On the Position of Frequency Adverbs in Spanish[*]

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The variation in position that certain types of adverbials experience in Spanish, such as frequency adverbs, is hardly describable when assuming very rigid syntactic structures. Instead, it might be interesting to give an account of this phenomenon which includes several factors that work together to bring about this adverbial alternation. Such variationist approach can shed some light on a subject traditionally avoided because of its complexity. This is the method adopted here, where variables such as weight, which has been claimed to be a typological universal, will be examined to determine if they influence the collocation of constituents in the sentence. The presence of an overt subject and its surface position are also studied here as a possible trigger for the change of position. The use of the online *Corpus de Referencia del Español Actual* (CREA) ensures that the data included in this research represents actual usage of modern Spanish. The significance of the analysis is guaranteed by the use of the Pearson's Chi-Square test applied to crosstabulation tables.

1. Introduction

The study of adverbs and adverbial expressions in Romance has traditionally been avoided because of its complexity. Some of the reasons that originate this complexity are (i) the many different types of adverbs that exist in any given language –many of them with a very different syntactic and semantic behavior– and (ii) the multiple positions in which they can occur in the sentence. Some accounts have tried to relate adverbial position to the existence of different syntactic structures. Cinque (1999) and Fernández Lagunilla & Anula Rebollo (1995), for example, tried to make generalizations on classes of adverbs by relating differences in meaning with the presence of different underlying syntactic nodes and aspectual projections, where the adverbs would originate. However, both of them failed when describing adverbs such as *frecuentemente* "frequently", because they can appear in different positions without a necessary change in meaning.

Apart from purely syntactic approaches, it is also possible to address this issue from a variationist point of view. Variation studies try, on the one hand, to make generalizations on actual data taken from corpora or from direct speech. On the other hand, they test the validity of their hypothesis by utilizing statistical tools, like the program SPSS used for this research. This approach is based on the belief that many different factors can interact at the same time to create a certain output.

In this paper, I apply a variationist approach to explain the diversity associated with the position of adverbial expressions that denote frequency in Spanish. First, I try to determine if argumenthood and weight, understood as the number of sentences that form a certain constituent, can influence the ordering of postverbal adverbials. Second, I test whether the position of the co-occurring subject is important to determine the collocation of preverbal constituents in the sentence. And finally, I provide different conclusions and generalizations derived from the results obtained.

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2. Weight and Argumenthood

Spanish frequency adverbs like *frecuentemente* "frequently" show a great variability as far as their position is concerned. They can appear in preverbal and postverbal positions, and basically everywhere in the sentence. Let's examine the different possibilities. The examples are taken from the online *Corpus de Referencia del Español Actual* (CREA).

1) Before a co-occurring XP in preverbal position

(1) a. 'Frecuentemente   los miembros de las comunidades   reciben cursos de protección
        Frequently   the members of the communities   receive   courses of protection
     ambiental.'
     environmental
     [*Prensa libre*, 26/06/1996: '150 familias refugiadas en al sel', Guatemala.]

     b. 'Frequently the members of the communities receive courses on environmental
        protection'.

2) After any co-occurring preverbal XP:

(2) a. 'Los agentes del SIN   frecuentemente   realizan redadas en empresas…'
        the agents of-the SIN   frequently   realize   raids   on companies…
     [*Excelsior*, 01/11/1996: 'Mexicanos, los Inmigrantes Ilegales' Mexico.]
     b. 'The SIN agents frequently carry out raids on companies…'

3) Preceding any co-occurring postverbal XP, immediately adjacent to the verb:

(3) a. 'la actividad del citado empresario   transciende   frecuentemente   el mero
        the activity of-the cited businessman   transcends   frequently   the mere
     aspecto comercial'
     aspect commercial
     [*Época*, 27/10/1997: 'La persistente paradoja argentina', Spain.]
     b. 'The activity of the aforementioned businessman frequently transcends the merely
     commercial aspect'.

4) Following any co-occurring postverbal XP, at sentence final position:

(4) a.'…pero esto   hace   que   se posponga   incluso se pierda   el hilo
            but   this   makes that   CLITIC-postpone   even   CLITIC-lose the thread
     argumental o narrativo   frecuentemente'
     argumental or narrative   frequently
     [*ABC Cultural*, 20/12/1996: 'La del alba sería', Spain.]
     b. '…but this makes postpone even lose the line of the plot or narration frequently'.

In all the previous examples, the position of the adverb does not affect the meaning of the sentence. The event described would still be the same, irrespective of position. For instance, we can take any of the previous examples and change the position of the adverbial, the event described would be identical.
    The position of these Spanish adverbials constitutes a challenge for the linguistic models which claim that adverbial expressions have a fixed position in the syntactic tree, let's call them syntactic approaches (SAs). In order to maintain that the underlying representation of adverbials is always the same, SAs need to assume a wide variety of movements, which can hardly be motivated. A more open approach that is able to consider different factors as the triggers for variation could be a better way to explain phenomena such us the one discussed here (see for example Hawkins (2000) and Wasow and Arnold (2003)). The latter is the line of research that I will follow.

