THE EXTRACTION OF POSITIVE AND NEGATIVE LANGUAGE TRANSFER FACTORS

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This study aims at exploring the possibility of extracting two language factors, i.e., negative and positive language transfer factors, by means of the statistical technique of factor analysis. One thousand five hundred and forty-four Sudanese students, who are native speaker of Arabic, were asked to write five Wh-questions in response to five tasks set by the researcher. Each of the linguistic forms in the five Wh-questions was treated as a test item and was scored according to a certain marking scheme. The seven scores obtained by each student were factor analysed. A rotated factor analysis produced two factors. The first factor had loadings from the linquistic forms which are found in Arabic and English, whereas the second factor had its significant loadings from the linguistic forms that are used in English, but not in Arabic.

1. INTRODUCTION

Contrastive analysis (hereafter CA) has for a long time maintained the existence of positive and negative language transfer (Fries, C. 1945, Lado, R. 1957). Yet, it seems that no attempt has been made to verify this hypothesis through the powerful statistical technique of factor analysis, even though factor analysis has been used in the sister discipline of language learning

(see Carrol, J.B, 1941, 1958 and Oller, 1979). (A computer assisted search in the ERIC documents has not shown that factor analysis has been used in CA research). It is possible to attribute this to at least two reasons. Firstly, factor analysis can only be used when the variables being tested vary in a meaningful way. Rummel, R.S.(1970: 13) makes the point that, 'If the variables have no variation, that is if all the values are the same, then no more than one factor can be derived from the data.' If, for instance, we ask a group of students whose mastery of English is perfect to write a number of sentences and then score their responses, it is unlikely that more than one factor will be extracted from the resulting data. Secondly, this could also be due to the absence of tools or tests which tested purely one type of transfer or the other.

Indeed, researchers in the areas of contrastive and error analysis continue to rely heavily on using simple statistical descriptive techniques, viz morpheme counts, in their attempt to describe, classify and hence speculate about the underlying causes of foreign language learners' errors, even though this technique is being criticized by an increasing number of researchers such as, J.Schachter and M. Celce-Murica, (1977), Bernared spolosky (1979), and Rod Ellis (1985).

2. OBJECTIVES OF THE STUDY AND THE DEFINITION OF THE PROBLEM

The present study was suggested by a paper presented by Hamed el Nil el Fadil (1986). The researcher found in this paper, in which he tried to study the acquisition of Wh-questions by native speakers of Arabic, strong evidence suggestive of positive and negative language transfer. This was suggested by the finding that almost all the students acquired the linguistic forms which have a parallel in Arabic, whereas the linguistic forms which are not paralleled in Arabic were not acquired by almost half the students in the final year of the eight-year English language course. Like many other researchers in the field of EA, Hamed el Nil el Fadil (1986) used the simple descriptive statistical technique of morpheme counts in an attempt to describe and hence speculate about the causes of foreign language learners' errors. However, and as has been mentioned earlier, the use of these simple statistical techniques is either not adequate enough to study the relationships between the different language items, or to discover the learners' underlying abilities. The present study, therefore, attempts to

redress this shortcoming in the field of CA and EA research by employing the more powerful statistical technique of factor analysis. This statistical technique will 'tell us what tests or measures belong together – which ones virtually measure the same thing, in other words, and how much they do so' (Kerlinger, 1973). The study will therefore, use this technique in order to try to find out if on the one hand the errors made by students in their attempt to use Wh–question sentences belong together, and if on the other hand the linguistic forms that the students have mastered also belong to one another. More specifically, the study will attempt to provide answers to the following three research questions.

1. Will a factor analysis of the responses of students in forming Wh–question sentences produce two factors, i.e. a factor of positive language transfer and a factor of negative language transfer?

2. Will the factor of positive transfer obtain its highest loading from the linguistic forms that are used in English and Arabic Wh–questions, i.e. the five question words: 'where', 'when', 'how', 'why', and 'who', the infinitive verb, 'buy', the demonstrative pronoun, 'this', the object word 'watch' and word order?

3. Will the factor of negative transfer obtain its highest loading from the linguistic forms that are used in forming English Wh–questions, but not in forming Arabic Wh–questions, i.e. the auxiliary 'did' and the pronoun 'you'?

3. LIMITATIONS OF THE STUDY

The focus of the study was on Wh–questions only, and it has not considered other types of language use. There is a reason for this, however. Since factor analysis requires the use of a specific and consistent set of variable scores, it was necessary to have a certain measure of consistency in the subjects' responses. This was thought to be possible only, if the linguistic items that were going to be factor analysed, could be predetermined. One possible way of making sure that all the subjects would be consistent in their use of the items that were to be factor analysed was to ask them to form wh–questions. In addition to this, and since the subjects were asked to form five Wh–questions, it was possible to base the subjects' scores for each linguistic item not only one occasion, but on at least three

occasions in the subjects' responses. Furthermore, this study was confined to the Greater Khartoum Educational District, for a number of obvious reasons, not least important of which was the ease of the accessiblity of the schools.

