same word. This version is a repeat of one of the models and the learners have to indicate which version they heard; the correctly pronounced Spanish version or the interlanguage version. As the program progresses the learners hear models which, through the use of sound morphing software, become progressively more and more similar. The program is sensitive to the competence of the learners at the task and adjusts the difference between the models so that learners are working at their point of competence where they are only just able to discriminate between the two models. The activity is presented in the form of a game where the learners receive feedback on their progress through the game.

The Language Train software is based on earlier software called Phenomena. Language Train, however, provides modelling and training of discriminations in the context of foreign language words while Phenomena divorces training from meaningful contexts and practises purely at the level of the phoneme.

The trial of the Language Train software is placed entirely in the context of modern foreign language teaching in Britain where the time available for teaching is short, and where language teaching is expected to be meaningful and communicative. Methods and materials, if they are to be considered effective, must involve the target language and must be able to demonstrate a learning effect or learning advantage within a few hours of use. Foreign language classes in British primary schools are small, and the sample is consequently also small.

The Language Train software is a prototype and the trial should be viewed in this light. It is intended as material which will support and enhance foreign language learning and is not a complete language learning method in its own right.

PROBLEM SOUND CONTRASTS IN SPANISH PRACTISED WITH LANGUAGE TRAIN

palatatised n - commonly replaced by English /n/ or /n̩/

syllable final monophthongs replaced by English diphthongs more common in final positions. Thus the word for handkerchief in Spanish is commonly given a distinctive English "o", as in *go* or *blow*, at the end, quite different from the Spanish original.

THE ASSUMPTIONS

The Language Train software is based on the following assumptions:

1. The inability to distinguish and reproduce the full range of correct foreign language phonemes will be a barrier to the learning and use of the correct foreign language sounds.
2. The root of this problem is an auditory one, learners cannot hear and therefore cannot make the necessary sound discriminations.
3. If you improve the auditory discrimination of crucial sound contrasts you remove difficulties in hearing the contrasts. This will remove a barrier to making the necessary sound contrasts, which will remove a barrier to other aspects of language learning.

RESEARCH QUESTIONS

The aim of the evaluation was to address the following questions:

1. Does intervention using Language Train software improve learners' abilities in the auditory discrimination of Spanish words containing the target phoneme distinctions?
2. Does the intervention associate with the ability to identify and discriminate words containing the target phoneme sounds in a meaningful listening activity?
3. Does the intervention associate with the ability to make the phoneme distinctions in speech – is pronunciation of Spanish improved?
4. Does the intervention associate with/promote enhanced learning – is more language learned as a result, eg more words? This is an ambitious question given the limited amount of teaching involved in the project.

METHOD

An intervention strategy was used to attempt an answer to these questions.

1. A class of 12 7, 8 and 9 year-olds was split into two groups. Each group contained learners with a mix of academic abilities so the groups are similar. The experimental group received intervention in the form of auditory discrimination practice using the Language Train software. The control group did not have the intervention but continued with normal class work. The groups were then joined for an elementary lesson in Spanish and learning differences between the two groups were investigated.

2. Word contrasts, containing problem sounds, were practised by the experimental group using Language Train software. This allowed words containing the correct Spanish sound and the common English substitute to be morphed so they became progressively more similar. There were three interventions allowing the learners to work through all the word contrasts provided in their own time. Learners took between 30 and 45 minutes to work through all sound

contract practices, and thus had between 1 hours 30 minutes and 2 hours 15 minutes practice in all.

3. The joint class introduced:

- the words practised in the intervention
- other words containing the sounds practised in the intervention
- a limited range of structures
- material was introduced orally with the aid of flashcards and later in writing and provided oral and written practice with work sheets (examples are provided in Appendix 5).

4. Data was collected during and after this process.

5. It is not intended, with the very small numbers of learners involved, to subject the data to elaborate statistical analysis. The prototype nature of the software and project cannot be stressed too strongly.

THE JOINT CLASS (IN 3 ABOVE)

The class comprised five sections:

- the oral introduction of vocabulary and word repetition (video clip 3)
- a bingo game (video clip 7)
- the introduction of written forms of the new word – a matching game (video clip 10)
- vocabulary consolidation with a worksheet (video clip 11)
- a final matching exercise to test vocabulary knowledge (video clip 13).

There were:

- 5 students who had undergone the intervention (a sixth student who also underwent to the intervention was absent for this class)
- 6 students who had not had the auditory training.

