

Parameterized Functional Features and SLA

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1. Introduction

Systematic differences between native speaker and nonnative speaker attainment, and inter- and intra-group variation in levels of attainment among nonnative speakers have been reported in the adult SLA literature. Nevertheless agreement has not been reached as to how best to account for these differences, and a number of proposals can be found in the recent literature. In this paper I will investigate the predictions of one of these accounts, namely the Failed Functional Features Hypothesis (FFH, Hawkins and Chan, 1997), which predicts that the acquisition of L2 functional features not instantiated in the learner's L1 feature inventory will result in persistent divergence in adult learners.

I will be assuming that UG makes available a set of functional features and that languages select subsets of these for inclusion in their functional feature inventories (Chomsky, 1998, 1999, 2001). Features can then be classified into universal (i.e., selected by all languages) and parameterized (i.e., selected by some languages but not others). This distinction is relevant to the FFH explanation of L2 divergence: universal features are predicted to be acquirable by all adult L2 learners in principle; by contrast, parameterized features are predicted to be fully acquirable only in cases where they were present in the learner's L1 functional feature inventory.

The predictions of this proposal were tested by investigating a group of nearnative Spanish speakers from a range of L1 backgrounds (English, French, German, Greek, Italian and Portuguese) and focusing on attainment in the areas of structural Case, and uninterpretable number and gender. The choice of L1/L2 pairings and grammatical features allowed me to investigate the following contrasts:

- (1) The contrast between SLA of universal versus parameterized functional features
- (2) The contrast between SLA of parameterized functional features present in the L1 and those which are not

The functional feature responsible for grammatical gender agreement (i.e., uninterpretable gender or [*u*Gender]) appears to be a parameterized feature since there is evidence for its presence in some languages (e.g., Spanish) but not others (e.g., English). This feature was used as the basis for grouping subjects into two groups according to whether their L1 had [*u*Gender] or not. The -gen group (i.e., the group of speakers whose L1 did not have [*u*Gender]) was made up of L1 English speakers, and the +gen group was made up of L1 speakers of French, German, Greek, Italian and Portuguese.

Like gender, the feature responsible for number agreement (i.e., uninterpretable number or [*u*Number]) seems to be parameterized. For example, languages such as Chinese do not appear to have it, while languages such as English, Spanish or Greek do. All the languages spoken by the subjects in the present study show evidence of having [*u*Number]. Finally, some of the experimental tasks allow one to see how the subjects perform on the production of structural Case features [*u*Case], and the assumption here is that this feature is universal and therefore present in all the languages spoken by the subjects.

A comparison between the acquisition of gender and number on the one hand and Case on the other constitutes an adequate testing ground for contrast (1). A comparison between the acquisition of gender in the -gen group versus the acquisition of gender in the +gen group and number in both groups constitutes a good testing ground for investigating contrast (2). This paper reports on a series of studies designed to test the predictions of FFH for these three features, and Table 1 is a schematic representation of the overall experimental design. According to FFH all functional features should be

fully acquirable by adult L2 learners except those not present in the L1 functional feature set, in this case uninterpretable gender features in the -gen group.

Table 1: Experimental groups and features investigated

	+gen group		-gen group	
	L1: French, Germ., Greek, Ital., Port.		L1: English	
	universal	parameterized	universal	parameterized
present in [F _{L1}]	[uCase]	[uNumber] [uGender]	[uCase]	[uNumber]
not present in [F _{L1}]	-		-	[uGender]

2. The empirical study

Two experimental groups and a group of native speaker controls were tested on five tasks that aimed at tapping their knowledge of these features. Information about the subjects and tasks is schematically presented below.

