TRANSLATION PATTERNS OF ENGLISH TERMS INTO SPANISH[1]

María Luisa Carrió Pastor y Eva María Mestre Mestre
Universidad Politécnica de Valencia
lcarrio@idm.upv.es

As new concepts, objects or ideas are conceived in the field of scientific knowledge, so new terms appear to accommodate them. These terms are adapted to other languages in order to gain worldwide recognition. However, the procedure followed to transmit this terminology varies depending on the specificity of the field and on the richness of the target language. Sometimes, the target language has a similar term or phrase, which may be used to transmit the concept; i.e. an existing term can be adapted to convey the same idea. If this is not the case, a new term is introduced in the target language to express the concept or the term is literally copied from the original language. In this paper, we intend to analyse the different procedures followed to adapt English terms to the Spanish language. The objectives of this paper are to observe and classify the different translation patterns of English terms into Spanish and to determine whether a procedure or standard organization exists which is taken into consideration when a new term is introduced to the Spanish lexicon. To date, we have not unveiled a standardised procedure for adapting an English term into Spanish. Hence, the need for standardised procedure to be followed when adapting new English terminology into Spanish will be proven.

Keywords: *translation patterns, Spanish, English, lexical standardization.*

A medida que conceptos, objetos o ideas nuevas aparecen en el campo del conocimiento científico, a la vez surgen términos para definirlos. Estos términos se

adaptan a otras lenguas para poder ser conocidos internacionalmente, sin embargo el procedimiento que se sigue para transmitir esta terminología varía según la especificidad del campo y la riqueza de la lengua meta. En ocasiones la lengua meta posee un término o expresión similar, que puede utilizarse para transmitir el concepto, es decir, un término existente que se adapta para transmitir la misma idea. Si este no es el caso, se introduce un nuevo término o se copia literalmente el término de la lengua original. En este artículo, vamos a analizar los distintos procedimientos que se siguen para adaptar términos ingleses al español. Los objetivos de este trabajo son observar y clasificar los diferentes modelos de traducción que se siguen al adaptar términos ingleses al español, y determinar si existe un procedimiento u organización que se considera referente cuando se adapta un nuevo vocablo al español. Hasta este momento no se ha observado un procedimiento aceptado por todos que logre adaptar de forma estandarizada un término ingles al español. En este artículo se demuestra la necesidad de un procedimiento estandarizado que se pueda seguir para adaptar la terminología inglesa a la española.

Palabras clave: *modelos de traducción, español, inglés, estandarización léxica*.

1. INTRODUCTION

In the field of applied linguistics, several approaches have been documented for the study of the influences between languages in contact. For instance, the behaviourist approach stated that transfer between the first and the second language will always exist, and that this is always negative because old habits deter the formation of new ones. For behaviourists, any influence of the mother tongue (L1) on the acquisition of the second language (L2) was negative and had to be eliminated, as described by Ellis (1985: 20).

This idea has been reviewed by several authors (Ellis 1985, Odlin 1989) who consider it to be over-pessimistic. There is a certain degree of consensus about the *movement* or translation of elements between different languages used by the same individual. Indeed, this phenomenon cannot be qualified simply in positive or negative terms. However, some authors (e.g. Odlin 1989) have highlighted the fact that interference has always been examined with reference to the negative meaning of transfer between two languages. These authors point out that in some situations this need not be the case, and that there can be a positive influence derived from the command of a given language (for instance the cases of language, context or cultural proximity).

However, although interference is a term used by other schools (contrastive analysis, error analysis, etc.), the negative behaviourist view prevails. L1 interference is mainly considered to be a negative type of transfer in L2 output. In attempting to avoid this perception, some scholars (Odlin 1989) affirm that transfer includes some aspects that interference tends to omit.

Transfer has mainly been viewed in terms of the interference of L1 with L2 (Carrió Pastor 2002, 2003 & 2004). Since most scientific production is conducted in English either by native speakers or by non-native speakers, most scientific production written in other languages tends to be translated, derived, related, transformed, etc. from English. In this study we will not only be looking at L1 transfer to L2, but also at the reversal of this process, that is, the existing transfer from L2 (English) to L1 (Spanish). This is most likely to be found in L1 translations from L2. In addition, attention has been given to the possible traces of L1 that can be identified in the choices made in the translations from L2 (Chung & Nation 2003, Elorza 2002, Montalt 2005).

Particularly in the field of scientific language, barbarisms have always been a matter of concern in Spanish. That is, the danger of *foreign* words (words which initially could not be found to be part of the language) entering through the floodgate of scientific language has been long established and studied.