4. SUBJECTS

The subjects of this study were one thousand, five hundred and forty-four male and female Sudanese, preparatory and secondary school students, who are all native speakers of Arabic. In order to have a representative sample, the students were drawn from schools representing three different levels of academic achievement, i.e. low, average and high. This was done in consultation with the Education Officers of the Greater Khartoum Education District. Since English is taught in the Sudan from the beginning of the preparatory stage, i.e. from grade 7, the test was given to a sample of the students in grades 8 to 12.

5. MODES OF DATA COLLECTION AND ANALYSIS

The object of this study was to treat each of the six linguistic items in the Wh-question sentence, plus word order as the variable to be factor analysed. This was done by the following procedure.

Firstly, the students were asked in Arabic to imagine that a foreign friend had bought a watch which they liked. They were asked to write five questions to find out from him or her, from where, when and why he/she bought that watch, how much he/she bought it for and who gave him or her the money to buy it. Secondly, each of the linguistic forms in each of the five wh-questions, i.e. the wh-question words, the AUX, the pronoun, the main verb, the demonstrative pronoun, and the object word 'watch', was copied out on a special form, so that each of the student's uses of any of these forms will be seen in a row (see Appendix A). Thirdly, each of the student's uses of these forms was scored according to a certain marking scheme (see Appendix B). Fourthly, each of the student's total score for every individual linguistic form was obtained and entered on a special form, in addition to the student's mark in his or her use of word order (also see Appendix B). This means that each student had seven total scores, which were used in the factor analysis. Fifthly, each of the student's seven scores and the

student's sex, were entered into the prime 2250 computer. Finally, a rotated Principal–Components Factor Analysis was run for the seven students' scores for the whole population.

6. RESULTS AND DISCUSSION

Table 1

A Principal–Components Rotated Factor Matrix for the seven scores obtained by the subjects in their use of wh–questions.

SCORES	Factor P	Factor N
Question words	.68	.46
AUX (did)	.18	.90
Personal Pronoun (you)	.33	.81
Infinitive verb (buy)	.65	.39
Demonstrative Pronoun (this)	.83	.23
Object word (watch)	.79	.17
Word Order	.62	.68

Table 1 above presents the result of a varimax rotated Principal–Components Analysis. It may be observed from this table that two factors seem to have been extracted. (Values over 50 were considered to be significant). Factor 1 takes its significant loadings from the question words (.68), the infinitive verb 'buy'(.65), the demonstrative pronoun 'this' (.83), the object word 'watch' (.79), and word order (.62).

These five items must, therefore, be measuring the same thing, and they must form one factor. The researcher has strong reason to suggest that they were measuring positive language transfer. These linguistic forms, i.e. the Wh–question words, the main verb 'buy', the demonstrative pronoun 'this', the object word 'watch' and their word order are used in both English and Arabic, when forming Wh–questions. It seems, therefore, that factor P is

measuring positive first language transfer. In other words, the abilities which the students have gained in learning to form Wh–questions in their native language have come to be useful when learning English as a foreign language. We may, therefore, tentatively call factor P a postive language transfer factor, since it takes its highest loadings from the linguistic forms which are found in Arabic and English. This finding provides postive answers to the first two research questions.

It may also be observed from Table 1 that factor N takes its highest loading from three items, namely, the auxiliary 'did' (.90), the personal pronoun 'you' (.81) and word order (.68). It must be pointed out again that the foregoing items must be measuring the same thing. The researcher has strong reason to believe that they form one factor and that this factor was measuring negative language transfer. In order to explain this, we need to briefly understand the structure of Wh–questions in English and Arabic as far as these three items are concerned. Firstly, whereas English uses the AUX in forming Wh–questions, Arabic does not. Secondly, English as well as Arabic use personal pronouns when forming Wh–questions. However, English uses a free form, whereas Arabic uses a bound form affixed to the end of the verb. Since these two linguistic forms have significant saturations on factor N, it can be suggested that factor N seems to be indicative of negative language transfer and therefore it may tentatively be called a negative language transfer factor.

However, word order as a variable poses a problem because it seems to have high loading on factor P as well as on factor N How are we to explain this? It needs to be remembered that research question number 2 assumed that word order will have high loadings on the hypothesised positive language transfer factor and not on the negative transfer factor. This was based on the assumption that both Arabic and English Wh–questions have more or less similar Wh–question word order. However, it seems that the factor analysis was more senstive to this than our mere subjective assumptions. First, an attempt will be made to explain why word order seems to have significant saturations on factor P, and why it has significant saturations on factor N.