2.1. Method

I have considered two factors that might influence the ordering of adverbials: weight and argumenthood. The way in which I will determine if these factors are relevant is through the use of the statistical tool SPSS and Pearson's χ^2 test.

The dependent variable is the position of adverbs, whose four variants are instantiated in examples (1) to (4). The adverbials that I will examine are the following: *frecuentemente* "frequently", *en muchas ocasiones* "on many occasions" and *en más de una ocasión* "on more than one occasion". They represent instances of adverbial expressions that share a similar meaning, denoting frequency, but they have a different number of words, which will be necessary if we want to determine the importance of weight. All of them can appear in the 4 distributions seen above.

2.2 Hypothesis

My main interest is to determine, on the one hand, if weight has an influence on the ordering of these adverbials. This is why I have chosen three expressions containing a different number of words. On the other hand, I will also examine the importance of argumenthood. I will follow Hawkins (2000) for the definitions of both terms.

Definition of weight:
    -I will follow Hawkins (1994, 1919, 2000 …) and consider that weight is determined by the number of words that a certain constituent has. A higher number of words will increase the weight of the constituent.
    -The concept of weight is linked to a universal preference to Minimize Domains 'the fewer words and nodes that need to be processed simultaneously in order to reach a given processing decision, the better' (Hawkins 2000).

Lexical dependencies can also determine preferences in constituent ordering. An argument will tend to appear near the verb it modifies, and *vice versa*. In this sense, the definition of 'argumenthood' is crucial for my study.

Definition of argumenthood or Dependency
I will take into account the following principles:

1. Subjects, direct objects (NPs or IPs/CPs like 'comer' in [V *quiero* [IP *comer*]] 'I want to eat'), indirect objects are arguments.

2. Prepositional Phrases:
2.a. Directional PPs (Direction / Source expressions (D/S) in Hawkins' terms) are considered arguments. Hawkins (2000) showed that they tend to appear immediately adjacent to the verb. In this sense, they do not behave like adjuncts, but like internal arguments.
2.b. Again, I will adopt Hawkins' (2000) definition of lexical dependency, which I name argumenthood in this research. He describes two different kinds of dependencies between Vs and PPs:

    1) The interpretation of the verb might depend on the co-appearance of another element, and *vice versa*. Two different tests can be used:

        (5) Verb entailment test
            "If [X V PP PP] entails [X V], then assign Vi
            If not, assign $V_{d\dots}$." (op. cit: 242)
            In the previous definition, Vi means 'independent verb', which is a verb whose interpretation does not depend on the appearance of any other element, while V_d refers to a dependent verb that needs a PP to be interpreted.

Ex:

John waited for Mary entails *John waited'*, so *wait* is Vi.

John accounted for this fact in his book does not entail *John accounted*. So *account* is V_d.

(6) Pro-verb entailment test

If [X V PP] entails [X Pro-V PP] or [something Pro-V PP] for any pro-verb sentence listed below, then assign P_i.

If not. Assign P_d.

Pro-verb sentences: X *did something* PP; X *was* PP; *something happened* PP; *something was the case* PP; *something was done* (*by* X) PP. (op. cit: 242-243)

The term dependent preposition (P_d) refers to a preposition whose interpretation depends on the meaning, while independent preposition (P_i) is used to indicate that the PP headed by that preposition is independent from the event expressed by the verb.

Ex:

John played on the playground entails *John did something on the playground*, so *on the playground* is P_i.

3. Postverbal APs (adjectival phrases with a predicative use) are considered arguments here, since they are necessary for the interpretation of the sentence where they appear. Examples of such APs are *tall* and *red* in the following sentences:

(5) a. John is <u>tall</u>.
    b. John gets <u>red</u> easily.

2.3. The tests

In order to find out what is the influence that argumenthood and weight may have on the ordering of adverbial expressions, I have coded 811 sentences containing the three adverbial expressions mentioned above. I have taken into account the number of words in all the co-occurring constituents, both in preverbal and postverbal positions. The reason why I coded the weight of preverbal constituents too is because it might be the case that it also influences the final arrangement of preverbal constituents, when there is more than one. If this is the case, it would be interesting to determine if the heavy elements will tend to appear near the verb or at the beginning of the sentence.

If weight is in fact a universal principle, the results should show that as we increase the number of words in a certain constituent, *i.e.*, when weight increases, the heavier constituent will tend to appear to the right of the sentence in a higher percentage of appearances.

When it comes to the influence of argumenthood, Hawkins (2000) and Wasow et al. (2003), for example, have shown how arguments tend to appear immediately adjacent to the verb. These two forces should interact to decide the final output.

