

INFORMATION FOCUS, SYNTACTIC WEIGHT AND POSTVERBAL CONSTITUENT ORDER IN SPANISH

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ABSTRACT. In Spanish, postverbal constituents – such as direct object, locative adjunct or depictive – can be ordered in different ways (e.g. *Juan bailó desnudo en su casa* vs. *Juan bailó en su casa desnudo*). The present paper examines two possible factors for postverbal constituent order: information focus and syntactic weight. Based on data from a perception experiment it will be shown that information focus and syntactic weight indeed influence in postverbal constituent order in Spanish: both the focalization of a constituent and the increase of the weight of a constituent increase the frequency with which the respective constituent takes up the sentence final position. As concerns the strength of the two factors, our results suggest that information focus and syntactic weight influence in postverbal constituent order to a similar extent. As concerns the syntactic position of narrow information focus in Spanish, our results show that the sentence final position is the preferred position for narrowly focused constituents, but such constituents are not limited to the sentence final position.

Keywords. constituent order; Spanish; information focus; syntactic weight.

RESUMEN. En español los constituyentes posverbales – como objeto directo, adjunto locativo o depictivo – pueden ser ordenados de varias maneras (p.e. *Juan bailó desnudo en su casa* vs. *Juan bailó en su casa desnudo*). En este estudio examinamos dos factores posibles para el orden de constituyentes posverbales en español: el foco informativo y el peso sintáctico. Sobre la base empírica de un experimento de percepción mostramos que ambos influyen en el orden de constituyentes posverbales: la focalización de un constituyente y el aumento del peso sintáctico de un constituyente aumentan la frecuencia con la que el constituyente respectivo aparece en la posición final de la oración. En cuanto a la fuerza de los dos factores, nuestros datos muestran que ambos influyen en el orden posverbal en un grado similar. Con respecto a la posición del foco informativo estrecho, nuestros datos indican que la posición final de la oración es la posición preferida para estos constituyentes, sin estar limitados a esta posición (también pueden aparecer en posiciones prefinales).

Palabras claves. orden de los constituyentes; español; foco informativo; peso sintáctico.

1. Introduction¹

In Spanish, various constituents have their unmarked position after the sentence's main verb: direct objects (1a.), indirect objects, locative adjuncts (1b.), temporal adjuncts, depictives (1c.), etc.

- (1) a. Juan compró una casa. S-V-dO
Juan bought a house
'Juan bought a house'

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- b. Juan bailó en el jardín. S-V-LOC
Juan danced in the garden
 'Juan danced in the garden'
- c. Juan bailó desnudo. S-V-DEP
Juan danced naked
 'Juan danced naked'

The linearity of linguistic expressions implies that if two (or more) postverbal constituents co-occur in a sentence, they must be ordered in a certain way. The co-occurrence of a direct object and depictive in postverbal position, for example, might thus result in an order where the direct object precedes the depictive (cf. (2a.)) or in an order where the direct object follows the depictive (cf. (2b.)).

- (2) a. Juan compró la casa desnudo. S-V-dO-DEP
 b. Juan compró desnudo la casa. S-V-DEP-dO
Juan bought naked the house
 'Juan bought the house naked'

Cross-linguistic and typological studies have shown that the order of constituents in a sentence may be influenced by various factors: the semantic role of the constituents, their syntactic function, their animacy, their information structural status, or their syntactic weight (cf. Siewierska 1995 and Bader & Häussler 2010 for an overview). Taking as a starting point the ordering principles short-before-long and given-before-new, I will examine in this paper to which extent syntactic weight and information focus influence postverbal constituent order (PCO) in Spanish. The alleged relevance of syntactic weight and information focus will be briefly introduced below and described in detail in Sections 2 and 3.

Syntactic weight has been identified as a determining factor in constituent order since the beginning of the 20th century (Behaghel 1909, 1930, 1932). Behaghel's (1932: 6) third law of constituent order states that shorter constituents precede longer constituents when possible.² More recently, the investigation of syntactic weight has received a boost through the conducting of psycholinguistic experiments and the analysis of large digital corpora (cf. §3). A well-studied case which shows the impact of syntactic weight on postverbal constituent order is Heavy NP Shift in English, as illustrated by the data in (3). In (3a.) the heavy direct object *the wine we had ordered* precedes the PP *to the table*, while in (3b.) the heavy direct object follows the PP. Although (3b.) is a deviation from the unmarked order *dO-PP*, it is (in this case) the order which obeys Behaghel's Law: the shorter constituent precedes the longer constituent.³

- (3) Heavy NP Shift (HNPS)
 a. basic: dO-PP
 The waiter brought the wine we had ordered to the table.

² "Gesetz der wachsenden Glieder [...] es besagt, daß von zwei Gliedern, soweit möglich, das kürzere vorausgeht, das längere nachsteht." (Behaghel 1932: 6)

³ The fact that *dO-PP* is the basic order is shown by the reduced grammaticality of the order *PP-dO* in cases where the direct object is not heavy:

(i) ^{??}The waiter brought to the table the wine. PP-dO

- b. shifted: PP-dO
 The waiter brought to the table the wine we had ordered.
 (Arnold et al. 2000: 28)

Based on corpus data, Arnold et al. (2000: 36-37) show that shifted orders (those with the dO in final position) become more frequent when the dO is longer than the PP. Crucially, if the direct object contains at least four words more than the PP then the shifted order (*PP-dO*) is more frequent than the basic order (*dO-PP*).

The number of languages for which the effect of syntactic weight on constituent order has been systematically investigated is relatively small, and the majority of research has been devoted to English. To our knowledge, very few studies on the effect of weight on Spanish constituent order exist (cf. §3). Thus, the present study adds to the set of languages in which the weight effects are studied.⁴

As for information structure, early formulations of the principle that given information precedes new information can be found in the 19th century in Weil's (1844) work on word order, and later in the 20th century in Firbas (1964, 1966).⁵ One result of the ongoing research on information structure over recent years has been that languages use quite different strategies to encode information structure (cf. amongst others Breul & Göbbel 2010; Zimmermann & Féry 2010; Krifka & Musan 2012). Accordingly, ordering principles such as given-before-new are not equally important cross-linguistically. Spanish, however, is a language where constituent order is determined to a large degree by information structure (cf. Bolinger 1954; Contreras 1983; Bossong 1984a, b; Hernanz Carbó & Brucart 1987; Gutiérrez Ordoñez 1997; Zubizarreta 1998, 1999; Rodríguez Ramalle 2005; Gabriel 2007, 2010; Gutiérrez-Bravo 2007, 2008; Bosque & Gutiérrez-Rexach 2009; Adli 2011). An important advance in the study of information structure lies in the refinement of the descriptive inventory; thus different levels of information structural partitions have been distinguished: topic vs. comment, focus vs. background, given vs. new (cf. Krifka 2007 for a recent survey). The information structural partitions of a given sentence on these three levels often align (i.e. *topic* ~ *background* ~ *given* and *comment* ~ *focus* ~ *new*); but since this is not always the case the levels must still be considered separately.⁶ The level of information structure that is at the center of the present study

⁴ Hawkins (1994: 66-67) notes that whether or not the principle short-before-long is relevant also depends on the branching direction of the respective language; crucially, in VO-languages such as English or Spanish it should be relevant. Cf. Yamashita & Chang (2001) for experimental evidence for a long-before-short preference in Japanese.

⁵ It should be mentioned that the opposite principle, namely new-before-given, has also been proposed in the literature; Givón (1989: 225) argues for a principle of "task urgency" according to which newer and less predictable information should precede older and more predictable information.

⁶ As concerns the relation between givenness and focus, it needs to be stressed that the focus typically expresses new information. The example (i) shows that these two levels do not always align in this way. In (i) the focus contains given (= non-new) information.

- (i) A: I know that John stole a cookie. What did he do then?
 B: He [returned [the cookie]_{Given}]_{Focus}
 (Krifka 2007: 40)

Example (ii) shows that the comment in a sentence does not always correspond to the focus of the sentence. In B's answer the focus is only a subset of the comment.

- (ii) A: When did [Aristotle Onassis]_{Topic} marry Jacqueline Kennedy?
 B: [He]_{Topic} [married her [in 1968]_{Focus}]_{Comment}
 (Krifka 2007: 42)

is the focus–background partition. This constitutes a novelty insofar as the few studies in which the impact of syntactic weight and of information structure on constituent order have been explicitly compared (cf. Hawkins 1992, 1994; Siewierska 1993) have considered givenness as a factor and not information focus (as in the present paper).

Following on from these introductory remarks on syntactic weight and information structure, the aims of this paper can be defined as follows.

