

A COMPARATIVE ANALYSIS BETWEEN ENGLISH AND SPANISH NATIVE SPEAKERS' PRODUCTION AND COMPREHENSION OF N-N COMPOUNDS

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Abstract

Taking as a point of departure the compounding parameter and its process of acquisition (Snyder 1995), the present study examines both differences and similarities in the use of English N-N compounds produced by a group of English native speakers and a second group of monolingual Spanish speakers learning English as their L2. The study also analyses whether the differences among the two groups of speakers, if any, could be attributed to crosslinguistic transfer from their L1 in the case of Spanish native speakers. This possible transfer will appear in the form of compound reversals (as shown in Nicoladis 2002) and it will be further related to other constructions with a similar word order, such as the Saxon genitive and the placement of adjective and noun within the noun phrase, since word order is the most likely and clear evidence of L1 transfer when dealing with Spanish learners of English (Nicoladis 1999).

Resumen

El siguiente trabajo consiste en un análisis del uso y producción de compuestos nominales ingleses (i.e. compuestos N-N) que parte del parámetro de los compuestos propuesto por Snyder (1995) y el proceso de adquisición de los mismos. El principal interés es comparar las diferencias y semejanzas entre hablantes nativos ingleses y hablantes nativos españoles aprendiendo inglés cuando tratan con este tipo de construcciones para establecer si las posibles diferencias se deben a la influencia lingüística de la L1 de los españoles en su L2. Puesto que el orden de los elementos gramaticales es la principal evidencia de este tipo de influencia, se espera que los compuestos producidos por los participantes españoles tengan el núcleo a la izquierda y no a la derecha (Nicoladis 1999, 2002). Además, también se analizan el genitivo sajón y el orden de los sintagmas nominales para ver si existe relación entre la producción de estas tres construcciones.

Keywords: N-N compounds, compounding parameter, L1 transfer, Saxon genitive, periphrastic constructions, adjectival modification, head-directionality.

Palabras clave: compuestos N-N, parámetro de los compuestos, transferencia de la L1, genitivo sajón, construcciones perifrásticas, modificación adjetival, direccionalidad del núcleo.

1. INTRODUCTION

Compounding is a common process of term formation used in most languages to create new words for naming novel items. Nevertheless, despite being a process spread across languages, language families vary in the frequency and productivity of noun compounds found in them. Thus, while Germanic languages such as English prefer forming N-N compounds rather than using prepositional phrases to express the relationship between two entities, in Romance languages such as Spanish or French periphrastic constructions are much more common to describe new lexical items (Nicoladis 2002). For this reason, Spanish and English, as examples of a Romance and a Germanic language respectively, deal with the so-called compounding parameter (Snyder 2001) in a different manner. That is, N-N compounding is a highly productive construction in English whereas it is an infrequent structure in Spanish (although it does exist). Consequently, if these two languages are compared in terms of the Subset Principle, English will represent the superset language since it allows [+affixal] and [-affixal] constructions and Spanish will be the subset language with only the [-affixal] option (Slabakova 2002; Liceras 2001).

Thus, the present study compares the production of English N-N compounds by a group of English native speakers (NSs) and a group of Spanish NSs learning English in order to see the degree of influence of the Spanish NSs' L1 into L2 when dealing with N-N compounding as well as other constructions with a similar word order: Saxon genitive and adjectival modification.

As for its organization, the study begins with a summary of the main grammatical issues considered for this research. Secondly, I will introduce the participants who took part in the study; thirdly, I will explain the tasks and materials used to elicit data individually. After this, I will present the results obtained in the analysis. Within this section, I will first present a general overview of the data; secondly, the data obtained in each of the three first tasks; thirdly, the individual performance in the tasks. These are followed by the translation task results. To

conclude the study, I will discuss the obtained results in order to draw conclusions from them. Finally, after the general conclusion, a reference list and the set of appendices end the study.

2. LITERATURE REVIEW

2.1. COMPOUNDING IN ENGLISH AND IN SPANISH

Compounding is a morphological process by which two or more words are joined to form a new word which functions grammatically and semantically as a single word (R.A.E; Quirk 1997). It is a very common process both in English and in Spanish. However, each of these two languages has its own preferences and restrictions when forming compounds.

A particular case of compounds are N-N compounds, formed by two nouns (head + modifier) which maintain a relation of resemblance, function, origin or other defining characteristics (Quirk 1997; R.A.E.). This type of compound is found in both languages, but while N-N compounding is a highly productive construction in English, Spanish prefers other derivational constructions like modifying Prepositional Phrases (e.g. *caja de bombones*) or adjectival modification (e.g. *vaca lechera*) to relate the meanings of the two nouns (Liceras 2001).

Apart from productivity, English N-N compounds also differ from their few Spanish equivalents in aspects such as head directionality and recursivity. Regarding the former, Spanish and other Romance languages have left-headed N-N compounds (e.g. *perro policía*). Although, some right-headed examples exist in Spanish, (e.g. *radiodifusión*), they are not common (R.A.E.). On the contrary, English N-N compounds are right-headed following the form “modifier+ head” as shown in: *police dog* (Miller 2010). In addition, English N-N compounds are recursive which means that more nouns can be added to the left of the head noun to complete or modify its meaning. Thus, there are no limits to the addition of new nouns to an already existing N-N compound (e.g. *cranberry apple pie*). For Spanish, recursivity is only allowed in periphrastic constructions (e.g. *perro policía del departamento de narcóticos* versus **departamento de narcóticos perro policía*), therefore, only one noun can act as modifier of the head noun (Slabakova 2002; Liceras 2001; Miller 2010). This fact is explained by means of Piera’s (1995) Double Bracket Restriction Theory, discussed in the articles by Slabakova (2002), Miller (2010) and Liceras

(2001). According to this theory, Spanish nouns have a word marker to mark the inflectional element which is indicated by double brackets occurring to the left of the word (*[[[tart]a]*). They act as a barrier and restrict the placement of modifiers to the right side of the compound, as well as preventing the incorporation of new nouns to the compound.

2.2 POSSESSION IN ENGLISH AND THE SAXON GENITIVE

As Foley and Hall (2003) explain, the Saxon genitive is the most common way of indicating possession in English. It consists of two nouns joined by 's in which the first noun is the possessor and the second represents the possessed object (e.g. *My car's paintwork*).

Other times, possession is marked in English by means of a noun + *of* + noun construction (e.g. *the paintwork of my car*). These two constructions are used in different situations. Whereas, the Saxon genitive is preferred with proper nouns (e.g. *Sheila's new car*), measures (e.g. *an hour's delay*), names of companies or shops (e.g. *I'm getting the Thanksgiving shopping at Macy's*); the periphrastic construction is preferred with abstract nouns (e.g. *the philosophy of science*) or with inanimate things (e.g. *the bottom of the mountain*). Both constructions can be interchanged to express ideas such as object quality (e.g. *the ship's sheer size* or *the sheer size of the ship*), the subject or theme of something (e.g. *the King's crown* or *the crown of the King*) and with countries, cities, institutions or buildings (though the genitive is more common: *One of New York's most famous theatres*).