These are the variables I am taking into account:

1. Dependent variable: Position of adverbs:
- Before XP in Prev.   b
- Adjacent to the left of the verb   l
- After XP in Postv.   a
- Adjacent to the right of the verb   d

2. Weight of co-occurring postverbal XP
- XP with 1 or 2 words   1
- XP with 3 or 4 words   3
- XP with 5 or 6 words   5
- XP with 7 words or more   7
- No co-occurring XP   z

3. Weight of co-occurring preverbal XP
- XP with 1 or 2 words   2
- XP with 3 or 4 words   4
- XP with 5 or 6 words   6
- XP with 7 words or more   m
- No co-occurring XP   c

4. Argumenthood of postverbal XP
- XP argument   r
- XP non-argument   n
- No XP   i

5. Argumenthood of preverbal XP
- XP argument   s
- XP non-argument   x
- No XP   p

6. Adverbs
- Frecuentemente   f
- Con mucha frecuencia   e
- En más de una ocasión   +

From the 811 sentences annotated, only 621 have been selected for the final analysis. Sentence selection and coding take into account the following principles:

a. When there is more than one co-occurring constituent in preverbal position, apart from the adverbial expression, I will only count the subject. But if there is no overt subject, then I will count the leftmost one.
b. When there is more than one co-appearing constituent in postverbal position, apart from the adverbial expression, I will only count the leftmost one.
c. I consider 'c' (zero tokens, no-count) the preverbal arguments that are *wh-* forms, since they must appear at the very beginning of the sentence, and there is no variation in that.
d. I have not taken into account any phrase or element that appears between commas, since it is widely known that we can insert a pause anywhere in the sentence to introduce a comment, and there is no clear knowledge about the underlying representation of such inserted constituents. However, appositions (nouns describing nouns) and clauses modifying another element (like defining relative clauses) add their weight to the antecedent[1].
e. Clitics were not counted as constituents in the sentence, since its position is obligatorily immediately adjacent to the left of the verb.

2.3.1. Results: weight effects

All the studies on the importance of weight have centered their efforts in determining the influence of such typological universal on the position of postverbal constituents. As far as I know, there is no research on the effects of weight on preverbal XPs. However, applying cross-tabulations to the data obtained from the corpus CREA, we can determine that weight seems to somehow influence the position of adverbial expressions even in preverbal position. Table 1 shows that the two positions adjacent to the verb seem to be the default positions for frequency adverbs, being the place to the right the preferred one, and the one to the left slightly dispreferred. However, when weight increases there seems to be a higher independency from the verb, and other positions become more frequent.

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[1] These clauses are clearly recognized because they must occur immediately following the antecedent, so their position is not free. Furthermore, adding elements in between the antecedent and the apposition/modifying clause yields an ungrammatical sentence or degrades the acceptability.

When we only pay attention to postverbal positions, the Pearson's Chi-Square test considers statistically significant the effects of adverbial weight, as table 2 shows. Remember that a hypothesis is considered relevant when p = 0.05 or lower.

Apart from the weight of the adverbials themselves, I also tested the influence of co-occurring XPs in both preverbal and postverbal positions. My intention was to determine the importance of the weight of these elements.

Table 1

Position of adverbials * Type of adverb Crosstabulation

			Type of adverb			
			En más de una ocasión	En muchas ocasiones	Frecuente mente	Total
Position of adverbials	After XP in postverbal position	Count	64	9	4	77
		% within Type of adverb	15.2%	9.0%	4.0%	12.4%
	Before XP in preverbal position	Count	26	9	2	37
		% within Type of adverb	6.2%	9.0%	2.0%	6.0%
	Adjacent to the right of the verb	Count	176	50	63	289
		% within Type of adverb	41.8%	50.0%	63.0%	46.5%
	Adjacent to the left of the verb	Count	155	32	31	218
		% within Type of adverb	36.8%	32.0%	31.0%	35.1%
Total		Count	421	100	100	621
		% within Type of adverb	100.0%	100.0%	100.0%	100.0%

Table 2

Crosstab

			Type of adverb			
			En más de una ocasión	En muchas ocasiones	Frecuente mente	Total
Position of adverbials	After XP in postverbal position	Count	64	9	4	77
		% within Type of adverb	26.7%	15.3%	6.0%	21.0%
	Adjacent to the right of the verb	Count	176	50	63	289
		% within Type of adverb	73.3%	84.7%	94.0%	79.0%
Total		Count	240	59	67	366
		% within Type of adverb	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.922[a]	2	.001
Likelihood Ratio	17.527	2	.000
N of Valid Cases	366		

[a.] 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.41.

In table 3 we can observe that the weight of co-occurring XPs in postverbal position has also influence on the final location of postverbal adverbials. Again Pearson's Chi-Square shows the high relevance of these data (p = 0.0001). However, SPSS also makes explicit that weight does not seem to influence the disposition of constituents in preverbal positions, which is shown in table 4. We had already seen that the weight of adverbials has only an indirect effect on position, contributing to the separation from the right side of the verb.

