

Contrasting the rhetoric of abstracts in medical discourse

Implications and applications for English/Spanish translation*

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The present study aims at offering a contrastive analysis framework for the specific textual patterns of the expert-to-expert communicative setting from a semantic and a functional approach. Our methodology tries to identify patterns of behaviour in one of the genres that might be said to be exclusive of expert-to-expert discourse in medicine: abstracts. By means of describing regularities, differences in the way information is distributed will be pinpointed. Since textual realizations have been agreed to bridge the distance between the semantic and the functional component, cohesion will be analysed both as a semantic marker and as an indicator of information distribution — pragmatic marker — according to functional constraints. ‘Ad hoc’ comparable and translation corpora have been built, extracted from medical journals with a significant impact. Intra and interlingual analysis of those corpora has been carried out to attain a comprehensive description of textual patterns from the above mentioned semantic, formal and functional parametrical levels.

Keywords: contrastive analysis, genres, rhetoric, lexical cohesion, English/Spanish

1. Information distribution in expert-to-expert discourse

The growth of science and the use of the English Language as a medium of international communication have both increased extraordinarily in the last decades. Nowadays, English is the acknowledged language of information dissemination, which means that most of the best contributions in science are published in this

language; hence, scientists are informed of the important advances in their fields in English. This statement suggests that experts have to come up with a set of rules to convey not only the proper information but also the form to illustrate and share their knowledge. It is well known that when experts in any given field discuss their subject among themselves they use a highly specialized language with highly specialized textual patterns assuming that both writer and reader share a common language and also that when certain linguistic patterns are used, they understand what is meant and what is implied. Certain terms and phraseological units in a given field have a unique and explicit meaning because experts have agreed to understand and use them as originally defined, assuming they have the same or similar level of expertise. As for the form, expert-to-expert communication develops specific macrotextual patterns in which knowledge is represented.

Therefore, we can state that communication between experts, which is one of the highest levels at which specialized languages may be used, develops its own rhetoric. Thus, experts in any given field discussing their subject are likely to use micro and macrolinguistic patterns that the ordinary speaker of a language will not understand, because specific meanings have already been assigned to them.

These linguistic patterns share both a basic meaning and a function between languages, but languages differ in the way information is distributed. In this sense, Rabadán (2002:39) maintains that languages show preference for particular rhetoric strategies, observed in the distribution and frequency of certain structural, semantic and pragmatic rhetorical patterns. Accordingly, knowing and understanding these micro and macrolinguistic patterns of behaviour seems to be essential not only for those experts whose native language is not English but also for translators and technical writers; if languages use different resources to express both meaning and form, translators, technical writers and experts should be aware of them, so that their research and advances can be successfully reported and accepted by other members of the discourse community.

As we have suggested, this information distribution never occurs at random, otherwise experts would have not only to identify the relevant information but also to understand its pragmatic function. In this sense, every textual pattern allows experts to recognize the functions designated by the language from the way the microlinguistic component is distributed. If information distribution depends on the microlinguistic as well as on the macrolinguistic aspects, a Contrastive Analysis of the specific textual patterns of this specific communicative situation is needed in order to discover the differences between languages within those textual patterns in that communicative situation. Once the differences between the standards for those textual patterns in two different languages have been observed and classified, writers — experts, translators and technical writers — will be able to adapt their texts to the features of the English language within this communicative situation.

In other words, and as Rabadán (ibid.) states, in a particular communicative situation — expert-to-expert — with a particular communicative function — mainly informative — meaning is partly shaped by some specific syntactical, grammatical or rhetorical features, constituting the concrete content to be conveyed (Bondarko 1984:47 cited in Rabadán 2002:41). Following Bondarko (1984:2), our analysis describes the structure of expert-to-expert genres combining elements of different levels of analysis interacting on a semantic basis; thus, the system of language means is seen through the semantic principle of their grouping, considering the correlation between central and peripheral components of the field, the relations among the components, and the overlapping zones with other fields. In this regard, Bondarko (1984:22) defines the ‘centre’ as the optimal concentration of all attributes combined in a given phenomenon, whereas the ‘periphery’ consists of entities with a deficient number of such attributes with possible alteration of their intensity.

Along with our previous statement, in a certain communicative situation, expert-to-expert in the present study, certain textual patterns are associated with certain forms and functions, taking into account the semantic field as the nuclear parameter of the analysis; that is, the occurrences of some textual patterns, forms, and functions will be *central* for a particular discourse community, while others will be considered as *peripheral*. As we have suggested previously, central forms and functions of a particular textual pattern will have to be described in each language in order to find out differences that may be useful for translators, experts within a given field and technical writers.

In the present paper, we will carry out a Contrastive Analysis with a semantic-functional approach of some textual patterns of expert-to-expert communication that may be of great help to develop a comprehensive Translation Studies model of analysis.

2. The genres in expert-to-expert communication

These textual patterns are known as genres. Swales (1990:9) defines genres as classes of communicative events, which possess features of stability, name and recognition. According to Swales (1990:9), the main criterion that turns a collection of communicative events into a genre is some shared set of communicative purposes. Genres are realized through registers; that is to say, genres constrain the ways in which field, tenor and mode can be combined in a particular discourse community. Genre constraints operate at the level of discourse structure, whereas registers impose constraints at the linguistic level of vocabulary and syntax. In other words, unlike registers, genres can only be realized in complete texts.

Exemplars of a genre exhibit patterns of similarity in terms of structure, style, content and intended audience. So, the micro- and macrolinguistic levels are comprised in the notion of genre and hence, by contrasting the rhetorical prototypical structure of the genres within expert-to-expert communication in English and Spanish, certain differences that are useful for translators and, accordingly, for successful communication, will be distinguished. As we have suggested, in order to meet this goal, we have to restrict our analysis to a semantic domain and register within specialized communication and to the genres it presents. The biomedical specialized language and cardiac arrhythmias are the register and the semantic domain chosen for our analysis and thus, broadly speaking, expert-to-expert communication in medicine shows different genres, among which we can point out case reports, research articles, and abstracts.

2.1 Abstracts

Our analysis will be focused on abstracts, because we consider that this genre shows best the features of specialized communication between experts. We have chosen abstracts since they function as independent discourse as well as advance indicators of the content and structure of a longer text, the scientific Research Article (RA). Nord (1997:54) defines abstracts as a complementary or secondary genre based on a primary text, the Research paper (RP), which may have a metatextual function. On the other hand, abstracts are defined by ISO 214–1976 (E), as an “abbreviated, accurate representation of the contents of a document, without added interpretation or criticism and without distinction as to who wrote the abstract”; that is to say, this type of abstract has been derived from a fully elaborated text by condensing its relevant information (Gläser 1995:97). Thus, abstracts can be defined as secondary genres, depending on the RAs from which they derive and show accurately and briefly the contents of the whole text. In this sense, Sager et al. (1980:318) affirm that specialized language abstracts were developed for additional economy in order to select information or concentrate on limited groups or purposes, further specializing the message for a subgroup of readers of the whole text.

