ENGLISH COMPLEX NOUN PHRASE INTERPRETATION
BY SPANISH LEARNERS

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ABSTRACT. *English complex noun phrases (CNPs) are, in some cases, juxtaposed nouns without any preposition that would identify their semantic connections. Because their element number can be hypothetically infinite, it is well known that CNP understanding represents an important obstacle for non-native speakers of English, even more for Spanish learners of English at an L2 level designated as B2 by the Common European Reference Framework. This study was carried out, on one hand, to analyse the changes that take place in the position of the different elements making up English premodified CNPs (PCNPs) when translated into Spanish and, on the other hand, to establish the most frequent syntactic patterns so that these may be used to help learners of English. In addition, pedagogical strategies are proposed, which can help English teachers. Towards that end, we examined a corpus of twelve experimental research articles written by native speakers of English and published in leading medical journals. One thousand seven hundred and eighty-six PCNPs were recorded, which were divided into five different categories according to the number of words making them up. Afterwards, we analysed the Spanish learners' translations, contrasting the PCNP English and Spanish word order, to determine if learners could easily identify the most frequent translation patterns. The more elements that were involved in English PCNPs, the more Spanish translation patterns that were found. Additionally, we observed that the most frequent translation pattern was leftwards from the head noun. The wide pattern range found indicated a difficulty in distinguishing the key words and therefore, the need to establish didactic strategies to help English teachers.*

KEYWORDS: *English complex noun phrases, premodification, translation patterns, Spanish learners, interpretation.*

RESUMEN. *Los sintagmas nominales complejos (CNPs) son, en algunos casos, nombres yuxtapuestos sin ninguna preposición que defina sus conexiones semánticas. Como sus elementos pueden ser potencialmente infinitos, la comprensión de los CNPs representa en ocasiones un gran obstáculo para los hablantes no nativos de inglés, incluso más si se trata de alumnos de lengua inglesa con un nivel B2, siguiendo la dis-*

*tribución del Marco común europeo de referencia para las lenguas. Este estudio sur-
gió, en primer lugar, para analizar los cambios que sufren los elementos que forman
parte de la premodificación de los sintagmas nominales ingleses al ser traducidos al
español, en segundo lugar, para establecer los modelos más frecuentes de interpreta-
ción que puedan servir de ayuda a los aprendices de lengua inglesa, y finalmente, para
proponer estrategias pedagógicas que sirvan de apoyo a los docentes. Para responder
a estos objetivos, se examinó un corpus de doce artículos de investigación escritos por
autores ingleses y publicados en revistas médicas internacionales. Mil setecientos
ochenta y seis sintagmas nominales complejos se recopilaron, los cuales se dividieron
en cinco categorías según el número de palabras que los componían. A continuación
fueron analizadas las traducciones hechas por alumnos con un nivel intermedio de len-
gua inglesa, comparando la posición de los elementos de este compuesto para averi-
guar si seguían un modelo o si los interpretaban de forma distinta. Estas traducciones
fueron revisadas por intérpretes expertos y se constató que cuantos más elementos
tenía el compuesto nominal, más modelos de traducción existían. Adicionalmente, se
observó que el modelo que más se utilizaba para la traducción de estos compuestos era
el que empezaba desde el núcleo del sintagma nominal y continuaba traduciendo los
distintos elementos hacia la izquierda del sintagma. Sin embargo, el gran número de
modelos que se encontró la dificultad en encontrar el núcleo del sintagma o palabra
clave, y por lo tanto, la necesidad de establecer estrategias didácticas que ayuden a los
profesores de lengua inglesa.*

PALABRAS CLAVE: *Sintagmas nominales complejos, premodificación, modelos de traducción, estudiantes españo-
les; interpretación.*

1. INTRODUCTION

This article investigates the role of Spanish learners of English with regard to
cluster interpretation. It specifically looks into how expanded premodification is
understood in complex noun phrases (CNPs) and how it affects text interpretation and
comprehension. Long premodification is not considered a key aspect in English learning,
but the data found in this research indicated that special consideration should be paid
when teaching CNPs to Spanish learners.

