

PHONEME DISCRIMINATION AND THIRD LANGUAGE LEARNING

MARIJKE LOOTS

Faculty of Letters
Catholic University Brabant
P.O. Box 90153, 5000 LE Tilburg, The Netherlands

ABSTRACT

Bilingual children appeared to make fewer errors in discriminating between the phonemes of a foreign language than their monolingual peers. This difference is explained on the basis of a greater awareness on the part of bilinguals of the fact that phonemic boundaries may differ per language.

INTRODUCTION

In August 1986 the teaching of English at Dutch primary schools was made obligatory. One of the questions that this decision has raised is whether the addition of English to the curriculum will constitute an extra burden for immigrant children, who are already in the difficult position of having to keep up two languages, the command of one of them often being inferior to that of the other. A research project was set up to study the impact of bilingualism on third language learning, including various tests on the learning of grammar, vocabulary and phonology. What this paper on phonological contrast has in common with the whole study is that it is not limited to achievement, but rather explores the strategies bilingual children develop to cope with unfamiliar linguistic input. Most of the research on bilingualism comes from the United States, which has a long history of bilingual education. For a long time bilingual children were considered to have a handicap in comparison with their monolingual peers [1][2]. The poor performance on a number of tasks was ascribed to a negative influence of bilingualism on the children's intellectual development. The most serious flaw in these early investigations seems to be that they did not control for the fact that bilingual children often originated from families with a comparatively low socio-economic status. Since the sixties, studies into bilingualism have shown that "balanced" bilingual children show a wide range of advantages rather than disadvantages when compared with monolinguals from a comparable socio-economic background, the most conspicuous of these being the ability to separate word sound from word meaning. Some authors have claimed that bilingualism also helps individuals to learn additional languages more easily ([2], p. 180). To our knowledge, bilingualism has hardly ever been studied in relation to foreign language learning, the one exception being an achievement study in Sweden. In a nationwide investigation with standardized tests on

vocabulary, grammar, reading and listening comprehension, it appeared that bilingual children performed slightly better than monolingual children when compared on the level of parental education [3]. In the same way that bilingual children may have a greater cognitive flexibility than monolingual children, and are better able to distinguish between form and meaning, they might also be more aware of the fact that the relation between sound and phoneme need not always be the same. As they already have two phoneme sets at their disposal and consequently a larger number of phoneme boundaries, they might be more capable of discriminating between the phonemes of a third language than their monolingual peers. This hypothesis formed the starting point of the present experiment into the relation between bilingualism and sound discrimination in foreign (third) language learning.

THE TEST

Subjects

Forty children who were pupils of the two final grades of ten different schools took part in the experiment. Their age varied from 9 to 12. At the moment of testing they had just started their English lessons. The mother tongue of the monolingual children was Dutch, the bilingual children spoke Turkish and Dutch. The children were matched on socio-economic status on the basis of a standard classification of their father's profession. They were matched on intelligence with the help of the non-verbal Raven's progressive matrices. To determine the degree of bilingualism, the Turkish-speaking children were asked to do a standard editing test for Dutch and cloze test for Turkish. Furthermore, the Turkish teachers and the Dutch teachers of the children were asked to evaluate the children's performance in Turkish and Dutch, respectively, with the help of four categories describing their command of the two languages. For both monolingual and bilingual children we determined whether they spoke any language apart from Dutch, or Dutch and Turkish. As a result, we were left with twenty "truly" monolingual children and twenty children who, having a fair command of both languages, may be called "balanced" bilinguals.

Material

The test contained a Dutch and an English part, the Dutch test being used as a check whether the two groups scored in a comparable way on a language they were both supposed to have mastered. The choice

on the items included in the Dutch test was based on experience from foreign language teaching. For back vowels, the most difficult phonemic contrasts for Dutch learners of English lie in the area between close and half close, and half close and half open. For front vowels, they lie around the line dividing the open area from the half open area. The contrasts used in the test can be inferred from Figure 3 and 4.