DATA COLLECTION

1. Details in the levels of auditory discrimination are collected by the Language Train software itself during the intervention process. If the auditory training is effective then later practice should show better discrimination than earlier practice.

2. As the words used in the lesson are introduced students will be given the opportunity to repeat these words, first chorally and then individually. It might be expected that the students who have undergone the intervention will identify the new language sounds more readily and more accurately than the other learners and pronounce them better. The accuracy of the pronunciation of the target words and sounds will be judged by a native speaker of Spanish with no connection to the project who is simply asked to categorise each word exemplifying the target sounds as good or bad.

3. The ability to discriminate the target sounds in a meaningful listening activity will be tested by means of a game of bingo. The learners have cards with pictures of words containing the target sounds. The words include those which have been explicitly practiced by the Language Train software. They have to cross these off when they hear the words for the pictures they see spoken by the teacher. The learners are told they have to listen for the correct

pronunciation and the difference between correct Spanish pronunciation and incorrect, anglicised pronunciation explained and illustrated. These words are initially pronounced with incorrect Spanish pronunciation and later with correct pronunciation. It might be expected that the learners who have not had the intervention will identify words containing the target sounds before learners who have had the intervention – they won't be able to discriminate between correct and incorrect pronunciation – they will cross off more pictures and will call bingo first. This task is designed so that it will give a negative result if the two groups behave similarly and if the experimental group have not changed their capacity to recognise the importance of the target and other sounds when they hear them in meaningful language use.

4. In a recall task of the words taught during the class, the learners will be asked to match pictures of the new words with the written form of the words. Learners from the experimental group might be expected to recall higher proportions of the lexis than the control group.

RESULTS

1. Changes in auditory discrimination ability

The highest scores on each section of the intervention are recorded in Appendix 1 to this document. They show that, overall, the learners were willing and able to carry out the activity and achieve believable scores in most cases. There is one case of a learner being absent for one session. There are seven cases (out of 102) where learner scores are not recorded or where a very low score – near random mouse clicking – are recorded. These appear to be due to the minds of the learners wandering at periods in the activity – remember they are very young. However, three of these seven cases involved the word *pañuelo*, the only three-syllable word being practised, and it seems possible that the additional word length is enough to provide some confusion in the practice of this word.

Overwhelmingly, learners' ability to distinguish the target sounds from very similar sounds improves with practice. In 27 cases out of 36 the learners improved their discrimination scores between the first and the second or third practice sessions. Some of these improvements are very considerable. In four instances the best scores decreased in this period and five scores remained the same.

Even learner E, who was clearly very able even at the start, improved in four out of six practice words with the other two remaining stable. The levels of discrimination attained, approaching 100, matched the performances of trained phonologists in the university.

In response to research question 1, therefore, the use of the Language Train software does appear to improve the auditory discrimination of target foreign language sounds. This is a positive result especially given the young age of the learners and the comparatively short time given to the use of the software and auditory discrimination practice.

2. Bingo: discriminating words using these sounds in a listening activity

The learners formed pairs for this exercise, except for one learner who worked alone. Thus, there were three pairs of learners from the control group and two pairs and one single learner from the intervention group. The results of these groups are in Appendix 2.

Learners with the intervention perform nearly identically to the learners from the control group. The learners from the control group, even though they have had very little exposure to the new language sounds have no more difficulty than those from the intervention group in spotting Spanish words which have English sounds inappropriately inserted. In response to research question 2, therefore, enhanced auditory discrimination skills does not appear to improve the identification and discrimination of words containing these sounds where the words occur in a meaningful listening activity.

I have included two video clips (video clips 8 and 9) demonstrating that boys from the intervention group can fail to spot the word final diphthong in *lago*, and girls from the control group can distinguish the presence of a word final diphthong in *mono*.

Remember, however, that this activity was carried out before the written form of these words was introduced. Orthographic interference comes up later.

3. Word repetition and pronunciation accuracy

The six words on which the auditory training was based were taught to the learners. Each learner was given the chance to repeat each word. A Spanish native speaker listened to these words and judged the particular sounds that were trained, for correctness. The results are presented in Appendix 3. Examples of pronunciation rated both good and bad are included in the attached video materials (video clips 1, 2, 4, 5 and 6)

The learners who did not undergo the intervention made proportionately fewer pronunciation errors on the target phonemes than the learners who had the intervention: 86% correct compared with 71%. We are dealing with a very small number of learners and a single learner in the intervention group, learner D in Appendix 1, was responsible for four of the seven mispronunciations identified and this contribution is skewing the data. Omit his data and the percentage of correct pronunciations for the intervention group rises to 79%.

