Raising, Control and their Respective Order of Acquisition

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Abstract

The basic aim of the present study is to tease out the respective order of acquisition of Control and Raising constructions in L_2 setting under the subset principle of Learnability Theory in combination with the principles and parameters model of Binding Theory. In the light of the previous relevant L_1 and L_2 acquisition studies, the nativist model of language learnability has been adopted for the current study. The particular measures selected for the current study are a grammaticality judgment task and two translation tasks. For the interpretation of the responses from the subjects, logistic regression has been employed. The findings from both the Acceptability Judgment and the Translation Tasks indicate that the sub-set relationship on acquisition order between control and raising constructions is not instantiated on the behaviour of the subjects in this study.

Keywords: *Learnability theory; sub-set principle; nativist model; principles and parameters model; raising to subject and raising to object.*

1. Introduction

The subset principle both in L_1 and L_2 studies (Becker, 2005; Kirby, 2010; Saleemi, 1992; White, 1989) is half of the answer to the gaps (learnability issue and representational issue). The representational half is taken care of by UG, particularly by the P&P model; whereas the learnability part is attended to by the innate domain specific learnability principles. The subset principle (Berwick, 1985) specifically guides the learners from the perspective of the order of acquisition of the parameterized grammars in a language.

Grammars in a language and across languages may not only be parameterized but also stand in a subset-superset relationship. The across languages example is the binary division of *Null-subject* vs. *Non-Null Subject* languages (Saleemi, 1992); whereas, the within language example of parameterized grammars is the case of Control and Raising constructions in English which stand in a subset-superset relationship. On the nativist approach, natural language data has no room for negative evidence and it is claimed that natural language provides only positive evidence which may be employed by the learners through limited induction. From the subset point of view, the respective values of the parameters in a language are arranged in such a fashion that one value of a parameter is contained in the other.

The one contained in the other is termed as the *restrictive grammar* and similarly the containing one is called a *wider grammar*. In such cases, it is proposed that the restrictive and the wider grammars stand in a subset-superset relationship. According to the subset principle, it is the subset grammar which during acquisition is selected first, followed by the superset/wider grammar. The reason given is that natural languages lack negative evidence and once a learner in his choice of grammar(s) goes for the wider grammar, there will be no room for correction due to absence of any negative evidence.

2. Control and Raising Constructions

The pair of constructions which is being investigated in the present study under the subset principle are the grammatical constructions respectively termed as control and raising. These constructions stand in a subset-superset relationship in the English language.

2.1 Subject Control (SC) and Raising to Subject (RS) Constructions

As can be seen, both control and raising verbs prima facie fit well in the syntactic frame in (1) in English.

(1) a. The baby tends [*t* to eat the porridge] (raising)
b. The baby likes [*PRO* to eat the porridge] (control)

The important difference between (1a) and (1b) may be explained as:

"In (1a), the embedded NP moves from the subject position of the infinitival clause to the subject position of the matrix clause leaving behind a trace t, whereas in (1b), no movement of the embedded NP is involved and there PRO acts as the subject of the infinitival clause. Despite the fact that both control and raising verbs can occur in the same type of syntactic frame, it is only the raising verbs which have the capacity to give room to expletive subjects, as can be seen in (2)":

(2) a. There tends to be rains in Monsoons
b. ∗There likes to be rains in Monsoons

Going by the hypothesis of the sub-set principle, children's first assumptions regarding a novel verb given in (3) should be that of a control verb as against a raising one. Suppose the learner has made a wrong guess regarding (3), there is a possibility that the learner may come across (2a) in which case the learner stands a chance of correcting her/himself in revising her/his first guess. If it is assumed that for a single verb there is no possibility of having simultaneous membership in two verb classes, subsequent evidence of a verb's occurrence with expletive subject shall imply that the verb in question cannot assign an external theta-role

and is therefore categorized as a raising verb excluding the possibility being a control verb. On the contrary, if the learner's first assumption regarding the novel verb in (3) is a raising guess, there is no possibility of the wrong guess to be refuted with positive evidence as (2b) never occurs as positive datum in the input data.