Subjects Group 1: Spanish native speakers (controls)
 Group 2: speakers of L1 French, German, Greek, Italian, Portuguese (+gen L1)
 Group 3: speakers of L1 English (-gen L1)

Tasks	1. Missing pronoun task	}	production tasks
	2. Informal interview		
	3. Find the appropriate adj/N task	}	interpretation tasks
	4. Guessing game		
	5. GJT with correction		

All the experimental subjects reported here obtained scores of 615-850 in the *University of Wisconsin Spanish Placement Test*, which was the range of scores obtained by the native controls. Knowledge of gender assignment was checked through an independent task, where subjects were asked to indicate which article should be used with each of the words used in the tests. The accuracy scores were almost perfect for all groups, at 99.78% for natives, 99.57% for the +gen group and 98.57% for the -gen group.

2.1. Missing pronoun task

The first task presented the subjects with a list of sentences with one word missing in each. The subjects were told that a word had been omitted in each sentence and the aim of the test was to see if they could provide the missing words. There were 18 test sentences and 6 distractors. Missing from the test sentences were obligatory accusative and dative pronouns. Half of the missing pronouns were singular and the other half plural. There were 6 sentences with missing masculine accusative pronouns, 6 with missing feminine accusative pronouns and 6 with missing gender neutral dative pronouns. The missing words in the distractor sentences were all monosyllabic, as in the test sentences (they were prepositions and the complementizer *que* 'that').

Sentences (3) and (4) are practice items that were provided at the beginning of the test. The words in brackets were not provided in the test – they were the expected answers. Practice item (3) models a test sentence and (4) models a distractor sentence. Table 2 is a summary of the subject information and Table 3 presents the main results.

(3) *Los dos enchufes que compré estaban fallados. ¿Será posible cambiar(los) por unos nuevos?*

'The two plugs I bought were faulty. Could I change (them) for new ones?'

(4) *Anoche María me prestó su abrigo porque hacía mucho frío cuando terminó la fiesta. Ahora tengo que ir(a) devolvérselo.*

'Last night María lent me her coat because it was very cold after the party.

Now I must go (to) give it back to her'

Table 2: Subject information

L1	n	age range	age mean	prof. score range	prof. score mean
Spanish	25	20 - 76	45.32	615 - 850	830.55
+gen	25	20 - 82	49.24	615 - 850	770.38
-gen	15	21 - 62	40.53	615 - 850	779.58
Total	65				

Table 3: Gender, number and Case mistake frequencies

Group/Error Type	*Case	*number	*gender	Total
L1 Spanish (n=25)	0	5	2	7
L1 +gen (n=25)	2	5	1	8
L1 -gen (n=15)	0	5	11	16

A chi-square test was performed to find out whether the association between L1 and mistake type was statistically significant, and the results showed that it was ($\chi^2=13.776$; $p<0.05$).

The groups' performances on [*uCase*], [*uNumber*] and [*uGender*] would seem to indicate that there is no difference between acquisition of universal and parameterized features in principle, as they provide no evidence that the contrast in (1) has effects in terms of L2 attainment. The results for [*uGender*] pattern neither with universal [*uCase*] nor with parameterized [*uNumber*]. This asymmetry suggests that L2 learners may be sensitive to the contrast between parameterized features present in or absent from the L1 functional feature set, and could be interpreted as evidence for the suggestion that the features contrasted in (2) pose a different learning problem to adult L2 learners. (More details about this study have been reported in Franceschina, 2002)

These results suggest that the contrast in (2) might be more interesting to investigate than (1). The following task looks more closely at the contrast between the acquisition of [*uNumber*] and [*uGender*].

2.2. Informal interview

The subjects in this study were two L1 Italian subjects, two L1 English subjects and two Spanish NS controls from the same subject pool as in the previous task. The NNS subjects were matched for L2 proficiency. They were recorded during informal conversation, and no special elicitation techniques were used. The results shown here are from 15-20 minutes excerpts from each of these recordings. All gender and number mistakes on categories that can be marked for gender and number (i.e., nouns, adjectives, articles and pronouns) were coded and counted. The results in Figures 1-6 show the subjects' accuracy in contexts where the controlling nouns had the following forms: *-o* (masc. sing), *-a* (fem. sing), *-os* (masc. pl.), *-as* (fem. pl), *-e* (masc./fem. sing) and *-i* (masc./fem. sing) contexts.