In both groups the only three-syllable word, *pañuelo*, was the principal cause of mispronunciation. Three of the seven errors in the intervention group and three of the five errors in the non-intervention group occurred where the test sound occurred in this word.

The intervention group does not, therefore, appear to be at an advantage in producing correct Spanish sounds in word repetition even though they had been explicitly trained in the discrimination of these words.

The results on words containing the target sounds, but not explicitly practised in the Language Train software, is very much the same. The Spanish native-speaker passed judgement on the first 15 such words occurring in the presentation and repetition phase of the lesson. These words, and her judgements, are also given in Appendix 3. They show the non-intervention group reproducing accurately the new language sounds more frequently than the intervention group.

Both groups appear able to produce the sounds, which traditionally cause learning problems, with considerable accuracy in this type of exercise. In response to research question 3, therefore, it is not obvious that learners who have undergone the intervention have an advantage in pronunciation of the words containing the sounds they learned to discriminate so precisely.

However, this lesson also introduced the spelling of these new Spanish words and the written form of the words appears to introduce considerable orthographic interference. Words which appear to have given little trouble when learned orally, are produced with obvious errors once the written form appears. Video clip 12 gives several examples of this occurring: *queso*; *Espana* and *rinoceronte*. Remember, learners of this age are coming to terms, or have just come to terms, with reading in English where very firm sound and symbol correspondences are formed. These can conflict with equivalent correspondences in the foreign language. The Language Train software, addressing sound discrimination only, appears unable to prevent this kind of interference.

4. Vocabulary recall

The scores obtained on this task are given in Appendix 4. The scores from the two groups are very similar. In response to research question 4, therefore, the intervention group does not appear to have benefited noticeably from the intervention in learning the vocabulary of the lesson.

The highest scores – complete recall of all 20 test items from the vocabulary of the class – were obtained by the youngest learner (learner E who appeared the brightest in the class with a reading age approximately two years above her chronological age of 7) and the oldest learner in the class (Learner U with a chronological age of 9).

CONCLUSIONS

This is a small-scale trial designed to give an indication, and it can only be an indication, as to whether the learning gains expected from the Language Train software can be seen. Nonetheless, if the use of auditory training and phonetic discrimination practice has an impact on the learning of a foreign language in the way which teachers will expect, then some indication of the benefits should be seen even in a small-scale trial. This should give an indication of whether larger-scale trials are worth pursuing and if so in which direction they might go.

1. It is possible to use the Language Train software to train quite impressive levels of sound discrimination ability between foreign language phonemes and frequently confused native-language phonemes, in young learners between 7 and 9 years old. The Language Train, in a very short time, can successfully train young learners to discriminate troublesome foreign language sound distinctions, and in a game format that children are happy to play with.
2. There is nothing from this class to suggest that these enhanced abilities contribute to better performance in a foreign language class at least in the short term. Learners who were trained did not appear better in foreign language word recognition or word repetition than those who were not trained. Foreign language pronunciation skills were not obviously improved. The trained learners were not obviously advantaged in word learning than the learners who were not trained. This study has concentrated on only a short period of language training with similarly brief preliminary discrimination practice. The effect of prolonged use of the software and on learning over a period of years remains untested.
3. Prior to the introduction of the written form of the words they learned, all learners were impressively good at imitating the words and sounds which were modelled to them. Once spelling is introduced then Anglicised pronunciation emerges in words which caused little or no problem before. Auditory discrimination practice does not seem to influence this process. Difficulties lie with both phonological interference, which the software is designed to address, and with orthographic interference which in its current form it is not.
4. These conclusions probably fit with analogous research in this area. Some kind of auditory skill is commonly associated with foreign language learning ability, at least in learners old enough to have gained the ability to read. Pimsleur included a sound discrimination test in his Language Aptitude Battery (1966), for example. Carroll also experimented with this kind of test but ultimately omitted it from the Modern Language Aptitude Test (created with Stanley Sapon in 1958). The most recent published tests in this area, for example Meara et al's (2001) Language Aptitude Tests, omit sound discrimination tests in favour of tests of the ability to create sound and symbol correspondences. The conclusion of researchers in this field is generally that sound discrimination abilities *per se* do not influence foreign language learning. Rather, it is the ability to identify sounds, codify them and link sounds with written symbols which connects with foreign language learning success. The processing and the storage of

words in language are intimately associated with the combination of sounds and their orthographic representation.