Firstly, we wish to examine whether syntactic weight and information structure are factors for postverbal constituent order in Spanish. Since syntactic weight and information structure often correlate (Arnold et al. 2000: 34) - e.g. pronominal NPs like *her* in (4) are syntactically light and typically express given or non-focal information - it must be examined whether information focus and syntactic weight are independent and not just epiphenomenal factors.⁷

(4) John gave her a green hat. given > new; light > heavy

Secondly, we are not only interested in whether syntactic weight and information focus are determining factors or not, but if so, also in the strength of the two factors:

- Which of the two factors has a stronger impact on PCO in Spanish, information focus or syntactic weight?
- Do the factors apply as preferential or as categorical constraints? (For example, do narrowly focused constituents always appear in sentence final position?)

Thirdly, and finally, our results shall be compared in two respects with the existing literature:

- As mentioned above, weight has, until now, not been systematically investigated for Spanish and consequently we will see how Spanish compares with languages such as English as concerns the effect of weight and the relative importance of this factor in different languages.
- In recent years, the debate on the syntactic position of information focus in Spanish has been stimulated by several experimental studies which show that information foci in Spanish are not restricted to the sentence final position (§2); the present paper is also a contribution to this ongoing debate.

The experiment underlying this study is construed in a way that allows us to determine the impact of the two factors independently of each other and thus to evaluate and compare their impact. Based on the results of this experiment, I will defend the following main claims on postverbal constituent order in Spanish:

- Both information focus and syntactic weight are determining factors in PCO in that they increase the frequency at which focused constituents or constituents with increased syntactic weight take up the sentence final position.
- Information focus and syntactic weight are independent (and not epiphenomenal) factors in their impact on PCO.

⁷ Correlations of weight with other factors are also discussed in Rosenbach (2005) and Bader & Häussler (2010). Arnold et al. (2000) argue on the basis of English data that weight and information structure are independent factors.

- Information focus and syntactic weight can be considered as equally strong factors.
- Information focus and syntactic weight do not imply the final position; the respective ordering principles thus apply as preferences rather than rules.

The remainder of the paper is structured as follows. In §2 and §3 the alleged relevance of information focus and syntactic weight in constituent order will be discussed based on the existing literature. The discussion of the factor weight will be centered around the literature on English, given the limited amount of research on Spanish. For information focus, we will directly focus on the situation in Spanish. Section 4 is dedicated to the experimental study itself and forms the core of this paper. In this section, the method and material used in the experiment will be introduced and the results will be presented and discussed.

2. FOCUSFINAL: Information focus as a factor in postverbal constituent order in Spanish

In a recent survey article on information structure, Krifka (2007) convincingly shows that different levels of information structure need to be distinguished: focus (as indicating alternatives), givenness (as indicating that a denotation is already present in the Common Ground of speaker and hearer), topic (as specifying what a statement is about) and frame setting/delimitation. Despite the necessity to distinguish between them, all levels have in common that cross-linguistically the respective partitions, e.g. focus vs. background or given vs. new, are often signaled through constituent order (or variation in constituent order).

As concerns postverbal constituent order in Spanish, mainly givenness and focus are relevant, since topics typically appear in preverbal positions (inside or outside the core sentence).⁸ In the experimental set up used in this study, however, only the impact of focus will be tested. Although I will come back to givenness in the discussion of the results of the experiment, I will describe in the following paragraphs only the role of focus for postverbal constituent order in Spanish.

Following Rooth (1985, 1992), Krifka (2007: 18) defines *focus* as follows: "Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions". Thus in the example in (5) *a new car* is focus because for this part of the sentence alternatives that are relevant for the interpretation of the sentence exist: the focus *a new car* specifies that among all the things that John might have bought, he actually bought a new car.

- (5) (Context: What did John buy?)
 John bought [a new car]_F

Several types of focus can be distinguished and these distinctions can be made with respect to various parameters. As concerns the size of the focus one can distinguish between *sentence focus* vs. *VP focus* vs. *narrow focus*, as in (6).

⁸ In Spanish, topics may appear in postverbal position, but in these cases the respective constituent is dislocated, i.e. it is in a position outside the core sentence:

(i) Lo vi ayer, a Juan. (Sedano 2006: 61)
him I.saw yesterday, P Juan
 'I saw him yesterday, Juan'

- (6) a. (Context: What happened?)
 [John bought a new car]_F sentence focus
 b. (Context: What did John do yesterday?)
 He [bought a new car]_F VP focus
 c. (Context: What did John buy?)
 He bought [a new car]_F narrow (argument) focus

One can further distinguish different types of focus based on the relation that the focused constituent has to its context. *A new car* in (7a.) clearly has a different relation to the context than *a new car* has in (7b.). While the focus in (7b.) contrasts with an element of the preceding context, no such relation holds in (7a.): the focus just contributes new information to the discourse (in this case it is information that is explicitly requested in the preceding question). Based on these distinct relations with the preceding context, *information focus* as in (7a.) and *contrastive focus* as in (7b.) are distinguished.

- (7) a. (Context: What did John buy?)
 He bought [a new car]_F information focus
 b. (Context: John bought a house, right?)
 No, he bought [a new car]_F contrastive focus

Within Rooth's (1985, 1992) *Alternative Semantics*, the distinction between information and contrastive focus can be stated in terms of the size of the alternative set, i.e. the set of alternatives to the focused constituent. In the case of the contrastive focus in (7b.), the set of alternatives for the focus *a new car* consists of one element only, namely *a house*.⁹ In the case of the information focus in (7a.), however, the set of alternatives is an open set, which may contain *a house, a dog, a bike, etc.*

Languages differ with respect to the formal means they use to signal the focus of a sentence (e.g. prosody, constituent order, specific syntactic constructions such as clefts, morphological marking). Within single languages it is often the case that different formal means are used for the signaling of different types of focus, i.e. information focus and contrastive focus may be encoded differently. In the following I will concentrate on a specific type of focus (narrow information focus) in a specific language (Spanish) and report the literature on the relation between narrow information focus and constituent order in this language.

Two basic views can be identified in the literature on the syntactic position of narrow information focus in Spanish: (i) narrow information foci always appear in sentence final position in Spanish (cf. Zubizarreta 1998, 1999; Revert Sanz 2001; Martín Butragueño 2005; Rodríguez Ramalle 2005), (ii) narrow information foci do not always appear in sentence final position in Spanish (cf. Gabriel 2007, 2010; Heidinger submitted, forthcoming). Beginning with the first view, a prominent exponent is Zubizarreta (1998, 1999). Zubizarreta (1999: 4228ff.) distinguishes between two types of nuclear accents in Spanish: a neutral and an emphatic accent. The first one is used in the case of information focus, the latter in the case of contrastive focus. Crucially, the neutral nuclear accent needs to be in sentence final position, and all non-final nuclear accents are thus emphatic.¹⁰ Since the nuclear accent must lie within the focus domain, the sentence final position of the neutral

⁹ Cf. Repp (2010: 1335) on the relation between different types of focus and the alternative set.

¹⁰ Note that this does not exclude the possibility of a sentence final emphatic accent.

nuclear accent implies that information focus is in sentence final position. I refer to this principle as FOCUSFINAL.

- (8) (Context: What did Juan buy?)
 Juan compró [una casa]_F
Juan bought a house
 'Juan bought a house'

Since non-final foci must be interpreted as contrastive, they are pragmatically infelicitous in a non-contrastive context such as a simple WH-question (cf. (9a.)), but felicitous in a context such as (9b.).

- (9) a. (Context: What did Juan buy?)
 #[Una casa]_F compró Juan
- b. (Context: Juan bought a car, right?)
 [Una casa]_F compró Juan
a house bought Juan
 'Juan bought a house'

It follows from Zubizarreta's (1998, 1999) view, that narrow information focus on constituents causes deviations from basic word order if the focused constituent's basic position is not the sentence final position. Thus, a narrow information focus on the subject (in a sentence with a verb and a direct object) results in a deviation of the basic order subject-verb-object; the subject ends up in sentence final position which is not its unmarked position.¹¹

- (10) S-V-dO to V-dO-S
- a. (Context: What did Juan do?)
 Juan [compró una casa]_F S-V-dO (unmarked order)
- b. (Context: Who bought a house?)
 Compró una casa [Juan]_F V-dO-S
bought a house Juan
 'Juan bought a house'

In the same way, FOCUSFINAL may also cause alterations in the order of postverbal constituents. Let us consider the order between the postverbal constituents direct object and locative adjunct. The unmarked order between the constituents is that the direct object appears before the locative adjunct (as in (11a.)). But FOCUSFINAL implies that the focused constituent ends up in final position; if both postverbal constituents are expressed this results in an order where the locative adjunct precedes the direct object (cf. (11b.)).