Once the English terms have been selected for translation, several mechanisms are used to adapt these words for the language

into which terms are being translated. This can range from direct incorporations into the language to literal adaptations. These mechanisms have been widely studied in the literature, and general, long-established classifications were drawn up to identify these, as outlined by Fernández & Montero (2003) and Spasic (2004).

With regards to this, in order to establish some sort of method, general regulations were designed to control and monitor this process of incorporating new words into language. Despite this, it is notable that the speed at which science unfolds and requires the coinage of new terms cannot keep up with the speed at which these words are studied, agreed upon, accepted and incorporated into the language, as pointed out by Cabré (2007). These processes are not always identical and only in very few cases can the existing mechanisms meet the requirements created by the scientist.

In addition to the use of language, its establishment and standardization has benefited the entire scientific community as stated by Kachru (2003), who points out that native speakers no longer control the standardisation of English terms.

There are some institutions responsible for regulating the use and coinage of terminology. In this context, the European Association for Terminology (EAFT) deserves to be mentioned in that it is one of the most important bodies. It is designed to provide a platform for promoting and professionalizing terminological activities and raising public awareness of this process. It is also committed to furthering plurilingualism within Europe.

Also worth mentioning is the International Organisation for Standardization, ISO, which, according to its own definition is the world's largest developer of standards[1]. Among the different standards they develop in relation to technical appliances, etc., they highlight the importance of terminology, which for this organization is the first step in any standardization process, particularly in international standardization. The ISO is a network of national standard institutes belonging to a set of countries, based on one member per country, with a Central Secretariat coordinating the system.

AENOR is the Spanish Standards Institute belonging to this network. It was created in 1986 and has been active since 1992. This institute carries out standardization audits and courses. It also has a documentation service to support its activities. These tasks are carried out by subcommittees which meet to work on one or more subjects. For instance, Subcommittee 1 of the CTN50 is integrated by different working groups, one of which (GT3) is dedicated to deciding upon terminology.

In Spain, other centres exist which are dedicated to the development of terminology, such as the Termcat in Catalonia, EuskalTerm in the Basque Country or Termigal in Galicia, each operating for the different official languages spoken in those regions.

As observed, substantial worldwide consensus has been reached with regards to the need for an institution capable of governing and regulating terms, which should be considered as part of the development of technology and the research process. However, the existing institutions in charge of this are non-governmental, and depend on the consensus and interest of the parties involved to take these into consideration and to enforce them when necessary.

Cabré (2007) highlights the fact that the standardization of terminology is more strongly related to the development of industry than to scientific use. On the one hand, industry needs specific terms to be translated in order to communicate with potential costumers, so they try to standardise terms. On the other hand, scientists, who use terms related to specific areas of knowledge in their studies and linguists, who study those terms, are sometimes responsible for coining them, depending on their areas of expertise. Scientists and linguists do not always coincide in the coinage they provide but once the process of adaptation of the new term is completed, standardised lists of terms are numbered and offered for use. However, these are neither public nor free of charge.

United Nations documents provide another source of terminology. This organization publishes official documents in a set of languages, used by many as referential documentation since these are parallel documents. In addition, occasional glossaries appear in

relation to a set of specific subjects, which are of interest for the agencies developing the lists. Again, these are not freely available.

Scientists can also obtain terms from the on-line dictionary of the European Union[2], in which references to the terms, the glossaries and the corresponding terms for many subject matters (politics, finance, education, applied sciences, humanities, etc.) are listed. Specific online dictionaries supported by professional schools (medicine, law, etc.) are other sources from which terms or terminology can be obtained.

As indicated, several possible access routes to reasonably reliable terminology exist, all of which require a certain degree of research and prior knowledge. In some cases, prepayment and knowledge of how the institutions function and how they elaborate their resource documentation is also required. This restricts individual access. Most scientists find the terms in articles with the same or a related subject matter, or read directly from English and approximate a translation, which they find appropriate for the term they are using within the context they wish to use it.

Sometimes the different translation processes related to the world of science and research are conducted in such a way as to almost ignore the stipulations set out for this particular kind of specific production. In some cases, the scientists themselves translate their own texts, or the sources they are reading from. These, in turn, become the sources for the terms and vocabulary they use in their own written production. With reference to this, Crystal (2001) mentions the existence of many *Englishes* and of many varieties with different levels of standardization. Although this author mainly refers to the English of existing English-speaking communities, this could probably be extended to other types of communities where English is also used as the everyday language of communication, such as the language used by scientists to publish their findings.