Abstracts are often classified on the basis of content, purpose and structure as well as authorship; in this sense, Russell, among others (1988:4), distinguishes two standard types of abstracts, with two different functions: descriptive and informative abstracts. The first summarizes the scope of the text, but does not contain extensive data and is not designed to replace the original text, whereas the second gives more detailed information on the content of the article, replacing, in some cases, the source text. Informative abstracts contain information on purpose, scope, methods, results and conclusions or recommendations and hence, they are

written to accompany RAs. In other words, as informative abstracts can replace the source text, they have to be divided into the same sections as RAs, following what is known as “the IMRD pattern”.¹

Medical journal editorial committees typically direct submitters to write informative abstracts, in order to have a “report in miniature” (Jordan 1991:507), that is to say, in order to have a condensed version of the content and the structure of the primary text. As Ventola says (1994:333), abstracts “have become a tool of mastering and managing the ever increasing information flow in the scientific community” since they direct medical readers to RAs of potential clinical research value and help journals to select contributions.

Journals have set policies and requirements regarding style, content, structure and so on; in fact, most rules for submitting papers to scientific journals explicitly require the IMRD pattern to be mentioned in the abstracts of the papers submitted for publication as well as its paragraph structure and the number of words.

Sometimes, informative abstracts are the only piece of writing that is read. This is because there are now so many research journals that experts do not have time to read all the RAs they contain. Thus, these abstracts have become a key to the content of the whole text. However, because several journals publish only abstracts as a source of quick information and orientation, in some cases, the informative abstract is the only piece of published writing. Therefore, a well-written abstract becomes increasingly important in directing readers to articles of potential value.

3. Method and tools: English/Spanish comparable and parallel corpora

As we have stated (see Section 1), we intend to search for and recognize patterns of behaviour in the English and the Spanish languages within this genre in expert-to-expert discourse. These patterns of behaviour allow us to obtain a favourite or prototypical external and internal information distribution for this genre, according to Bondarko’s study; such structure results from the semantic analysis of each of the sections and moves within an abstract that has been previously described. Once this favourite structure has been obtained for each subcorpus, contrasting them leads us to establish and observe differences in their construction. These differences can be useful for suggesting strategies that may help translators and technical writers.

Since we intend to observe and classify micro- and macrolinguistic differences in the construction of biomedical abstracts in English and Spanish, our methodology presents a parallel structure: it is divided into two main frames, a microlinguistic and a macrolinguistic analysis.

As far as the microlinguistic aspect is concerned, we focus on the semantic aspects within biomedical expert-to-expert discourse as a means of achieving textual cohesion. To this end, considering the same situational meaning — genres associated with a communicative situation — we observe the referential meaning of the terms integrating the abstracts in order to look for the organizational meaning (Larson 1984). The field under study is cardiac arrhythmias and, eventually, the function of the genres is informative, since experts want to share their advances and knowledge in the field with other members of the discourse community. With respect to the referential meaning, the analysis of the types of terms and the relations they establish among them leads us to the organizational meaning, or the relations the terms establish in the abstract. To sum up, we consider lexical cohesion a resource to give functional meaning to the genres in a discourse community, since meanings cannot be read from the text but into the text, as Seidlhofer and Widdowson (1999:210) state.

In order to discover lexical cohesion in abstracts we focus on three parameters: prominence, substitution and reference. The concepts of prominence and substitution assume a central position in our methodology, since they establish a direct relationship with the analysis of terminology; on the other hand, reference is only considered whenever it participates in lexical chains made up of more than one element.

In this sense, ‘prominence’ is a feature of discourse structure which makes one part more important, i.e., more significant. Prominence can be defined as ‘marked’ and ‘unmarked’; the former implies the status of a term according to the position it holds in the syntactic and textual structure, whereas, by means of the latter certain lexical items, usually unmarked, are stressed because of their position in the text (Larson 1984:405–407). Specialized languages present different resources to assign prominence and, in this study, we concentrate on the following: ‘forefronting’, ‘repetition’, ‘nominalization’ and the so-called ‘expectancy chains’.

‘Substitution’ (Halliday and Hasan 1976:88) is a relation in the wording rather than in the meaning; consequently, in this parameter, the repetition of certain terms by means of relations between terms — such as synonymy — and hierarchical relations between concepts in a text or between systems of concepts and their representation — such as hyponymy — have been considered.²

Finally, ‘reference’ (Halliday and Hasan 1976:31) is characterized by the specific nature of information that is signalled for retrieval. Thus, the cohesion lies in the continuity of reference, whereby the same thing enters into the discourse a second time. In our study, reference has been achieved by examining three different points of view: comparison, ellipsis and personal reference.

Regarding the macrolinguistic aspect, the study of conjunction in this genre bridges the micro- and macrolinguistic aspects. Halliday and Hasan (1976:226)

suggest that conjunction is a cohesive device, rather different in nature from other cohesive relations since conjunctive elements are cohesive by virtue of their specific meanings; these elements express certain meanings which presuppose the presence of other components in the discourse. Thus, by means of conjunction, lexical cohesion comes to light, since the logical and the syntactic aspects are linked; therefore, textual coherence and cohesion are achieved.

Finally, our last step in this methodology is designed to provide understanding of the consequences in the use of certain terms in the abstract; particularly, we consider that the analysis of thematization gives us a method to observe predication as a resource to add information in the abstract. Lexical chains will occur not only on a particular scale but also in a specific position within the text and, hence, the functional value of the abstract, as a specific genre within the discourse community, will be complied with.

When analysing conjunction, we consider the sentence the minimal unit to establish this type of relationship as Halliday and Hasan (1976), Mann and Thompson (1988) and Martin (1992) maintain. Conjunction links lexical chains whenever, at least, a cardiology specific term can be found in each of the sentences. On the other hand, completed lexical chains can be introduced through conjunctions so that textual cohesion and coherence are achieved in the abstract. Dealing with thematization, three methods of including new information have been examined: 'lineal', 'constant' and 'rhematic' thematization.³

3.1 English/Spanish comparable and parallel corpora

Our methodology is not used in order to observe only meaning but also the use and function of the terms in abstracts, because, as Baker (1993:237) states, correspondence in meaning amounts to correspondence in use. Therefore, our methodology will be applied using the most useful tool we have in linguistics: a computerized corpus, which allows us to describe real utterances within a communicative situation.