Mother tongue interference influences the understanding of some parts of the text
that are expressed differently in a second language (L2), as Murata (2007) explains. We
have to determine whether CNPs reading comprehension difficulties are caused by a
lack of language competency, transfer factors or background knowledge. Walter (2007)
indicates that second language misunderstanding is an access problem to a reading
comprehension skill, not a transfer of the mother tongue skills. Complex noun phrases
should be studied in order to discern the patterns that can help Spanish learners of
English to identify key words and to identify their inner semantic relationships.

The comprehension of English complex noun phrases (CNPs) entails difficulty for
the English learners since the number of their internal constituents can be infinite.
Nevertheless, the combination of elements which occurs in a CNP is not entirely random
but rather appears to follow certain semantic and syntactic patterns. Writers resort to the
assembly of descriptive words in a whole unit when they want to mention an entity

which possesses no name of sufficient specificity. Levi (1978: 241) explains this process in the following way:

> The use of a novel form occurs when a speaker wishes to denote an object by means of a concise name rather than by a more explicit but lengthier descriptive phrase, but no well-established name exists for the object in question.

The conveyed information is presented in a shorter, more direct and condensed fashion, thus having a greater impact upon the reader. The intricacy or misunderstanding is not the most important factor to be considered in CNPs whose semantic explicitness is sacrificed on behalf of linguistic economy. Premodification is a functional means for creating compact packages of information. It is space-saving and non-redundant, as it captures a static image event or a process shared by a set of readers and transforms it in a single concept (Varantola 1993: 75). The lack of verbs and prepositions in premodified noun phrases entails a loss of explicit information and requires more background knowledge from the reader than an expression containing a postmodifying structure does (Dubois 1982: 154). This can be observed in examples such as *'21 consecutive adult cardiac allograft recipients'* where the premodification may cause difficulty in understanding the noun phrase (NP) because the semantic and syntactic relationships of the elements are obscured by the length of the premodification. By contrast, Spanish language uses prepositions or subordinated phrases to express the same concept as can be observed in the translation of the above example: '*21 receptores consecutivos de transplantes alogénicos cardiacos que son adultos.*'

The excessive use of noun premodification has been criticized on the ground that it is inelegant and very context-dependent (Kvam 1990: 160). Moreover, it has been argued that the occasional ambiguity or vagueness of complex premodifiers is not noteworthy if we consider the meaning condensation and the space-saving that these clusters represent (Mutt 1967: 407). Postmodification is thus preferred in some contexts where the use of many premodification elements would obscure the meaning of a sentence or where the reader does not have enough background knowledge of the matter being discussed (Dubois 1982; Abberton 1977; Sadler & Arnold 1994).

As noted above, the premodifying structure reduces explicitness as compared to the postmodifying one, and, in some cases, if the relationships between the nouns become unclear or unpredictable, premodification is unacceptable, e.g.[2]* '*pathologic insoluble fibrillar protein extracellular deposition.*' In these cases, it is advisable to use postmodification structures, e.g. '*extracellular deposition of pathologic insoluble fibrillar proteins.*' Conversely, not all noun premodifiers have prepositional phrase analogues, e.g. '*trust status*' |=| * '*status of the trust.*'

Additionally, other aspects should be taken into account, such as the variability of premodification if applied to different genres. For example, scientific writing differs greatly from other styles in having a higher proportion of premodified complex noun phrases (PCNPs). Bartolic (1978: 257) points out that "This structure is one of the most (if not the most) dynamic and flexible of all structures that are used in technical

language." An indefinitely wide range of grammatical and semantic data is transmitted by means of the internal constituents of the NP. This information can either be previously established in the preceding discourse or be assumed as knowledge shared by scientists or researchers who express it or refer to it with reduced explicitness, and, consequently, increased economy. Nominalising, as Halliday and Martin (1993: 61) notice:

> […] far from being an arbitrary or ritualistic feature, is an essential resource for constructing scientific discourse. We see it emerging in the language of this period, when the foundations of an effective register for codifying, transmitting and extending the 'new learning' are rapidly being laid down.