The linguistic forms which are used in both the English and Arabic Wh–questions take similar positions in the respective Wh–question

sentences. The question words, for instance, take initial position in the English and the Arabic Wh–question sentences. Morever, the object word 'watch' takes final position in the Arabic as well as in the English Wh–question sentences. In both sentences the object word is preceded by the demonstrative pronoun, which is itself preceded by the infinitive verb. Therefore, it can safely be concluded that the question word, the demonstrative pronoun, the infinitive verb and the object word take similar postions in both the English and Arabic wh–question sentences. And it appears that the subjects' word order scores correlated highly with their scores on the use of the words that have high saturations on factor P. This may explain why word order has high saturations on factor P. But why does it also have high saturations on factor N?

Two quite closely related reasons may be suggested to explain this. On the one hand the students' major difficulty does not seem to be in placing 'did' and 'you' in their correct positions in the Wh–questions, but essentially in their acquisition (see Hamed el Nil el Fadil, 1986). On the other hand, the students who failed to use 'did' and 'you' or either of them were also marked down for not having acquired the correct word of these two linguistic forms (see Appendix B). Consequently, the subjects' scores on the use of these two forms, i.e. 'did' and 'you', seem to be highly correlated with their word order scores. That is why it seems word order has also high saturations on factor N. It can, therefore, be surmised that factor N has high loadings from the linguistic forms which are not used in Arabic Wh–questions and also from their placement in the Wh–question sentence.

7. CONCLUSION AND THEORETICAL IMPLICATIONS

This study attempted to give answers to the three research questions set at the beginning. It was possible to extract two factors. The first factor had high loadings from the linguistic forms which are used in English and Arabic Wh–questions. Therefore, it was tentatively called "Positive Language" transfer factor, or P factor. The second factor had high loading from the linguistic forms that are used in English Wh–questions, but not in Arabic Wh–questions. This factor was, therfore, tentatively called a "Negative Language" transfer factor, or N factor.

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APPENDIX A

STUDENTS' RESPONSES AND SCORES IN THE USE OF THE Wh-QUESTION WORDS

SCHOOL———————————:FORM———————

S.N.	Q.1. Where	Q.2. When	Q.3. How	Q.4. Why	Q.5. Who	SCORE
944						
945						
946						
947						
948						
949						
950						
951						

APPENDIX B
MARKING SCHEME

A. Wh- question Words

Award one point for each correct use of the question word in each of the 5 questions.

Award .5 for for using the wrong form of Wh-question word e.g. where

for 'when', 'what' for 'why' etc.
Award .25 for the use of an auxiliary, or any other modal verb? or the copula.
Award zero for each omission of the Wh-question words.

B The Auxiliary 'did'

Award one point for each correct use of 'did'.
Award .5 for each wrong form of the auxiliary, e.g. 'do', 'does' etc..
Award .25 for the use of copula, e.g. 'is', 'was', 'are', 'were', etc..
Award zero for each omission of 'did'.

C. The Personal Pronoun 'you'

Award one point for each correct use of 'you'.
Award .5 for the use of the wrong form of the P.P., e.g. 'he', 'she', etc..
Award .5 for the use of 'your'? .
Award .25 for the use of other possessive pronouns, i.e. 'his', 'her', 'my', 'their', etc..
Award zero for each omission of 'you'.

D. The Infinitive Verb 'buy'

Award one point for each correct use of 'buy'.
Award .5 for using a wrong form of the verb, e.g. 'bought' etc.
Award .25 for the use of the copula + buy 'is buy'.
award .25 for the use of a wrong verb, e.g. sell, etc.
Award zero for every omission of 'buy'.

E. The Demonstrative Pronoun

Award one point for each correct use of 'this' or 'the'.
Award one points for the use of 'it' instead of 'this watch'.
Award .5 for using the wrong form, i.e. 'that', 'these' etc.
Award .25 for using 'a', 'an'.
Award zero for each omission of 'this' or 'the'.

F. The Object Word 'watch'

Award one point for each correct use of 'watch'.
Award one point for the use of 'it'?
Award .75 for using 'clock'.
Award .25 for using 'o'clock.'
Award zero for each omission of 'watch'.

G. Word Order

N.B. Score Wh-questions with 'where', 'when', 'why', below only for word order
Where did you buy this watch?
When did you buy this watch?
Why did you buy this watch?
Award 6 points for each correct use of word order.
deduct 1 point for the omission of any word .
deduct two points for the omission of two words, 3 points for the omission of 3 words and so forth.
deduct 1.5 for failure to invert subject and auxiliary e.g.
*where you did buy this watch?