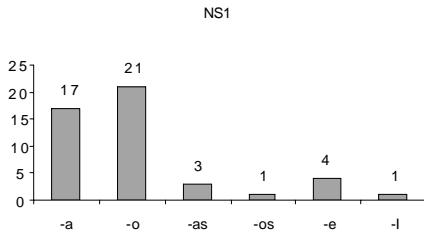


Figure 1: Total number of nouns surveyed: 52
Total number of nouns in *-a, -o, -as, -os, -e, -i*: 47

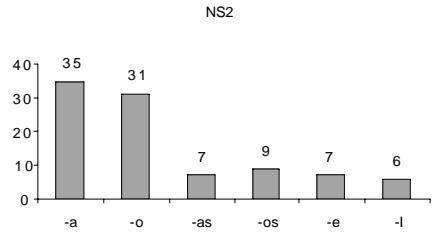


Figure 2: Total number of nouns surveyed: 105
Total number of nouns in *-a, -o, -as, -os, -e, -i*: 96

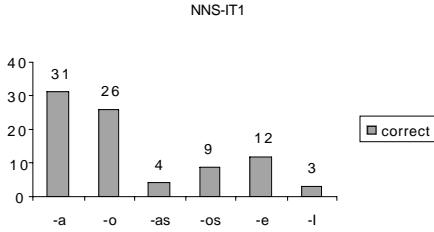


Figure 3: Total number of nouns surveyed: 95
Total number of nouns in *-a, -o, -as, -os, -e, -i*: 85

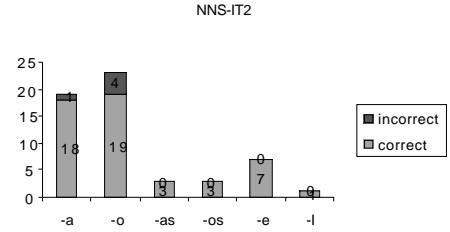


Figure 4: Total number of nouns surveyed: 175
Total number of nouns in *-a, -o, -as, -os, -e, -i*: 55

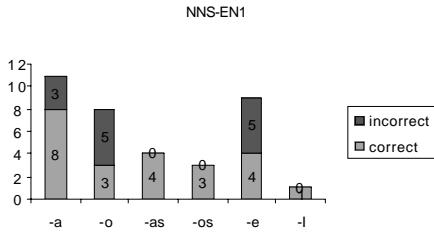


Figure 5: Total number of nouns surveyed: 47
Total number of nouns in *-a, -o, -as, -os, -e, -i*: 31

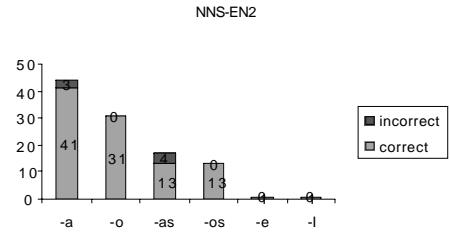


Figure 6: Total number of nouns surveyed: 146
Total number of nouns in *-a, -o, -as, -os, -e, -i*: 97

The mistakes made by NNS-IT2 were all related to the morphophonology of determiners (she appears to have used the Italian contraction strategy in some of the contexts where the following noun was vowel-initial). The mistakes made by NNS-EN1 and NNS-EN2, on the other hand, were all related to gender agreement. None of the subjects made any mistakes related to number. (A more detailed discussion of these results can be found in Franceschina, 2001)

These results are informative with respect to the contrast in (2), and they show the same pattern as those from the previous task: the parameterized feature [*μ*Number], present in both NNS groups' L1, did not appear to be a problem. The parameterized feature [*μ*Gender] was not a problem for the L1 Italian speakers, who have it in their L1 functional feature set, but it was for L1 English speakers, who do not have it in their L1 as they made relatively more gender mistakes.