We built a specific purpose corpus, according to pragmatic criteria. In selecting our texts, we considered the representativity and availability of the abstracts; in other words and according to Nwogu (1997:121), the abstracts were chosen to ensure a representative sample of the language of members of the discourse community. Availability, on the other hand, refers to the ease with which abstracts constituting the corpus can be obtained.

Finally, our corpus is described as bilingual and synchronic; first, because it is based on English and Spanish abstracts and second, because the sample texts were chosen by publication date; particularly, only those abstracts published in the last decade were considered for inclusion in the corpus.⁴

But not only is our corpus characterized by these features, it is also divided in two subcorpora: a comparable subcorpus, made up of fifty abstracts originally written in English and fifty abstracts in Spanish, and a translation subcorpus, made up of fifty abstracts translated into Spanish and fifty into English; we have to mention that this translation subcorpus is a parallel subcorpus, in other words, the sample texts included in this subcorpus are not translations from the samples included in the comparable subcorpus, but texts translated into Spanish and into English. The decision to build a comparable and a translation corpus lies in the fact that we are interested in the acceptability of abstracts by the other language discourse community, although we are aware that samples translated into Spanish will not show the same importance.

In order to compile the English comparable corpus we started our search on the Internet; and in this sense, several Internet sites contain links to scientific community databases such as MEDLINE, MEDAIDS, PUBMED, etc. However, as we are interested only in those abstracts dealing with cardiac arrhythmias, we restricted our search to Medscape MEDLINE, a robust search engine which contains a subset of 269 clinical English-language journals selected as a clinician's library. This search engine selects abstracts and RAs depending on their scientific validity, importance, originality and contribution to the medical specialty. Medscape selection criteria could be called into question; nevertheless, each title included in it has to meet one of the following criteria:

- expert opinion of pre-eminent clinicians and researchers (...);
- named as one of the nine English-language international general medical journals whose full-time editors are members of the International Committee of Medical Journal Editors;
- inclusion in a 1994 internal JAMA (Journal of American Medical Association) journal list;
- a journal impact factor greater than 2 as ranked by the Institute for Scientific Information's Journal Citation Reports; and
- high readership scores determined by PERQ (Pharmaceutical and Health Care-related promotion research).⁵

However, the next criteria we used was the journal impact within cardiology. In this sense, the Institute for Scientific Information (ISI) ranks journals according to their impact in the scientific community and this is the main criteria used for our corpus compilation.⁶ Only those cardiac arrhythmias abstracts published in the fifteen journals with greater impact were selected.⁷

Regarding the Spanish comparable corpus, international impact could not be used, because ISI does not include any Spanish cardiology journal within its impact ranking; however, Medscape includes two Spanish cardiology journals in

their selection and, consequently, we took the abstracts from those two journals: *Revista Española de Cardiología* and *Medicina Clínica*.

The Translation into English and into Spanish corpora were assembled from samples taken from Medscape MEDLINE using the same method as the compilation of the English comparable corpus.

4. English/Spanish rhetorical structure of abstracts

Research papers and abstracts are two genres that have been studied quite extensively (Dudley Evans 1994; Dudley Evans and St. John 1998; Hyland and Tse 2004; Nwogu 1997; Maingueneau 2002; Posteguillo 1999; Salager-Meyer 1990; 1991; 1992; Samraj 2002; 2005; Swales 1990; 2004; among others). Although these studies are useful to a better understanding of genres as well as to the teaching of linguistic devices to ESP and translation students, technical writers and experts within the fields, most of them are focused on the rhetorical structure of a certain genre intralingually. However, the functional approach is necessary not only for intralingual studies, but also from an interlingual point of view in order to account for differences and similarities between languages in terms of discourse organization (Marmaridou 1990:561).

Although the number of contrastive studies is increasing (López and Méndez 2006; Martín 2003; Williams 2006; among others), most studies relating to the rhetorical structures of RAs and abstracts have not considered interlingual comparative studies of these genres, thus revealing their internal differences; in other words, they have not included translation as one of their aims or implications. Nevertheless, they can be used as a starting point to describe the differences in the rhetorical structure of RAs and abstracts between English and Spanish. In the present corpus-based study, we will only focus on the abstracts of RAs, assuming Swales' study (1990; 2004) as a starting point. Swales (1990) establishes that RAs and abstracts can be divided into different moves.⁸ Each move contains several constituent elements, known as steps, combining in identifiable ways and some of them compulsory for the construction of abstracts that are acceptable to the discourse community (Nwogu 1997:122).

4.1 Abstract sections: Introductions

Informative abstracts as derived forms of RAs that maintain the same external structure (the IMRD pattern) should observe the same rhetorical structure as RAs. What differentiates them is not only the amount of information they include, but mainly their communicative purpose and function; as mentioned above, editorial

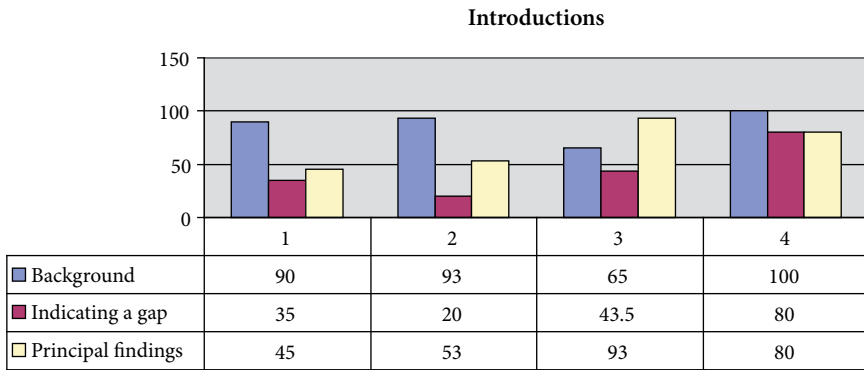
committees restrict abstracts to 250/300 words, and, consequently, authors must select the information they want to include. Swales (1990:141) states that the Introduction of RAs can be divided into three moves, defining a move as a semantic unit related to the writer's purpose. Table 1 summarizes the semantic distribution in moves and steps for abstracts Introductions.

Table 1. Comparison of external structure of RAs and abstracts.