2.3. ADJECTIVE-NOUN ORDER IN NOUN PHRASES (NPs)

As is the case with compounding, English and Spanish NPs formed by an adjective and a noun also differ with regard to word order. While Spanish NPs are left-headed (e.g. *el coche rojo*)¹; in English NPs, adjectives always precede the modified nouns. Therefore, the structure of English NPs containing an adjective and a

¹ Sometimes Spanish adjectives precede the noun that they modify (e.g. *el pobre chico*) and this position implies meaning connotations. Quantitative adjectives also precede the noun in Spanish.

noun is parallel to that of English N-N compounds (e.g. *the red car—the apple tree*) in that both are right-headed. This difference between the two languages may affect the production of non-native speakers of English, with regard to word order both in English NPs with an adjective and in N-N compounds.²

3. THE STUDY

3.1. AIMS

The following study aims at analyzing the production and interpretation of English N-N compounds by a group of English NSs and one of Spanish NSs, in order to compare them so as to identify their preferences for a particular construction and to see whether the differences between compounding processes in both languages affect their behaviour.

3.2. RESEARCH QUESTIONS

The present study on English N-N compounds is structured around 4 research questions which account both for the production and interpretation of this construction and compare the performances of both groups of participants. These research questions are the following:

- A) Would the two groups' performances differ from each other? That is, would Spanish NSs behave differently from English NSs when producing and interpreting English N-N compounds?
- B) Would crosslinguistic influence from their L1 affect the Spanish NSs' performance of English N-N compounds?

² Nicoladis (1999) also accounts for this idea in her study of French NSs learning English when producing English N-N compounds.

- C) Regarding production versus interpretation, would participants behave differently when producing and when interpreting English N-N compounds or would they perform consistently in both cases? For Spanish NSs, would they perform better in either of the two types of tasks?
- D) In the case of the Spanish NSs, is their production of N-N compounds related to their production of the Saxon genitive and adjectival modification in NPs? In other words, as the three constructions are right-headed in English but left-headed in Spanish (e.g. *la casa de Pedro* = *Peter's house*; *la ventana azul* = *the blue window*)³, will Spanish NSs produce the 3 of them following the Spanish word order or will they rather produce them as three independent structures without one affecting the other?

The research questions described above lead me to propose the hypotheses that are outlined in the next section.

3.3. HYPOTHESES

As N-N compounds are uncommon in Spanish, I hypothesize that Spanish NSs learning English will use them at a lower degree than English NSs and that, influenced by their L1, they will produce more periphrastic constructions instead. This prediction leads to a second hypothesis, according to which Spanish NSs' L1 will affect their performance. This influence can have two forms in terms of compound formation: head directionality and use of periphrastic constructions.

On the one hand, if Spanish NSs are aware of the existence of N-N compounds in English, they may produce them with a reverse order. In other words, they may apply the Spanish word order to English N-N compounds, therefore, having left-headed compounds in which the noun acting as the complement will follow the head noun. For example, they would say **dog police* and not *police dog*. This ungrammaticality would be derived from the fact that the Spanish equivalent to *police dog* is *perro policia*.

On the other hand, if Spanish NSs fail to learn the existence of N-N compounds in English, they would rather use a periphrastic construction (i.e. noun+ preposition+

³ Nicoladis (2002) also considers the possibility of finding wrong-headed N-N compounds among French NSs as the adjective usually precedes the noun in French phrases.

noun) which can express the same semantic relation as N-N compounds and which is possible in both languages. This reaction implies a direct translation from Spanish and, as a matter of fact, Spanish NSs would prefer the preposition “*of*”⁴ to any other preposition for being the direct equivalent of the Spanish preposition “*de*”. Therefore, structures like “*a house of bricks*” (e.g. *una casa de ladrillos*) will be more common than “*a brick house*” (e.g. **casa ladrillos*) in the analyzed data.

Thirdly, I predict that, whereas English NSs’ performance will be consistent regardless of whether they are dealing with production or interpretation tasks, Spanish NSs will make more mistakes in the production tasks (i.e. naming and translating tasks) as they involve transforming their L1 grammar and they will prefer to use similar constructions to those of their L1.

Regarding the possible relation between the Spanish NSs’ production of N-N compounds, the Saxon genitive and adjectival modification in NPs, my hypothesis is that if Spanish learners of English produce English N-N compounds following the Spanish word order, they will apply the same order in other patterns such as NPs and the Saxon Genitive. Moreover, there will be a double correspondence between the latter structure and N-N compounds, since the construction of N+ *of*+ N can also be applied to express possession. In this case, Spanish NSs would prefer to say “*the house of Peter*” rather than “*Peter’s house*”, using the periphrastic construction instead of the Saxon genitive to indicate possession because of their L1 transfer.

4. THE METHOD

4.1 PARTICIPANTS

A total of 31 people participated in the study. They consisted of a group of English NSs and another group of Spanish NSs. All of the participants were adult learners, with a mean age of 29.6 for the English group and a mean age of 23.94 for the Spanish group. The Spanish NSs had been studying English for a mean time of 9 years and they continued were still doing so at the time of the present study. Among these Spanish NSs there were two different subgroups. The first one consisted of 10 participants who had been studying English continuously and were still learning it;

⁴ The preposition *of* in compounds has a neutral meaning, this is why it is the one used in the tasks and expected to be found in the analysed data. However, as Krott et al. (2008) mentioned the relation established between the two nouns in an N-N compound may have different interpretations (FOR, PART OF, MADE OF, HAVE, LIKE...).

and a second group of 5 participants who stopped studying English for a mean time of 4 years, but were studying it again when the study was carried out. Eventually, one of the Spanish participants was excluded from the study since he was no longer studying English and his results were not very different from those of the other participants.

4.2 TASKS AND MATERIALS

The following study is based on four different written tasks⁵ which were distributed to the participants via email, so they did not have to do all the exercises at the same time and that they could do them in any order they liked.

Together with the set of tasks, participants received some instructions to do the exercises and a glossary of useful words (Appendix II), included to avoid constructions different to those that I expected in terms of vocabulary. In the instructions they were told about how to proceed to do the tasks, as well as the deadline to send them back to me. Participants were also asked not to use the dictionary in order not to alter the final results. They were advised to use it as a last resort and only if it was impossible for them not to use it to complete the task. In any case, they were allowed to ask me any doubts, including questions about vocabulary, so help was offered whenever they needed it.

There were 4 experimental tasks in total which consisted of a naming task, two multiple-choice tasks and a translation task⁶ and a description of each one of them follows:

4.2.1 The naming task consisted of 25 pictures of an object, an animal or a person, which were borrowed from Liceras and Fernández Fuertes' study (2000). Participants were asked to name what they saw in each picture by using a compound. For example, they were shown a picture of a tree with apples on it, so they should write "*apple tree*". In order to ease the analysis of the answers, participants were

⁵ Before handing them to the participants, the exercises were corrected by an English Ns who checked the possible ambiguity in sentence interpretation.

⁶ The actual tasks appear in Appendix I. Due to length restrictions, only a few examples of the naming task are included so that readers have an idea of what the participants had to do to complete it.

My purpose in including a second multiple-choice task was to check whether the Spanish NSs were able to understand the meaning of N-N compounds or rather they selected their options automatically, due to a repeated exercise mechanism. The fact that they understood the compound implied that they knew its correct head directionality and that they could identify the modifying and the head nouns. This exercise had an added difficulty as some compounds change their meaning depending on whether they are N-N compounds or periphrastic constructions. As a consequence, it was a good task to test the Spanish learners' knowledge and understanding of compounds.