- (11) S-V-dO-LOC to S-V-LOC-dO
- a. (Context: What did María do?)
 María [compró el diario en el kiosco]_F dO-LOC (unmarked order)

¹¹ In Zubizarreta (1998: 124), such word order alterations are called *p-movement* (short for *prosodic movement*), since they are prosodically motivated, in that the focused constituent ends up in the position where the sentence's neutral nuclear accent lies. But cf. also López (2009: §5.2.4) who argues that what Zubizarreta's refers to with the term *p-movement* is not prosodically motivated.

- b. (Context: What did María buy at the kiosk?)
 María compró en el kiosco [el diario]_F LOC-dO
María bought at the kiosk the newspaper
 'María bought the newspaper at the kiosk'

According to authors such as Zubizarreta (1998, 1999), changes in constituent order as in (10) and (11) are obligatory, since the focused constituent must end up in sentence final position (even if this is not its unmarked position).

As mentioned above, not all researchers share the view that in Spanish narrow information foci must be in final position. In a recent line of experimental research, Gabriel (2007, 2010) and Heidinger (submitted, forthcoming) have presented evidence from semi-spontaneous production experiments which show that narrow information foci can also appear in non-final positions in Spanish. The main finding is that prefinal narrow information foci as in (12) are in fact possible in Spanish.

- (12) (Context: What did María buy at the kiosk?)
 María compró [el diario]_F en el kiosco. S-V-[dO]_F-LOC
María bought the newspaper at the kiosk
 'María bought the newspaper at the kiosk'

Gabriel (2007, 2010) has tested in his experiments (amongst other things) the encoding of narrow information focus of postverbal constituents such as direct objects, indirect objects and locative adjuncts.¹² As concerns the order of a locative adjunct and a narrowly focused direct object, Gabriel's results clearly show that the sentence final position of the focused direct object is far from obligatory. In fact, the following data from Gabriel (2010) on Argentinian Spanish (cf. Table 1) show that *in situ* focalization of the direct object in prefinal position is preferred over the focalization of the direct object in sentence final position (through *p-movement*).

Table 1: Order of LOC & [dO]_F (Gabriel 2010: 213, 216f.; adapted)

	abs.	%	
S-V-[dO] _F -LOC	19	38	← <i>in situ</i> in prefinal position
S-V-LOC-[dO] _F	7	14	← <i>p-movement</i>
[dO] _F -V-S	2	4	
rest (e.g. reduced answers)	22	44	
total	50	100	

In another recent experimental study, Heidinger (submitted, forthcoming) shows that although the sentence final position is the preferred position of narrowly focused postverbal constituents, postverbal constituents are by far not limited to the final position. Table 2 presents the relative frequency (as percentage) at which different postverbal constituents occur in final position (subject-oriented depictive (DEP), direct object, locative adjunct) in two different contexts: sentence focus and narrow information focus. The table reads as follows: in the case of a sentence focus, the locative adjunct (in combination with a depictive as a second postverbal constituent) is placed in sentence final position by 68.12% of the participants (while they are

¹² Gabriel (2007, 2010) has also investigated the position of focused subjects, both in contrastive and non-contrastive contexts; he shows that preverbal narrowly focused subjects are possible in non-contrastive contexts (cf. also Silva Corvalán 1984; Gutiérrez Ordoñez 1997).

placed in prefinal position by 31.88% of the participants); in the case of a narrow information focus on the locative adjunct, the locative adjunct is placed in sentence final position by 92.54% of the participants (while they are placed in prefinal position by 7.46% of the participants) etc.

Table 2: Focus and final position (Heidinger submitted; adapted)

	percentage occurrences in final position	
	sentence focus	narrow information focus
LOC (+DEP)	68.12%	92.54%
DEP (+LOC)	31.88%	55.07%
DEP (+dO)	84.72%	91.30%
dO (+DEP)	15.28%	63.89%

Three results are important in the present context: (i) narrow focalization increases the frequency of the sentence final position for each of the constituents tested (compared to sentence focus), (ii) narrowly focused constituents appear more often in final than in prefinal position, (iii) narrow focalization does not imply the final position, e.g. 45% of the narrowly focused depictives (in the context of a locative adjunct) appear in prefinal position.

We can now turn to the conclusions with respect to the impact that narrow focalization has on postverbal word order in Spanish. The strong relation between narrow information focus and the sentence final position is shown by two facts: (i) for several authors, the final position is the only acceptable position for narrow information focus in Spanish and (ii) experimental data from Heidinger (submitted, forthcoming) suggests that speakers put narrowly focused postverbal constituents more frequently in final than in prefinal position. However, the data presented in Gabriel (2007, 2010) and Heidinger (submitted, forthcoming) also suggest that narrow information foci are not limited to the final position. In summary, we must expect that narrow focalization has an impact on postverbal constituent order since it may cause alterations in the constituent order: constituents with a non-final unmarked position take up (more often) final position if they are narrowly focused.

3. ENDWEIGHT: Syntactic weight as a factor in postverbal word order

The discussion of the factor narrow information focus in §2 was centered on the situation in Spanish. The discussion of the second factor, syntactic weight, will be based on cross-linguistic data (including the few studies on Spanish where reference is made to weight).

The idea that the length or complexity of constituents has an impact on their ordering and that long and complex constituents tend to be placed in sentence final position is not new; it can already be found in the works of Otto Behaghel (1909, 1930, 1932):

"So bildet sich unbewußt in den Sprachen ein eigenartiges rhythmisches Gefühl, die Neigung, vom kürzeren zum längeren Glied überzugehen [...] was ich [...] als das Gesetz der wachsenden Glieder bezeichnen möchte."¹³ (Behaghel 1909: 139)

¹³ "Thus, a peculiar rhythmical feel unconsciously takes shape in languages: the tendency to go from shorter to longer elements ... what I ... would like to designate the law of growing elements". (translation from Wasow 1997a: 103)

"Das Gesetz der Wachsenden Glieder: Von zwei Gliedern von verschiedenem Umfang steht das umfangreichere nach."¹⁴ (Behaghel 1930: 85)

The impact of weight on constituent order has remained a topic in linguistic research since Behaghel's early observations (e.g. Blinkenberg 1928 on French constituent order or the work on Heavy NP shift in early Generative Syntax (Ross 1967; Chomsky 1975; Emonds 1976)). However, a consistent line of research on the topic has only been established since the 1990s through the respective works of John A. Hawkins and Thomas Wasow (cf. Hawkins 1992, 1994, 2000, 2001; Wasow 1997a, b, 2002, Wasow & Arnold 2003, Arnold et al. 2000). In the remainder of this section, several issues linked to the impact of weight on constituent order will be addressed: a) What phenomena are sensitive to weight effects?, b) Why does weight matter?, c) What kind of weight?, d) Cross-linguistic distribution of ENDWEIGHT.

a) What phenomena are sensitive to weight effects?

A wide range of phenomena in the domain of constituent order have been identified to be sensitive to weight effects. Based mainly on English data, Hawkins has developed a comprehensive theory according to which syntactic weight is the most important determinant of constituent order (cf. Hawkins 1992, 1994, 2000, 2001). Despite such statements on the general impact of weight, authors have often focused on individual constructions or constituent order alternations in their investigation of the impact of weight.

A much investigated example of such an alternation is *Heavy NP Shift* in English (cf. Arnold et al. 2000; Wasow 1997a, b; Hawkins 2001). In this case, which is illustrated in (3) (§1), the basic order in which a direct object precedes a prepositional phrase (PP) is shifted if the direct object NP is heavy or to a certain degree heavier than the PP. On the basis of a corpus study, Arnold et al. (2000: 36f.) show that the frequency of the shifted order increases if the direct object is longer than the PP; in cases where the dO is four or more words longer than the PP, the shifted order is more frequent than the basic order (irrespective of whether the dO expresses given or new information).

Particle movement (Arnold et al. 2000; Wasow 1997a, 2002) is another weight sensitive alternation which concerns the position of particles in combinations of a particle verb and a direct object. The particle can be placed either before the direct object (and thus adjacent to the verb) or after the direct object. The effect of weight is that if the direct object is heavy it tends to be placed in final position resulting in the order V-particle-dO (as in (13b.)).

- (13) a. Sandy picked the freshly baked apple pie up. V-dO-particle
 b. Sandy picked up the freshly baked apple pie. V-particle-dO
 (Arnold et al. 2000: 28; modified)

The dative alternation is yet another case for which the impact of weight has been identified (Arnold et al. 2000; Wasow 1997a, b; Bresnan & Ford 2010). In the case of this alternation, a dative argument is either expressed as a prepositional object or as a non-prepositional object, yielding the two alternative orderings in (14).¹⁵

¹⁴ "The law of growing constituents: Of two constituents of different size, the larger one follows the smaller one." (translation from Wasow 1997b: 348)

¹⁵ In this case the alternation between the two patterns not only consists of a change in the linearization of constituents, but also involves a change in mapping between semantic roles and syntactic functions.