Swales's moves and steps for RA Introductions	Moves for Abstracts	
	<i>Claiming Centrality</i>	
<i>Establishing Territory</i>	<i>Making Topic Generalizations</i> <i>Review of Previous Research</i>	<i>Background Information</i>
	<i>Counter Claiming</i>	
<i>Establishing a Niche</i>	<i>Indicating a Gap</i> <i>Question Raising</i> <i>Continuing a Tradition</i>	<i>Indicating a Gap</i>
	<i>Outlining Purposes</i>	
<i>Occupying the Niche</i>	<i>Announcing Present Research</i> <i>Announcing Principal Findings</i> <i>Indicating RA Structure</i>	<i>Principal Findings</i>

If we compare the first move of RAs ('Establishing Territory') with that of abstracts, we can see that, because of the concise nature of abstracts, only one of the steps within this first move is included. This step is that of 'Making Topic Generalizations' and authors tend to present this step because it involves a more neutral statement than the other two. Regarding the second move ('Establishing a Niche') we can see, in the abstract, the existence of a sentence in which a gap in the field is pointed out. Authors consider this aspect to be very relevant because they need to justify their research in the next move. Therefore, the inclusion of this second move in the abstract is a way of linking moves. Finally, the third move ('Occupying the Niche') contains, generally speaking, at least a step in which authors want to highlight their research as well as their findings. So, they stress both their research and their contribution to the scientific community. To sum up, Introductions of RA abstracts in cardiology contain three moves and, at least, a step within each move; we call the first move and step 'Background', the second 'Indicating a Gap' and the third 'Principal Findings'.

The results of the analysis carried out on the Introductions subcorpus are summarized in Graph 1.



Graph 1. Occurrences for informative abstracts in the Introduction section (%). Numbers 1 to 4 correspond to ‘English comparable’, ‘Spanish comparable’, ‘Translation into English’ and ‘Translation into Spanish’ corpora respectively.

Our analysis shows that the move indicating a gap is not very popular among the Spanish medical community in comparison to the English practice. In other words, Spanish authors prefer highlighting the principal findings of their own study rather than indicating other studies’ failures as it is shown in example 1; a translation into English for each of the examples in Spanish is provided in Appendix 1:

- (1) *INTRODUCCIÓN: El desarrollo de arritmias en los pacientes con hipertensión arterial se ha relacionado con la presencia de hipertrofia ventricular izquierda. El objetivo del estudio fue determinar la presencia y la relación entre hipertrofia ventricular izquierda y arritmias en la hipertensión arterial ligera.* (Extracted from: Pose-Reino, A. 1996. “Estructura miocárdica y estudio de las arritmias durante el registro electrocardiográfico ambulatorio en la hipertensión arterial esencial ligera”. *Medicina Clínica* 106:7–10).

However, when we carried out the analysis in the ‘Spanish comparable’ subcorpus, a very striking feature in the rhetorical structure of the sample texts was found: 10% of the RA abstracts in this subcorpus show a singular rhetorical distribution, which seems to be closer to that for descriptive rather than for informative abstracts. So to speak, the typical rhetorical structure of this group of descriptive abstracts only summarizes purpose and methodology and is not designed to replace the source text. Nevertheless, those abstracts were not discarded in our study, because they are real samples of scientific communication in the Spanish language. This significant distribution becomes the first difference found in our analysis of the comparable corpus: although editorial committees advise authors to construct informative abstracts and although readers expect this type of abstracts to be part of RAs, certain Spanish scientific writers do not follow this norm

and the consequences it may lead to could be disastrous for the acceptability of these abstracts by the international scientific discourse community.

Regarding the descriptive abstracts group, certain aspects must be mentioned: some of them do not follow a common rhetorical structure, while others (9) include the first two moves — ‘Background’ and ‘Indicating a Gap’ — that is 9 descriptive abstracts do not include the ‘Principal Findings’ move. The following abstract (example (2)) exemplifies descriptive abstracts found in our corpus:

- (2) *La fibrilación auricular es la arritmia cardíaca más frecuente en la práctica clínica. La fibrilación se caracteriza por una desorganización total de la actividad eléctrica auricular con pérdida de la función de marcapasos por parte del nódulo sinusal. El mecanismo fisiopatológico está basado en la coexistencia de múltiples frentes de onda eléctricos que cambian constantemente de localización, tamaño y dirección, dando como resultado una actividad eléctrica auricular caótica. Distintos estudios utilizando cartografía detallada de las aurículas han confirmado este mecanismo. Asimismo, diversos estudios han mostrado que los múltiples frentes de onda presentes están basados en reentradas funcionales. Para que una fibrilación auricular se perpetúe, son imprescindibles unas ciertas características electrofisiológicas que den como resultado la presencia de un impulso eléctrico con una longitud de onda adaptada al tamaño de la aurícula. La modificación de la longitud de onda mediante fármacos conlleva la perpetuación o la terminación de la fibrilación.* (Extracted from: Brugada, J. 1996. “Mecanismos electrofisiológicos de la fibrilación auricular”. *Revista Española de Cardiología* 49(2):8–12).

On the other hand the analysis of the ‘Translation’ subcorpus also shows outstanding features to be mentioned; those sample texts in the ‘Translation into English’ subcorpus follow the same pattern as the ‘Spanish comparable’ subcorpus, which means that informative and descriptive abstracts (20%) can be found in this subcorpus. As far as the descriptive abstracts group is concerned, only 5 descriptive abstracts show the first and second move, as in example (3):

- (3) Sudden cardiac death is a major medical problem. The techniques to identify high risk patients have a limited value. Only betablockers, and perhaps amiodarone, are useful for primary prevention of sudden cardiac death. Prospective studies being carried out today with implantable cardioverter-defibrillator, will show us if these are the best way of treatment (secondary prevention) of sudden cardiac death. (Extracted from: Pedrote, A. and Errazquin, F. 1995. “Current Perspective in the Prevention and Treatment of the Cardiac Sudden Death”. *Revista Española de Cardiología* 48:710–21).

With respect to the results obtained in the analysis of this subcorpus, two features need to be mentioned; first, the occurrence of descriptive abstracts in this subcorpus seems to indicate that Spanish scientific writers do not take into account the typical or favourite rhetorical structure for this genre in the English language (see Table 2 below). This feature could make not only acceptability but also communication difficult, since native English speaking experts do not expect this structure to be part of RAs. In addition, sometimes, scientists could see their research rejected for publication, not because of the content but for the form in which they present their findings.

Table 2. Occurrences for descriptive abstracts in the Introduction sections.

Descriptive abstracts			
Corpora:		Spanish Comparable	Translation into English
Occurrences within the subcorpus		10%	20%
Moves within	<i>Background</i>	9 samples	5 samples
descriptive abstracts	<i>Indicating a Gap</i>		

As for the informative abstracts, we would like to point out that the structure they show seems to be closer to that favoured by the English language, since the percentages found are similar.