(3) The baby *gorps* to eat the porridge

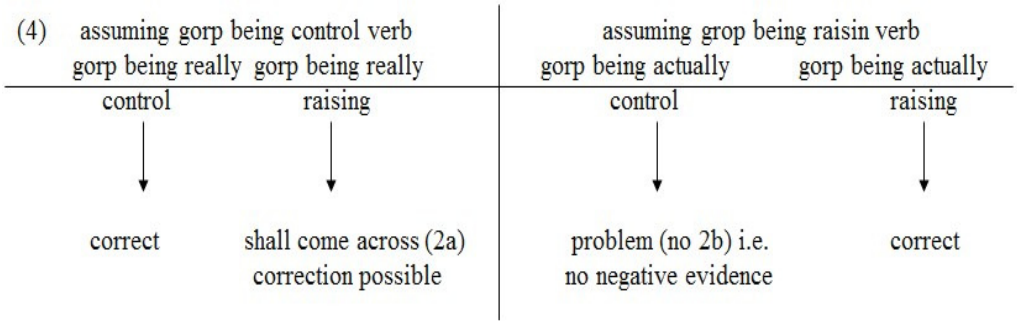

Figure 1: Logical path from restrictive to wider grammar (Becker, 2005, p. 53)

3. Background

This is what has been referred to as the "null hypothesis" in the context of nativist approach to the acquisition of syntax. This relative complexity of control and raising constructions has consistently been assumed in a series of acquisition studies (Kirby, 2010; Becker, 2005; Frank, 1998). In fact, from a developmental perspective (Hirsch & Wexler, 2007; Wexler, 2002; Borer & Wexler, 1987), the relative order of acquisition of these constructions has been ascribed to the availability/nonavailability of "A-movement" mechanism which is not available to child learners before attaining the age of five years. On this approach control, (narrower grammar) which must be acquired first, is compared to raising, which is regarded as a broader and more complex grammar. According to Becker, "the primary difference between raising and control verbs is that control verbs stand in a thematic/selectional relationship with the matrix subjects, but raising verbs do not" (Becker, 2005, p. 54).

A related phenomenon to the issue of A-movement is the question of "the economy of derivation" (Kirby, 2010). From the perspective of economy of derivation, there are different approaches. On the one hand, researchers (Hornstein, 2001; Chomsky, 1995) claim that Merge (PRO) is more economical as compared to Move (raising). Similarly, Shima (2000) is of the view that Move is more economical. Shima's (2000) view is not only supported by previous empirical findings (Kirby, 2010; McElree & Bever, 1989), but also the findings from the present study bend in Shima's (2000) direction.

4. Research Questions

The present study explores the following research questions:

1. Whether or not, the L_2 learners follow the subset principle order, i.e., their initial guess regarding control and raising constructions is a narrower one or the other way round?
2. Whether or not, while acquiring control and raising grammars, the L_2 (English) learners instantiate any L_1 (Pashto) transference phenomenon?
3. Whether or not, the UG parameterized grammatical representations interact with the subset principle as assumed in L_1 acquisition?
4. Whether or not, UG and learnability principles (the subset principle in the present case) remain intact in L_2 acquisition and whether they are as much operative as in the case of L_1 acquisition?

5. Method

The population of the current study is adult learners of English having Pashto as their L_1. For this very purpose, the researcher has followed sampling method from Becker (2005) in case of the GJ Task. His design has been customized, keeping in view the adult learners in the L_2 setting among the subject population. Simple stratified random sampling procedure was employed in the L_2 learners of English. The population has been divided into three strata—FA, BS, and MS. The control group (L_1), being the native speaker of English, was selected from two universities in USA. The acceptability judgment tasks were sent online.

5.1 Subjects

Two groups of subjects were included in the present research. The first group consisted of L_2 learners of English with their L_1 as Pashto. These L_2 learners were sub-divided into three groups for the purpose of administering the data. All EFL learners were native speakers of Pashto. Overall, 127 L_2 learners participated in the different tests that were conducted in this research. Of the 127 participants, 30 were female and 87 male. The second group of participants consisted of adult native speakers of English from the Universities of Oregon, Eugene, Oregon and World Learning Brattleboro, Vermont of United States of America. This group acted as a control group for the present study. The participation of these subjects was limited only to the GJ Task.

5.2 Grammaticality Judgment Task (GJT)

Like Becker (2005), the present study's GJ task consisted of four types of test sentences and all the test sentences had an inanimate matrix subject (Table 1). The first two sentences had a matrix control verb and the last two a raising one. In addition to that, another element was introduced, i.e., whether or not the embedded infinitival complement clause had semantic compatibility with the inanimate subject in the main clause. Sample test sentences are given in Table 1.