In order to identify factors which influence the ordering of such NPs and PPs, Thuilier (2012) has annotated a total of 1434 sentences (with respect to weight, but also with respect to other parameters such as the animacy or the information status of the constituents). As concerns weight, the main result of her study is that in 82.5% of cases the principle short-before-long makes the right prediction for the ordering of the two postverbal constituents (Thuilier 2012: 239). This result suggests that ENDWEIGHT is a good predictor also in French.

The above studies and phenomena focused on postverbal constituent order. In addition, Siewierska (1993) has shown that weight effects can also be observed when one looks at the verb's core arguments, subject and direct object. In her work on Polish constituent order, Siewierska (1993) conducted a corpus study on the text frequency of the main constituent orders (SVO, SOV, VSO etc.) and linked the order to the syntactic weight of the subject and the object. Crucially, in 52% of cases the order of S and O follows the short-before-long principle, in 21% S and O are equally long (and thus weight does not matter), and in only 27% of cases, the order of S and O is such that the longer constituent precedes the shorter one.

Table 4: Percentage of clauses with a placement of subject and object following short-before-long (Siewierska 1993: 240; adapted)

Weight relation	Percentage (abs. frequency)
short-before-long	52% (392)
same length	21% (161)
long-before-short	27% (207)

Finally, it should be noted that weight not only plays a role for constituent order on the sentence level, but also within the NP. Rosenbach (2005) has shown that the English alternation between the *s*-genetive and the *of*-genetive, as in (16) below, is also sensitive to the weight of the possessor and the possessum.

- (16) a. the king's palace *s*-genetive
 b. the palace of the king *of*-genetive
 (Rosenbach 2005: 614)

In my own experimental study (presented in §4), I look at the order of a direct object and a subject-oriented depictive on the one hand and the order of a locative adjunct and a subject-oriented depictive on the other. The first case involves an argument and an adjunct (cf. (17)), the second case involves two adjuncts (cf. (18)). All constituents in question are postverbal constituents in the sense that their unmarked position is after the verb. In both cases the two orderings only differ in the linearization of the constituents and do not involve alternative mappings between semantic roles and syntactic functions as in the case of the English dative alternation.

- (17) DEP & dO
 a. María pintó el armario descalza. dO-DEP
 b. María pintó descalza el armario. DEP-dO
 María painted barefoot the wardrobe
 'María painted barefoot the wardrobe'

(18) DEP & LOC

- a. Juan bailó disfrazado en su casa. DEP-LOC
 b. Juan bailó en su casa disfrazado. LOC-DEP
Juan danced in his house disguised
 'Juan danced disguised in his house'

b) Why does weight matter?

The above survey shows that there is now sufficient evidence that weight is a factor in the ordering of constituents. It is thus not surprising that researchers have wondered about the reasons why weight matters. In the recent literature answers to this question have been given from two perspectives: the perspective of language production and that of language processing. While Hawkins has argued that weight matters because short-before-long makes sentence processing (i.e. comprehension) easier, Wasow (and collaborators) hold that short-before-long makes sentence production easier and matters for this reason.

The basic idea of Hawkins' processing based theory of constituent order is captured in the following quote:

"I believe that words occur in the orders they do so that speakers can enable hearers to recognize syntactic groupings and their immediate constituents (ICs) as rapidly and efficiently as possible. Different orderings result in more or less rapid IC recognition." (Hawkins 1992: 197)

He illustrates this principle with an example of the ordering of a direct object NP and a PP (cf. (19)) and shows that the choice between the two possible orders (basic vs. shifted) makes a considerable difference with respect to the recognition of the constituent structure in the postverbal domain if the direct object is syntactically heavy.

(19) a. basic order

I_{VP}[v[*introduced*] NP[*some friends that John had brought to the party*]
 1 2 3 4 5 6 7 8 9 10
 PP[*to Mary*]
 11

b. shifted order

I_{VP}[v[*introduced*] PP[*to Mary*] NP[*some friends that John had brought*
 1 2 3 4
to the party]
 (Hawkins 1992: 197; adapted)

Hawkins (1992: 197) assumes for the sentences in (19) that the VP node dominates three further nodes (V, PP, NP) and a total of 12 words. He further assumes that constituents are recognized once the parser reaches its first word. Depending on the relative order of NP and PP, either 11 or four words need to be parsed in order to recognize all three immediate constituents of VP. If the direct object consists of nine and the PP of two words, then the shift from the basic dO-PP order to the PP-dO order reduces the number of words that need to be parsed for the identification of the ICs from 11 to four words. Hawkins (1992, and subsequent work) uses the term *Early Immediate Constituents* (EIC) for this principle, according to which constituents are

arranged in such a way that the syntactic constituent structure of a sentence can be recognized as fast and as easily as possible.¹⁷

A different reason for short-before-long has been advocated by Wasow (1997a, b, 2002; cf. also Arnold et al. 2000). The basic idea is that "[p]ostponing elements that are hard to produce, such as long and complex constituents, gives the speaker more time to formulate them." (Arnold et al. 2000: 32) Wasow (1997b) presents data that suggest that speakers tend to follow their own interests in the case of a conflict between the speaker's and the hearer's interests. One type of evidence that Wasow (1997b) presents has to do with Heavy NP shift in the context of collocations. Wasow looked at verb phrases including a transitive verb, a PP and a slot for a direct object.¹⁸ Based on the relation between the PP and the verb he distinguishes between (i) cases without collocation, (ii) transparent collocations and (iii) opaque collocations; (ii) and (iii) are illustrated in (20). In the case of opaque collocations the relation between the verb and the PP is the closest since the interpretation of the verb and the PP depends on the respective other element.

- (20) a. to bring sth. to an end transparent collocation
 b. to bring sth. to bear opaque collocation
 (Wasow 1997b: 352)

Table 5 gives the percentage of HNPS for the three relations between V and PP. The data clearly show that the relation between the verb and the PP is a factor in the percentage of the shifted order: the percentage is highest in the case of opaque collocations (60%), followed by transparent collocations (47%) and cases without collocations (15%).

Table 5: Relation between V and PP and percentage of HNPS (based on Wasow 1997b: 353)

Relation between V and PP	% HNPS
opaque collocation	60% (147 out of 247)
transparent collocation	47% (90 out of 192)
no collocation	15% (59 out of 388)

As to the interests of speaker and hearer, Wasow's (1997b: 353) interpretation of the data is as follows: He assumes that opaque collocations are not indicative since in this case both speaker and hearer profit from the shifted order.¹⁹ In the case of the transparent collocations, however, the speaker still benefits, while the hearer does not. The speaker benefits because "[...] once a collocation has been selected by the speaker, producing it immediately buys time to plan the direct object NP, irrespective of whether the collocation is transparent or opaque." (Wasow 1997b: 353) Since the shifted order in the case of the transparent collocations does not provide any advantages for the hearer, a hearer-based account would predict that the frequency of

¹⁷ Although Hawkins has presented the most comprehensive theory on the relation between comprehension and weight effects, similar ideas can also be found in Bever (1970), Frazier & Fodor (1978) and Kimball (1973).

¹⁸ The verbs used in the corpus search are *attribute ... to, bring ... to, obtain ... from, share ... with, take ... into* (Wasow 1997b: 352).

¹⁹ The speaker benefits because the order V-PP-dO, with the two parts of the collocation adjacent, gives more time for the planning of the rest of the sentence; the hearer benefits because the adjacency of the two collocates facilitates the incremental interpretation. (Wasow 1997b: 353)

the shifted orders is not above that of the non-collocations. Wasow (1997b: 353) interprets the fact that the frequency of the shifted orders is much higher in the case of transparent orders than in the case of non-collocations as an argument for the speaker-based account: increased planning time for the speaker is a factor in shifted orders.

c) What kind of weight?

Another issue that has been discussed in the literature is how weight can be measured and what type of weight is actually relevant. In work on the HNPS in English, for example, scholars tried to define the heaviness of dOs that can or need to be shifted; e.g. Ross (1967) defines an NP as heavy if it dominates a sentence (cf. the survey in Wasow (1997a: 85)). Other scholars, however, have not tried to define the heaviness of the constituents in question, but instead have compared their weight. Wasow (1997a) argues convincingly in favor of the latter approach; in recent work on weight effects, relative weight is considered almost exclusively as a factor. The principle short-before-long thus means that the shorter constituent precedes the longer element (and there is no need to define what *short* or *long* means). A relative notion of weight is also a prerequisite for observations such as that of Hawkins (2000), mentioned above, who shows that weight effects become stronger with increasing differences in relative weight (cf. Table 3 above).