As several researchers have indicated (Bartolic 1978; Salager-Meyer 1983, 1985; Williams 1985; Horsella & Perez 1991), the linguistic principle of space economy is the main reason for the widespread use of CNPs in scientific English. Additionally, it should be pointed out that complex writing patterns are used to express dense concepts which are easier to understand if the reader or learner shares the specialist's implicit knowledge.

Some authors (Richman 1979; Salager-Meyer 1985; Navarro 1995; Dikken & Singhapreecha 2004) are conscious of this fact and assume that there is no simple explanation concerning the equivalence of English premodification structures in other languages, since readers' interpretation can only be the product of language experience and cannot be achieved through the mastery of textbook content. When the English learner interprets premodification patterns, he/she should pay close attention and learn to identify the complex unit that premodifiers and the modified head make up since there could be more than one possible semantic relation. This can be seen, for instance, in *'clonal plasma cells'* which could be understood as '*clonal cells of plasma'* or as *'cells of clonal plasma*.' Background knowledge and the contextual references help the specialist to choose the correct interpretation of the CNP.

Limaye and Pompian (1991: 7) recommend that "[…] students, as readers, be reminded of the headword's importance and nominal compounds be employed for clearer understanding only following their syntactically fuller forms in a manner similar to that employed for acronyms." Also, Newmark (1995: 156) suggests procedures to solve these problems: "When you approach a technical text, you read it first to understand it then to assess its nature and its intention." Even so, as an example, CNPs present difficulties for Spanish learners of English that are the result of the lack of rules to guide them and the different procedures used in a foreign language to express the same reality. English can simply juxtapose different words by their semantic relationship, as in *'blood urea nitrogen concentrations*.' However, Spanish is not a synthetic language and needs connectors to join the different elements of a phrase, i.e. '*concentraciones <u>de</u> nitrógeno <u>en la</u> urea <u>de la</u> sangre*.'

However, Halliday (1994: 193) differentiates between two types of functions in premodification. On the one hand, it acts as a univariate structure, i.e. a structure generated by the recurrence of the same function: the head '*a*' is modified by '*b*', which

is modified by '*c*', etc. On the other hand, it acts as a multivariate structure, i.e. many elements, each having a distinct function with respect to the whole: the head '*a*' is modified by '*d*', which is modified by '*c*', etc. Both interpretations should be considered when teaching multiple premodification, as all the components influence the CNP meaning and the head noun should be identified.

The different types of relationships that the constituents of a sentence bear to one another can be contrasted, comparing the English elements of a sentence with those in other languages (James 1986; Seliger & Shohamy 1990; Moon 1997; Swan 1997; Nagy 1997; Moreno 2004; Carrió 2005). There are common guidelines or equivalences in different languages that can be analysed and used to help non-native English speakers to learn how to write and/or understand English CNPs (Canagarajah 2002).

The present study aims at analysing the procedure followed by Spanish learners of English when interpreting the inner semantic relationships of premodified complex noun phrases. To this end, the most frequent changes that occur in the order of the elements making up English-written PCNPs when these are translated into Spanish are determined. Furthermore, the most frequent Spanish translation patterns are identified to provide guidelines to Spanish learners of English. The process they followed to identify key words and to establish the inner semantic relationships of the phrase elements is analysed in order to develop didactic strategies that aid English teachers.

2. MATERIALS AND METHOD

The corpus used in the present research consisted of twelve experimental research articles taken from the Science Edition of the *Journal Citation Reports* (JCR) and written by native English writers. The medical journals were filtered by the section 'medicine, general and internal,' considering the journal rankings sorted by impact factor. The top ten journals were considered the most representative samples of the medical English literature consulted nowadays. We thus selected *The Lancet, The New England Journal of Medicine, The Journal of the American Medical Association (JAMA)* and *The British Medical Journal (BMJ)*. Twelve research articles were randomly chosen in total from all these journals (see Appendix 1). The length of each article ranged from 1,253 to 2,585 words, totalling a number of 23,028 running words.

Those research articles, whose main authors did not seem to be native speakers of English, as judged by name and institutional affiliation, were disregarded. In addition, those papers with extensive mathematical procedures and/or statistical treatment were eliminated. Abstracts, titles, footnotes, graphs along with their legends, comments, tables, acknowledgements and bibliographic references were excluded from the corpus.