Table 1: Sample Test Sentences in the GJ Task

Sentence	Matrix Verb	Embedded Predicate
*The mango likes to be on the tree.	Control	Compatible
*The mango likes to move upward.	Control	Incompatible
The book tends to get tougher.	Raising	Compatible
*The book tends to get angry.	Raising	Incompatible

This test included twenty target and twenty filler items. The filler items, again, were bi-clausal tough movement constructions (Anderson, 2002). The expected response pattern on the respective individual items at different educational levels is given in Table 2.

Overall there were twenty targeted test sentences. Of these twenty sentences, ten contained matrix control verbsand the rest of the ten contained matrix raising verbs. In the light of the subset principle, the following response pattern was assumed for the GJ task (Table 2):

i. If the subjects' first guess regarding these sentences is a control construction guess and if (as is required) they assume an animate matrix subject for the control verbs, their response may be a negative one on all the four sentences since all the subjects in the given sentences are inanimate.
ii. If the subjects' guess regarding these constructions is a raising one (contra subset principle), they may accept those sentences with a compatible lower predicate and reject the ones with an incompatible lower predicate.
iii. In the final case, if these adult subjects do have a mature knowledge of raising and control, they may behave like the control group.

Table 2: Expected Response Pattern on the Basis of Respondents' Assumptions

Sentence	Assumption (i) All Control		Assumption (ii) All Raising		Assumption (iii) Control Group	
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
*The mango likes to be on the tree.		☐	☐			☐
*The mango likes to move upward.		☐		☐		☐
The book tends to get tougher.		☐	☐		☐	
*The book tends to get angry.		☐		☐		☐

5.3 Translation Task I

The first translation task included four L_2 sentences (items), two each from RS and SC construction frames, respectively. In this task, the subjects were asked to translate the English version into their native language (Pashto). The purpose was to check whether or not L_2 learners, who were to be administered the subsequent GJ task, had a working capacity of understanding the items under investigation.

5.4 Translation Task II

The second translation task included the same 4 itemswhich had been used in the TTI. The difference between these two tasks was that in the first (TTI), English versions of the RS and SC were translated by the L_2 subjects into their native Pashto language. In TTII, the 4 translated (Pashto version) sentences were again presented to the subjects for re-translation into English. This was basically a production task since the subjects were producing English version of raising and control constructions. It was at this stage that the subjects' data may yield findings, favoring the strong access hypothesis of UG in combination with the subset principle.

6. Results

This section mainly consists of tabulated data that were retrieved after applying tests of logistic regression analysis on the percentage responses of the subjects on the various tasks that were administered to them. For the sake of clarity, the respective percentage responses have also been graphically represented.

6.1 Grammaticality Judgment Task

Table 3represents the actual cumulative percent response pattern of the three nonnative groups and a fourth control group on the SC and RS constructions. On the whole, the response pattern of all the three experimental groups on all the four construction types on Table 3accorded with the response of the control group, with the exception of the behaviour of the FA group on the 1st SC construction type.

Table 3: Cumulative Percent Responses on GJT

Sentence	FA		BS		MS		CG	
	+ ve	- ve	+ ve	- ve	+ ve	-ve	+ve	- ve
The mango likes to be on the tree.	50	50	39	61	26	74	15	85
The mango likes to move upward.	13	87	15	85	5	95	4	96
The book tends to get tougher.	71	29	71	29	80	20	91	9
The book tends to get angry.	24	76	25	75	17	83	6	94

The data in Table 3 is the cumulative data and was analyzed in two steps. In the first step, the analysis was carried out in terms of education level and in the second step, by verb type. The statistical technique of logistic regression was performed on the cumulative percentage responses with the objective to compare the response pattern of the experimental three groups to a chance level (i.e., 50%).A test of the hypothesis indicated that the responses of the participants for sentences like *The mango likes to be on the tree*, are above chance levels on the SC constructions for the BS and MS groups, respectively but at chance level for the FA group (FA, z = 1.400, p = 0.416; BS, z = 0.474, p = 0.009, MS, z = 0.129, p = 0.000; CG, z = 0.624, p = 0.004).