However, under this relative conception of weight one still needs to define how weight is measured, i.e. what needs to be counted or looked at in order to decide which constituent is longer (and how much longer it is). Candidates for the measurement of weight are words, syllables, phonological phrases, syntactic nodes, phrasal nodes. Based on data from Heavy NP shift and the dative alternation in English, Wasow (1997a: 91-93) has compared the predictive power of three measurements of weight: phrasal nodes, nodes, and words. For the comparison, he determined the percentage of examples which are consistent with the generalization of "weight monotonicity" (which says that the constituents appear in order of non-decreasing weight). Table 6 shows that the percentages for the three measures are nearly identical and that the data does not suggest a preference for one measurement over another.

Table 6: Evaluation of weight measure (Wasow 1997a: 92)

Measurement	% weight monotonicity	
	HNPS	dative alternation
Phrasal nodes	91.4%	90.6%
Nodes	89.9%	86.8%
Words	88.4%	91%

Thuilier (2012: 227) comes to a similar conclusion as Wasow (1997a) in her comparison of the predictive power of the weight measures words, syntactic nodes, syntagmatic nodes. The predictive power goes from words 86.7% to syntactic nodes 85.4% to syntagmatic nodes 83.6% (cf. Thuilier 2012: 227).

d) Cross-linguistic distribution of ENDWEIGHT

The final question to be addressed is the cross-linguistic distribution of the ordering principle short-before-long. If one compares the state of research on weight effects with phenomena such as the order of the sentence's main constituents S, V and O, then one must conclude that very little is known about the cross-linguistic

distribution of ENDWEIGHT and weight effects in general. Nevertheless weight effects have been attested for several languages. English is undoubtedly the language for which weight effects have been most extensively studied. Other Indo-European languages for which weight has been investigated are German, Polish, Ancient Greek, Latin, French, and Spanish (this list is most probably not exhaustive). While the findings on Polish (cf. Siewierska 1993) and on French (cf. Blinkenberg 1928; Thuilier 2012; Abeillé & Godard 2004, 2006) suggest that syntactic weight is a factor in constituent order in these languages, studies on German provide a mixed picture: Fanselow (2000), Bader & Häussler (2010) suggest that weight is not a factor, at least for middlefield-internal constituent order, but Behaghel (1909) and Hawkins (1994) provide evidence from corpus counts that weight does affect constituent order in German.

As concerns Spanish, there are to my knowledge no large-scale studies primarily devoted to the impact of syntactic weight on constituent order (which would be comparable to those conducted by Wasow and Hawkins). Nonetheless, syntactic weight has been referred to by several authors. These references to weight usually occur in relation to a specific phenomenon.

Demonte & Masullo (1999: 2483), for example, note that the unmarked order of a depictive and other adjuncts is such that the depictive precedes the adjunct, but that there are also other factors, such as weight (and information structure), which have an impact on the order (besides the syntactic functions). Similarly, Dufter (2009: 107), who discusses the position of adverbials in sentence initial and/or final position, assumes that the syntactic weight of the respective constituents is a factor in the positioning in that heavy adverbials preferably appear in sentence final position. Fernández Ramírez (1986: 458) refers to weight when it comes to subject-predicate order in the case of a sentence initial adverbial phrase. He assumes that the order between subject and predicate is governed in such cases by the short-before-long principle. Accordingly, the longer subject *las reglas que hay que tener en cuenta* follows the shorter predicate *son muy variables* in (21).

- (21) En los coches son muy variables las reglas que hay que tener en cuenta.
in the cars are very variable the rules that have to take into account
 'In cars, the rules that one has to consider are very diverse'
 (Gómez de la Serna; Fernández Ramírez 1986: 458)

Hernanz & Brucart (1987:78) and Fernández Soriano (1993: 131) also mention syntactic weight as one factor which influences the order between subject and verb in that long subjects tend to appear in postverbal position (cf. (22) and (23) from Hernanz & Brucart 1987: 78).²⁰

- (22) a. María ha telefoneado.
 b. Ha telefoneado María.
has telephoned María
 'María has called'
- (23) a. ?La propietaria del coche robado ayer en pleno centro de Barcelona
 ha telefoneado.

²⁰ The role of syntactic weight for NP-internal order in Spanish is mentioned in Hernanz & Brucart (1987: 167-168) and Bogard (2009: §2.4.3.5).

- b. Ha telefonado la propietaria del coche robado ayer
has telephoned the owner of.the car stolen yesterday
 en pleno centro de Barcelona.
in plain center of Barcelona
 'The owner of the car that has been stolen yesterday in the
 center of Barcelona has called'

Finally, one can also find studies on Spanish in which the factor weight is not only assumed, but also empirically tested. One such example is that of Bellosta von Colbe (2005), who investigates the order of direct and indirect objects in Spanish. Syntactic weight is one of the factors he looks at as a predictor for ordering. Based on a corpus of 1538 sentences including both dO and iO, he examined for both orders, i.e. V-dO-iO and V-iO-dO, how often the first constituent is shorter than the second one ($1 < 2$), how often they have the same weight ($1 = 2$), and how often the first one is longer than the second ($1 > 2$); as a measure of weight he counted the words (cf. Bellosta von Colbe 2005: 107). His main finding is that the orders with short-before-long are much more frequent than those with long-before-short; this holds for both V-dO-iO and V-iO-dO (cf. Table 7).

Table 7: Syntactic weight and the order of dO and iO in Spanish (Bellosta von Colbe 2005: 108)

	V-dO-iO	V-iO-dO
1<2	76.86% (754)	80.79% (450)
1=2	16.92% (166)	10.95% (61)
1>2	6.22% (61)	8.26% (46)
	100% (981)	100% (557)

Delbecque (1987, 1991) has analyzed factors for the order of subject and verb in Spanish. Based on corpus-data she shows that the length of the subject is factor in that long subjects tend to appear postverbally more often than short subjects (cf. Delbecque 1991: 118, 122).

Valverde Ibáñez (2009) has analyzed the syntactic position of constituents with argument status in Spanish. One of her corpus-based findings is that these constituents appear with a very high frequency after the verb if they have the form of a finite or non-finite clause (99.5% and 98.0% respectively); she attributes this to the increased syntactic weight of constituents with the form of a clause and to the fact that such long constituents tend to appear in sentence final position (cf. Valverde Ibáñez 2009: 259).

Finally, it should also be stated that also the opposite view, namely that ENDWEIGHT is not a factor in Spanish, can be found in the literature. Contreras (1983: 124-125), in his monograph on constituent order in Spanish, briefly considers the possible impact of constituent length on linear ordering, but comes to the conclusion that length is not a factor and that information structure is decisive for Spanish constituent order. But it needs to be mentioned that he builds his argument on only three examples which confirm his assumption; and since weight effects are usually tendencies and not rules, I assume that such a small amount of data is not sufficient to evaluate the effect of weight in a given language.

In summary, there are several languages for which the impact of weight on constituent order has been shown. Spanish is among the many languages for which relatively little is known about the impact of weight - given the small number of studies that take up this issue. Nevertheless, we expect from the above survey that weight does have an impact on postverbal constituent order in Spanish: it might cause alterations of the postverbal constituent order because a long or heavy constituent with a non-final unmarked position might end up in sentence final position.

4. Experimental study

4.1. Material and method

The research goals defined in §1 require that the impact of focus and weight are determined independently of each other and in such a way that they can be compared. As shown in the following paragraphs, both requirements are fulfilled in the experiment that is at the basis of the present study.

The data for this study stem from a perception experiment conducted by the author in Cáceres, Spain, in February 2013. A total of 40 persons participated in the experiment; but only the data of the 39 native speakers of Iberian Spanish were considered (one participant was a native speaker of a variety of American Spanish). All participants were students from the Universidad de Extremadura, Cáceres. The experiment was conducted in two runs, with 20 participants each, in the language laboratory of the university, under the author's supervision and guidance. The total duration of the experiment was approximately 25 minutes including an instruction phase, a practice phase and the experiment *sensu stricto*.

The experiment is a forced choice experiment where participants have to indicate their preferred choice between two options. The stimulus material consisted of short question-answer dialogs. The answers of the dialogues were always presented in two variants, which differed with respect to the order of the two postverbal constituents. For each dialog, participants had to indicate the variant of the answer that they considered more natural in the context of the question (cf. (24)).

- (24) ¿Qué hizo Juan? 'What did Juan do?'
 o Juan bailó disfrazado en su casa. DEP-LOC
 o Juan bailó en su casa disfrazado. LOC-DEP
 Juan danced in his house disguised
 'Juan danced disguised in his house'

All answers contained two different postverbal constituents: either a subject-oriented depictive (DEP) and a direct object (dO) (as in (25a.)), or a subject-oriented depictive and a locative adjunct (LOC) (as in (25b.)).