Indeed, this means that, in practice, the field of scientific language and terminology can often differ considerably from its theoretical description. If scientific language needs to be one-sided, direct, objective, and the scientists translate their own terms, individually, and according to their own criteria, then the results can

sometimes be a far cry from the objectives and the *rules* established for translation. Two scholars can translate and use two terms in different ways at the same time, resulting in a set of variations, which conflict with the principles of mono-referentiality and univocal interpretation (Freixa, 2002).

In other cases, this type of translation results in the use of synonyms, contrary to the recommendations of scientific language. These are used to obtain a greater degree of specificity and rigour and, according to some authors are very much dependent upon the degree of specialisation within the texts; that is, the more specialised the text, the lower the use of synonyms, as explained by Freixa (2002).

Additionally, there are times in which the use of synonyms is even justified depending on the type of audience they are directed at. The context and the addressees change and in turn, some variations must occur in the text. Therefore, according to Suarez (2004), it depends very much on the degree of knowledge of the matter shared by the audience.

In some situations, L1 plays a significant role in the choices made. It should be remembered that translations are made to facilitate an understanding of the subject matter in the mother tongue. That is to say, translations are made by agents belonging to one specific scientific community and directed at that specific scientific community, which differs from the scientific community producing the original text.

For this reason, traces of L1 can be detected in some of the choices made when translating from L2. In other cases, English influences translations made by scholars. It is normal to find examples where the choice has even been made to retain the English word, ignoring any attempt to find an equivalent in the target language.

2. RESEARCH QUESTIONS

By considering the translation process, our study attempts to establish whether any transfer actually occurs, and, if so, in which direction.

The first objective of this study is to revise the way in which words are translated from English (L2) into Spanish (L1). The second objective is to assess whether the existing mechanisms used to create and distribute terms are useful in guaranteeing a univocal use of terms. Although some institutions exist, as previously mentioned, access to these is neither free nor direct. Furthermore, they produce terms at a much slower speed than is required by science. Therefore, we intend to demonstrate the adequacy of the existing organisms that register new words into Spanish, avoiding barbarisms.

3. METHODOLOGY
3.1. Corpus

A set of articles written in English by native speakers of English and a set of articles written by Spanish-speaking authors were selected to be our corpus. These articles were published in international journals in order to ensure their acceptance by the research community.

The field of Computer Science, which is constantly evolving, and more specifically the discipline of Artificial Intelligence, was deliberately selected in order to find words that could be open to different interpretations. We collected 21 articles in English and 27 articles in Spanish. 8,373 keywords were found in English and 13,871 in Spanish. Of these, 300 were considered adequate terms for our corpus in the English texts and 360 in the Spanish texts.

The articles were randomly selected with only one proviso: that they be as recent as possible. All articles have been published or are accepted for publication in *Revista Iberoamericana de Inteligencia Artificial*, a journal distributed by the Spanish Association for Artificial Intelligence (AEPIA). In this manner, we ensured that they were scientific articles accepted by and aimed at the scientific community.

3.2. Study design

First, as outlined above, a corpus that could help to prove our hypothesis was chosen. As suggested by McEnery & Wilson (2001),

the articles were randomly selected to ensure that the sampling could be as varied and unbound as possible. The following step involved the sampling of the corpus. Here, in accordance with Sinclair (2005), some considerations were taken into account, such as the variety of language, the selection criteria used for the samples and their nature and dimensions. Our sampling policy centred on the fact that our corpus was based on written texts, in particular scientific articles published in scientific journals. Since the idea was to study a constantly evolving discipline, in which the need to translate new terms was essential, the date on which the articles were published or accepted for publication had to also be taken into account. It was important that the articles had undergone the previously mentioned selection process, and that they had been accepted for publication, since this would imply that the writing contained therein had been accepted by the scientific community at which they were aimed.

We obtained a corpus to contrast the terms used in the articles written in English and in the articles written in Spanish in order to study what types of translations are made when writing scientific texts. A contrast was established between the texts taking into account the concepts used throughout these papers.

In order to identify the terms, the Simple Concordance Program[3] was used. The intention was to be able to identify the terms in English from the very outset, then to compare these to the texts in Spanish.

First of all, the texts were analysed individually, considering *keywords* to be those words with a frequency of use above 4 and below 15. This range was considered approximate, since a term which occurred under 4 times could not be considered of interest within a text, and a term which occurred more than 15 times risked being a word from the common language. Next, all the texts were cleansed of wrong entries or defective identifications. Defective identifications were deemed to be words either which had not been correctly identified or any word which could be identified as ordinary (non specific) words. We included in this category adverbs, prepositions or pronouns (e.g. *with, which, likely*, etc.), also general words as *external, response, formal*, etc., or too common names as *algebra, algorithm, bytes*,

etc. All numbers (e.g. three, six, etc.), and units (e.g. milliseconds, etc.) were also eliminated from the corpus. Finally, an analysis was completed with all the remaining terms from the total number of texts considered as a whole.

