

# Aspiration and velarization of /f/ in Argentine Spanish\*

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This study explores the variable phenomenon of velarization and aspiration of /f/ in the Spanish of Corrientes, Argentina.<sup>1</sup> As opposed to previous work that have treated the change as a case of alternation between members of the peripheral class (labials and velars) (Cho, 1991), in this paper I argue that there is debuccalization followed by a fortition process when [f] is followed by [+back] vowels. The process of debuccalization is triggered by the OCP constraint that disallows consecutive segments with identical features (McCarthy, 1988), both /f/ and /o u/ are [labial] (Clements and Hume, 1995). Analysis of the data indicates that the process of debuccalization originates with the following [+back] vowel /u/ and that it spreads to the rest of the [-low] vowels, in the case of more advanced speakers. With the front vowels /e, i/ there is no subsequent spreading of the [coronal] feature, because this feature is underspecified in the representation (Rice and Avery 1991).

## 1. Introduction

The aspiration and velarization of /f/ is a phenomenon present not only in Corrientes Spanish, but also in other Spanish dialects such as the ones spoken in New Mexico, Colombia and Venezuela (Quilis 1993:283). It has also been reported in other romance and non-romance languages such as Rumanian, Italian (Lloyd 1987:215) German, Hausa and Korean (Cho, 1991). The study of this change in progress in Corrientes Spanish is further evidence of a natural phonological process and it provides additional data to the study of a long-standing question in historical linguistics:

Why do sounds change?

How is the change realized and how can it be explained?

How does the innovation spread throughout the language?

In this paper, I focus on the first two questions, and leave the last for future work that makes use of a more robust amount of data. I analyse the change observed in Corrientes Spanish and relate it to a similar process that occurred in the creation of Castilian from Latin. I study the shift of /f/ to /x/ and /h/ under the theory of autosegmental phonology (Clements 1985) further developed by Rice and Avery (1991), which allows to show the relationship between peripheral consonants, such /f/ and /x/, as opposed to coronal consonants. The

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<sup>1</sup> Corrientes city is the capital of the province of Corrientes, located at the northeast of Argentina.

model proposed by Clements and Hume (1995) is especially relevant for this study, since it provides a hierarchical tree that places consonants and vowels on the same tier making it possible to explain processes that involve both. While I argue that in the change from /f/ to /x/ there is a double process: first debuccalization and then fortition, I also explore another possibility, that is, the shift from /f/ to /x/ could be seen as a case of alternation between members of the peripheral class (labials and velars) as has been previously suggested (Cho, 1991). I explain why this hypothesis is inadequate and provide further evidence for the Debuccalization Hypothesis.

The shift from /f/ to /h/ can be traced back to the development of Castilian from Latin, almost a thousand years ago (Lloyd 1997:216). The process by which Latin *f*- came to be eliminated from the spelling of most popular Spanish words has been the subject of intense debate (Lloyd 1997:212-223; Penny 1991:90-94). I will hereby discuss only the points that are relevant for the purpose of this study. According to Penny (1991:92), from the 10<sup>th</sup> to the 15<sup>th</sup> centuries there were three allophones of /f/ governed by the nature of the following phoneme:

- (1) /f/: - [ɱ] before [w]: [ɱwerte];  
 - [h] before syllabic /o u/ (i.e. not [w]): [horno] < *furnu*;  
 - [ϕ] elsewhere (includes non-back vowels, the glide [j], [ɾ], [l]): [ϕarina], [ϕjiera], [ϕrido].

As a result of a process of generalization, in the 13<sup>th</sup> century [h] came to occur before all syllabic vowels (rather than only back vowels) (Penny, 1991:92). The use of *h* in the spelling of these words can be taken as an evidence of this shift (Lloyd 1987:216). Eg. *figo* > *higo* ‘fig’, *farina* > *harina* ‘flower’, *fornu* > *horno* ‘oven’. Interestingly, the use of the aspirate variant was as stigmatized then as it is now. As Alarcos Llorach (1951) states, the substitution of /f/ for /h/ did not involve a change in meaning, since they were variants of the same phoneme, but there was a certain social value attached to each form; while /f/ was the prestige form, /h/ was the deviant one used by uneducated people (Lloyd 1987:218).