- (25) a. María pintó un armario descalza. dO & DEP
 María painted a wardrobe barefoot
 'Maria painted barefoot a wardrobe'
 b. Juan bailó disfrazado en su casa. DEP & LOC
 Juan danced disguised in his house
 'Juan danced disguised in his house'

In order to assess the impact of information focus and weight, three general experimental conditions were determined: (i) a neutral condition in which the answer

has a VP-focus and both postverbal constituents in the answer have their neutral syntactic weight (as in (24)), (ii) a narrow-information-focus condition in which one postverbal constituent of the answer is narrow information focus and both postverbal constituents have their neutral syntactic weight (as in (26)), and (iii) an increased-weight condition in which the answer has a VP-focus and one of the postverbal constituents has an increased syntactic weight (as in (27)).

(26) *Narrow-information-focus condition*

¿Cómo bailó Juan en su casa? 'How did Juan dance at his house?'

- a. Juan bailó en su casa [disfrazado]_F.
- b. Juan bailó [disfrazado]_F en su casa.
Juan danced disguised in his house
'Juan danced disguised in his house'

(27) *Increased-weight condition*

¿Qué hizo Juan? 'What did Juan do?'

- a. Juan [bailó en la casa decorada por sus hermanas disfrazado]_F.
- b. Juan [bailó disfrazado en la casa decorada por sus hermanas]_F.
Juan danced disguised in the house decorated by his sisters
'Juan danced disguised in the house that has been decorated by his sisters'

To determine the impact of a given factor on postverbal constituent order, data from the neutral condition and the respective non-neutral condition must be compared. Recall that both factors presumably favor the sentence final position of the respective constituent. To verify, for example, the impact of narrow information focus, a constituent's percentage of occurrence in final position in the neutral condition and in the narrow-information-focus condition need to be compared. Applied to the stimuli in (24) and (26), the basic idea is thus as follows: How often do participants choose LOC-DEP (and not DEP-LOC) in the neutral condition (as in (24)) and how often do they choose it in the narrow-information-focus condition (as in (26))? As mentioned, the prediction would be that they choose LOC-DEP more often in the case of the narrow-information-focus condition than in the neutral condition. The impact of the syntactic weight, the second factor we are interested in, is verified in the same way: How often do participants choose DEP-LOC in the neutral condition and how often is DEP-LOC chosen in the increased-weight condition (as in 27)?

The impact of the two factors is thus measured through the increase in the percentage occurrence of the final position of the respective constituent (for DEP (& LOC), LOC (& DEP), DEP (& dO), and dO (& DEP)). The respective measures are Δ_{Focus} and Δ_{Weight} , which are calculated as in (28) and (29) below: Δ_{Focus} is the difference between the percentage occurrence of a constituent in final position in the narrow-information-focus condition and the percentage occurrence of a constituent in final position in the neutral condition.

$$(28) \quad \Delta_{\text{Focus}}: \% \text{ Finalposition}_{\text{Focus}} \text{ minus } \% \text{ Finalposition}_{\text{Neutral}}$$

Δ_{Weight} is the difference between the percentage occurrence of a constituent in final position in the increased-weight condition and the percentage occurrence of a constituent in final position in the neutral condition.

$$(29) \quad \Delta_{\text{Weight}}: \% \text{ Finalposition}_{\text{Weight}} \text{ minus } \% \text{ Finalposition}_{\text{Neutral}}$$

In order to determine the impact of information focus and syntactic weight on postverbal constituent order in such a way, the following variables had to be controlled for in the experiment: syntactic functions of the two postverbal constituents (DEP & LOC, DEP & dO), focus-background partition of the answer (VP-focus, narrow focus on one postverbal constituent), and syntactic weight of the postverbal constituents (neutral, increased weight of one postverbal constituent). This amounts to a total of ten conditions, as in Table 8. Each of the conditions was lexicalized in two different ways, which results in a total of twenty stimuli (i.e. mini-dialogs with two variants of the answer) which were presented to each participant in the experiment.

Table 8: Conditions tested

		neutral weight	increased weight DEP	increased weight {LOC dO}
DEP & LOC	[VP] _F	<i>DEP-LOC</i> <i>LOC-DEP</i>	<i>DEP-LOC</i> <i>LOC-DEP</i>	<i>DEP-LOC</i> <i>LOC-DEP</i>
	[DEP] _F	<i>DEP-LOC</i> <i>LOC-DEP</i>		
	[LOC] _F	<i>DEP-LOC</i> <i>LOC-DEP</i>		
DEP & dO	[VP] _F	<i>DEP-dO</i> <i>dO-DEP</i>	<i>DEP-dO</i> <i>dO-DEP</i>	<i>DEP-dO</i> <i>dO-DEP</i>
	[DEP] _F	<i>DEP-dO</i> <i>dO-DEP</i>		
	[dO] _F	<i>DEP-dO</i> <i>dO-DEP</i>		

Note that in this experimental setup, the two factors information focus and syntactic weight were controlled for separately, i.e. only one factor is tested at a time. There are no conditions in which syntactic weight and narrow information focus directly compete.

The focus-background partition of the answer was controlled for by the type of question (e.g. the question in (24) triggers a VP-focus). The weight was controlled for by presenting the constituents either with their neutral weight (DEP = one word (adjective), dO = two words (determiner + noun), LOC = three words (preposition + determiner + noun)) or with an increased weight (at least four additional words - at least two of which are content words; e.g. *en su casa* 'in his house' vs. *en la casa decorada por sus hermanas* 'in the house decorated by his sisters').

In the experiment, the stimuli were presented to each participant on a separate computer screen using LimeSurvey. Only one mini-dialog was presented on the screen at a time. While the questions of the dialog were presented in written and audio format, the two variants of the answer were presented in audio format only.²¹ To listen to the audio, participants had to click on a player embedded in LimeSurvey.

²¹ The audio stimuli were produced by native speakers of Iberian Spanish. While the questions of the dialogs were produced by three different speakers (two female, one male), the answers were all produced by a fourth (female) speaker. This fourth speaker is a linguistically trained person who knows about information structural notions such as focus. Each of the forty answers in the experiment was produced three times by this speaker and two other speakers had to choose for each of the forty answers the version which sounded most natural to them in the context of the question; only this version was then used in the experiment.

4.2. Results

We begin our presentation of the results with a table that shows for each of the ten conditions the preferences of the participants (cf. Table 9). More precisely, it shows for each of the ten conditions the percentage of participants who chose each of the two orders in question. For example, under the neutral condition (cf. (24)) 58.97% have chosen DEP-LOC and 41.03% LOC-DEP.

Table 9: Preferred constituent orders (percentages)

		neutral weight	increased weight DEP	increased weight {LOC dO}
DEP & LOC	[VP] _F	58.97 DEP-LOC 41.03 LOC-DEP	25.64 DEP-LOC 74.36 LOC-DEP	85.90 DEP-LOC 14.10 LOC-DEP
	[DEP] _F	35.90 DEP-LOC 64.10 LOC-DEP		
	[LOC] _F	76.92 DEP-LOC 23.08 LOC-DEP		
DEP & dO	[VP] _F	28.21 DEP-dO 71.79 dO-DEP	10.26 DEP-dO 89.74 dO-DEP	61.54 DEP-dO 38.46 dO-DEP
	[DEP] _F	12.82 DEP-dO 87.18 dO-DEP		
	[dO] _F	87.18 DEP-dO 12.82 dO-DEP		

Although Table 9 provides a complete overview of the results, it's not the pertinent presentation with respect to the impact of narrow information focus and syntactic weight on postverbal constituent order. As laid out in §4.1, what we need to look at is the percentage of occurrence of constituents in the final (as opposed to prefinal) position under three different conditions: neutral, narrow information focus, and increased weight. Table 10 below shows the percentage of occurrence in final position under these three conditions for the postverbal constituents DEP, dO and LOC. Leaving aside the values in brackets, the table reads as follows: under the neutral condition, 41.03% of the participants preferred the variant LOC-DEP (with DEP in final position) over DEP-LOC (with DEP in prefinal position); under the condition with narrow information focus on the DEP, 64.10% of the participants preferred the variant LOC-DEP over DEP-LOC etc. In addition, the table indicates the Δ-values, i.e. the value whereby the percentage of the occurrence in final position under the non-neutral conditions (narrow information focus, increased weight) deviates from the percentage of occurrence in final position under the neutral condition.

Table 10: Percentage of occurrence in final position in three different conditions

	neutral condition	narrow-information-focus condition	increased-weight condition
DEP (& LOC)	41.03	64.10 (Δ = 23.07)	74.36 (Δ = 33.33)
LOC (& DEP)	58.97	76.92 (Δ = 17.95)	85.90 (Δ = 26.93)
DEP (& dO)	71.79	87.18 (Δ = 15.39)	89.74 (Δ = 17.95)
dO (& DEP)	28.21	87.18 (Δ = 58.97)	61.54 (Δ = 33.33)

Finally, the following two figures illustrate the impact of the two factors on postverbal constituent order. They show how much the percentage of occurrence in final position of the constituents increases due to the narrow focalization (cf. Figure 1) or the increased syntactic weight (cf. Figure 2).