In this second exercise, participants had to choose between two options which could be either two N-N compounds with a changed order (as in (3)) or an N-N compound and a periphrastic construction, as in (4):

(3) *I saw the horse race from the wall. The favourite horse was the winner.*
race horse

(4) *Pass me the ink bottle, I have to write a letter.*
bottle of ink,

4.2.3 The translation task, also designed specifically for this study, consisted of 21 Spanish sentences which should be translated into English. This task was only sent to the Spanish group since English NSs did not know Spanish and, therefore, it was impossible for them to complete it. Apart from N-N compounds (which may also be translated as periphrastic constructions with *of*), the 21 sentences included other similar constructions in terms of word order, namely, Saxon genitive constructions and NPs involving an adjective modifying a noun. These constructions are right-headed and their correct or incorrect production may be related to the production of English N-N compounds. Thus, if Spanish NSs placed the adjective after the noun, they would probably fail in the production of right-headed N-N compounds, due to the influence of their L1. In addition, when producing the Saxon genitive, the participants' answers will also show whether they tend to use periphrastic constructions more than N's -N constructions, which could be considered as another case of L1 transfer. Thus, my hypothesis was that if the participants followed the Spanish word order within English NPs containing a modifying adjective and a noun (e.g. **house green*) and when producing the Saxon Genitive (e.g. **house's Peter*), this tendency will lead to the production of left-headed N-N compounds (e.g. **box telephone*). Another possibility is that they would rather overuse periphrastic constructions with *of* (e.g. *the clothes of the children*). In other words, there would be a correlation between these types of different but related structures in the Spanish NSs' performance.

The translation task included 12 constructions of each structure (except for N-N compounds which were 13). These constructions were distributed randomly among the 21 sentences participants had to translate. In some sentences, there was only one of the three constructions but in others there were two or even three, as examples (5) and (6) show:

(5) *Marion lava la ropa de los niños todos los jueves.*

(6) *Lucía va a hacer un trabajo de investigación sobre los animales marinos.*

It is important to notice that cases like *cooking book* were not considered because they consists of a gerund (i.e. an ambiguous form between verb and noun) and a noun; therefore, they do not fit within the N-N compound pattern on which this study focuses. Only those constructions that corresponded roughly to one of the three possible constructions were analyzed.

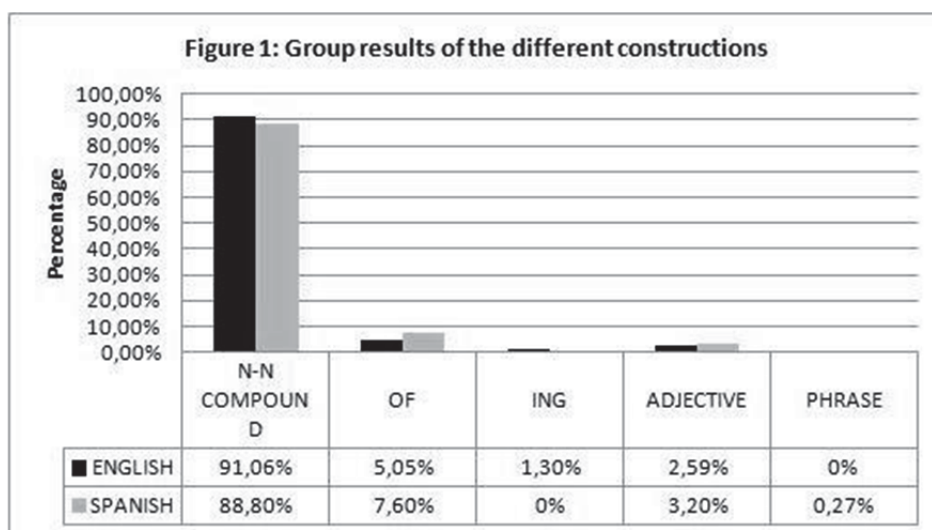
Since these 4 tasks can be grouped into two types according to whether they focused on the participants' production (i.e. translation and naming tasks) or on their interpretation of complex constructions (i.e. multiple-choice tasks), I hypothesize that the results will differ in the two groups and that Spanish participants will behave more naturally in the production tasks. Thus, they would produce more periphrastic constructions and more left-headed instances since they are not helped by already made answers as in the multiple-choice tasks and their answer will be closer to what they would say in a real situation.

5. RESULTS

5.1. GENERAL RESULTS

The two groups' percentages of compounds, N-*of*-N and other constructions used in the first three exercises⁷ are shown in Figure 1:

⁷ The translation task tokens are not included in this general overview since the English NS did not do this exercise.



Firstly, N-N compound use is higher in the case of the English NSs (91.06% versus 88.8%), although both groups used compounds more than 85% of the time. It is important to notice, however, that this general percentage includes both left-headed and right-headed N-N tokens produced by the participants and it shows the general tendency of producing each type of construction. The actual number of correct and incorrect N-N compounds will be distinguished later in the separate analysis of the tasks.

In the case of the other constructions, the Spanish NSs produced more periphrastic and adjective + noun constructions than the English NSs, this difference being higher in the case of the periphrastic constructions (2.55% versus 0.61%).

Another noun-modifying construction which appears in both groups is the *-ing* construction. The English native group uses it more than the Spanish one (the difference is 1.17%). This *-ing* modification is produced basically in the naming task and some examples are (7), (8) and (9):

(7) *Milking cow* (English 1⁸)

(8) *Smoking dog* (English 7)

(9) *Homing pigeon* (Spanish 8)

⁸ The term “English” will refer to the English NSs when citing examples of actual answers of the exercises, and “Spanish” to the other group.

On the other hand, the Spanish NSs also used other kind of phrases and constructions which did not appear in the English group's data. These phrases were mostly a noun modified by a prepositional phrase other than "of", such as (10) or Saxon genitive constructions as in (11):

(10) *Tree with apples* (Spanish 10)

(11) *Spider's web* (Spanish 8)

After this general overview, a detailed analysis of the different tasks separately follows in order to compare the two groups in a more accurate manner.

5.2. NAMING TASK:⁹

This task shows the tendency of the participants to produce N-N compounds or other kind of constructions when they have to name different pictures which represent people, objects or animals that share double properties and that, therefore, favour the production of N-N compounds. In addition, the results help to compare the preferences for the use of N-N compounds over periphrastic constructions as well as the differences between the two groups of participants in terms of head directionality.

As mentioned above, this exercise consisted of 25 pictures which were expected to be named by using two nouns from the glossary provided for this purpose. In order to analyze the participants' production, their answers were compared to a list of expected constructions, included in Appendix III. Since some of the pictures were ambiguous and the head of the compound was not very clear (11 out of the 25 expected structures, which means half of the experimental constructions), the possibility of double head directionality was accepted in cases in which the picture matched the compound. Some instances of this double head directionality are (12) and (13):

(12) *Frog king/king frog*

(13) *Woman octopus/octopus woman*

Apart from these ambiguous compounds, participants produced other unexpected but grammatical constructions such as single nouns or NPs pre-modified

⁹ Some of the participants failed to name all the pictures and left a blank instead. One participant of each group forgot to do this exercise. Therefore, the data analyzed here only considers the actual answers.

by adjectives and *-ing* constructions, which were taken into account for the analysis. Some of these constructions are (14), (15), (16), (17) and (18):

(14) *werewolf* (English 11)