In the late Middle Ages, [h] was dropped from the pronunciation of most words. On the other hand, any [f] that followed or preceded another consonant remained unchanged (e.g., *infernu* > *infierno* ‘hell’, *fronte* > *frente* ‘forehead’), as well as some instances of [f] followed by a vowel (e.g., *forte* > *fuerte* ‘strong’). That is, the shift from /f/ > /h/ > /Ø/ did not affect all the lexical items in the language (compare *fornu* > *horno* with *forte* > *fuerte*), and, for some reason that remains unexplained, did not reach total completion.

The allophones [ɱ] and [ϕ] were later modified to the labiodental [f] by Frenchmen who entered Spain in large numbers in the 12<sup>th</sup> and 13<sup>th</sup> centuries, sometimes occupying positions of great social prestige. These people would have great difficulty in imitating the labiovelar [ɱ] and the bilabial [ϕ], and may have replaced them with the most similar sound in their native language (namely [f]) (Penny, 1991:93), a practice which arguably then spread to native speakers of Spanish, particularly those of an educated, urban background, who would have been in closest contact with Frenchmen.

In Corrientes Spanish, [f] alternates with three different variants, the velar fricative [x], [h] and [Ø]. As the examples in (2) show, the occurrence of these variants is mainly determined by the context in which they occur:

- [f] appears with the low vowel /a/, [f] *amilia*
- [Ø] happens with /e/, [Ø] *estejabamos*
- [x] occurs with the back vowels /o, u/, and [x] *orma*
- [h] is used with the high front /i/, as shown in (1): *sacri[h]icada*

Distribution of the variants [f], [h], [x] and [Ø] according to following vowel<sup>2</sup>

[f] <i>amilia</i>	*[Ø] <i>amilia</i>	*[h] <i>amilia</i>	*[x] <i>amilia</i>	<i>amilia</i>	‘family’
[f] <i>estejabamos</i>	[Ø] <i>estejabamos</i>	*[h] <i>estejabamos</i>	*[x] <i>estejabamos</i>	<i>festejabamos</i>	‘we celebrated’
<i>sacri[f]icada</i>	* <i>sacri[Ø]icada</i>	<i>sacri[h]icada</i>	* <i>sacri[x]icada</i>	<i>sacri[Ø]icada</i>	‘sacrificed’
[f] <i>orma</i>	*[Ø] <i>orma</i>	*[h] <i>orma</i>	[x] <i>orma</i>	<i>orma</i>	‘form’
[f] <i>uí</i>	*[Ø] <i>uí</i>	*[h] <i>uí</i>	[x] <i>uí</i>	<i>uí</i>	‘I went’

## 2. The Debuccalization hypothesis

As the examples above show, the following vowel conditions the occurrence of one or the other variant. To explain this phenomenon, I argue that there is a process of debuccalization (aspiration) that affects the labiodental [f] when followed by [-low] vowels, as shown in (3). With the [back] vowels /o u/ there is a subsequent velarization process, as represented in (4).

(3) [f] → [h] / \_\_\_\_\_ V [-low]

(4) [h] → [x] / \_\_\_\_\_ V [+back]

The debuccalization process is triggered by an OCP (obligatory contour principle)-driven constraint that disallows two consecutive segments bearing the same feature. In this case, both [f] and /u/ are [labial].<sup>3</sup> The debuccalization is then extended (by analogy) to the other labial vowel /o/, and it can eventually spread to the [front] vowels /i e/, in the case of more advanced speakers (see below). This process will be developed in detail in the Discussion Section.

The data on which this study is based were taken from three sociolinguistic interviews with native speakers of Corrientes Spanish conducted in June/July 2002. The interviewees, two men, Jose<sup>4</sup> (aged 50) and Miguel (31), and one woman, Maria (71), have low education and belong to the lower social class. In an earlier study of /s/ deletion in the same dialect of Corrientes Spanish (Mazzaro 2003), I explain in more detail how subjects were grouped into different sociolinguistic categories (i.e. social class, education, and age).

<sup>2</sup> The star is used to show reconstructed forms, these forms do not occur in the actual data.