The two studies discussed so far looked at L2 production. On the basis of this evidence alone it may be possible to argue that the differences between the two types of parameterized features are not necessarily a reflection of representational differences in these speakers, as FFH would claim they were, but simply production problems. The following three studies looked at the interpretation of [*μ*Gender] in the two experimental groups, and they could therefore help to address this question.

2.3. Find the appropriate adjective or noun task

The main aim of this test was to compare how the different groups made use of gender clues in an exercise which required them to choose one of two logically possible options differing in gender specification to fill in gaps in sentences. The subjects had to choose from 12 given words to fill in each gap, but only two words in each pool were logically possible in the corresponding gaps. Once the subjects spotted the two logically possible words in the pool, they had to choose the correct one on the basis of gender agreement with other words in the context. The target items were nouns (n=12) and adjectives (n=12). The first 12 contexts presented to the subjects were sentences where nouns were missing, and the second group of 12 contexts were sentences with missing adjectives. In all cases, the correct option could only be determined by matching the gender of nouns and other gender-marked words in the context. Below is an example:

- (5) *Me lastimé la martillando la silla rota*
 I hurt the(f) hammering the chair broken
 'I hurt my hammering the broken chair'
- (6) a. *soprano* 'soprano'
 b. *novio* 'boyfriend'
 c. *colegio* 'school'
 d. *mano* 'hand' (f) ← logically possible + grammatically correct
 e. *profesora* 'female teacher'
 f. *bailarín* 'male dancer'
 g. *revistas* 'magazines'
 h. *dedo* 'finger' (m) ← logically possible
 i. *novia* 'girlfriend'
 j. *libros* 'books'
 k. *maestro* 'teacher'
 l. *escuela* 'school'

Table 4 is a summary of the subject information, and Table 5 and Figure 7 show the overall results.

Table 4: Subject information

L1	n	age range	age mean	prof. score range	prof. score mean
Spanish	30	20 - 81	49.57	615 - 850	823.32
+gen	30	20- 89	55.15	615 - 850	780.15
-gen	15	21 - 62	40.53	615 - 850	779.58
Total	75				

Table 5: Overall group means

L1	n	mean	s.d.
Spanish	30	23.53	0.63
+gen	30	23.60	0.56
-gen	15	21.58	1.38
Total	75	23.24	1.07

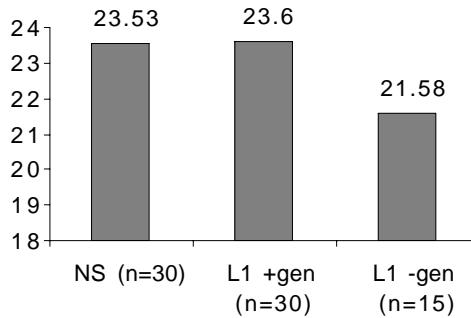


Figure 7: Overall group means

A Levene Test of Homogeneity of Variances indicated that a non-parametric statistical test should be used with these data, and so a Kruskal-Wallis test was used instead of a between subjects ANOVA to find out whether the differences in the means of the three groups were significant. The calculations showed that they were indeed significant ($\chi^2(2)=25.531$; $p<0.0001$), indicating that the subjects' L1 had a significant effect on overall test scores. Post-hoc tests (Tukey HSD and Scheffé) revealed that there were significant differences between the L1 Spanish group and the L1 -gen group, and between the L1 +gen group and the L1 -gen group, but the scores of the L1 Spanish group and the L1 +gen group were not significantly different.

The performances on this interpretation task focusing on [*u*Gender] pattern in the same way as in the naturalistic and experimental production tasks. The following study further looks at the interpretation of grammatical gender by the same speakers.