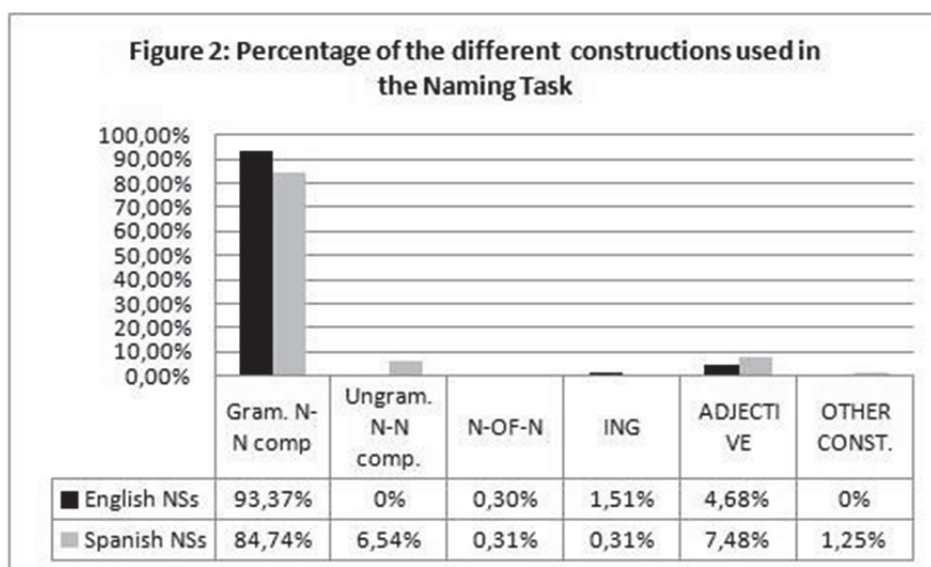
(15) *milking cow* (English 6)

(16) *diver* (English 13)

(17) *orange tree* (Spanish 9)

(18) *teacher ant* (Spanish 2 15)

After considering all the possible options for this production task, the participants' production was transcribed and the results are summarized in Figure 2.



According to these results, English NSs preferred to use N-N compounds rather than other kind of constructions, even if they also used them. Among these other constructions I found NPs consisting of an adjective and a noun in 4.68% of the tokens (e.g. *sexy spider*, English 9 or *big cow*, English 2); and an *-ing* word modifying a noun in 1.51% of the tokens (*smoking gun*, English 3).

With regard to Spanish NSs, it is worth mentioning that, even if they also preferred the use of N-N compounds to describe these pictures (91.28% in total) and the difference in use in comparison with the English native group seems irrelevant

(only 2.09% of the tokens), they produced 6.54% of ungrammatical left-headed N-N compounds. These wrong N-N compounds were produced randomly without any relation among them, as examples (18), (19), (20), and (21) show:

- (18) *Bike pirate* (Spanish 3) (19) *cow milk* (Spanish 4)
 (20) *box tool* (Spanish 1) (21) *bee queen* (Spanish 2)

Thus, the difference with the English NSs increases up to 8.63% because all the compounds produced by the English NSs were right-headed. Moreover, Spanish NSs sometimes produced wrong English N-N compounds due to the use of the plural mark in the modifying noun, as reflected in (22) and (23):

- (22) *Tools box* (Spanish 7)
 (23) *Two sides bench* (Spanish 11)

This mistake is due to the direct translation from the Spanish “*caja de herramientas*” and “*banco de dos lados*”. Therefore, it is a clear evidence of crosslinguistic influence from the Spanish NSs’ L1.

Another difference is that Spanish NSs produced 2.8% more Adjective + noun constructions than the English ones. Moreover, the Spanish group also used other constructions which did not appear in the English data and which were mainly prepositional phrases modifying a noun (e.g. *apple with trees* or *dog in a suit*), and –*ing* modification (e.g. *diving man* and *homing pigeon*).

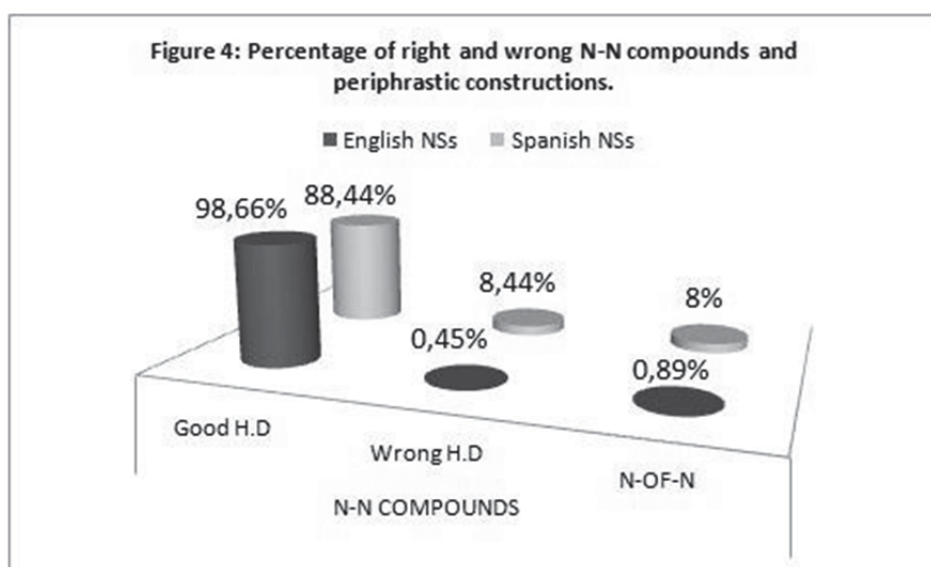
Finally, the last finding is that both groups used periphrastic constructions (N+ *of*+ N) in very few occasions. None of the two groups used them excessively and their percentages are less than 0.5 % in both groups.

5.3. MULTIPLE CHOICE TASK 1:

Next, I turn to the results of the first multiple choice task. Figure 3 summarizes the actual number of correct and incorrect choices that participants made. And Figure 4 shows the percentage of N-N compounds and periphrastic constructions chosen by the participants of the two groups, as well as the percentage of right and wrong answers according to head directionality.

	RIGHT ANSWERS	WRONG ANSWERS
English NSs	223/225	1/225
Spanish NSs	206/225	19/225

Figure 3. Total number of right and wrong answers.



Unsurprisingly, English NSs are more accurate than Spanish NSs in choosing the right answer (i.e. 223 versus 206 tokens respectively) including both N-N compounds and periphrastic constructions. Though both options are grammatical in English, it is important to notice that only those answers with a single choice were analyzed. In other words, those cases in which both the periphrastic construction and the N-N compound were selected within the same exercise were disregarded because the participant did not decide for one option or the other, consequently it is impossible to judge his preferences for any of the two constructions.¹⁰

¹⁰ This example clarifies what I mean with double answers:

With regard to wrong answers, they represent left-headed N-N compounds which were much more frequent in the Spanish NSs' production (8.44%) with cases like (24) or (25):

(24) *Critic restaurant* (Spanish 1, 2, 6, 14)

(25) *spoon wood* (Spanish 7)

than in the English NSs' (0.45%), who only chose one left-headed compound (*consumption energy*, English 7¹¹). The difference between both groups (7.99%) can be attributed to the Spanish NSs' L1 influence in their L2 production.

Second, Spanish NSs chose periphrastic constructions in 8% of their responses, whereas the English NSs only did so in 0.89% of theirs. There are only two instances of this type of construction (i.e. "*box of tools*", English 2 and "*market of labour*", English 7). These two examples are also found in the Spanish group's data, together with other instances such as (26), (27) or (28):

(26) *House of bricks* (Spanish 6, 7, 11)

(27) *spoon of wood* (Spanish 4, 10, 11, 13)

(28) *consumption of energy* (Spanish 7, 9, 10, 11)

In addition, there are some more isolated instances such as *inspector of taxes* (Spanish 7), *matches of football* (Spanish 1) or *shoes of tango* (Spanish 1), which correspond in Spanish to a Prepositional Phrase with "de". In addition, some of them require the plural mark (e.g. *casa de ladrillos*, *inspector de tasas*) which does not appear in the English N-N compound (e.g. *brick house*, *tax inspector*). This fact may be somehow related to the Spanish group's preference for the periphrastic construction instead of the N-N compound. However, further study will be required to clarify this hypothesis.