<sup>3</sup> I am hereby assuming the feature organization of vowels as proposed by Clements and Hume (1995) and further discussed in Section 4 below.

<sup>4</sup> To guarantee anonymity, I am using pseudonyms instead of the speakers’ real names.

### 3. Results

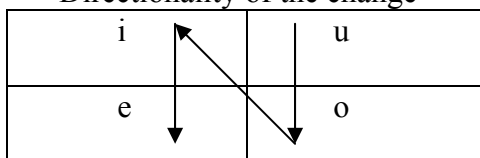
Table 1 shows the results for all the speakers; while the results for each of the speakers are represented in Appendix A:

	[f]		[h]		[x]		[Ø]		Total
	%	N	%	N	%	N	%	N	
_a	100	39							39
_e	86	18					14	3	21
_i	90	38	10	4					42
_o	85	17			15	3			20
_u	30	35			70	81			116

Table 1: Percentage of [f], [h], [x] and [Ø] according to following vowel for all the speakers

The results in Table 1 show a tendency towards a complementary distribution of the variants, with a high percentage of [x] (70 percent) before /u/ and a significantly lower percentage of [x] (15 percent) before /o/. While [h] occurs with the vowel /i/ (10 percent), [Ø] is the variant used with /e/ (14 percent), and [f] categorically appears with /a/. These results show that the debuccalization rule is variable and that it affects only [-low] vowels /e i o u/. The increased rate of [x] before /u/ suggests that the process originates with the [labial] vowel /u/ and that it gets extended to /o/ in a lesser extent. When the debuccalization rule reaches the [front] vowels, it seems to affect the [high] vowel /i/ first, which is evidenced by the higher percentage of debuccalization before /i/. The directionality of the change is illustrated in (5) below.

(5) Directionality of the change



### 4. Discussion

The change of /f/ to /x/ has often been analyzed as a case of alternation between members of the peripheral class (i.e. labials and dorsals vs. coronals) (Cho, 1991). In this paper, however, I argue that this alternation could be better explained as a case of debuccalization followed by a fortition process when the fricative precedes a back vowel.

Since the dissimilation process involves vowels and consonants, I use Clements and Hume (1995) model of Feature Geometry, in which consonants and vowels are classified by the same set of features. Their constriction-based model makes the following predictions, as shown in (6): it predicts that front vowels can form a natural class with [coronal] consonants, back vowels with [dorsal] consonants and [labial] consonants with round vowels.

<sup>5</sup> The higher percentage of [Ø] before /e/ cannot be taken as face value, since it is the same word uttered three times by the same speaker.

(6) Natural classes formed by consonants and vowels

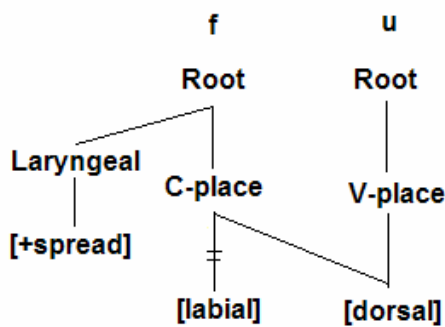
- [labial]: labial consonants ↔ rounded or labialized vocoids  
 [coronal]: coronal consonants ↔ front vocoids  
 [dorsal]: dorsal consonants ↔ back vocoids (Clements and Hume, 1995:277)

The features [labial], [coronal] and [dorsal] for vocoids replace the traditional features [back] and [round]. As stated before, placing vowels and consonants on the same tier and using compatible features for both make it possible to explain the processes of dissimilation (debuccalization) and assimilation (velarization) that involve vowels and consonants, as depicted in (7) below.

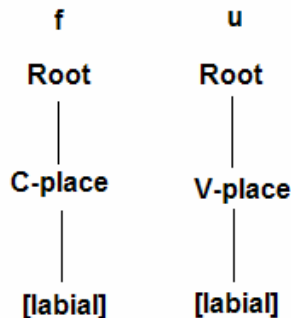
The trigger of the dissimilation process when [f] is followed by the back vowel /u/ is an OCP-driven constraint that prohibits two “adjacent identical elements” (McCarthy, 1988:88). Both, /f/ and /u/ are [labial], thus, to prevent an OCP violation by the adjacent [labial] features there is delinking of the place node of the consonant. Following Clements and Hume’s (1995) classification of vowels, I assume that /u o/ are fully specified as [labial] and [dorsal]. The [dorsal] feature of /u o/ spreads onto the preceding debuccalized segment.