In this situation it is necessary to consider other factors that might trigger movement to preverbal positions.

Table 3

Position of adverbials * Weight of postverbal XP Crosstabulation

			Weight of postverbal XP			
			Postverbal XP with 1 or 2 words	Postverbal XP with 3 or 4 words	Postverbal XP with 5 words or more	Total
Position of adverbials	After XP in postverbal position	Count	31	8	6	45
		% within Weight of postverbal XP	66.0%	23.5%	8.2%	29.2%
	Adjacent to the right of the verb	Count	16	26	67	109
		% within Weight of postverbal XP	34.0%	76.5%	91.8%	70.8%
Total		Count	47	34	73	154
		% within Weight of postverbal XP	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	46.769[a]	2	.000
Likelihood Ratio	47.207	2	.000
N of Valid Cases	154		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.94.

2.3.2. Results: argumenthood

The effects of lexical dependencies on constituent ordering have been a common issue in the variationist and typological approaches. As an example, linguists like Hawkins (2000) and Wasow and Arnold (2003) showed that argumenthood has a clear influence when determining the collocation of PPs and NPs in postverbal position, as long as weight differences are not involved. However, the data analyzed here, represented in table 5, show that adverbial expressions are not influenced by the argument or adjunct nature of any co-occurring XPs.

In preverbal position, argumenthood does not seem to have a clear influence either, but it would be necessary to analyze more data, since it is not common to find adverbs in preverbal position that are accompanied by another preverbal XP.

2.4. Conclusions

In the previous discussion, we have analyzed the effect that argumenthood and weight have on the ordering of constituents. To be precise, the Chi-Square test showed that argumenthood has no relevance when describing position of adverbial expressions. However, adverbial position could not escape the universal effect of weight. In this sense, the number of words that form both the adverbials and any co-appearing XPs has a clear influence on the final disposition of elements in the clause: the heavier the element, the more likely it is that it appears at the end of the sentence. This is clear in postverbal positions, but we have also seen that preverbal positions can only be influenced by weight in an indirect way. Adverbials tend to appear immediately adjacent to the right of the verb, although when weight increases the chances that the adverb will appear in other positions grow.

At this point, we understand quite well what determines the position of postverbal adverbials. We also know that the second most 'popular' position for adverbial expressions is immediately adjacent to the left of the verb, but we need a clearer understanding of the reasons that trigger this leftward movement. Thus, the next section will deal with the importance of the occurrence of overt subjects in Spanish.

Table 4

Position of adverbials * Weight of preverbal XP Crosstabulation

			Weight of preverbal XP			
			Preverbal XP with 1 or 2 words	Preverbal XP with 3 or 4 words	Preverbal XP with 5 words or more	Total
Position of adverbials	After XP in postverbal position	Count	22	11	12	45
		% within Weight of preverbal XP	19.1%	24.4%	25.5%	21.7%
	Before XP in preverbal position	Count	17	8	9	34
		% within Weight of preverbal XP	14.8%	17.8%	19.1%	16.4%
	Adjacent to the right of the verb	Count	64	21	24	109
		% within Weight of preverbal XP	55.7%	46.7%	51.1%	52.7%
	Adjacent to the left of the verb	Count	12	5	2	19
		% within Weight of preverbal XP	10.4%	11.1%	4.3%	9.2%
Total		Count	115	45	47	207
		% within Weight of preverbal XP	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.421[a]	6	.754
Likelihood Ratio	3.709	6	.716
N of Valid Cases	207		

a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 4.13.

3. Overt subjects

When other hypothesis failed, the mere inclusion of a single variable can shed light on the problem of preverbal adverbials. At this point I have added to the analysis 139 sentences more, pertaining to another one word adverbial, *diariamente* "daily", whose inclusion will be justified in the next section.

Table 6 shows that when the subject appears before the verb, the adverbial expressions will only appear in preverbal position in a 19% of the cases. However, when the subject is in postverbal position or omitted, the chances of having preverbal adverbials increase to 45% approximately. Table 7 shows that the importance of subject ordering is statistically significant when determining if preverbal adverbials will occupy the position adjacent to the left of the verb or before any co-occurring XP in preverbal position. In this respect, Pearson's Chi-Square shows a significance of p = 0.0001. Table 7 also indicates that when there is an overt preverbal subject, the adverbials will tend to precede it in a 72.9% of the cases. When the subject is omitted or in postverbal position, the adverbial will prefer to appear immediately adjacent to the left of the verb.

Table 5

Position of adverbials * Argumenthood of postverbal XP Crosstabulation

| | | | Argumenthood of postverbal XP | | |
			Co-occurring postverbal XP is non-argumental	Co-occurring postverbal XP is argumental	Total
Position of adverbials	After XP in postverbal position	Count	15	62	77
		% within Argumenthood of postverbal XP	25.9%	29.4%	28.6%
	Adjacent to the right of the verb	Count	43	149	192
		% within Argumenthood of postverbal XP	74.1%	70.6%	71.4%
Total		Count	58	211	269
		% within Argumenthood of postverbal XP	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.276[b]	1	.599		
Continuity Correction[a]	.131	1	.718		
Likelihood Ratio	.280	1	.596		
Fisher's Exact Test				.743	.363
N of Valid Cases	269				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.60.