The response pattern on SC constructions like **The mango likes to move upward* are above chance level for all the three groups (FA, z = 0.043, p = 0.002; BS, z = 0.077, p = 0.000, MS, z = 0.029, p = 0.001; CG, z = 1.025, p = 0.003). The response pattern of all the three experimental groups on such constructions assimilated to the control group's behavior.

Similarly, on the RS constructions like **The book tends to get tougher* the response pattern of all the three experimental groups was above chance level (FA, z = 11.000, p = 0.001; BS, z = 4.600, p = 0.000, MS, z = 34.000, p = 0.001; CG, z = 1.025, p = 0.003). Once again, the experimental groups behaved like the control group.

Finally, on RS constructions like **The book tends to get angry*, the response pattern of the experimental groups was also above chance level (FA, z = 0.043, p = 0.002; BS, z = 0.120, p = 0.000, MS, z = 0.029, p = 0.001; CG, z = 1.025, p = 0.003). Once again behaviour wise, the three experimental groups followed the response pattern of the control group.

Table 4 represents a graphic representation of the percentage results of Table 3, with the aim to give pictorial snapshot to the reader for better understanding of the findings.

Table 4: Graphic Results of GJT: Relative Proportion of Correct (+ve)/Incorrect (-ve) Responses

Sentence	FA		BS		MS		CG	
	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve
The mango likes to be on the tree.								
The mango likes to move upward.								
The book tends to get tougher.								
The book tends to get angry.								

Overall, the response pattern on the different infinitival constructions showed that the response pattern particularly of the FA group deviates from the expected pattern. These findings clearly indicated that at least initially, the L_2 subjects (the FA group in the present study) carry over some of the structural features from their L_1 into their L_2. This has implications for UG as well as the learnability theory.

6.2 Translation Task I

Overall, on the infinitival constructions referred to above, Pashto represents a wider grammar as compared to the English language. The assumption was that the learners while translating the different types of English infinitival constructions into Pashto, would go for translations which would contain the complementizer *that* (che) which is not found in the English version of such constructions. The results of this task in percentage are given in Table 5.

Table 5: Percent Translation Items With/Without Complementizer

Sentence	FA		BS		MS	
	With	Without	With	Without	With	Without
Aslam likes to work without a break.	100	0	100	0	100	0
They decided to leave earlier.	100	0	84	16	100	0
The ball seems to be in the air.	100	0	98	2	100	0
The statue appears to be a fake one.	62	38	100	0	100	0

The data in Table 5was analyzed item-wise. The statistical technique of logistic regression was performed on the responses with the objective to compare the response pattern of the experimental three groups to a chance level (i.e., 50%). A test of the hypothesis indicated that the response pattern on all the four pairs of the infinitival constructions was above chance level, i.e., the L_2 learners dominantly produced translations with a wider grammar as predicted.

Table 6: Results of the Statistical Analysis of the Translation Task I

#	Results
1	(FA, z = 1.022, p = 0.002; BS, z = 1.009, p = 0.000, MS, z = 1.015, p = 0.001)
2	(FA, z = 1.022, p = 0.002; BS, z = 0.364, p = 0.000, MS, z = 1.015, p = 0.001)
3	(FA, z = 1.022, p = 0.002; BS, z = 1.009, p = 0.000, MS, z = 1.015, p = 0.001)
4	(FA, z = 0.422, p = 0.226; BS, z = 1.009, p = 0.000, MS, z = 1.015, p = 0.001)

6.3 Translation Task II

On the whole, the response pattern (Table 7) on the different infinitival constructions showed that the response pattern of all the three L_2 groups deviate from the expected pattern. These findings clearly indicated that the L_2 subjects did not carry over the complementizer feature from their L_1 into their L_2. This has implications for UG as well as the learnability theory.

Table 7: Percent Response Pattern on Translation Task II

Sentence	FA		BS		MS	
	Without	With	Without	With	Without	With
Aslam ghwari che bagher da waqfe kar okri.	96	4	98	2	97	3
Haghwi faisla okra che pa wakth laar shi.	92	8	80	20	97	3
Dase khakari che baal pa hawa ke de.	75	25	95	5	97	3
Dase khakari che mujassima naqli da.	56	44	87	13	95	5

A test of the hypothesis for the first sentence indicated that the response pattern on the 1st SC construction was above chance level for all the three groups, i.e., they dominantly produced translated version of the Pashto version into English without a complementizer (FA, z = 0.043, p = 0.002; BA, z = 0.018, p = 0.000, MS, z = 0.029, p = 0.001). The same pattern of translation was replicated on the 2nd SC construction, i.e., the response pattern for all the three groups was above chance level (FA, z = 0.091, p = 0.001; BS, z = 0.191, p = 0.000, MS, z = 0.029, p = 0.001).