Those items made up of at least two individual lexical constituents separated one from the other by a space or a hyphen were treated as PCNPs. The words separated by a hyphen were considered different elements in the NP as in '*amyloid-related organ disease*.' Thus, in this example, the PCNP was classified as being made up of four

different elements. The constituents of PCNPs made up of two or more heads were also counted as individual ones as in '*clinical symptoms and diseases*' which was considered as '*clinical symptoms*' and '*clinical diseases.*' Articles, possessive adjectives and pronouns, determiners, chemical formulae and abbreviations were not taken into consideration.

Premodification structures and heads were considered part of our corpus, but postmodification was not taken into account. As a result, initially our corpus was divided into the categories of '*s* genitive and NPs made up of two, three, four, five or more elements.

Five different categories were drawn because only in rare cases was a premodified PCNP composed of more than five lexical elements. Thus, the last category included the five, six or seven element PCNPs. Table 1 gives examples of each category:

's genitive	nosocomial legionnaires' disease
Two-elements	life expectancy bone marrow
Three-elements	tumour clinical features marrow plasma cells
Four-elements	blood urea nitrogen concentrations cause-specific mortality trends
Five-elements	urinary free monoclonal light chains identical clonal immunoglobulin-gene rearrangement
Six-elements	two different McGill University teaching hospitals
Seven-elements	iodine 123-labelled serum amyloid P component

Table 1. *PCNPs categories*

Five, six or seven-element occurrences were composed in most of the cases by nouns and one or two adjectives. Although the elements of the CNPs selected were mainly nouns, those including adjectives were not rejected to demonstrate the difficulty of being understood by Spanish learners and that the longer PCNPs are, the more difficult it is to translate them.

In the second stage of this study, the recorded PCNPs were contrasted with their Spanish translations in order to distinguish the changes in the position of the elements. Thirty-six Spanish medical students, whose competence of English was determined as B2[2] level, translated the PCNPs in order to analyse the patterns followed and determine the most complex ones. Five specialist informants, who are Spanish researchers used to writing in English international journals, checked the translations and discrepancies were discussed and the solutions agreed upon. The procedure to establish the change of the position of the elements within the PCNPs was to number the components of the English PCNPs and, after that, contrast their position when being translated by Spanish

researchers. This method was chosen to identify the most frequent translation pattern of each category of the corpus and the changes in the element order. A sample of this process can be observed in Table 2:

English PCNPs	Spanish translation

(1) fuel consumption
    1 - 2
	consumo de gasolina
	    2 - 1

(2) motor neuron disease
    1 - 2 - 3
	enfermedad de la neurona motora
	    3 - 2 - 1

(3) combinatory logistic regression models
       1   -   2   - 3 - 4
	modelos de regresión logística combinatoria
	    4 - 3 - 2 - 1

(4) government sponsored cancer research program
     1   - 2   - 3 - 4 - 5
	programa para la investigación del cancer financiado por el estado
	    5 - 4 - 3 - 2 - 1

Table 2. *Change in the element order in the translation of PCNPs*

The different Spanish translations of the PCNP elements were classified. Different groups were formed in each category according to the position of the PCNP elements in order to determine the most frequent ones. The PCNP translations were analysed to identify the most frequent interpretation patterns and to provide the inner semantic relationships that could determine the element order in the Spanish interpretation. Finally, the translations provided by the students and by the informants were contrasted in order to determine the didactic strategies to be recommended to English teachers.

3. RESULTS

One thousand seven hundred and eighty-six (1,786) PCNPs were recorded in our medical English corpus. As Table 3 shows, the number of PCNP occurrences varied in the different categories. The number and the percentages of PCNPs were calculated over their total amount. The most frequent pattern of our corpus corresponds to the two-element PCNPs (almost 58% of the occurrences) and the least frequent to the five or more-element PCNPs (almost 3% of the occurrences).