Table 6

Position of adverbials * Subject position Crosstabulation

| | | | Subject position | | | |
			Omitted	Postverbal	Preverbal	Total
Position of adverbials	After the verb	Count	189	27	205	421
		% within Position of adverbials	44.9%	6.4%	48.7%	100.0%
		% within Subject position	55.1%	52.9%	81.0%	65.1%
		% of Total	29.2%	4.2%	31.7%	65.1%
	Before the verb	Count	154	24	48	226
		% within Position of adverbials	68.1%	10.6%	21.2%	100.0%
		% within Subject position	44.9%	47.1%	19.0%	34.9%
		% of Total	23.8%	3.7%	7.4%	34.9%
Total		Count	343	51	253	647
		% within Position of adverbials	53.0%	7.9%	39.1%	100.0%
		% within Subject position	100.0%	100.0%	100.0%	100.0%
		% of Total	53.0%	7.9%	39.1%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	46.640[a]	2	.000
Likelihood Ratio	48.966	2	.000
N of Valid Cases	647		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.81.

This last statement is derived from the fact that when there was more than one preverbal XP, I only included the subject, ignoring any other co-occurring XP.

The data provided in table 8 show that the influence of overt subjects on postverbal constituents is irrelevant. So, we can derive that subject position only affects the ordering of preverbal constituents. The reasons for this will be analyzed in the last section.

Table 7

Position of adverbials * Subject position Crosstabulation

			Subject position			Total
			Omitted	Postverbal	Preverbal	
Position of adverbials	Before XP in preverbal position	Count	3		35	38
		% within Subject position	1.9%		72.9%	16.8%
	Adjacent to the left of the verb	Count	151	24	13	188
		% within Subject position	98.1%	100.0%	27.1%	83.2%
Total		Count	154	24	48	226
		% within Subject position	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	137.198[a]	2	.000
Likelihood Ratio	119.080	2	.000
N of Valid Cases	226		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.04.

Table 8

Position of adverbials * Subject position Crosstabulation

			Subject position			Total
			Omitted	Postverbal	Preverbal	
Position of adverbials	After XP in postverbal position	Count	30	7	43	80
		% within Subject position	15.9%	25.9%	21.0%	19.0%
	Adjacent to the right of the verb	Count	159	20	162	341
		% within Subject position	84.1%	74.1%	79.0%	81.0%
Total		Count	189	27	205	421
		% within Subject position	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.562[a]	2	.278
Likelihood Ratio	2.539	2	.281
N of Valid Cases	421		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.13.

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4. Are all frequency adverbials similar?

As mentioned before, adverbials are a very heterogeneous group, which includes different types of parts of speech and syntactic phrases, like PPs or NPs. The question here is whether the previous analysis is a valid generalization for all the different types of adverbials that denote frequency. Because of this, I have added to this analysis another one word adverb, *diariamente* "daily", which

was already introduced in the previous section. Other adverbials with a behavior that is similar to *diariamente* are *todos los días* "every day", *todas las mañanas* "every morning",… It is beyond the scope of the present paper to analyze in detail every single XP that can have a frequency interpretation. In fact, this task could be the topic of a whole book. But here I have compared this short adverbial with *frecuentemente* "frequently". Unlike *frecuentemente*, adverbials such as *diariamente* have been claimed to have a stronger tendency to appear in postverbal positions. In charts 1 and 2 we compare their distribution in the sentence.