Figure 1: Percentage of occurrence in final position (neutral vs. narrow focus)

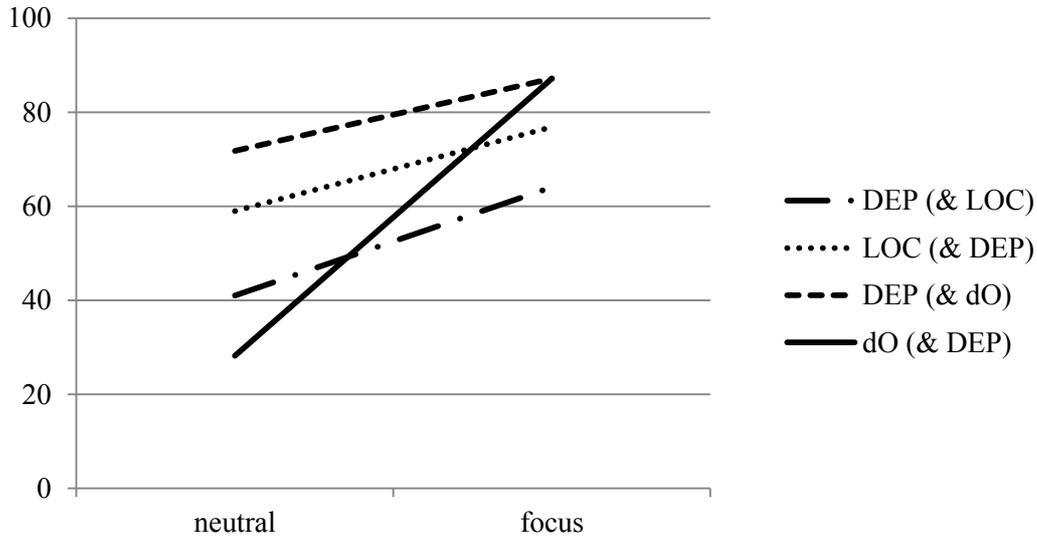
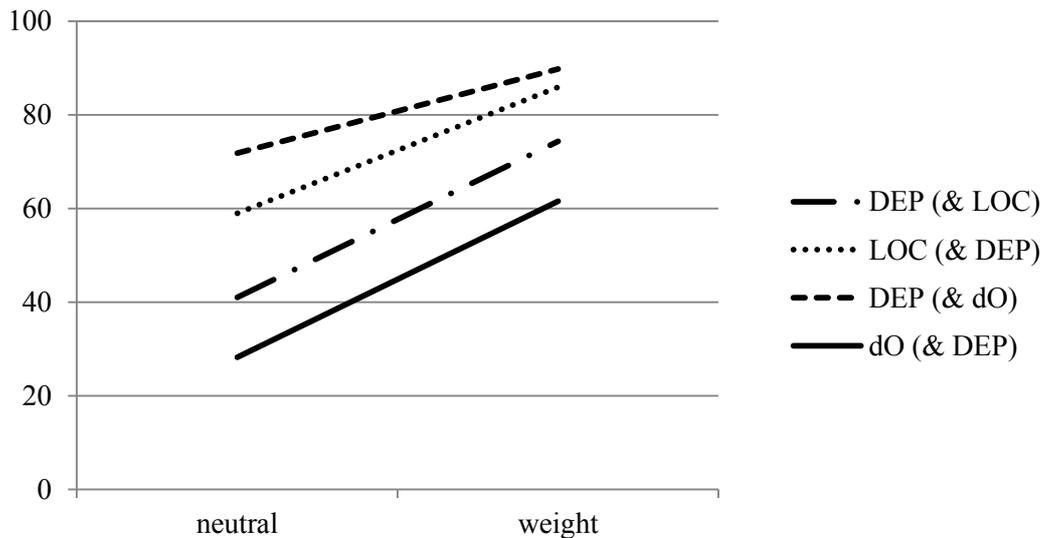


Figure 2: Percentage of occurrence in final position (neutral vs. increased weight)



On the basis of the data in Table 10, we can now answer the research questions laid out in §1. The most basic question is whether narrow information focus and syntactic weight are factors in postverbal word order in Spanish. The results of the experiment clearly show that both narrow information focus and syntactic weight have an impact on constituent order: It applies to all constituents that the focalization significantly increases the percentage of occurrence of the respective constituent in final position (compared to the neutral condition) (cf. Table 10 and Figure 1) ($p < 0,05$ (McNemar)). Further, it applies to all constituents that the increase of weight significantly increases the percentage of the respective constituent in final position (cf. Table 10 and Figure 2) ($p < 0,05$ (McNemar)). The results show that both information focus and syntactic weight have an impact on postverbal constituent order in Spanish because they increase the percentage of occurrence of the respective

constituent in final position. Further, the design of the experiment ensures that the observed impact of the two factors is not epiphenomenal since only one factor has been tested at a time.

Two more research questions concern the strength of the impact of focus and weight. Firstly, we are interested in which of the two factors has a stronger impact and, secondly, we want to know whether the factors apply in a rule-like fashion or rather as preferences. As concerns the first issue, we must look at the change values (Δ) in Table 10 above. The values in brackets in Table 10 show how much the percentage of occurrence in final position increases due to focalization and increased weight. As outlined above, the change value is the difference between (i) a constituent's percentage of occurrence in final position under neutral condition and (ii) its percentage of occurrence in final position under focalization or increased weight. The average change values for the two factors are very similar, $\Delta = 28.85$ for focalization and $\Delta = 27.89$ for increased weight. Thus our results suggest that the two factors are equally strong in their impact on constituent order. As concerns the issue of whether the two factors apply as rules or rather as preferences for postverbal constituent order in Spanish, our results clearly show that the latter is the case: Despite the impact of the two factors it needs to be stressed that neither focalization nor increased weight implies the final position of the respective constituent. For example, 35.90% of the participants prefer the narrowly focused DEP (in the context of LOC) in prefinal and not in final position.

4.3. Discussion

4.3.1. Unmarked constituent order and its variation

In §2 and §3 the impact of FOCUSFINAL and ENDWEIGHT on postverbal constituent order has been described as follows: both factors might cause alterations of the postverbal constituent order in the sense that a constituent with a non-final unmarked position ends up in sentence final position. The premise of this description was that for any pair of postverbal constituents an unmarked order could be determined. In the light of our results, both the premise on the unmarked order and the subsequent description of the impact of FOCUSFINAL and ENDWEIGHT need to be revised. Starting with the aspect of unmarked order, the set of data we need to look at is that for the neutral condition; in these cases both postverbal constituents have the same informational value (both are focus) and have their neutral weight. However, the results of the experiment show that the unmarked order is not always easy to detect. Table 11 gives the participants' preferences for the ordering of DEP & LOC and DEP & dO under the neutral condition.

Table 11: Preferred constituent orders under neutral condition

DEP & LOC	58.97% <i>DEP-LOC</i> 41.03% <i>LOC-DEP</i>
DEP & dO	28.21% <i>DEP-dO</i> 71.79% <i>dO-DEP</i>

The preferred order is chosen by 58.97% in the case of DEP & LOC and by 71.79% in the case of DEP & dO (cf. Table 11). The preference for one of the two orders is considerably stronger in the case of DEP & dO than in the case of DEP & LOC. This has most probably to do with the fact that in the case of DEP & dO an

argument (dO) and an adjunct (DEP) are combined and that for two such constituents there is a strong preference to put the argument closer to its verb; in the case of the two adjuncts, DEP & LOC, no such ordering principle applies and the order is freer under the neutral conditions.²² As concerns the impact of focus and weight, two consequences follow from the fact that even the unmarked orders have the form of preferences rather than rules. Firstly, the two factors can inverse a preference, and secondly, the two factors can reinforce a preference (cf. Table 12). The preference is inversed in the case of the focalization and the increase in weight of dO (& DEP) and DEP (& LOC): the preferred order under narrow information focus and increased weight is not the same as that under the neutral condition (which counts as the unmarked order). A preference is reinforced in the case of the focalization and the increase in weight of DEP (& dO) and LOC (& DEP): here the preferred order under narrow information focus and increased weight is the same as that under the neutral condition and the preference for this order is even stronger than in the neutral condition.