In relation to the percentage of N-N compounds, the English NSs preferred them in 10% more of the answers than the Spanish NSs. Nevertheless, both groups chose grammatical N-N compounds more than 88% of the time, which suggests that Spanish NSs had become used to this construction and prefer it rather than its counterpart, the periphrastic construction, as English NSs.

1) To inform the NASA about their progress during their spatial missions, Astronauts establish **communication satellites**. Can be either **satellite communications**.

¹¹ This response is probably a mistake when selecting the answer since it is the only left-headed compound found in this participant's data.

5.4. MULTIPLE CHOICE TASK 2:

The aim of this task was to see whether the participants understood the meaning of compounds, periphrastic constructions and other types of nominal modification (e.g. Adjective + noun or *-ing* + noun) as, though similar, the meaning of these constructions sometimes differ¹². Figure 5 represents a diagram with the total number of understood and non-understood choices in the two groups, classified according to the type of construction.

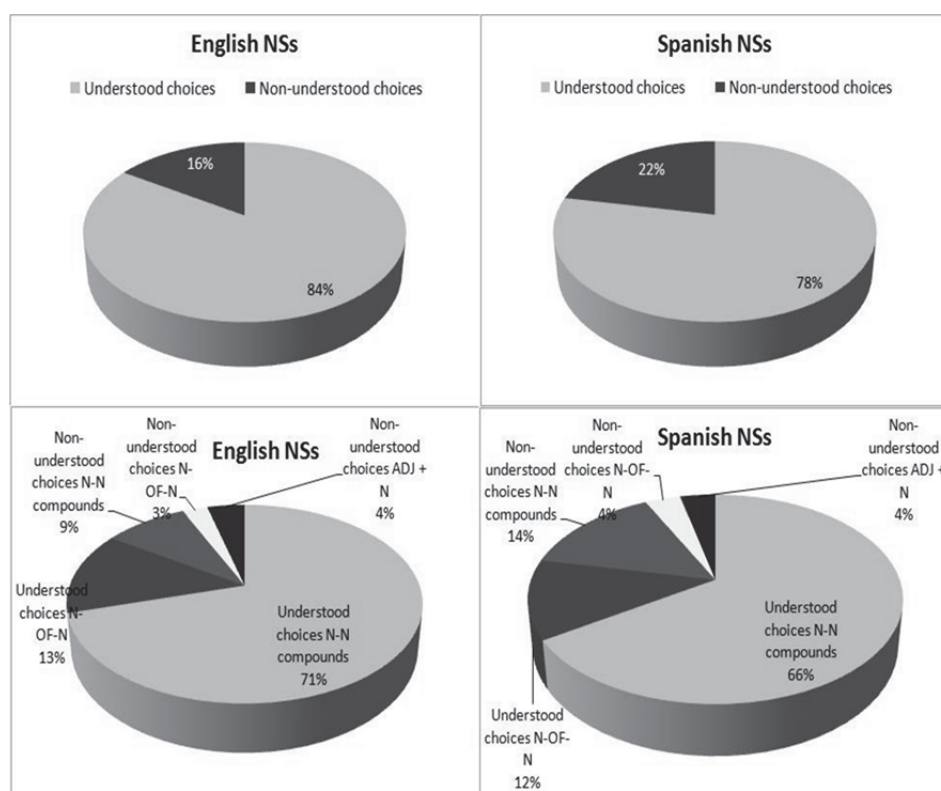


Figure 5. Percentage of understood and non-understood choices in general and with regard to the different constructions.

¹² A particular case is that of the compound nouns and periphrastic constructions related to containers. The first option only describes the container itself, without including what is contained in it.

The scores show that English NSs were more accurate in choosing the correct answer (84% of their choices) than the Spanish group (78%), although they also chose incorrect options (16%). These incorrect choices were usually related to containers as example (29) illustrates:

(29) *Box of matches* (English 7)

But there were also some cases of wrong N-N compounds like *paper filter* (7 of the 15 English participants chose this option), and *communication satellites* (6 out of 15 participants chose it), which might be due to a bad construction of the sentence or a misunderstanding of the compound.

Regarding the Spanish group's results, they understood N-N compounds in 66% and periphrastic constructions in 12% of the tokens; therefore, a total of 78% of the tokens. Among the 22% of the incorrect options they did not understand 14% of N-N compounds (i.e. 5% more than the English NSs); 4% of periphrastic constructions (i.e. 1% more than the English group) and 4% of Adjective+ Noun constructions. These mistakes were related to containers both in the case of N-N compounds (right and left-headed) and N+ *of* + N. Some of these incorrect answers are (30), (31), (32) and (33):

(30) *Tea cup* (4 participants)

(31) *ink bottle* (8 participants)

(32) *box of matches* (2 participants)

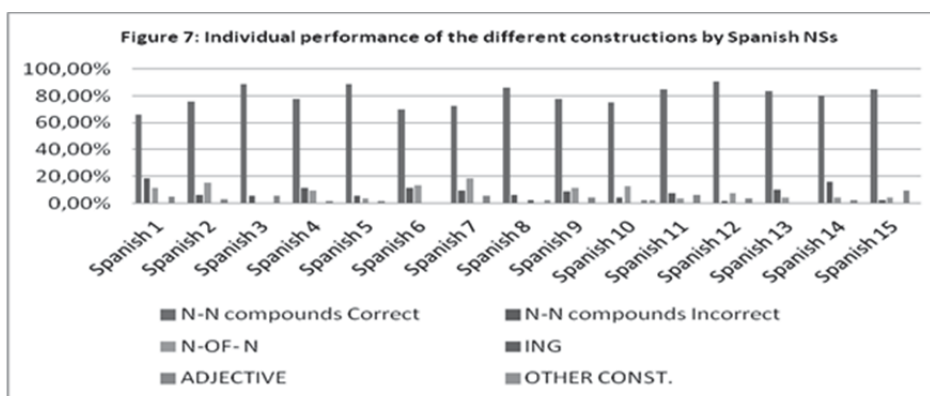
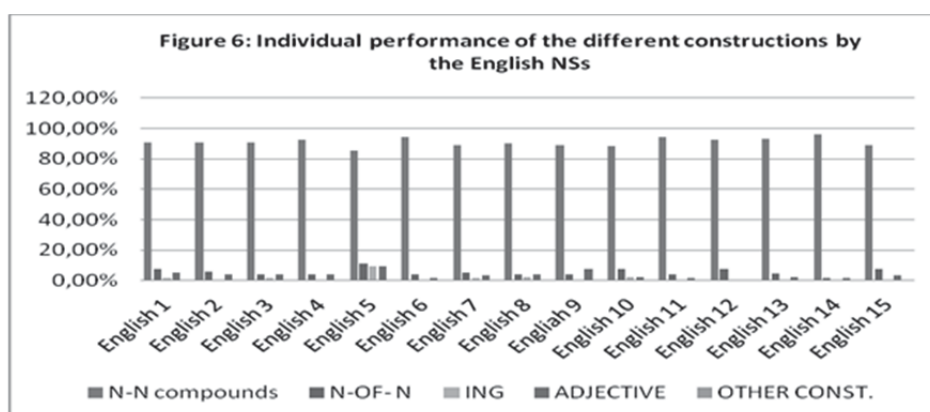
(33) *paper filter* (8 participants)

Both groups coincided in the choice of *paper filter*, *communication satellites*, *cylinder of gas*, and *ink bottle*, which suggests that the two groups had problems when dealing with containers and that the two first options are problematic probably due to the construction of the sentence in which they are included.