Categories of PCNPs	Occurrences	%
Two-element	1,031	57.72
Three-element	553	30.96
Four-element	130	7.27
Five-element or more	49	2.77
's genitive	23	1.28
TOTAL	1,786	100.00

Table 3. *PCNP occurrences in the different categories*

The small number of 's genitive occurrences and their simple premodification structure indicated that they are not frequently used in our corpus (see Table 3). For this reason, we did not analyse their translation into Spanish. The remaining categories were divided into groups according to the translation of PCNPs into Spanish with the aim of determining the most frequent element position. Each element of the categories was indicated with numbers to reflect the variation of the element position when being translated. The use of numbers was twofold: on the one hand, some guidelines can thus be offered to Spanish researchers for the interpretation of the most frequent PCNPs. On the other hand, it allows us to asses the statement put forth by some linguists (Bartolic, 1978: 275; Quirk et al., 1987: 919): "The direction of interpretation starts from the head noun and proceeds sequentially leftwards from the head noun."

In general, the translation of two-element structures obtained from the analysis of our corpus did not entail difficulty for the students and the specialist informants, as the position of the PCNP elements was 1-2 or 2-1 and there were not any discrepancies in their interpretation. This is why we did not analyse these results in depth. We focused on the three-element category and its different translations into Spanish. These were classified into eight groups, taking into account the different element position and the reduction or expansion of the noun phrase when being translated into Spanish. The results showed the most common patterns used, as indicated in Table 4.

Spanish translation	Occurrences	Percentage
3 - 2 - 1	**217**	**39.44**
3 - 1 - 2	**179**	**32.30**
1 - 3 - 2	98	17.71
1 - 2 - 3	38	6.85
Element reduction	13	2.35
2 - 3 - 1	4	0.72
2 - 1 - 3	3	0.53
Element expansion	1	0.10
TOTAL	553	100.00

Table 4. *Element position in the Spanish translation of the three-element category*

The most prevalent position of the elements in the translation of this category was 3 - 2 - 1, as exemplified in:

'*heart disease progresses*' = '*progresos de la enfermedad cardiaca*'
     1 - 2 - 3   3   -   2   -   1

followed by the position 3 - 1 - 2, as in:

'*positive biopsy result*' = '*resultados positivos de la biopsia*'
     1 - 2 - 3   3 - 1   -   2

The least common structure was expansion, i.e. when Spanish needs more words to explain a concept than English does. The most frequent procedure followed in this category to translate an English PCNP into Spanish was from the head noun proceeding leftwards as in:

'*bronchitis symptom overstrain*' = '*cansancio excesivo como síntoma de una bronquitis*'
    1 - 2 - 3   3 -   2 -   1

As can be observed in Table 5, there was a greater variability of element combination in the four-element category than in the previously commented categories. This, of course, resulted in a small number of occurrences in each group and in difficulty in providing guidelines to Spanish researchers.

Spanish translation	Occurrences	Percentage
4 - 3 - 2 - 1	**28**	**21.54**
4 - 3 - 1 - 2	**25**	**19.23**
1 - 4 - 3 - 2	17	13.08
1 - 4 - 2 - 3	14	10.77
4 - 1 - 2 - 3	14	10.77
4 - 1 - 3 – 2	13	10.00
1 - 2 - 4 - 3	6	4.61
Reduction	4	3.07
4 - 2 - 3 - 1	3	2.31
1 - 2 - 3 - 4	2	1.54
3 - 4 - 2 - 1	2	1.54
3 - 4 - 1 - 2	2	1.54
TOTAL	130	100.00

Table 5. *Element position in the Spanish translation of the four-element category*

As can be seen from the above Table, the most frequent group in the four-element category was 4 - 3 - 2 - 1, which can be observed in the following example:

'*blood urea nitrogen concentrations*' = '*concentraciones de nitrógeno en la urea sanguínea*'
    1 - 2 - 3 - 4   4   -   3 - 2 - 1

followed by the position of the translated elements 4 - 3 - 1 - 2, as in:

'*more rapidly progressing neuropathy*' = '*neuropatía que progresa más rápidamente.*'
    1 - 2 - 3 - 4   4   -   3 - 1 - 2

Additionally, we obtained groups of very few occurrences. This was the case of the position 1 - 2 - 3 – 4, whose premodifiers are words that are usually translated before the head noun, as in:

> *'type-two diabetes mellitus'* = *'tipo dos de diabetes melitus'*
>   1 - 2 - 3   -   4   1 - 2   -   3   - 4

The head noun was always formed by two words which were semantically connected. Another case was the 3 - 4 - 1 – 2 group, the head of which was also formed by two words with a semantic link:

> *'PC-SAS version 6.11'* = *'versión 6.11 de PC-SAS.'*
>   1 - 2 - 3 - 4   3 - 4 -   1 - 2

Given their very low frequency of occurrence, these groups were not considered representative. In this category, the most usual interpretation of the PCNPs was performed by starting with the head noun leftwards. However, the results were not so clear-cut, due to the low percentages of each group and the wide range of element combination.

No existence of more than seven-element CNPs was recorded in our corpus in the five, six or seven-element category. This is due to the fact that we did not consider relative or prepositional clauses as direct premodifiers of the noun in our corpus. As can be observed in Table 6, the great variability of the PCNP elements caused many translation possibilities. Therefore, a low percentage of occurrences was recorded in each group.

Spanish translation	Occurrences	Percentages
5 - 4 - 3 - 2 - 1	**7**	**14.28**
5 - 4 - 1 - 2 - 3	**6**	**12.24**
1 - 2 - 5 - 4 - 3	3	6.12
5 - 4 - 3 - 1 - 2	3	6.12
5 - 1 - 2 - 4 - 3	2	4.08
5 - 1 - 4 - 3 - 2	2	4.08
5 - 4 - 2 - 1 - 3	2	4.08
3 - 5 - 4 - 2 - 1	2	4.08
5 - 3 - 4 - 2 - 1	2	4.08
6 - 5 - 4 - 3 - 2 - 1	2	4.08
6 - 5 - 3 - 4 - 2 - 1	2	4.08
1 - 6 - 2 - 3 - 4 - 3	1	2.04
1 - 5 - 4 - 3 - 2	1	2.04
1 - 6 - 5 - 2 - 4 - 3	1	2.04

Spanish translation	Occurrences	Percentages
2 - 1 - 3 - 4 - 5 - 6	1	2.04
5 - 1 - 4 - 3 - 2	1	2.04
5 - 1 - 4 - 2 - 3	1	2.04
6 - 1 - 5 - 4 - 3 - 2	1	2.04
2 - 1 - 3 - 4 - 5	1	2.04
5 - 1 - 2 - 3 - 4	1	2.04
2 - 1 - 3 - 5 - 4	1	2.04
3 - 6 - 1 - 5 - 4 - 2 - 3	1	2.04
5 - 3 - 4 - 1 - 2	1	2.04
5 - 6 - 3 - 4 - 1 - 2	1	2.04
7 - 4 - 5 - 6 - 3 - 2 - 1	1	2.04
7 - 6 - 5 - 4 - 3 - 2 - 1	1	2.04
Reduction of elements	1	2.04
TOTAL	49	100.00

Table 6. *Element position in the Spanish translation of the five or more-element category*

The most frequent translation pattern was once again the group 5 - 4 - 3 - 2 - 1, as in:

'*urinary immunoreactive free deoxypyridinoline crosslinks*' =
   1 - 2 - 3 - 4 - 5

'*cruces de deoxipiridinolina sin inmunoreacción a la orina*'
   5 - 4 - 3 - 2 - 1

Another group occurring quite frequently in our corpus was 5 - 4 - 1 - 2 – 3, which can be observed in the following example:

'*significantly higher overall visit costs*' = '*coste de la visita significativamente superior a la media.*'
   1 - 2 - 3 - 4 - 5   5 - 4 - 1 - 2 - 3

The translation patterns of PCNPs that presented few occurrences were discarded. We focused the analysis only on the groups that presented more than 10% of the results to identify the most frequent translation patterns of premodified NPs in medical English.