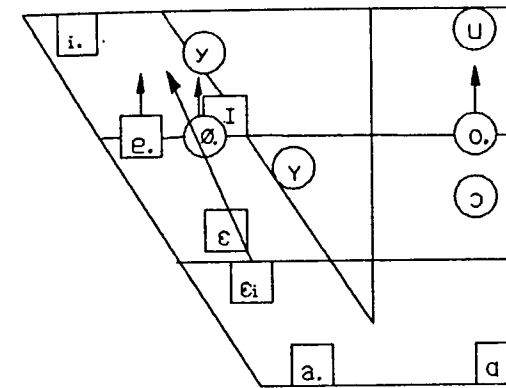


Figure 1. Dutch Vowel Diagram. Circles and boxes stand for rounded and unrounded vowels, respectively. The number of dots refer to phonemic duration. Arrows indicate direction and extent of diphthongization.

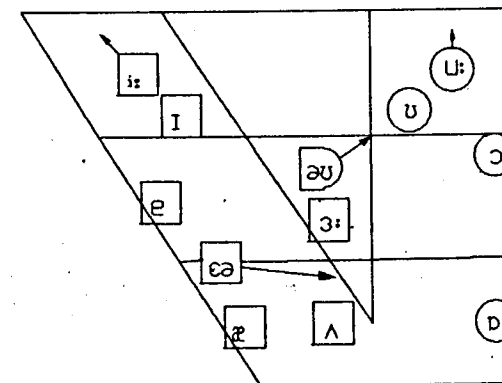


Figure 2. English Vowel Diagram. For further details, see caption Figure 1.

The test made use of an ABX paradigm in which a nonsense word X had to be compared with two nonsense words A and B, in which X did not have to be acoustically identical to A or B, there being two speakers for each language. For each phonemic contrast there were 8 items depending on the order in which the phonemes were contrasted, whether X was like A or B, and the speaker of X.

Method

The test was administered to individual children with the help of a cassette recorder and headphones. The numbers 1-80 were typed on four consecutive

sheets followed by the sequence A B ?. The children had to draw a circle around the A or the B, depending on the similarity they thought to have discovered between the third word and A or B. They were forced to give an answer, even if they heard no difference at all. Both the Dutch and the English part contained a number of trial items.

Results

There was no effect of the order of presentation ($t = 0.74$, $df = 38$, $p = 0.462$). Whereas there was no difference between the number of correct answers on the Dutch test ($t = .51$, $df = 38$, $p = 0.613$), the bilingual children scored significantly higher on the English test ($t = 2.86$, $df = 38$, $p = 0.007$). Both the monolingual children and the bilingual children scored higher on the Dutch test than on the English test (*mono*: $t = 8.25$, $df = 19$, $p > 0.001$; *bi*: $t = 6.51$, $df = 19$, $p < .001$). The scores of the individual phonemic contrasts can be inferred from Figures 3 and 4.

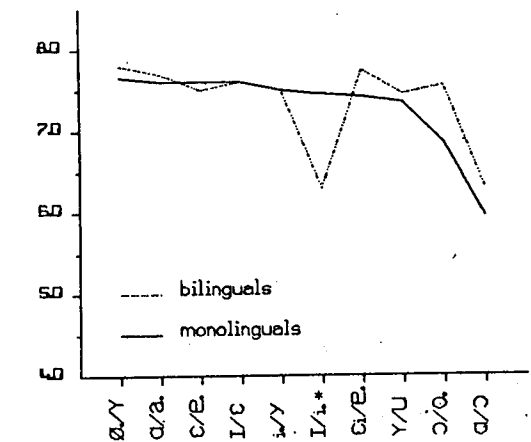


Figure 3. Mean scores for the Dutch test on the 8 items per contrast. An asterisk indicates a significant t-value for the difference between the two groups of listeners.

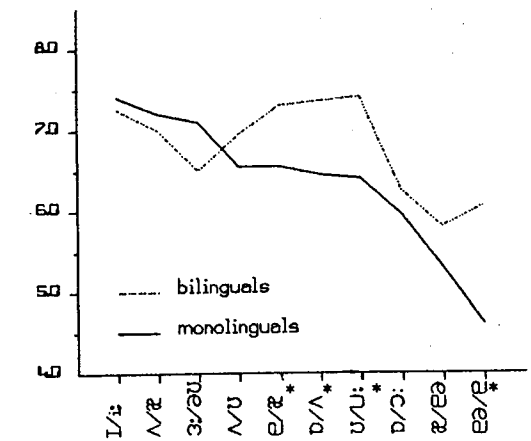


Figure 4. Mean scores for the English test. For further details, see caption Figure 3.