5.5. INDIVIDUAL RESULTS:

The analysis of the individual results helps to judge the individual level of linguistic competence of each participant, as well as to confirm the results found in the groups and to see the level of homogeneity of the two groups of participants in terms of proficiency. Figure 6 presents the individual production of N-N compounds,

periphrastic constructions and other type of constructions in the three tasks by English NSs. And Figure 7 shows the same information for the Spanish NSs.



A quantitative analysis of each participant's answers shows that N-N compounding was the construction preferred by all individual participants. However, participants differed in terms of accuracy; while all the English participants' N-N compounds were correct and they produced them more than 85% of the time, up to 18% of the total number of Spanish N-N compounds were incorrect. Furthermore, Spanish participant's production of N-N compounds was less consistent than that by English NSs. Moreover, the total number of compounds produced by each Spanish participant varied a lot in comparison with the variation between English participants, being Spanish 1 the one with the lowest production (65% of the total constructions) and Spanish 3 the one with the highest number of N-N compounds in his/her performance (84% of the tokens).

On the other hand, in the case of periphrastic constructions, Spanish NSs used them from 3 up to 18% of their total answers. This percentage was reduced in the case

of English NSs who used this type of construction less than 10% of the time for all individual participants.

As for the rest of constructions used in the individual performances, Adjectival modification was the most frequently produced construction by both English and Spanish individual participants (up to 9% of the total answers); whereas *-ing* modification was only found in English NSs and other constructions such as Prepositional phrases were only produced by Spanish NSs.

Figure 8 reproduces the analysis of the individual performances in the 3 tasks separately and confirms the general findings of the individual results.



Figure 8: Comparative analysis of individual results in each one of the tasks separately. The Spanish participants' results are on the left and the English NSs' ones on the right.

Despite the expected individual variability of each participant, the scores showed that the English native group was more homogeneous than the Spanish group in all the three tasks as their distribution of each different type of construction was similar and consistent across all the tasks. Thus, English NSs preferred the use of N-N compounds over the other type of constructions and their production of incorrect N-N compounds was always low or even non-existent in comparison with the Spanish NSs, being English 7 the participant with a higher percentage of wrong answers (20% in the Multiple Choice 2 task).

According to these results, the Spanish group produced a higher number of different constructions to N-N compounds than the English NSs in all the three tasks, although N-N compounds was always the most used construction in all the three tasks. Another difference with the English speaking participants is that Spanish participants produced a higher number of wrong answers regardless the type of elicitation task. The quantity of mistakes was higher in Multiple Choice Task 2 reaching up to 33% of the total answers. This number of wrong answers may be a related to the Spanish participants' lack of vocabulary.

5.6. TRANSLATION TASK

Finally, I move on to the analysis of the translation task. This task was designed to check a possible relation between the production of English N-N compounds by Spanish NSs and their production of Saxon genitive and NPs formed by an adjective and a noun. The element I looked at in this analysis was word order in the three constructions and I hypothesized that the order problems found in the production of N-N compounds will also be present in their production of Saxon genitive and Adjective modification. Furthermore, this task is also useful to analyse the Spanish participants' tendency to produce N+ *of* + N constructions rather than N-N compounds or Saxon genitive.

Before discussing the results, it is important to mention that I was not interested in the participants' vocabulary, grammar or correct sentence structure but in the actual production of the 13 N-N compounds¹³, the 12 Saxon genitive structures and the 12

¹³ A total of 15 N-N compounds are found in the task, however, only 13 were considered because "libro de cocina" and "El Libro de la Selva" were disregarded, as the first one consists of a noun modified by an *-ing* construction and the second one is the title of a well-known book.

adjective + noun constructions. For this reason, I took into account and considered examples such as *muñecas house* (Spanish 16) as correct since they follow the correct word order, though they combine both Spanish and English words.

On the other hand, there were some cases that I did not take into consideration for the analysis. These are single words like *cabin*, *research* or *bakery*; *-ing* + Noun constructions such as *dancing classes* and *cooking book* since they could not be included within any of the three analyzed categories.

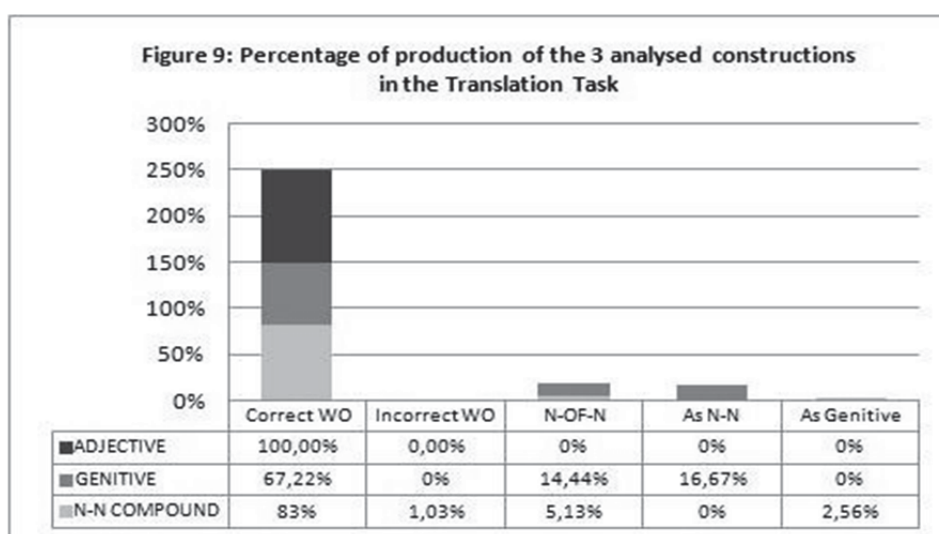


Figure 9 presents the scores obtained in the task by the Spanish native group.

First, I will discuss the findings associated with word order. According to the percentages, the only construction with incorrect answers due to the wrong order of its constituents is N-N compounding as the translations *dog police* and *cabin phone* exemplify. On the contrary, no examples of either a Saxon genitive or a NP with an adjective modifying a noun with an incorrect word order were found in the data. Therefore, the hypothesis of the association of the three constructions in terms of word order is not valid and the Spanish participants' production of left-headed N-N compounds appeared not to be related to their production of Saxon genitive or Adjective+ N constructions.

Second, I turn to the analysis of N+ *of* + N constructions used instead of either N-N compounds or Saxon genitive. In this case, participants used the periphrastic construction in the place of both constructions but to a different extent. Thus, this tendency is more common with the expression of possession (14.44% of the total

number of expected Saxon genitives) than with the production of N-N compounds (only 5.13% of the time). This fact supports the previous finding that the production of Saxon genitive and that of N-N compounds is independent from each other.

Among the most common instances of periphrastic constructions for the Saxon genitive, there are cases such as (34), (35) and (36); and for the N-N compounds, there are cases like (37), (38) and (39):

(34) *The best work of Beethoven* (Spanish 1, 5, 6, 7, 8, 10, 11, 13, 14)

(35) *The portrait of the Queen* (Spanish 1, 12, 13, 14, 15)

(36) *The (Wax) Museum of London* (Spanish 1, 2, 6, 10, 11, 12, 14)

(37) *Exposition of old cars* (Spanish 1, 3, 7, 8, 10, 11, 12 and 13)

(38) *Museum of Wax* (Spanish 12)

(39) *Film of pirates* (Spanish 10)

These examples showed that the periphrastic construction was frequently used with N-N compounds including a plural form and when there was an adjective modifying a noun in either N-N compounds or Saxon Genitive constructions. Then, participants usually felt insecure about placing a modifying adjective when it appears combined with an N-N compound or a genitive. Consequently, they placed the adjective before the wrong noun (e.g. *best Beethoven's work*) or they used the N + *of* + N construction or other Prepositional phrases modifying the head noun (e.g. *the Wax Museum in/near London*).