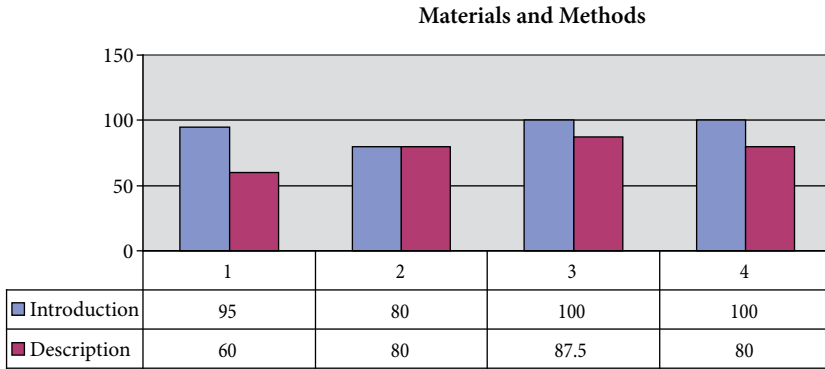
The results for the ‘Translation into Spanish’ subcorpus seem to illustrate that the information transmitted in these abstracts is more exhaustive than in those written originally in Spanish; for example, these abstracts tend to show the three moves found in Introductions, whereas the occurrence of the three moves in most abstracts of the Spanish comparable corpus cannot be reported. In this sense, we could consider the ‘translated into Spanish’ samples more explicit, and sometimes more redundant than those originally written in Spanish.⁹

4.2 Abstract sections: Methods

Swales’ study (1990) does not contain the rhetorical structure for the other sections included in a RA. However, we decided to analyse our corpus in order to see whether a rhetorical structure could be found in the other sections: Methods, Results and Conclusion. In this sense, certain similarities were discovered in the construction of the second section — Methods — of abstracts. These similarities revealed that this section is mainly divided into two moves, which we called ‘Introduction’ and ‘Description’.

Graph 2 summarizes the results found in our corpus. In this regard, we would like to mention that although descriptive abstracts within the ‘Spanish comparable’

subcorpus (9 abstracts) show these two moves in this section, the rhetorical structure seems to be more neutral and vague than in informative abstracts.

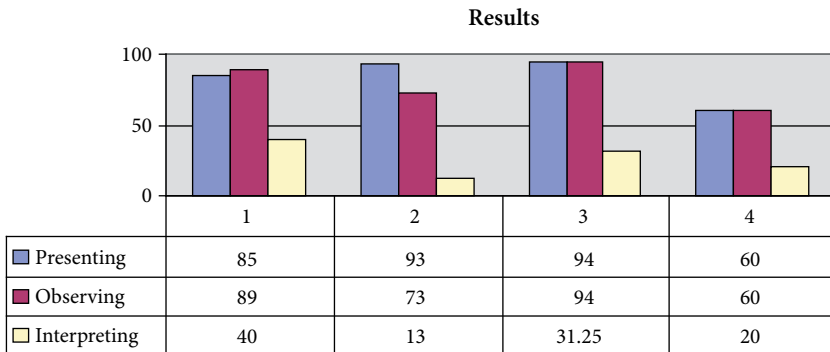


Graph 2. Occurrences for informative abstracts in the Materials and Methods section (%). Numbers 1 to 4 correspond to ‘English comparable’, ‘Spanish comparable’, ‘Translation into English’ and ‘Translation into Spanish’ corpora respectively.

As we have mentioned, the ‘Translation into English’ subcorpus shows that 20% of the samples within this subcorpus are descriptive abstracts, and these abstracts do not show any rhetorical structure at all. Finally, the analysis of this second section in the ‘Translation into Spanish’ subcorpus illustrates the same trend as in the previous section; that is, the information included in these abstracts seems to be more detailed than that included in the ‘Spanish comparable’ corpus (see Section 4.1).

4.3 Abstract sections: Results

Many studies illustrate that the Results sections of RAs are extremely diverse in their rhetorical structure. As Williams (1999:348) states, whereas some Results sections are short and undivided, others are divided into several subsections. This feature is observed in the abstract structure as well, although our analysis shows that Results sections in abstracts can be divided into three different moves: ‘Presenting’, ‘Observing’, and ‘Interpreting Results’. The division into moves can be considered a consequence of the concise nature of abstracts; in other words, despite the diversity in structure Results sections show in RAs, this section seems to be far more organized in abstracts, due to their function as advance indicators of the content of a longer text (see Graph 3 below). However, abstracts function as well as derived texts and the analysis of our corpus illustrates some variation in the rhetorical structure of this section.



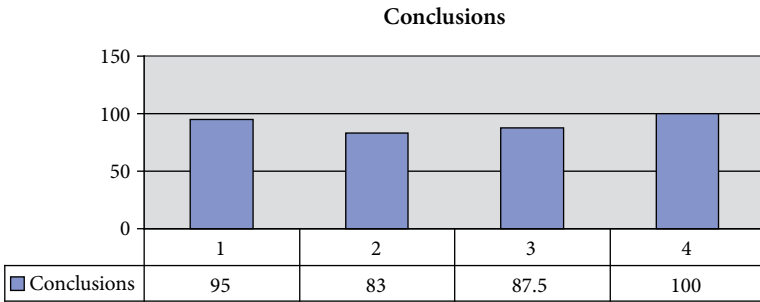
Graph 3. Occurrences for informative abstracts for the Results section (%). Numbers 1 to 4 correspond to ‘English comparable’, ‘Spanish comparable’, ‘Translation into English’ and ‘Translation into Spanish’ corpora respectively.

The occurrence of the first two moves in the comparable subcorpora seems to be significant in terms of rhetorical structure, while the percentage for the last move shows a certain degree of variation. On the other hand, as we have already mentioned, the ‘Spanish comparable’ subcorpus contains 9 descriptive abstracts and the analysis of their rhetorical structure does not show any kind of significant subdivision. The Results section for these abstracts seems to be focused on the understanding and interpreting of the data obtained, which implies, in some cases, the lack of the last move (see examples in Section 4.1).

The ‘Translation into English’ subcorpus presents informative and descriptive abstracts and the rhetorical structure of informative abstracts with respect to the Results section can be found in Table 2. Descriptive abstracts do not contain any significant subdivision, a situation similar to the analysis of the ‘Spanish comparable’ subcorpus for these abstracts and this section.

4.4 Abstract sections: Conclusions

The conclusions of the study and some recommendations are explained in the Conclusions section and no significant subdivision has been found in our analysis for this section. According to editorial committees, this section is compulsory for the construction of RA abstracts; nevertheless, many authors decide not to include it in their abstracts. Graph 4 shows the distribution of the Conclusions section in informative abstracts:



Graph 4. Distribution of the Conclusions section in informative abstracts (%). Numbers 1 to 4 correspond to ‘English comparable’, ‘Spanish comparable’, ‘Translation into English’ and ‘Translation into Spanish’ corpora respectively.