2.4. Guessing game

This test was designed in the form of a guessing game. The subjects simultaneously read and heard sentences which referred to objects or concepts not explicitly mentioned in the sentences presented to them, and the aim of the game was to 'guess' what the sentences were about by choosing one out of the three options provided in each context. The following was a practice sentence, and the subjects had to indicate which of the options in (8) the sentence was about:

(7) *Los trajo Martín y dijo que son para usted*
them(m) brought Martín and said that are for you
 'Martín brought **them** and said that they were for you'

(8) a. *flores* b. *joyas* c. *chocolates*
 flowers (f) jewels (f) chocolates (m)

The correct option was (8.c), since the object clitic *los* in (7) was masculine and (8.a) and (8.b) were feminine. The gender clues provided in the contexts were marked on two word classes: accusative pronouns (8 sentences) and adjectives (8 sentences). There were equal numbers of feminine, masculine, singular and plural examples in the pronoun and adjective sets of test sentences. The test sentences were also equally divided into those which referred to nouns with canonical gender markers (i.e., *-o* for masculine and *-a* for feminine) and those with non-canonical gender markers. There was the same number of distractors and test sentences (16 of each type). The distractors consisted of sentences where only one option was logically possible.

Table 6 contains the information on the subjects and Table 7 and Figure 8 show the results. A between subjects ANOVA was carried out to find out whether the differences in the means of the three groups were significant, and the calculations showed that they were ($F(2,72)=6.150$; $p<0.01$). Further post-hoc tests (Tukey HSD and Scheffé) revealed that there was a significant difference between the L1 Spanish and the L1 -gen groups ($p<0.01$). The differences between the L1 Spanish group and the

+gen group were not significant ($p=0.311$), while the differences between the -gen and the +gen groups approached significance ($p=0.063$).

Table 6: Subject information

L1	n	age range	age mean	prof. score range	prof. score mean
Spanish	29	20 - 76	44.79	615 - 850	823.41
+gen	29	20 - 89	55.10	615 - 850	780.06
-gen	15	21 - 62	40.53	615 - 850	779.58
Total	73				

Table 7: Overall group means

L1	n	mean	s.d.
Spanish	29	14.69	2.16
+gen	29	13.83	1.71
-gen	15	12.20	3.12
Total	73	13.84	2.39

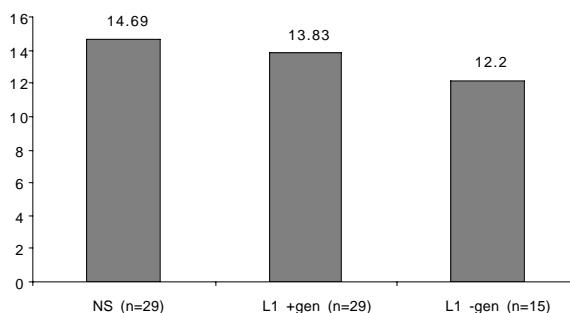


Figure 8: Overall group means

These results provide further evidence for the contrast between SLA of parameterized functional features present in the L1 and those which are not. The next and final study also focuses on the interpretation of [*u*Gender] by these speakers.

2.5. GJT with correction

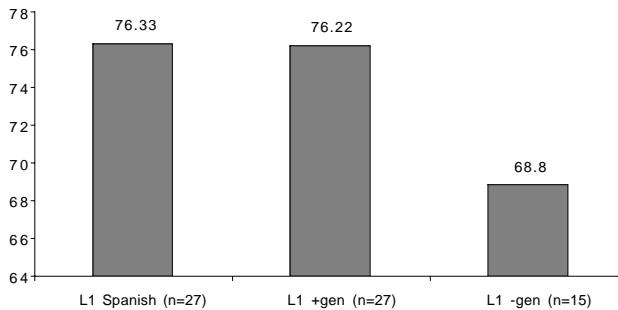
In this test ungrammatical sentences with gender mistakes were presented to the subjects, mixed with grammatical sentences. The main aim was to find out whether the different groups could distinguish the grammatical sentences from the ungrammatical ones and correct the mistakes where necessary. The test was designed in the form of a grammaticality judgement task with correction. The subjects simultaneously read and heard 80 sentences and had to indicate whether they were grammatical or not, and in the case of ungrammatical sentences they had to correct the mistakes. Half of the sentences were grammatical and the other half were ungrammatical. The grammatical and ungrammatical sets of sentences had equal numbers of masculine, feminine, singular, plural, canonical and non-canonical items. The two sets of sentences were also distributed in equal numbers among different types of grammatical contexts. Table 8 has information on the subjects and Table 9 and Figure 9 show the results obtained by the different groups.