Chart 1

Frecuentemente

Position of adverbials

Left of V
31.0%

After postv. XP
4.0%

Before prev. XP
2.0%

Right of V
63.0%

Chart 2

Diariamente

Position of adverbials

Left of V
20.1%

After postv. XP
7.2%

Before prev. XP
.7%
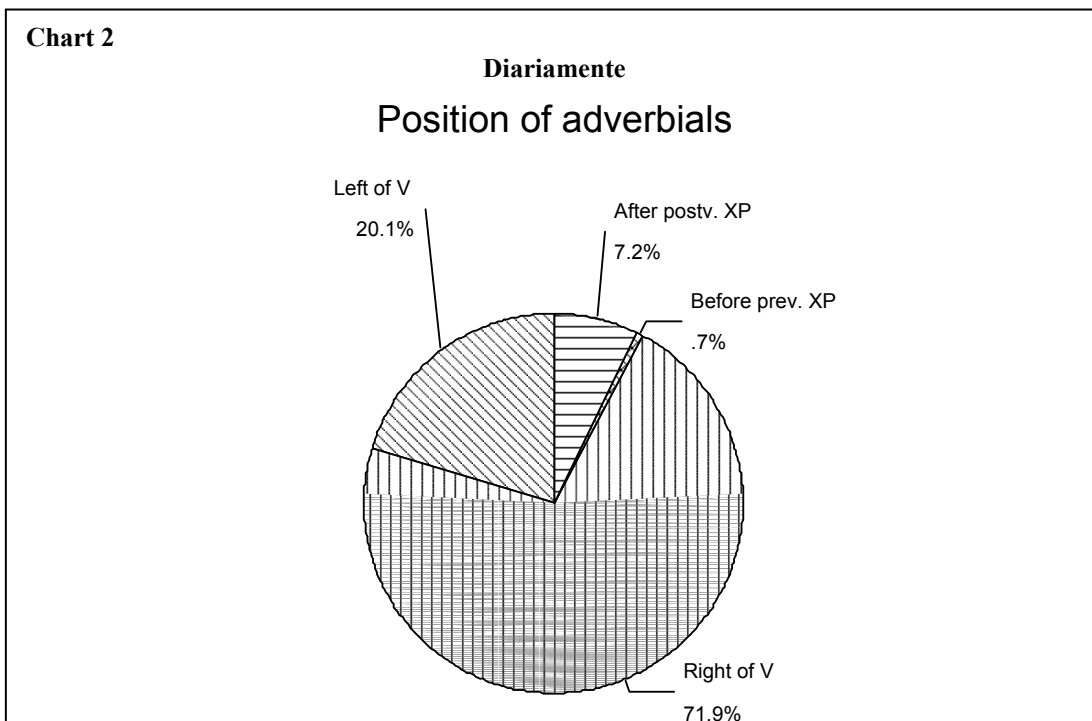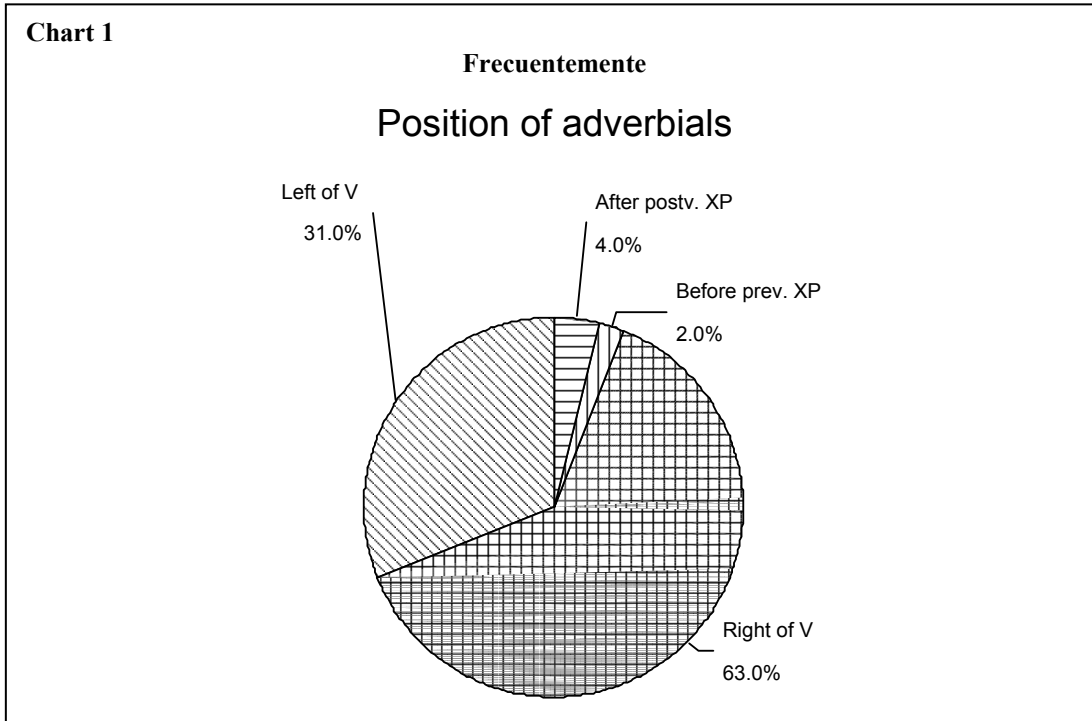
Right of V
71.9%

It seems true that *diariamente* shows a stronger tendency to appear in the positions to the right of the verb. However, this does not invalid the conclusions drawn in the previous sections. In table 9 we can see how *diariamente* follows the weight trend proposed above, but increasing the percentages of attachment to the right of the verb.

What table 9 shows is that there are lexical particularities, and this is a fact that is widely known and whose effects have been considered, for example, in the studies realized by Wasow and Arnold (2003). But again, a deep study of the singularities that show particular adverbials is not the aim of this research paper. Here we tried to provide a generalization of the principles that determine the ordering of frequency adverbials, although we are aware of the fact that not all words behave in exactly the same way and follow the tendencies with the same strength.