Surprisingly, 100% of descriptive abstracts in the ‘Translation into English’ subcorpus contain the Conclusions section. This data is striking considering the parallelism observed in the results of the analysis for the other three sections between the ‘Spanish comparable’ and the ‘Translation into English’ subcorpora. In other words, although the first three sections of descriptive abstracts written originally in Spanish and translated into English show a certain degree of similarity in terms of structure, the Conclusions section does not follow this pattern, but it displays the opposite tendency.

5. Prototypical structure for abstracts: Description

Our next step will be to focus on the terminology used and on the semantic relationships those terms maintain within the syntactic and textual structure of the abstract. Once this step is developed, the organizational meaning for every section and move will be examined in order to observe the nature of the lexical chains formed in those texts. Finally, by means of conjunction, the relations between lexical chains will be achieved.

However, we will focus only on those specific lexical chains for our semantic domain, cardiac arrhythmias; Table 3 illustrates the conceptual subdomains under analysis in the present study.

Table 3. Conceptual structure and nomenclature used in our study.

Cardiac arrhythmias	
CONCEPTUAL STRUCTURE	NOMENCLATURE FOR OUR STUDY
Disturbances on the impulse formation	Cardiac general disorder
Abnormal Conduction	Cardiac disorder
Therapy	Therapy
Protocol of the therapy	Protocol of the therapy

The following subsections (5.1 to 5.4) show the prototypical structure for abstracts in each of our subcorpora; Section 5 constitutes the basis for the comparison between subcorpora offered in Section 6, where differences between subcorpora regarding the prototypical structures are offered.

5.1 The ‘English comparable’ subcorpus

Table 4 summarizes the distribution of each of the subdomains under study according to our parameters. Columns two and three show the move and, more precisely, the step in which each of the subdomains starts lexical chains; columns four to six show the semantic preferences for those occurrences.

Table 4. Behaviour of the subdomains in the English comparable subcorpus: Rhetorical and Semantic.

Subdomains	Move	Step	Substitution	Reference	Prominence
Cardiac General Disorder	Introduction	Background (76%) Indicating a gap (28%)	Synonymy: abbreviations variation of the terminological unit		
Cardiac Disorder	Methods	Description (73%)	Minimal variation Synonymy: abbreviations, acronyms	Comparison	Forefronting Repetition Passive voice Expentancy chains
Protocol of the Therapy	Results	Observing (55%)	Minimal variation Synonymy: abbreviations, acronyms	Comparison	Forefronting Repetition Passive voice Expentancy chains
Therapy	Introduction	Indicating a gap (57%)	Subtechnical terms		

5.2 The ‘Spanish comparable’ subcorpus

Table 5 shows the distribution of each of the subdomains under study in the Spanish comparable subcorpus. As in Section 5.1, columns two and three illustrate the move and the step in which each of the subdomains under study starts lexical chains; columns four to six show the semantic preferences for those occurrences.

Table 5. Behaviour of the subdomains in informative abstracts of the Spanish comparable subcorpus: Rhetorical and Semantic.

Subdomains	Move	Step	Substitution	Reference	Prominence
Cardiac General Disorder	Results Method	Presenting (64%) Introduction (40%)	Synonymy: sub- technical terms, hyponymy		Repetition Passive voice Forefronting Expectancy chains
Cardiac Disorder	Results Conclusion	Observing (63%) (64%)	Meronymy Synonymy: acro- nyms, definition	Comparison	Repetition Passive voice Forefronting
Protocol of the Therapy	Method	Introduction (58%)	Synonymy: ep- onym, subtechnical terms	Comparison	Passive voice
Therapy	Method Results	Description (50%) Presenting (50%)	Synonymy: abbrev- iation, subtechni- cal terms	Comparison	

5.3 The 'Translation into English' subcorpus

Table 6 illustrates the behaviour of the subdomains under study in informative abstracts in the translation into English subcorpus. As in the previous sections, columns two and three show the moves and the steps in which each of the subdomains under study starts lexical chains, whereas columns four to six illustrate the semantic preferences for those occurrences.

Table 6. Behaviour of the subdomains in informative abstracts of the Translation into English subcorpus: Rhetorical and Semantic

Subdomains	Move	Step	Substitution	Reference	Prominence
Cardiac General Disorder	Introduction Method	Background (100%) Introduction (93.3%)	Synonymy: hyponymy definition abbreviation		Expectancy chains Repetition Passive voice
Cardiac Disorder	Introduction Method	Principal find- ings (73.3%) Introduction (66.6%)	Meronymy Synonymy: definition abbreviation		Repetition
Protocol of the Therapy	Results Conclusion	Presenting (57.14%) (66%)	Synonymy: hyponymy Abbreviation	Comparison	Passive voice Forefronting

Therapy	Introduction	Indicating a gap (50%)	Synonymy: subtechnical terms abbreviation
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5.4 The ‘Translation into Spanish’ subcorpus

The distribution of each of the subdomains under study in the present paper is illustrated in Table 7, where the moves and the steps in which lexical chains start is shown in columns two and three and the semantic preferences for those occurrences is shown in columns four to six.

Table 7. Behaviour of the subdomains in abstracts of the Translation into Spanish subcorpus: Rhetorical and Semantic

Subdomains	Move	Step	Substitution	Reference	Prominence
Cardiac General Disorder	Introduction Results	Background (100%) Observing (100%)	Synonymy: hyponymy abbreviations	Comparison	Forefronting Passive voice
Cardiac Disorder	Introduction	Principal findings (60%)	Synonymy: hyperonymy abbreviation		
Protocol of the Therapy	Introduction Results	Principal findings (80%) Interpreting (100%)	Synonymy: hyponymy abbreviation		Passive voice
Therapy	Methods	Introduction (60%)			Repetition

6. Juxtaposition and contrast of descriptive data

Once the distribution of each of the subdomains has been described in each of the subcorpus, the next step is to compare this distribution in order to find differences within patterns in abstracts (See Table 8 below). These differences have to be observed and classified so that strategies in the construction of abstracts can be inferred and will be of great help for experts-writers, translators and technical writers.

Table 8. Summary of relevant moves, steps and subdomains within the corpus.