(7) Derivation of [x]

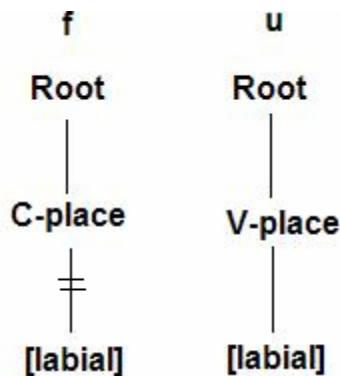
i. OCP Violation



ii Dissimilation



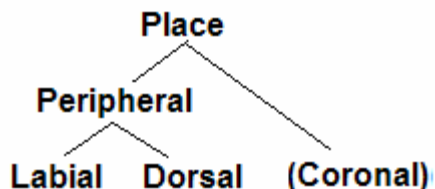
## iii. Dorsal Assimilation



I argue that the change of [f] followed by the [front] vowels /i e/ is an extension of the same rule that debuccalizes [f] when followed by the [back] vowels /u o/. The delinking of the place node of an [f] that precedes [front] vowels cannot be motivated by an OCP constraint, since the place features of [f] and /i e/ are not identical; [f] is [labial] and /i e/ are [coronal]. Thus, I argue that the process of debuccalization that affects the [front] vowels is not a different process, but an analogical extension of the same rule that debuccalizes [f] before /u o/. Further evidence to support this claim comes from the same dialect of Corrientes Spanish, where a process of aspiration that originally affected [s] before consonants (e.g., *politico[h] corruptos*, *e[h]tudiante*) has been likewise extended to other non-phonetically motivated environments, such as before vowels and pauses (e.g., *mi[h] amigo[h]*) (Mazzaro, 2003).

The lack of spreading of the [coronal] feature of /i e/ onto the preceding delinked segment is due to the fact that this feature is underspecified in the representation, and since it is not there, there is nothing to spread. In their article on laterality and coronality, Rice and Avery (1991) propose a model of Feature Geometry in which the [coronal] feature for consonants is underspecified, for those languages with one coronal articulation or where all coronal consonants pattern together. Assuming this model, the [coronal] feature is not present in the representation, but inserted by means of a “default rule in the phonetic implementation” (Rice and Avery, 1991:105). Their proposal is illustrated in (8), (irrelevant nodes have been omitted).

## (8) The internal organization of the Place node by Rice and Avery (1991:103)



This model was originally intended to explain processes that involve consonants only. To explain this change, however, I assume the same description for vowels and consonants, and propose that the [coronal] feature is underspecified in both of them. Thus, since the [coronal]

node is not present in the underlying representation of vowels, a subsequent spreading of this feature onto the preceding segment would not be expected to occur. This explains why [h] does not become an [s], for instance, when followed by /i/ or /e/.

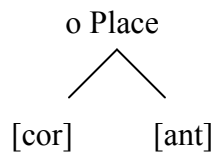
A second approach emanating from work by Cho (1991) considers the assimilation between labials and velars as the spreading of specified – and consequently marked – features to an adjacent, relatively unspecified segment. This model makes use of binary values for the features [coronal] and [anterior], which results in four natural classes, as represented in (9).

(9) The four places of articulation in Place of Articulation Theory (Cho 1991:161)

	Labials	Dentals	Palatals	Velars
Ant	+	+	-	-
Cor	-	+	+	-

Under this theory, the specified feature for labials is [-coronal], while velars are [-coronal, -anterior]. Cho (1991) argues that since velars are more marked than labials, they trigger assimilation but do not undergo the rule<sup>6</sup>. However, it is not clear how this theory can be applied to the assimilation that occurs between consonants and vowels, since the author only refers to assimilation between consonants. But, let us assume that the feature make up as presented in (10) can be used to characterize vowels as well.