Apart from word order and the preference for periphrastic constructions, the analysis of this task showed some interesting findings which are worth mentioning. The first one is that many of the participants produced N-N compounds as Saxon genitives or vice versa. They did so randomly as examples (40), (41), and (42):

(40) *Science's teacher* (Spanish 15)

(41) *Children clothes* (Spanish 1, 2, 6)

(42) *The Queen picture* (Spanish 2, 4, 7)

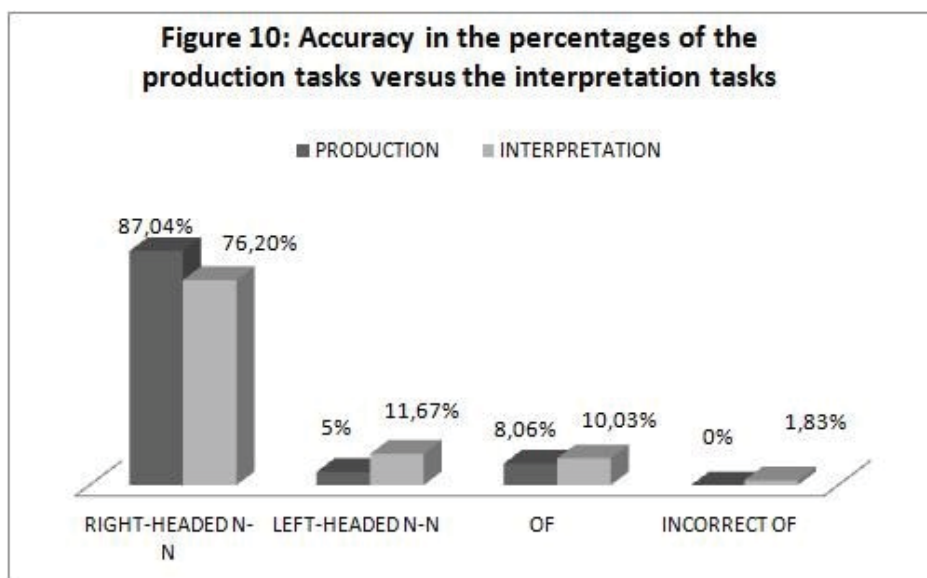
Another important finding is that Spanish participants produced non-native-like constructions with plural marks in the modifying noun in cases such as *dolls house*, *recipes book*, *trucks parking*, or *teeth brush*. All these instances implied a plural in the Spanish counterpart so the mistake can be attributed to crosslinguistic transfer from their L1. Another possible explanation could be a misspelling of the Saxon Genitive in which participants forgot to include the apostrophe.

To summarise, the translation task shows first that there is no relation between the production of N-N compounds and the knowledge and production of Saxon genitive

and NPs consisting of an adjective and a noun. The three constructions are independent from each other and the problems with word order are subjected to individual participants' knowledge. Second, the periphrastic construction is frequently used to express possession and it is normally associated with problematic constructions and lack of vocabulary. Third, L1 transfer is responsible for the production of left-headed N-N compounds and the addition of the plural mark to modifying nouns. Finally, participants mixed up N-N compounds and Saxon genitive constructions but they did it randomly so there is not a clear explanation for this confusion.

5.7. PRODUCTION VERSUS INTERPRETATION IN SPANISH NSS' S DATA

Having analysed all the data produced by the Spanish NSs, I can verify the validity of my previous hypothesis about the results expected in the production versus interpretation tasks. As said before, I expected to find a higher number of accurate answers in the interpretation tasks (Multiple choice tasks) than in the production tasks. Nevertheless, although the results were different between the two types of task, the scores were not the ones I expected. Figure 10 summarises the percentages of the two groups of tasks:



The first finding is that, contrary to what I expected, the periphrastic construction was chosen more in the interpretation tasks than it was produced in the production tasks (10.03% versus 8.06%). In addition, Figure 10 shows that Spanish participants made more mistakes when interpreting the N+ *of* + N construction than when producing it.

At first sight, the total percentage of N-N compounds used in the two types of tasks seems to be very similar between the two groups (92% in the production tasks and 88% in the interpretation tasks). Thus, the second finding indicates that Spanish NSs produced more N-N compounds in the naming and the translation tasks than I had predicted (87.04%) and, on the contrary, they chose N-N compounds to a lesser extent in multiple choice tasks (76.20%). Furthermore, they also misunderstood a higher number of left-headed N-N compounds in the interpretation tasks (11.67%) than they did in the production tasks (5%).

6. DISCUSSION AND CONCLUSION

The present is an empirical study based on written data which attempted to compare the behavior of English NSs and Spanish NSs with regard to N-N compound production. The aim was to see participants' preferences and to analyse the differences and similarities between the two groups. Besides, this study also aimed at analysing the degree of crosslinguistic influence into participants' L2. That is, it attempted to verify whether the incorrect answers made by the Spanish NSs could be attributed to the influence from their L1, appearing in the form of either left-headed N-N compounds or an overuse of N+ *of* + N constructions.

The last research question dealt with in this study was the relationship between N-N compound production and the production of related constructions in terms of word order: the Saxon genitive and adjectival modification.

From the results of the four different tasks, we can conclude that both groups of participants behaved similarly with regard to their preference for N-N compounds over other alternative constructions. The four tasks showed that there is not an important difference in the quantity of N-N compounds produced by the English and the Spanish NSs (still the difference is worth mentioning). Thus, N-N compounds are the most widely used construction, followed by periphrastic constructions and then by

adjectival phrases. These findings contradict my previous hypothesis predicting that Spanish NSs will use a higher number of periphrastic constructions due to the rarity of N-N compounds in their L1. In addition, the hypothesis stating that the Spanish participants' results in the production tasks (i.e. naming and translating tasks) will be very different from those implying interpretation (i.e. multiple choice tasks) also proved to be wrong since Spanish NSs made more mistakes and used less N-N compounds in the interpretation tasks than in the production ones. A possible explanation for these results is that the Spanish participants may have a high level of proficiency in English and have learnt that N-N compounds are a very productive construction in English. This explanation will account for the higher percentage of N-N compounds found in the production tasks, although it does not justify the highest number of mistakes made in the interpretation tasks. Another possible reason that accounts for both findings is Spanish NSs' awareness of their participation in a research, which may have affected their production by making their answers not natural and spontaneous but carefully analyzed before being answered (especially in the production tasks). This explanation will also justify the quantity of errors made in the interpretation tasks being higher than those made in the production tasks, as the former require less attention than the latter.

Another common characteristic found between English and Spanish NSs is that both groups had problems when interpreting the exercises related to containers in the second multiple choice task. In the case of the Spanish participants, this fact could be attributed to a misunderstanding of the N-N compound meaning due to a wrong interpretation of the head. Nevertheless, there is not a clear explanation for the English NSs, maybe they did not pay attention to the exercise or they did really have problems when referring to containers.