Corpora	English Comparable	Spanish Comparable	Translated into English	Translated into Spanish
Moves	Methods (M)	Introduction (I)	Introduction (I)	Introduction (I)
	Results (R)	Methods (M)	Methods (M)	Methods (M)
Steps	Description (M)	Background (I)	Background (I)	Background (I)
	Observing (R)	Introducing (M)	Introducing (M)	Introducing (M)
Subdomain	Cardiac disorder	Cardiac general disorder	Cardiac general disorder	Cardiac general disorder
	Protocol of the therapy	Therapy	Protocol of the therapy	Protocol of the therapy

6.1 Juxtaposition and contrast of the comparable subcorpora

The first difference observed is based on the nature of RA abstracts; thus, while the ‘Spanish comparable’ subcorpus includes descriptive and informative abstracts, the ‘English comparable’ subcorpus only includes informative ones. In other words, Spanish authors find both types of abstracts, informative and descriptive, as adequate textual instances for their RAs, whereas English scientists consider only the former type to be an appropriate textual pattern for their RAs.

Regarding informative abstracts, juxtaposition of both comparable subcorpora shows that the relevance given to subdomains seems to be not only different but opposite. Therefore, new information — represented by the protocol of the therapy subdomain — rules the relations with other subdomains in the ‘English comparable’ subcorpus, whereas in the ‘Spanish comparable’ subcorpus this function is played by the cardiac general disorder subdomain, or given information for the experts in the field. In other words, abstracts in the ‘English comparable’ subcorpus stress the results of the study while authors of Spanish abstracts emphasize the aim of the study.

Besides, the relations between terms within each of the subcorpora are different. From a lexical or terminological point of view, English samples refer to the concepts of the subdomains under study by means of specific terms; thus, hyponyms are repeated through the sample or substituted by acronyms as it can be observed in the example 4 below:

- (4) The role of programmed ventricular stimulation (VSTIM) for risk stratification in congenital heart disease is unclear. We analyzed the results of VSTIM in selected congenital heart disease survivors at a single center to determine whether it improved the ability to predict a serious outcome. METHODS AND RESULTS: Between July 1985 and September 1996, 140 primary VSTIM studies were performed on 130 patients (median age 18.1

years, range 0 to 51). (Extracted from: Alexander, M.E et alii. 1999. "Value of Programmed Ventricular Stimulation in Patients with Congenital Heart Disease". *Journal of Cardiovascular Electrophysiology* 10(8):1033–44).

On the other hand, the 'Spanish comparable' abstracts show a preference for variation. The terms referring to the concepts are substituted by acronyms, hyperonyms, subtechnical terms, definitions or even by terms belonging to other communicative situations. Certain terms are identified as belonging to a particular subdomain and hence, the implicatures between the participants seem to be diminished; these features are illustrated in the example 5 below and a translation into English of this example is provided in Appendix 1:

- (5) *La fibrilación auricular es la arritmia más frecuente y suele ocasionar síntomas que requieren tratamiento. Los fármacos antiarrítmicos constituyen el arma terapéutica de primera línea en los pacientes con esta cardiopatía, pero su uso encierra una serie de riesgos potenciales, junto a una limitada eficacia, que obliga a ajustar sus indicaciones.* (Extracted from: López Gil, M. et alii. 1996. "Mantenimiento farmacológico del ritmo sinusal y/o control de la respuesta ventricular en pacientes con fibrilación o flutter auricular". *Revista Española de Cardiología* 49(2):32–41).

Considering the communicative setting, the inclusion of certain definitions does not seem to be appropriate, interrupting or creating misunderstanding of the communication among the participants. These data are verified with the analysis of conjunction, since different types of relationships are expressed in Results sections of the 'English comparable' subcorpus and a variety of conjunct relations can be observed in the Introduction sections of the Spanish comparable subcorpus.

This difference in the relevance given to certain subdomains has an effect on the distribution observed among terms for every section, thus contributing to a particular information scattering which will be exclusive of each of those sections. Although sample texts for both subcorpora show certain similarities in relation to their subdivision in moves, the importance given to certain moves gives rise to some differences which influence their organization and distribution. Regarding the occurrence of moves within sections, relevant differences should be pointed out; in the Introductions, Spanish authors tend not to include the move indicating a gap as much as English authors (35% vs. 20%) and on the other hand, Spanish authors tend to highlight the principal findings within the Introduction more than English authors (53% vs. 45%). This strategy seems to show that Spanish authors give more prominence to their own aims in the study, while English authors tend to compare their study with other previously developed in their research area before stating the methods and results.

By comparing the occurrence of the moves within the Results sections, it can be observed that the move interpreting the results can be considered to be a favourite structure in the English subcorpus (40%), while it is a peripheral structure in the Spanish subcorpus (13%). In this sense, we can state that Spanish authors consider more relevant other aspects of their study than the interpreting of the results and, thus, they do not include this information in the abstract.

According to our analysis, the Methods and Results sections are the most relevant sections in the sample texts for the ‘English comparable’ subcorpus, whereas Introductions and Methods hold this position in the ‘Spanish comparable’ subcorpus. Consequently, Spanish authors seem to focus their attention on information related to arrhythmias, that is, given information for the readers, and English authors stress the results of their study, in other words, new information.

Therefore, the differences in the construction of abstracts between these two languages are not as important in relation to their subdivision into moves as in the information distribution within the moves. The results of the comparison show that the starting point abstracts assume is not only different, but opposite in the two languages under study.

6.2 Juxtaposition and contrast of the ‘English comparable’ and the ‘Translation into English’ subcorpora

Sample texts in the ‘Translation into English’ subcorpus present a different structure to those written originally in English. First, as secondary genres, abstracts are derived texts of RAs which are adequate and accepted by the discourse community originally targeted; however, when translated into English, abstracts should adapt their features to those typical for the English language in that communicative situation. Thus, translated abstracts have to be adequate not only to their primary texts but also to the target discourse community.

In this sense, 66% of the translated abstracts are longer than editorial committees advise, whereas only 36% of the samples in the comparable subcorpus are longer than 250 words. When analysing the subdivision into moves of the samples in the ‘Translation into English’ subcorpus, descriptive abstracts were found to be –12% of the abstracts; this occurrence implies not only a difference with the abstracts of the ‘English comparable’ subcorpus but also a similarity with those of the ‘Spanish comparable’ subcorpus. If we accept the English language to be *the* language for scientific communication, we have to accept its text patterns as well; hence, every diverted element — as the occurrence of descriptive abstracts may be — will be rejected by the target discourse community.

On the other hand, informative abstracts in the ‘Translation into English’ subcorpus present a higher trend towards a subdivision in moves, which can be

understood as an inclination to specify the information transmitted in it. As we have previously mentioned, this feature could modify the concise nature of abstracts, interfering with, once again, their acceptability in the target community.