Table 12: Impact of the factors: inversion vs. reinforcement of preferences

Neutral/Unmarked	Preferred order		Impact of focus and weight
	Narrow Information Focus	Increased Weight	
DEP-LOC	DEP-[LOC] _F (> [LOC] _F -DEP)	DEP-LOC _{iw} (> LOC _{iw} -DEP)	Preference reinforced
	LOC-[DEP] _F (> [DEP] _F -LOC)	LOC-DEP _{iw} (> DEP _{iw} -LOC)	Preference inversed
dO-DEP	dO-[DEP] _F (> [DEP] _F -dO)	dO-DEP _{iw} (> DEP _{iw} -dO)	Preference reinforced
	DEP-[dO] _F (> [dO] _F -DEP)	DEP-dO _{iw} (> dO _{iw} -DEP)	Preference inversed

4.3.2. Information structure vs. syntactic weight

Both factors have in common that they reinforce or inverse constituent order preferences (cf. Table 12) by increasing the frequency at which narrowly focused constituents and constituents with increased weight take up final position. Figures 1 and 2 in §4.2 show that both factors have approximately the same strength in this regard, i.e. they increase the frequency of the final position of the respective constituent to a similar extent ($\Delta = 28,85$ for focalization and $\Delta = 27,89$ for increased weight). How does this result fit with other studies in which the impact of weight and information structure have been compared? An explicit comparison of syntactic weight and information structure can be found in Siewierska (1993) on Polish and Hawkins (1992, 1994) on English. The authors use the same measures for weight and for information structure, namely Hawkins' EIC ratio and Givón's (1983) "referential distance" (RD).²³ However, they come to different conclusions with respect to the importance of the two factors. While for Hawkins (1994) syntactic weight is the most important factor (which even makes other factors superfluous), Siewierska (1993) concludes for Polish that information structure makes better predictions: "the more predictable > less predictable principle is reflected more consistently in the corpus than the short > long one." (Siewierska 1993: 251)

²² Note, however, that focalization and increased weight often overrule the principle of positioning an argument closer to the verb than the adjunct.

²³ RD can be interpreted as a measure for givenness and counts the number of sentences between the present occurrence of a referent and its previous occurrence in a text or discourse.

Although syntactic weight is measured differently and a different level of information structure is considered in our study (focus vs. givenness), our results shall nevertheless be compared to those reported in Hawkins (1992, 1994) and Siewierska (1993). On the one hand, our results do not support Hawkins' assumption that weight is more important than information structure, since the results were similar for both factors.²⁴ On the other hand, they do not support Siewierska's (1993) conclusion that information structure is more important than weight either. What our results do support is Siewierska's (1993) finding that information structure is a factor independently of weight – which was also a main finding in Arnold et al. (2000).²⁵

4.3.3. FOCUSFINAL in Spanish

As shown in §4.2, narrow information focus is a factor in postverbal constituent order in Spanish because narrowly focused constituents appear more frequently in sentence final position. We have also seen that the respective constraint, namely FOCUSFINAL is a soft (or preferential) constraint: focused constituents appear preferably, but not exclusively in final position (cf. Table 13).

Table 13: Percentage of narrowly focused constituents in final and in prefinal position

	Position of focus	
	final	prefinal
DEP (& LOC)	64.10%	35.90%
LOC (& DEP)	76.92%	23.08%
DEP (& dO)	87.18%	12.82%
dO (& DEP)	87.18%	12.82%
average	78.85%	21.15%

How does this finding fit with the existing literature on the position of narrow information focus in Spanish? The two viewpoints introduced in §2 are: (i) narrow information foci obligatorily appear in sentence final position, (ii) narrow information foci do not necessarily appear in final position. Our results clearly suggest that the first view is too strict, because for more than 20% of the narrowly focused constituents the participants chose the prefinal position. At the same time, however, our results suggest a strong relation between narrow information focus and the final position because nearly 80% of the focused constituents are in final position. Although the second view is correct – narrow information foci are not limited to the final position – it does not entirely capture our results, because it leaves out the preference for the focus in sentence final position. Our results thus suggest – at least

²⁴ In §3 weight has been described as a gradual parameter: the more the difference in weight between two constituents increases, the stronger becomes the tendency to put the longer one after the shorter one. In my experiment, however, this gradual character is not accounted for. Thus, it might be that weight becomes more important than focus if the difference in weight between the two constituents is further increased.

²⁵ In my description of the impact of focus and weight on postverbal constituent order in Spanish I only make reference to linear order. As pointed out by one reviewer, it would be interesting to look at the hierarchical structures underlying the respective linear orders and analyze (i) what type of movements are triggered by focus and weight and (ii) whether the two factors trigger the same type of movement. As these issues require substantial conceptual and empirical work, I must leave them for further research.

for postverbal constituents – a third view: narrow information focus in Spanish is not limited to the sentence final position, but preferably appears in sentence final position.

4.3.4. The syntactic position of DEPs in Spanish

Finally, our results also show how experimental data can contribute to the description of the syntactic position of individual constituents. In the literature on subject-oriented depictives in Spanish their position relative to other postverbal constituents has received considerable attention. In the following I will briefly summarize the respective views and then show how the findings from our experimental study may contribute to a better understanding.²⁶

As concerns the ordering between DEP and dO, the main points are (i) that both orders are considered grammatical by at least one author, (ii) that there are diverging views as concerns the grammaticality of the two orders (cf. Tornel 1996 vs. Cifuentes & Tornel 1996, RAE 2009, Demonte & Masullo 1999), and (iii) that the grammaticality of the orders can also depend on the lexical material: Demonte & Masullo (1999) consider the DEP-dO fully grammatical in the case of (30a.), but questionable in the case of (30b.).

- (30) a. DEP-dO
 La madre abandonó desolada a su hijo.
the mother abandoned devastated:F P her child
 'The mother abandoned devastated her child'
 (Demonte & Masullo 1999: 2468)
- b. ?DEP-dO
 ?Dionisio trabaja complacido la madera.
Dionisio works satisfied the wood
 'Dionisio works the wood satisfied'
 (Demonte & Masullo 1999: 2482)

Table 14 summarizes the views on the ordering of DEP & dO.

Table 14: Ordering of DEP & dO

	grammatical	?	*
dO-DEP	RAE (2009), Demonte & Masullo (1999), Cifuentes & Tornel (1996)		Tornel (1996)
DEP-dO	RAE (2009), Demonte & Masullo (1999), Tornel (1996), Cifuentes & Tornel (1996)	Demonte & Masullo (1999)	

As concerns DEP & LOC, here also both possible orderings are considered grammatical in the literature and again we find diverging views amongst the authors. While LOC-DEP is fully acceptable for Cifuentes & Tornel (1996) it is very questionable for Demonte & Masullo (1999).²⁷

²⁶ For an analysis of the information structure and constituent order in Spanish argumental small clauses cf. Jiménez-Fernández (2012) and Jiménez-Fernández & Spyropoulos (2013).

²⁷ Demonte & Masullo (1999: 2482f.) argue that DEP can interchange its position with constituents that are subcategorized by the verb (e.g. direct objects), but always has to precede adjuncts. They illustrate this with an example of a DEP and a temporal adjunct where they consider the order TEMP-DEP very questionable.

- (i) TEMP-DEP

Table 15: Ordering of DEP & LOC

	grammatical	*
LOC-DEP	Cifuentes & Tornel (1996)	Demonte & Masullo (1999)
DEP-LOC	Cifuentes & Tornel (1996), Demonte & Masullo (1999)	

One problem with respect to the interpretation of these statements is that the authors do not explicitly state for which conditions these statements hold. Do they refer to some sort of unmarked order or are these statements intended to hold independently of factors such as information structure? Demonte & Masullo (1999: 2483) at least mention that the position of the DEP is not only determined by the "basic configuration" but can depend also on other factors such as information structure or weight. This seems to suggest that their grammaticality judgments are intended for an unmarked situation (which is not further specified). The results of our study clearly show how important it is to consider factors besides the syntactic function of the constituents in question if one wants to determine the relative syntactic position of constituents in a language like Spanish. In fact, all the orders that have been presented are chosen in the experiment: DEP-dO, dO-DEP, DEP-LOC, and LOC-DEP. But the frequency with which they are chosen strongly depends on factors such as the syntactic weight of the constituents and the sentence's information structure. This leads to a more comprehensive description of the orderings and the syntactic position of DEP in the context of other postverbal constituents.

5. Conclusions

Based on the results of a perception experiment, I have shown that narrow information focus and syntactic weight have an impact on Spanish postverbal constituent order. Both the focalization of a constituent and the increased weight of a constituent increase the frequency with which the respective constituent appears in final position. The results strongly suggest that both factors apply as preferential constraints and not as rules. Although the majority of the participants prefers to have the focused constituent and the constituent with the increased weight in sentence final position, this is not always the case: sometimes orderings with focused or long constituents in prefinal position were chosen as the preferred order in the experiment. As concerns the debate on the position of narrow information foci in Spanish, our results suggest a strong relation between narrow information focus and the sentence final position. But our results also show that narrow information foci are not limited to the final position and may also appear in prefinal position (in contrast to Zubizarreta's (1998, 1999) view).

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??La enferma tosió esta mañana enfadada.
the patient coughed this morning annoyed
 'The patient coughed this morning annoyed'
 (Demonte & Masullo 1999: 2483)

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