Next, I turn to the analysis of the differences between the two groups of participants. The most important one is that Spanish participants produced a high number of left-headed N-N compounds whereas English participants did not produce any. Another characteristic of N-N compounds produced by Spanish NSs but not by English NSs is that the modifying noun is sometimes marked for the plural, being the resulting compound ungrammatical in English. The most plausible explanation for this ungrammatical production is crosslinguistic transfer from Spanish into English. Thus, Spanish NSs will transfer the Spanish word order into English N-N compounds so that they are left-headed and not right-headed as they should be. This crosslinguistic influence is also responsible for the use of plural marking in N-N compounds since it is found in tokens which are plural in Spanish.

Although periphrastic constructions were not as widely used as predicted, still the Spanish participants produced them more than the English ones. This fact could be also an instance of crosslinguistic influence from their L1. As a consequence, the

differences in the results between the two groups confirm the presence of crosslinguistic transfer in the Spanish NSs production and support the Subset Principle theory (Slabakova 2002).

Finally, with regard to the hypothesis of a relationship between N-N compounds, Saxon genitive constructions and adjectival phrases, the results showed that they are independent from each other and that the grammatical or ungrammatical production of the latter constructions does not affect the production of N-N compounds by Spanish NSs. These results support Nicoladis' (1999) results since the participants turn out to be less accurate in ordering compounds than in ordering adjectival phrases.

In conclusion, the data showed that Spanish NSs have been able to learn the high productivity of N-N compounds in English and they have realised that they need to use them in their English production. Moreover, the results also confirm that L1 transfer plays an important role in the Spanish NSs' production and affects it, being the main responsible for most of Spanish NSs' errors, especially those related to word order. Nevertheless, it is important to bear in mind that these findings and conclusions apply to the participants tested here and are open for further studies which can lead to a better understanding of Spanish NSs' competence of English N-N compounds. Some instances of further investigation on this topic could include a study of N-N compounds in casual speech to contrast native's production to that non-native's. Also, a future study considering the history of the usage patterns of N-N compounds by English NSs could also clarify the reasons behind their inclination towards N-N compounds, and this could be compared with Spanish NSs' data to see whether these two groups' performances evolve in the same way.

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APPENDIX I

TASKS

1- Choose the best option in each case.

EXAMPLE: My sister loves travelling so she buys many *magazines of travel*.
magazine travel.
travel magazines.

Woody Allen is a famous *director of films*.
film director.
director film.

1) *Air conditioners*
Conditioners of air were designed to filter air through soundproofing materials.
Conditioner air

2) My house is built with red rectangular items. It is a *house brick*.
house of bricks.
brick house.

- 3) Let me see your *shoe tango.*
tango shoes.
shoes of tango.
- 4) It's very difficult to go into the *labour market*
market of labour nowadays.
market labour.
- 5) We need a *spoon of wood.*
wood spoon to prepare this meal.
spoon wood
- 6) The letter arrived by plane. It was sent by *mail of air.*
mail air.
air mail.
- 7) I don't like watching *matches of football*
match football at home. I prefer doing it at the bar.
football matches
- 8) His job consists of checking that everyone pays their taxes. He is a *tax inspector.*
inspector tax.
inspector of taxes.
- 9) The major is giving a prize to the person who consumes less energy; that is, to the person who reduces his *consumption energy* the most.
energy consumption.
consumption of energy.
- 10) Mary has always wanted to visit the *reef of corals*
coral reefs in Australia.
reef corals
- 11) The plumber who came to repair the pipes forgot his *box tools*
box of tools at home.
tool box

- 12) Tom bought a new racket at the *sport shop*.
shop of sports.
shop sports.
- 13) Paul goes to many different restaurants, tries the main dishes and then writes about them.
 He works as a *critic of restaurants*.
critic restaurant.
restaurant critic.
- 14) She's really good at writing poems so she is attending the next *contest poetry*.
contest of poetry.
poetry contest.

2- Same exercise as before. Choose the best option.

- 1) There was a dangerous *gunfight* outside the disco last night.
fight gun
- 2) Here's your *cup of tea*. It's hot, so be careful!
tea cup.
- 3) The *Spanish students* are from Kentucky.
students of Spanish
- 4) Can you give me a *match box* to put this spider in?
box of matches
- 5) I saw the *horse race* from the wall. The favourite horse was the winner.
race horse
- 6) Where is the *gas-cylinder* to light this fire?
cylinder of gas
- 7) A gauge for measuring the oil is a(n) *gauge of oil*.
oil-gauge.
- 8) John has bought a new *boat-fishing* because the old one broke down.
fishing- boat
- 9) What is the name of the place from which oil is extracted? *field of oil*.
oilfield.

- 10) I need a *filter paper* to take apart this mixture of salt and water.
paper filter
- 11) To inform the NASA about their progress during their spatial missions, Astronauts establish *communication satellites*.
satellite communications.
- 12) The film *Chicken Run* is about a group of chickens which want to get away from the *chicken farm*.
farm chicken.
- 13) A *battery car* is required to drive this remote controlled car.
car battery
- 14) The bakery is the *house corner* in front of the church.
corner house
- 15) Pass me the *ink bottle*, I have to write a letter.
bottle of ink,

3-Translate these sentences into English.

- 1) La hermana de María ha comprado un libro de cocina.
- 2) ¿Tienes unos zapatos de ballet para las clases de baile?
- 3) El primer libro que leí fue *El Libro de la Selva*.
- 4) Lucas trabaja en una fábrica de pan.
- 5) El profesor de ciencias está enfermo, estará de vuelta la próxima semana.
- 6) Tiene una casa de muñecas en su habitación.
- 7) El amigo de Juan vive en una casa verde al lado de una cabina de teléfonos.
- 8) Anoche vi una película de piratas en casa de Marta.
- 9) Encontraron muchas revistas en el armario roto que estaba en la habitación cerrada.
- 10) El retrato de la reina impresionó mucho.
- 11) ¿Alguien ha visto un sacapuntas azul?
- 12) El padre de Laura es comisario y tiene un perro policía.
- 13) Tengo que comprar un cepillo de dientes.
- 14) Marion lava la ropa de los niños todos los jueves.
- 15) El grupo de estudiantes españoles visitó el Museo de cera de Londres.
- 16) Iremos a casa de la abuela pronto.
- 17) Lucía va a hacer un trabajo de investigación sobre los animales marinos.
- 18) La Novena Sinfonía es la mejor obra de Beethoven.
- 19) Están construyendo un campo de tenis cerca del aparcamiento de camiones.
- 20) ¿Has leído el artículo de Pedro en el periódico de hoy?
- 21) Hay una exposición de coches antiguos delante del Palacio Real.

4-Some example of the pictures in the naming task (Liceras and Fernández Fuertes 2001).



APPENDIX II

GLOSSARY OF USEFUL WORDS

man	cow	cat
boat	mill	apple
sausage	tool	postman
dog	chain	ship
milk	ant	table
police	box	
frog	woman	Pirate
bee	bird	wolf
wind	octopus	
queen	bike	
tree	picnic	
key	turtle	

APPENDIX III

EXPECTED CONSTRUCTION IN THE NAMING TASK

1- Pirate ship	7- Toolbox	13- Sausage spider	19- Postman bird
2- Queen frog	8- Police dog	14- Wolf woman	20- Ant woman
3- Wolfman	9- Ant man	15- Windmill	21- Picnic table
4- Sausage dog	10- Milk cow	16- Pirate bike	22- Octopus man
5- Postman turtle	11- Frog man	17- Spider man	23- Queen bee
6- Octopus woman	12- Police cat	18- Apple tree	24- Spider woman
			25- Keychain

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