The comparison of the subdomain distribution between these two subcorpora illustrates that sample texts in the translation subcorpus tend to emphasize both the cardiac general disorder and the protocol of the therapy subdomains; in other words, those subdomains stressed in the Spanish and in the English comparable subcorpora respectively. In the translation subcorpus, the relevance to the cardiac general disorder subdomain takes place in the Introduction sections and the protocol of the therapy subdomain is given importance in the Introduction and in the Methods sections. Thus, we can conclude that the Introduction and the Methods sections present a nuclear position in translated abstracts. Regarding term relations, translated into English samples show the same trend in terms of synonymous relations, such as the substitution of certain terms by definitions, subtechnical terms, etc.

These data confirm that translated abstracts share some features of the source and target discourse communities, interfering with communication and acceptability by the latter since readers do not recognize certain patterns of behaviour as typical for the communicative situation. In this sense, the comparison between the 'English comparable' and the 'Translation into English' subcorpora leads us to the concept of the *third code* (Frawley 1984; Baker 1998; Laviosa 1996; Overas 1998; among others); Frawley (1984:168) claims that "translation itself [...] is essentially a third code which arises out of the bilateral consideration of the matrix and target codes; it is, in a sense, a sub-code of each of the codes"; that is, a language that exhibits unique features which are a compromise between the norms or patterns of the source language and those of the target language (Laviosa 1996).

6.3 Juxtaposition and contrast of the 'Spanish comparable' and the 'Translation into Spanish' subcorpora

Sample texts included in this translation subcorpus tend to specify particular items, a feature observed in the length and occurrence of moves within the abstracts. Regarding the distribution of the subdomains, translated texts give relevance to the cardiac general disorder and the protocol of the therapy subdomains; it can be noticed that translation subcorpora stress the same subdomains, no matter the language those abstracts have been translated into. The moves in which these subdomains are stressed are the Introduction and the Methods sections as well.

7. Conclusion

The comparison of the favourite structures reveals certain similarities and differences in the construction of abstracts; differences have to be pointed out to reach a better understanding of this type of specialized communication.

Our analysis shows that central strategies for the comparable subcorpora are not only different but also opposite in the two genres under study. Spanish and English audiences in the medical discourse community seem to have an opposite tradition in the composition of abstracts, a fact that has to be considered when teaching composition strategies in both discourse communities.

On the other hand, the analysis of the 'Translation into English' abstracts has shown that these samples follow, to a certain extent, the proper conventions for the Spanish discourse community of experts. The variation in terminological units by means of definitions, the inclusion of terms belonging to other communicative settings, the importance attached to given information and the inclusion of descriptive abstracts resemble the strategies observed in the 'Spanish comparable' subcorpus. Since these strategies are not proper in the English community, they affect acceptability, in that the audience does not recognize those patterns of behaviour as proper for this type of genre within this type of communication.

The differences observed in the behaviour of abstracts have to be taken into consideration in specialized communication, since *the* language for scientific information dissemination is the English language. Technical writers, experts and translators should adapt their abstracts to the features of the English language for this communicative setting; otherwise, the target discourse community can reject those texts because they do not comply with the expectations readers have.

We think that contrastive studies from the theoretical angle of text linguistics are very helpful for subject specialists, translators and professional abstractors. We hope to have proved that interlingual comparative studies of abstracts reveal similarities inside this genre, but also, in spite of its seemingly uniform behaviour, a number of language-specific differences that have to be taken into consideration for translation related purposes.

Notes

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1. The IMRD pattern is the structure RAs and abstracts must adhere to, according to Journal requirements. IMRD stands for Introduction, Methods, Results and Discussion. The most striking characteristic is that each section contains a unique rhetorical structure, which differs from the others and readers of RAs and abstracts expect writers to adopt this structure.
2. Nevertheless, substitution by zero will be discarded in the present analysis, since this mechanism does not add a grammatical meaning to the abstract. Evaluating substitution by these mechanisms implies that the lexical chains have been previously formed.
3. The concepts of 'lineal', 'constant' and 'rhematic thematization' come from Daneš (1970:70–78). Lineal thematization consists of adding new information by means of terminology, and in this sense the textual position of cardiology specific terms will be considered for this type of thematization. On the other hand, constant thematization comprises lexical chains showing a meaning relationship with the main chain. Finally, rhematic thematization is built on the rhematic information that is available from the previously given information.
4. The classification of corpora we are using in the present study has been taken from the study of Bravo Gozalo and Fernández Nistal (1998) and Rabadán Álvarez and Fernández Nistal (2002:45–59).
5. Data obtained from <http://www.medscape.com>.
6. For impact classification see <http://isinet.com>.
7. According to ISI, the journals classified with the highest impact in cardiology are: Circulation, Circulation Research, New England Journal of Medicine (NEJM), Journal of the American College of Cardiology, The Lancet, Papers from the National Academy of Sciences (PNAS), Nature, Science, American Journal of Cardiology, Journal of American Medical Association (JAMA), Artherosclerosis Thrombolysis and Vascular Biology (Official Journal of the American Heart Association), Annals of Thoracic Surgery and Pacing Clinical Electrophysiology.
8. A move is a text segment made up of a bundle of linguistic features which give the segment a uniform orientation and signal the content of discourse in it (Nwogu 1997:122).
9. Although the aim of the present paper is not to make a careful study of either the features of the translation process or of translated texts, we would like to define explicitation as one of the feature of translated texts which makes them more redundant than texts originally written in the source language (Blum-Kulka 1986:19). For more information see Baker (1993; 1998) among others.

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Appendix 1: Translation into English of examples (1), (2) and (5)

- (1) Introduction: The development of arrhythmias in hypertensive patients has been associated with the presence of left ventricular hypertrophy. The study was designed to determine both the presence and the relation between left ventricular hypertrophy and arrhythmias in mild hypertension.
- (2) Atrial fibrillation is the most common arrhythmia in clinical practice. Atrial fibrillation is characterized by a complete disorganization in atrial electrical activity, resulting in a loss of sinus node pacemaker activity. The physiopathological mechanism of atrial fibrillation is based on the simultaneous presence of multiple wavelets in the atria that are continuously changing in localization, size, and direction, resulting in a chaotic electrical activity. This theory has been confirmed by several studies using detailed mapping of the atria during atrial fibrillation. In addition, the functional nature of the reentrant circuits during atrial fibrillation has also been demonstrated. For an episode of atrial fibrillation to perpetuate, the wavelength of the cardiac impulse has to be adapted to the length of the atria. Modifications of the wavelength by drugs may result in perpetuation or in termination of the atrial fibrillation episode.
- (5) Atrial fibrillation is the most common type of arrhythmia and it normally produces symptoms requiring treatment. Antiarrhythmic drugs represent the primary weapon in patients with this heart disorder, but their use does present a series of potential risks that in addition to their limited effectiveness mandates an adjustment of their therapeutic indications.