4. DISCUSSION

In this section, we discuss the most important findings of the study and suggest pedagogical strategies which may be of use to teachers of English. With reference to the

total occurrences of noun phrase premodification, the most common pattern was the two-element category and the least common the five or more-element category. Although the five or more-element PCNPs are sometimes complex to translate for a Spanish learner of English, their frequency is very low in medical discourse This finding could indicate that the alleged difficult interpretation of CNPs in scientific English (Quirk et al. 1987: 934; Salager-Meyer 1983: 142) does not represent such an obstacle since the most complex NPs are not very frequent. However, as we will show later, this is not altogether the case, as key words cannot be easily identified in the long PCNPs and the Spanish learner has to choose among quite different interpretation patterns.

As regards CNPs length, some linguists (e.g. Quirk et al. 1987: 916) have pointed out that premodification can be infinite, but the longest PCNPs found in the corpus of this study are composed of seven elements. Native English writers (NEWs) avoid long premodification as they are conscious of the fact that PCNPs greatly obscure the meaning of the concepts and interfere in the communication with non-specialist readers of English. This finding also corroborates the difficulty of Spanish learners in identifying the semantic relationships of long CNPs.

As noted by Trimble (1977: 58),

> Technical compounds create a different kind of learning problem. First, they are not a common lexical structure in many languages. Secondly, they do not all yield easily to a literal translation or to turning into simple phrases- even to the point of often confusing the native speaker of English.

Hence, the complexity of recognising the PCNP inner semantic interrelationships is added to the arduous task of translating all the specific words which make them up. Some researchers (Salager-Meyer 1985; Trimble 1985; Jordan 1994; Carrió 2005) provide some guidelines to understand or simplify PCNPs, although only Quirk et al. (1987) and Bartolic (1978) have indicated a 'rule' to comprehend PCNPs. They argue that the reader has to start from the last element, in general the head noun, and follow on leftwards. This appreciation is supported by our analysis, since the most frequent translation pattern in all the categories is the one starting from the last element leftwards. The head noun is the element carrying the key meaning of the phrase and it positioned next to the most direct premodifiers. This seems to simplify CNPs interpretation, as Spanish learners should understand them identifying the head. However, everyday practice does not corroborate this conclusion, as students find it difficult to understand the process of identifying or producing expanded CNPs. Teachers can suggest imitating the structures used by NEWs as a didactic strategy to produce CNPs, but there will still be a deficiency in the comprehension of the semantic relationships of the CNP elements.

In addition, it can be observed that the more elements that are involved in a PCNP, the more interpretation possibilities there are. Although the most common translation was the one mentioned above (from the head noun leftwards), we recorded other possible PCNP translations in our results. Therefore, it can be considered that the learners should identify the semantic head of the PCNP, which is commonly the starting

point of the translation. However, in some cases, the learner might have to content with other possibilities when interpreting or producing a PCNP, as for example, the key word could be placed at the beginning of the PCNP to emphasize it. In order to avoid misunderstanding or poor use of long CNPs, English teachers should consider activities to aid the students in identifying the key words and after, establishing the semantic relationships of the head noun with the other components of the PCNP.

The PCNP elements could be positioned from right to left, but the learner should also consider alternative semantic relationships of the elements. Indeed, he/she should disambiguate a given PCNP by whatever clues, semantic or cognitive (genre and context), in order to reach its proper comprehension. The numerous English into Spanish translation patterns of PCNPs found in the corpus by the students and the specialist informants tend to prove that the understanding of premodification structures is not as effortless as is generally thought (see Table 7). Furthermore, there is a need to consider the semantic relationships between the elements in the interpretation and creation of PCNPs.

PCNPs categories	Groups established
two elements	3 translation patterns
three elements	8 translation patterns
four elements	13 translation patterns
five elements	28 translation patterns
TOTAL	52 translation patterns

Table 7. *Different PCNPs translation patterns*

In all the interpretation patterns found in our corpus by the students and the specialist informants, the components of PCNPs have an individual meaning that, if not understood collectively, hides their correct comprehension. When a concept is transmitted without connectors, which is the case of the individual components of the PCNP, translations could vary, as the semantic relationships are flexible. On these occasions, learners with specialised background knowledge are expected to interpreting the meaning of the PCNPs. Specific vocabulary is needed to identify a second language PCNP with the equivalent concept in the mother tongue. The teacher should combine the instruction of semantic element relationships with the learning of domain specific vocabulary.