Table 9

Position of adverbials * Type of adverb Crosstabulation

| | | | Type of adverb | | | | |
			En más de una ocasión	En muchas ocasiones	Frecuente mente	Diariamente	Total
Position of adverbials	After XP in postverbal position	Count	64	9	4	10	87
		% within Type of adverb	15.2%	9.0%	4.0%	7.2%	11.4%
	Before XP in preverbal position	Count	26	9	2	1	38
		% within Type of adverb	6.2%	9.0%	2.0%	.7%	5.0%
	Adjacent to the right of the verb	Count	176	50	63	100	389
		% within Type of adverb	41.8%	50.0%	63.0%	71.9%	51.2%
	Adjacent to the left of the verb	Count	155	32	31	28	246
		% within Type of adverb	36.8%	32.0%	31.0%	20.1%	32.4%
Total		Count	421	100	100	139	760
		% within Type of adverb	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	54.753[a]	9	.000
Likelihood Ratio	58.917	9	.000
N of Valid Cases	760		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.00.

5. Syntactic implications
5.1. Facts

Once the different positions of frequency adverbials have been analyzed, we can provide a summary of the results and make a generalization about constituent ordering.

The first thing observed is that the most frequent position for adverbs is the right margin of the verb, while the second most 'popular' is the left edge of the verb. Both positions together add up to 81.6% of the total occurrences.

Second, we saw with respect to argumenthood that it does not have a clear influence on ordering, neither in preverbal nor postverbal positions. The implications of this will be discussed later.

Third, the analysis of weight effects on adverbial ordering showed that this factor has a significant effect on postverbal positions. In this sense, the number of words that forms a given adverbial expression denoting frequency interacts with the number of words that form any possible co-occurring constituent to determine the final output. The heaviest element will tend to be placed in sentence final positions. We also saw that increasing the weight of the adverbial expressions contributes to its separation from the default position, which seems to be the right edge of the verb.
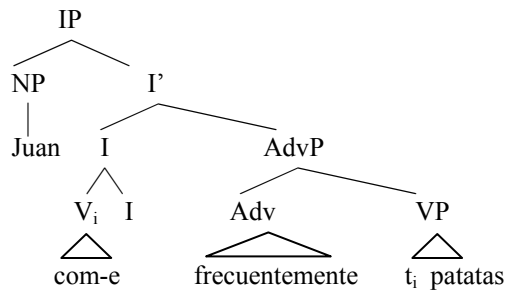
Eventually, since none of the hypothesis tested before could predict the ordering of adverbials in preverbal position, there was need to add a new factor: subject position. This factor proved to have a significant influence on the appearance of preverbal adverbials in the following way:

- When there is an overt subject in preverbal position, the adverbials will tend to appear in postverbal position.
- When the subject is located after the verb or when it is omitted (*pro*), there is a direct increase in the number of occurrences of preverbal adverbials. This effect was considered statistically significant.

5.2. Putting things together

Now it is time to provide a generalization about the behavior of frequency adverbials. If we assume that there is V-movement to INFL in Spanish, as it has been traditionally assumed, we can derive that the default position of the adverbial expressions is in a functional projection somewhere between IP and VP. The result of this would be a sentence in which the adverbial is placed to the right of the verb, between the verb and any following constituent.

(6) Juan   come   frecuentemente   patatas.
    Juan   eats   frequently   potatoes
    'Juan frequently eats potatoes'.

```
                    IP
                  /    \
                NP      I'
                |      /  \
              Juan    I    AdvP
                     / \   /   \
                   Vi  I  Adv   VP
                   /\      /\    /\
                com-e  frecuentemente  ti patatas
```

The reason why the argumental condition of any co-occurring XP in postverbal position does not seem to influence the final ordering might be due to the fact that there is no syntactic competition between the adverbial and the other arguments. The tree in (6) shows the most neutral position for adverbs and argumental NPs, in which both constituents occupy the positions where they are base generated. There is no real competition to occupy any syntactic position in the tree.

Then, what can motivate the appearance of adverbials elsewhere? To answer this question is necessary to take into account different explanations. Let's begin with the motivation for a rightwards movement of the adverb. In previous sections we saw that both the weight of the adverbial and any co-occurring XP can determine the final ordering. The heavier element will tend to appear more to the right. This hypothesis was considered statistically significant by Pearson's Chi-Square. However, this same test showed that weight has no influence on preverbal positions.

At this point, the variable subject position was added to the analysis, and we learned that the occurrence of preverbal subjects decreased the percentage of appearance of adverbials in preverbal position. However, when encountered with a postverbal or omitted subject, there was a significant increase of preverbal adverbials. But why should this be so?