Cluster analysis of aptitude tests, reported by Skehan (1989), identifies phonological ability among three separate factors which appear to impact on successful language learning. Skehan (1993) further hypothesises how these factors may interact in the course of language learning and suggests that phonological ability may influence learning positively only at the outset of learning. This might imply that sound related practice material, which the Language Train is attempting to create, would be most apposite at the outset of learning where it might positively influence both learning itself and confidence in language learning. However, recent attempts (by Alexiou now at Aristotle University in Thessaloniki and as yet unpublished) to link phonological abilities with foreign language learning among the very young have failed to demonstrate a statistically significant connection. My interpretation of her data is that the learners at this age are only just coming to terms with writing and that the tests which are commonly used to assess phonological ability require more refining before they are able to identify this trait in this age group. I strongly suspect that this trait does exist in young learners. Alexiou is also of the opinion that these abilities are still plastic in young learners and that practice of these skills can enhance them and might, therefore, promote foreign language learning ability.

5. In its present form, therefore, Language Train might work best with very young learners who are learning the foreign language orally and who will not have writing in any form interfering with their learning. The teacher in this trial observed that she thought this might work at the very outset of learning to give language learners confidence in their pronunciation.

6. If this kind of training has a future with older learners it seems likely that it will need to be adapted to include some kind of link to the letters or symbols which represent the sounds being practiced.

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APPENDIX 1

Highest discrimination level attained in each trail

nsr = no score recorded

The increase/(decrease) is calculated by taking the difference between the score on the first valid trail and the highest of the subsequent trials.

learner	sound	trial 1	trial 2	trial 3	increase/(decrease)
A	gnu	4	absent	2	(2)
	lago	86	absent	96	10
	panuelo	61	absent	91	30
	huevo	91	absent	96	5
	nube	30	absent	81	51
	sol	81	absent	96	15
B	gnu	21	81	34	60
	lago	81	96	96	15
	panuelo	nsr	96	76	(20)
	huevo	76	91	76	25
	nube	55	66	91	36
	sol	96	31	96	0
C	gnu	10	91	61	81
	lago	71	81	71	10
	panuelo	3	81	nsr	78
	huevo	96	91	91	(5)
	nube	11	71	57	60
	sol	71	71	nsr	0
D	gnu	19	91	21	72
	lago	81	96	91	15
	panuelo	11	71	81	70
	huevo	91	91	96	5
	nube	81	71	91	10
	sol	51	71	81	30
E	gnu	91	91	91	0
	lago	91	91	91	0
	panuelo	71	81	81	10
	huevo	81	96	96	15
	nube	81	91	91	10
	sol	32	81	81	49
F	gnu	61	71	86	25
	lago	61	74	81	20
	panuelo	42	26	26	(14)
	huevo	51	91	96	45
	nube	nsr	61	61	0
	sol	4	61	76	72

APPENDIX 2

Bingo Game – success in discriminating target language sounds

with intervention		without intervention	
group	score	group	score
pair 1	4	pair 3	4
pair 2	2	pair 4	2
single student	2	pair 5	1
total	10	total	9

APPENDIX 3

Correctness of pronunciation

- ✓ response judged correctly pronounced
- × response judged incorrectly pronounced

target word	with intervention	without intervention
nube	✓✓×✓✓	✓✓✓×✓✓
nu	✓✓✓✓✓	✓✓✓✓✓✓
sol	✓×✓✓✓	✓✓✓✓✓✓
huevo	✓×✓✓✓	×✓✓✓✓✓
lago	✓×✓✓✓	✓✓✓✓✓✓
panuelo	×××✓✓	××✓×✓✓
total correct	23	31
% correct	73	86

target word	with intervention	without intervention
mono	✓✓✓✓	✓××✓
niebe	××	✓✓✓
montana	✓	✓
queso	✓	✓✓✓
avion		×
cocodrilo	✓×	
rinoceronte	✓××	×
carne	×	✓✓✓
total correct	8	12
% correct	53	80

APPENDIX 4

Words correctly linked with their pictures (out of 20)

with intervention		without intervention	
student	score	student	score
A	absent	U	20
B	20	V	16
C	16	W	12
D	14	X	19
E	20	Y	18
F	14	Z	17
total	84	total	102
average	16.8	average	17