In the Dutch test, two contrasts appeared to be more difficult than the other items. For the monolinguals these were /a/-/ɔ/ and /ɔ/-/o./ for the bilinguals they were /a/-/ɔ/ and /I/-/i./ In a comparison of the phonemic contrasts between mono- and bilinguals, the contrast /I/-/i./ appeared to have been more difficult for the bilinguals, the contrast /ɛi/-/e./ for the monolinguals. In the English test, both mono- and bilinguals seem to have perceived the ten contrasts as three relatively easy ones, three relatively difficult ones and some that were neither the one nor the other, the relatively difficult ones being the same for mono- and bilinguals.

Discussion

The fact that the contrast /a/-/ɔ/ in Dutch proved difficult for both groups of listeners shows that its low scores are not related to the linguistic history of the testees. For the other contrasts, this influence cannot be dismissed offhand. There is some literature available on the production and perception of Dutch vowels by Turkish adults who are monolingual [4], [5], [6]. Here, all data indicate that the contrast /I/-/i./ is difficult for these subjects. It may be that our bilingual listeners suffered from interference from their first language.

Why the English phonemic contrast /I/-/i:/ is not significantly more difficult for the bilinguals than for the monolinguals may be ascribed to the fact that in English duration is a more important phonemic contrast than it is for Dutch [7]. We have no explanation why the contrast /ɔ/-/o./ should have been relatively difficult for Dutch listeners, nor why the contrast /ɛi/-/e./ should have received higher scores from the bilingual listeners than from the monolinguals. It may be that the bilingual listeners are more alert to the diphthongal character of /ɛi/. In the English test, the monolinguals made a large number of mistakes in the areas known to cause problems (see section Material). The three most difficult items were the same for both groups, although the monolinguals scored significantly lower than the bilinguals on one of them. The low scores on the contrast /ɜ:-/əv/ for bilingual listeners may perhaps be explained from the absence of central vowels in the Turkish vowel diagram [8]. Any attempt at explaining the relative ease of the contrast between /v/-/u:/, /ɒ/-/ʌ/ and /e/-/æ/ on the basis of a comparison of the Turkish and English vowel diagrams fails, however.

It would seem that bilinguals are better able to distinguish between the sounds of a foreign phoneme inventory. That their high scores cannot be explained with reference to their first language argues in favour of the hypothesis that they perform better because they have become aware of the fact that a sound falling within one phonemic area in one language may fall outside it in another language.

REFERENCES:

- [1] Diaz, R.M., Thought and Two Languages: The impact of Bilingualism on Cognitive Development in: Gordon, E.W., <<Review of Research in Education>>, 1983, 10, 23-55.
- [2] MacLaughlin, B., <<Second Language Acquisition in Childhood>>, 1984, Vol. 1.
- [3] Balke-Aurell, G., and T. Lindblad, <<Immigrant children and their languages>>, Research Bulletin, University of Gothenburg, 1983.
- [4] Boeschoten, J.A. van, Intelligibility of sounds in isolated Dutch words spoken by Turks, in Bennis, W.U.B., and M. van Lessen-Kloeke, <<Linguistics in The Netherlands>>, Foris Publications, Dordrecht, 1984, 23-33.
- [5] Boeschoten, H.E., and L. Verhoeven, Integration niederländischer lexikalischer Elemente ins Türkische - <<Linguistische Berichte>>, 1985, 98: 347-364.
- [6] Heuven, V.J. van, Some acoustic characteristics and perceptual consequences of foreign accent in Dutch spoken by Turkish immigrant workers, in: Oosen, J. van, and J. Snapper, <<Proceedings of the Colloquium on Dutch Linguistics>>, Berkeley Linguistic Society, 1986.
- [7] Gussenhoven, C., and A. Broeders, <<The pronunciation of English; a course for Dutch Learners>>, Wolters-Noordhoff-Longman, Groningen, 1976.
- [8] Demircan, O., <<Türkiye Türkçesinin ses Düzeni Türkiye Türkçesinde sesler>>, Ankara University Press, 1979.

I am grateful to Vincent van Heuven, who persuaded me to go on with this line of research when my enthusiasm was flagging, and to Roeland van Hout, who helped me in methodological matters. Rik Boeschoten and Ludo Verhoeven developed the cloze test.