The response pattern on the 2nd pair of RS constructions was dominantly above chance level for all the three groups as assumed (FA, z = 0.333, p = 0.020; BS, z = 0.057, p = 0.000, MS, z = 0.029, p = 0.001) and (FA, z = 1.182, p = 0.683; BS, z = 0.098, p = 0.000, MS, z = 0.029, p = 0.001), respectively.

7. Discussion

Looking at the results from Table 1, it can be observed that the findings are exactly the opposite of the subset principle's acquisition order i.e., the subjects' performance on raising constructions is not completely in accord with that of the control group. All the three non-native groups (FA, BS, & MS) performed well on the raising constructions but when they came to the performance on the control ones, especially the FA group, they took some of the control constructions like *The mango likes to be on the tree* as raising ones. Thus these findings showed that at least initially, the learners' first guess for control constructions is not a control guess; rather, they take such verbs to be raising ones. In other words, the empirical findings go against the formal (received) acquisition order.

The findings from the first GJT in this study are not new. Previous studies on control and raising in child acquisition data have also reported similar findings. In two such studies (Kirby 2010; Becker 2005) on child acquisition of the constructions under investigation in the present study, the results were of the same pattern, i.e., raising preceded control constructions contrary to the formal received pattern. The constructions which were given a raising interpretation in that study, were also of the same syntactic frame that has been used in the present study. Two such sentences, one from the previous L_1 study and one from the existing study, are reproduced here for convenience.

(5) "The flower wants to be pink" (Becker, 2005, p. 55).
(6) The mango likes to be on the tree.

In addition, in both cases, it was the initial group (3 years group in the child acquisition study and FA group in the present study, respectively) who behaved in a deviant pattern from their respective control groups. An interesting aspect of the present findings is that even L_2 learners are following the same behavioural

path as that followed by the L_1 learners in acquiring the same pair of constructions, i.e., control and raising.

From a classical point of view, Chomsky (1995) and Hornstein (2001) claim that merger (PRO/control) compared to Move (trace/raising) is more economical. But the present findings refute such an approach. Parallel to this are the views of Shima (2000), supported by empirical findings from McElree and Bever (1989) and Bever and McElree (1988), wherein it has been found that raising constructions (trace/movement) are comprehended faster than the control ones (merger). From the findings of the present study (GJ task) along with similar previous findings (Kirby, 2010; Becker, 2005; Saleemi, 1992), it can be concluded that PRO/control carries greater cognitive/processing load compared to the raising one. These findings also suggest that processing load is determined not by movement/trace, rather it is the number of theta-roles assigned in the respective constructions (raising carrying one theta-role lesser than control) which may have effect on the processing mechanism of the learners.

8. Conclusion

The researcher's first tentative conclusion on the whole is that learning of L_1 and L_2 are two different processes and that UG and the domain specific learning principle are not available to the L_2 learners. On a closer look, one can see that empirical findings like the present ones on the same constructions have also been reported in previous L_1 research (already referred to in the discussion section). The findings from the present study as well as from the previous L_1 studies suggest that it may well be possible that control (Merger) is more complex than raising (Movement). This in turn implicates that the relative complexity of control and raising may lead some reformulation at the theoretical level which has already been attempted by Hornstein (1999). On this view, the subset hypothesis (order) may still remain valid with reevaluation of the relevant constructs from a linguistic point of view.

In conclusion, it can be said that the answer to the first research question is in negative, i.e., the subjects in this study did not follow the subset path as assumed by Wexler and Manzini (1987). The answer to the second research question is also a negative one, the L_2 learners did not show any transfer from their L_1 which simultaneously favours the subset principle and logically the third research question—the availability of UG on the strong access approach is confirmed. The answer to the fourth research question, the interaction of UG, with the subset principle is that since L_2 learners deviantly behaved on the GJ Task and exhibited direct access to UG on the Translation Task II; it may well be that the relevant constructions of raising and control may need reformulation theoretically. Whether the learnability domain remains functional or not during the second language acquisition is a question that may be answered by future studies.

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