It is a common tendency in the literature to believe that Spanish overt subjects are adjuncts to INFL, rather than [spec, IP], while there is always a *pro* in [Spec, IP] position, independently from the appearance of an overt subject (see for example Fernández Soriano (1989)). If we take into account that there seems to be some kind of incompatibility between the appearance of overt subjects and preverbal frequency adverbials, we might think that there is some kind of competition to occupy a certain position in the tree, in this case the specifier position of IP. Even if it is possible to have overt subjects and adverbials co-occurring in preverbal position, this seems to be very unlikely, if we accept the analysis provided in previous sections. Otherwise, it would be difficult to explain why adverbials, which appear in preverbal positions in 41.1% of occurrences (see table 1), only co-appear in preverbal positions with a preverbal subject in 19.0% of the sentences studied here (see table 6).

Another interesting point is that the appearance of preverbal adverbials seems to be linked to the absence of the subject in that same position. My claim is that this fact is directly related to the

necessity of occupying certain syntactic positions when they are empty. In this sense, this would be related with another common topic in the literature: dative and locative subjects (see Fernández Soriano (1999) for an interesting discussion of this topic). In (7) I included an example of the so called 'locative subjects'.

(7)   Under the rug is a good place to leave the keys.

As far as preverbal position is concerned, frequency adverbs seem to behave more like subjects, since they tend to appear immediately adjacent to the left of the verb. Both frequency adverbials and overt NP subjects would be specifiers (or adjuncts) to IP.

Finally, it is necessary to give an account of the other positions available: before co-appearing XP in preverbal position and after co-appearing XP in postverbal position. We saw that the appearance of overt subjects in preverbal position decreases the possibilities of having preverbal frequency adverbials. However, out of 647 sentences containing the first three adverbials examined here, there are still 38 sentences in which adverbials and subjects appear together in preverbal position. When this happens (see table 7), the subject will appear after the adverbial in 72.9% of the cases.

A possible way to account for this fact, following the lines of the current proposal, would be to posit that the overt subject will normally occupy the lower specifier position of IP, possibly because of case assignment and interpretation, and co-indexation requirements. The cases in which the adverbial shows a lower position are very uncommon, being this due to the reasons just stated.

The only position that still needs an explanation is the one in which the adverbial is located after a co-appearing postverbal XP. In the current discussion, we saw the importance of weight, considered statistically very significant in postverbal positions. In this situation, we might expect that increasing the weight of the adverbial will imply a higher number of appearances in this final position. The interaction with the weight of the co-appearing XPs will give place to a very wide range of possibilities. From a syntactic point of view, we might be describing a phenomenon similar to the one known as 'heavy NP shift', but in this case, the category that shifts positions is the adverb.

6. Recapitulating

One of the purposes of this paper is to include the use of the variationist approach to formal grammar, in particular generative syntax. Using statistical tools and data obtained from the Spanish corpus CREA, I was able to find different factors that can successfully describe ordering in more than 700 sentences containing the four frequency adverbials included in this analysis: *frecuentemente* "frequently", *en muchas ocasiones* "on many occasions", *en más de una ocasión* "on more than one occasion" and *diariamente* "daily". **Weight** and the **occurring of an overt subject** were shown to be triggers for position alternation, and their relevance was proven to be statistically significant.

These factors have a considerable influence on the ordering of frequency adverbial expressions, but it is necessary to inscribe this description inside a theory of language, to be able to, not only describe data, but also to explain the reasons that motivate variation. Following these principles, I made a generalization about the syntactic position of adverbials, which should be base generated in a functional projection between IP and the higher VP (if there are several VPs). These adverbial expressions that denote frequency could also appear adjoined to IP with a function similar to locative subjects.

The cases in which adverbs appear after a co-occurring postverbal XP, are due, in most cases, to weight effects and 'Heavy XP shift', rather than 'Heavy NP shift'.

Furthermore, it is necessary to remember that the study developed in this paper is inscribed in the line of research followed by variationist approaches, where several factors work together to bring about the final output, which is constituent ordering in this case. Apart from the factors described here, it would be wise to include others such as 'ambiguity avoidance', 'old/new information',… and many others that have already been taken into account in modern research (Wasow and Arnold (2003) analyze a great deal of these hypothesis to determine their influence on constituent ordering).

The contribution of this paper lies in the fact that weight has been determined to have an influence also on AdvPs and PPs that have traditionally been considered adjuncts in many cases. We have shown that they might behave like real subjects in preverbal position. We have analyzed in detail the multiplicity of orderings that these expressions display and determined that their base position is in a functional projection between IP and the higher VP. Finally we have analyzed the importance of a factor that had never been considered as an element that can determine the ordering of adverbials: subject position.

Eventually, I would like to suggest that the adoption of less rigid syntactic structures and the inclusion of different factors as triggers of the alternation can provide more reliable results. If we add the scientific help of statistical tools and the thorough analysis of considerable amounts of data, we will be building on very stable and solid grounds and the final hypothesis will have an unquestionable scientific value.

Derived from the previous argument, I would like to suggest that modern syntactic theory should include processes such as 'Heavy XP shift', a much more generalizing version of 'Heavy NP Shift', and incorporate the well known effects of this typological universal into the theory in a systematic way.

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