English PCNP expansion should be considered as a teaching strategy for an accurate comprehension, as Spanish does not use the same translation patterns. Sometimes, learners have a large number of Spanish translations available that constitute single choices but might appear as entirely different interpretations of the initial CNP. The mother tongue of the learner should be regarded as relevant in the interpretation of clusters because some expressions already exist in a language, but if translated literally, provoke barbarisms. In this case, interpretation is the key aspect to be noted by the teacher and the learner.

Although we have provided some indications to help Spanish learners of English to understand and produce a CNP, the semantic links of the elements cannot be easily established. In this study, the following aspects to be emphasized concerning the PCNP translation patterns and possible guidelines for their understanding and production are:

a) the head noun is the key word of a PCNP, and generally it is the first element to be translated;

b) the most common English into Spanish PCNP translation is from the end leftwards;

c) non-specialist learners of English should consider alternative CNP interpretation and production. If a word is positioned wrongly it can sometimes change the meaning of the CNP or obscure communication;

d) the specific conceptual knowledge expressed in a PCNP is essential for correct interpretation or production;

e) CNPs should be expanded when possible, as this strategy can facilitate the interpretation of the text.

5. CONCLUSION

Complex premodification in English NPs is a linguistic strategy that allows the learner to express specific concepts in fewer words. In contrast, the Spanish language does not allow premodified complex noun phrases or strings of three, four, five or more-elements before the head noun without linking words. Thus, it is not easy for Spanish learners to translate or produce them correctly. Students are usually helped by their specific conceptual knowledge and their linguistic competence that facilitate the choice of the correct translation patterns into Spanish. Language teachers can help them with teaching strategies that include clear instructions to identify key words and the semantic interdependence of the elements, to understand domain specific vocabulary and to try several interpretations beforehand, in order to conceptualize the equivalent notion in Spanish.

From the results presented in this study, it seems obvious that the more elements are involved in an English PCNP, the more translation patterns are found. For example, the wide range of translation possibilities of five or more-element English CNPs into Spanish made it impossible to provide, in this category, sound guidelines for Spanish learners of English. Nevertheless, the results obtained in the three and four-element categories demonstrated that the most frequent interpretation pattern followed is to start from the head noun at the end of the PCNP and follow leftwards with the most direct modifiers. Adjectives are, in general, placed next to the noun they refer to with the exception of determiners such as 'some,' 'every,' 'several' etc., which are located first in English PCNPs. The learner should interpret or produce all the elements of a PCNP

following these guidelines and then verify that the specific concepts are fully understood and the whole cluster has semantic or conceptual likeness in Spanish.

The problem is compounded by the fact that each language has different ways of expressing the same reality, so there is no one-to-one linguistic equivalence of the same specific concept in two languages, and more so if their roots are not the same. Learners should evaluate the various possible Spanish translations of the cluster and find the most adequate phrase in its specific context. The linguistic competence of both the first and second language of the learner, the different textual levels (general or specific) or/and the cognitive capacity to identify the concepts determine the level of difficulty of PCNPs for English learners. English teachers should provide learning activities that allow students to improve their specific linguistic competence in their first and second languages.

We recommend the avoidance of noun clusters when possible, as they are confusing to Spanish learners of English and increase the difficulty in understanding and producing scientific language. Scientific committees of international journals as well as language teachers should be conscious of this fact and be more flexible with CNPs use. The expansion of elements and the use of prepositions should be accepted if grammatical rules are correctly applied. Economy is an important aspect in language writing, but the difficulty in determining the semantic relationships among the different elements for non-English speakers should be considered as an inconvenience.

We hope this study will stimulate further investigation that could establish guidelines for the comprehension of English noun premodification considering other reference languages such as French, Greek or Italian. Hence, considering the different linguistic/cultural background of the learner, the different perceptions of non-native English speakers could be identified.

NOTES

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1. This symbol means unacceptable CNP.
2. The B2 level was determined selecting the students who passed an exam based on the Common European Reference Framework guidelines.

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APPENDIX 1. CORPUS REFERENCES

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