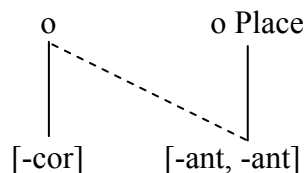
(10) Place of Articulation Theory (McCarthy 1988:99)



The model as depicted in (10) predicts that /o, u/, which are [-coronal, -anterior] will constitute a natural class as opposed to /e, i/, which are not specified for the features [coronal] and [anterior]. Since the central vowel /a/ satisfies none of these definitions, it will be treated as phonologically placeless (Clements and Hume 1995:277). Thus, the assimilation of [f] to [x] in Corrientes Spanish could be conceived as the spreading of specified [-anterior] feature of /o, u/ onto the neighbouring [f], which becomes [x] through acquiring the [-anterior] feature, as shown in (11).

<sup>6</sup> In a theory of underspecification, features that have positive values are considered unspecified for those values.

- (11) Assimilation rule spreading the [-anterior] feature of the back vowels /o, u/ onto the preceding labial consonant [f].



In contrast to the formulation in (7), there is no previous delinking under the present theory. In addition to this rule, there has to be another one that applies to [f] when followed by /e, i/, where there is only delinking of the place node of [f] but no spreading of features from the following vowels. In other words, it is necessary to propose two independently motivated rules to account for the change from [f] to [x] before /o, u/ and from [f] to [h] or [Ø] before /i, e/.

Besides being uneconomical, this proposal assumes that there are two unrelated processes acting upon /f/, assumption that seems rather inadequate when considering the historical account and parallel phenomena present in other Spanish dialects. As stated in the introductory section above, historically, the aspiration of [f] had the back vowels as its locus first and it was later generalized to the rest of the vowels. In addition, similar diachronic processes have been reported in various dialects of Spanish, such as the ones spoken in New Mexico and Colombia, where the velarization of /f/ occurs with all the vowels, not just the back ones: [x]amosa > *famosa* ‘famous’, ca[x]e > *café* ‘coffee’, di[x]icultad > *dificultad* ‘difficulty’, [x]orastero > *forastero* ‘foreigner’, [x]usil > *fusil* ‘gun’ (Quilis 1993:183). Based on this evidence, I have argued that there is one single debuccalization process that effects all [-low] vowels and a subsequent spreading of the [dorsal] feature of /u o/ onto the preceding delinked segment.

A final question to consider is whether this language change in progress in Corrientes Spanish is equally affecting all the lexical items that contain /f/, or whether it is occurring among more frequent words as opposed to less frequent ones, e.g. *fui* ‘I went’ (32 instances in 238 tokens) vs. *perfumeria* ‘drug store’, which occurred only once in all the interviews. The data collected so far indicate a strong tendency towards the debuccalization of the forms of the preterit of the verb *ir* ‘go’: *fui* ‘I went’, *fue* ‘s/he went’ and *fuimos* ‘we went’, which are the most frequently occurring words with /f/ in the interviews. They constitute 80 out of the 112 words with <fu>. This could be evidence for lexical diffusion (Wang 1977), which assumes that the process of sound change operates upon words. The opposing view has been raised by Neogrammarians, who argue that the significant unit affected by sound change is the phoneme, not the word. The evidence presented in this study, however, seems to suggest that this change is both “phonetically motivated and lexically gradual” (Wang & Cheng, 1977). Thus, while the results obtained so far have indicated that the debuccalization process affects /f/ when followed by [-low] vowels, the data have also shown that frequent words seem to undergo the change more quickly than infrequent ones, such as in the case with the past forms of the verb *ir* ‘go’.



## 5. Conclusion

The object of this study was to provide a phonological account of the processes of aspiration and velarization that affect /f/. I mentioned an OCP-driven constraint that disallows two [labial] features in a row as a plausible trigger of the dissimilation process. I argued that there is delinking of the [labial] feature of /f/ with subsequent spreading of the [dorsal] feature of /u/ onto the preceding delinked node. The debuccalization rule is then generalized to other vowels, except for /a/. This process goes in hand with what has occurred in the development of Castilian from Latin, where the debuccalization rule seemed to have had the [back] vowels as its locus first, being later extended to the rest of the vowels including /a/.