Table 8: Subject information

L1	n	age range	age mean	prof. score range	prof. score mean
Spanish	27	20 - 76	46.22	615 - 850	830.68
+gen	27	22 - 82	49.59	615 - 850	780.73
-gen	15	21 - 62	40.53	615 - 850	779.58
Total	69				

Table 9: Overall group means

L1	n	mean	s.d.
Spanish	27	76.33	2.43
+gen	27	76.22	2.22
-gen	15	68.8	8.14
Total	69	74.65	5.24

**Figure 9:** Overall group means

A between subjects ANOVA was done to find out whether the differences in score means between the three groups were significant, and the calculations showed that they were ($F(2,68)=17.891$; $p<0.0001$). Post-hoc tests (Tukey HSD and Scheffé) revealed that there were significant differences between the L1 Spanish group and the -gen L1 group and between the +gen L1 and -gen L1 groups. The differences between the natives and the +gen L1 group were not significant.

This study further confirms the asymmetry found in the acquisition of the parameterized feature [*u*Gender] in the previously discussed production and interpretation tasks.

3. Discussion

The nativelike results for Case and number for both experimental groups seem to indicate that the L2 acquisition of universal and parameterized features is not intrinsically different in terms of outcomes. Instead, the interesting contrast would appear to be the one between parameterized features present in the L1 and those not present in the L1, as indicated by the groups' performance on gender. It is difficult to imagine what factor other than the L1 functional feature specification would allow one to predict the selective difficulties observed in these speakers.

There may be L1 transfer at the morphophonological level, but this would not account for the patterns of selective difficulties observed here. For example, English does not have grammatical gender morphology and so the L1 English speakers' difficulties might be explained by reference to this. However, there is evidence that L2 speakers can be completely nativelike in the production of L2 morphology that does not exist or is different in their L1 (a case in point is the successful acquisition of Case marking on pronouns by an L1 Chinese speaker reported in Lardiere, 1998a, b). Furthermore, if L2 divergence was mainly the result of L1 influence at the morphological level, we would predict, for example, that the L1 Italian speakers should have problems with number morphophonology in L2 Spanish, as the morphological operation used to mark plurality in the L2 (affixation) is different from

that of the L1 (allomorphy). But L1 Italian speakers do not seem to have any problems acquiring number morphology in L2 Spanish. Also, the subjects in the +gen group are L1 speakers of languages with gender morphology which in some cases is quite different from Spanish gender morphology, and yet this did not seem to have a detrimental effect on their acquisition of L2 Spanish.

The results reported here may also be accounted for by reference to mapping problems or lexical access difficulties. However, if the problem was the mapping from the syntax to the morphology or access to the correct forms in real time production, we should expect to find an asymmetry between production and interpretation tasks (with subjects being more accurate in the latter), but this is not the case. Also, the differences between the level of difficulty that different features pose for different L2 groups would still remain unaccounted for.

In view of these observations, I would like to argue that FFH stands as the most satisfactory account of the empirical data discussed here that is available at present. Moreover, there is some evidence to suggest that the patterns of selective divergence predicted by FFH on the basis of L1 functional feature specification are found in the acquisition of features and language pairs other than those considered here (e.g., Lardiere, 1998a, b; Liszka, 2001; Hawkins et al. 2002; Young, 1989). This said, further study of the representation of L2 functional features in nearnatives is clearly required before one can take this as a definite conclusion.

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