The analysis of this phenomenon allows us to see a change in progress and it helps us understand what happened with /f/ in the evolution of Castilian from Latin, where we only know the end result and can only hypothesize about the stages that lead to that change. One question that remains is whether /f/ is a case of a well-established sociolinguistic variable or whether it is a new sound change in progress in Corrientes Spanish. To answer this question, a proper variationist sociolinguistic analysis of this phenomenon should be carried out taking into consideration both linguistic and social factors. By increasing the number of speaker and tokens, it will be possible to determine with more precision the nature and extent of this change. Finally, it would be interesting to explore how this phenomenon fits within the system of fricatives in this dialect of Spanish, and how the rest of the system accommodates to such change.

## References

- Alarcos Llorach, E. (1951) Alternancia de f y h en los arabismos. *Archivum* 1, 29-41.
- Bybee, Joan. (2002) Word frequency and context of use in the lexical diffusion of phonetically conditioned sound change. *Language Variation and Change*, 14, 261-290.
- Cho, Y-M Y. (1991) On the Universality of the Coronal Articulator. In Paradis, C. y J-F Prunet (eds.), *Phonetics and Phonology: The Special Status of Coronals*. San Diego: Academic Press, pp. 101-124.
- Christy, C. (1983) *Uniformitarianism in Linguistics*. Amsterdam and Philadelphia: John Benjamins.
- Clements, G. N. y E. Hume (1995) The Internal Organization of Speech Sounds. In Goldsmith, J. (ed.) *The Handbook of Phonological Theory*. Cambridge: Blackwell, pp. 245-306.
- Lloyd, P. (1987) From Latin to Spanish. *Memoirs*, vol. 73. Philadelphia: American Philosophical Society.
- Mazzaro, N (2003) *Speaking Spanish with Style. A Sociolinguistic Analysis of /s/ in Corrientes, Argentina*. M.A. dissertation. Toronto, Canada: York University.
- McCarthy, J. (1988) Feature Geometry and Dependency. *Phonetica* 43, 84-108.
- Penny, R. (1991) *The History of the Spanish Language*, 2<sup>nd</sup> ed. Cambridge: CUP.
- Prince, A and P. Smolensky (1993) *Optimality Theory: Constraint interaction in generative grammar*. Ms., Rutgers University, New Brunswick and University of Colorado, Boulder. Report no. RuCCS-TR-2. New Brunswick, NJ: Rutgers University Center for Cognitive Sciences.
- Quilis, A. (1993) *Tratado de Fonética y Fonología Españolas*. Madrid: Editorial Gredos.
- Rice, K. y P. Avery (1991) Laterality and Coronality. In Paradis, C. and J-F Prunet (eds), *Phonetics and Phonology: The Special Status of Coronals*. San Diego: Academic Press, pp. 101-124.
- Wang, W. (1977) (ed.) *The Lexicon in Phonological Change*. The Hague: Mouton.
- Wang, W. and C.-C. Cheng (1977) Implementation of phonological change: The Shaungfen Chinese case. In Wang (ed.) *The Lexicon in Phonological Change*. The Hague: Mouton, pp. 86-100.

Appendix A: Percentage of [f], [h], [x] and [Ø] by speaker

<b>José</b>	<b>[f]</b>		<b>[h]</b>		<b>[x]</b>		<b>[Ø]</b>		<b>Total</b>
	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	
<b>_a</b>	100	15							15
<b>_e</b>	72	8					27	3	11
<b>_i</b>	88	24	11	3					27
<b>_o</b>	71	5			28	2			7
<b>_u</b>	20	8			79	31			39
<b>María</b>	<b>[f]</b>		<b>[h]</b>		<b>[x]</b>		<b>[Ø]</b>		<b>Total</b>
	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	
<b>_a</b>	100	4							4
<b>_e</b>	100	5							5
<b>_i</b>	55	5	33	1					6
<b>_o</b>	100	4							4
<b>_u</b>	16	6			83	31			37
<b>Miguel</b>	<b>[f]</b>		<b>[h]</b>		<b>[x]</b>		<b>[Ø]</b>		<b>Total</b>
	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	
<b>_a</b>	100	20							20
<b>_e</b>	100	9							9
<b>_i</b>	100	9							9
<b>_o</b>	88	8			11	1			9
<b>_u</b>	52	21			48	19			40