After the texts had been searched through and words belonging to the aforementioned categories had been eliminated, three hundred terms were identified in the English articles, and three hundred and sixty terms in the Spanish ones. Of the group of terms obtained from the Spanish articles, approximately 25% (90 occurrences) were English words.

The results from both languages were contrasted, and all types of correspondences were identified and classified. For each term identified in English, the corresponding terms in Spanish were located. Where more than one possibility existed, these were classified. Subsequently, the most common patterns were extracted, and analysed. Once the results had been provided, the translations were evaluated and some concluding remarks based on these were made.

4. RESULTS

An example of the way in which the results are classified is given in Table 1 below. The different columns show the different Spanish translations found for the English terms.

ORIGINAL TERMS	TRANSLATED TERMS		
ENGLISH	SPANISH (1)	SPANISH (2)	SPANISH (3)
Class	Clase		
Classes	Clases		
Comparing	Comparing		
Complex	Complejos		
Computational	Computational		
Computer	Computables	Computation	
Concurrence	Concurrencia	Concurrent	Concurrente
Concept	Concept	Conceptuales	
Connections	Conexionistas		
Consistency	Consistencia	Consistency	Consistente

English terms.

Table 1. Sample of term translation.

All occurrences that did not appear as part of sentences were removed from the corpus as several interpretations could be offered. Some examples of this can be seen in Table 2.

TERM	OCCURRENCES	EXAMPLES
Computational	77	we consider the **computational complexity** approach in which **computational use** is What should we do?: **computational representation** the /Workshop on **computational Models**
Computer	71	show the results of **computer simulations** Certain problems in **computer networks** constitute especially for **computer scientists** who are examples where **computer calculation**
Concept	45	as a **predictive concept** of social Nash **equilibrium concept** is such that as the **driving concept** in complex This **canonical concept** avoids those
Consistency	18	of **moral consistency** on the reasoners A **standard consistency** requirement names of **universal consistency**, no-regret

Table 2. English terms in context.

The following step in the analysis was the identification of terms and translation. Examples of this are shown in Table 3. As can be seen, in many cases, the authors did not translate the original English words into Spanish.

ENGLISH	SPANISH (1)	SPANISH (2)	SPANISH (3)
Comparing	Comparing		
Complex	Complejos		
Computer	Computation	Computacional	
Concurrence	Concurrencia	Concurrent	Concurrente
Concept	Concept	Conceptuales	
Connective	Conexionistas		
Consistency	Consistencia	Consistency	Consistente

Table 3. Term translations into Spanish.

In order to obtain the different translations of the English terms into Spanish, we contrasted the words in context, as shown in Table 4.

Has the **conceptual advantage** that of entities/The **conceptual model** contains the the **conceptual framework**, will be tested level bridges the **conceptual gap** between the agent	Los **Mapas Conceptuales** Como Estrategia las **conexiones conceptuales** que deben **texto y árboles conceptuales** basados la utilización de **grafos conceptuales**.
establishes a **connection** to the computational represented by this **connection**. In general, will focus on the **connection** to the prescriptive	Automática, **Modelos Conexionistas**. Introducción mediante **técnicas conexionistas**, como arquitecturas **conexionistas** en herramientas
Conorms/that **model fuzzy connectives**, **Connectedness** of each of the N	en **modelos conexionistas**, para obtener
of **moral consistency** on the reasoners A **standard consistency** requirement names of **universal consistency**, no-regret	**condición de consistencia**: si considerarse Las **técnicas de consistencia** de los sistemas **chequeo de la/consistencia** de las variables el **enfoque de consistencia**/lo, uno
	casco (i.e., **hull consistency**) está de caja/(i.e., **box consistency**) está
	una **aproximación consistente** en la **enfoque alternativo consistente** en

Table 4. Term translations in context.

The following translation patterns were obtained:

a) New word formation

In some cases, the Spanish term chosen is not an entry in the Real Academia Española (RAE) dictionary, and therefore, has clearly been invented to match the English term. As this word is incorporated into the Spanish language, it assumes the necessary *variations*. This can be observed in Table 5:

Behavioral **Behavioral** research suggests that the main **behavioral** trends. implications of the **behavioral** research general **behavioral** tendencies. We are **behavioral** strategy : H Ai, where **behavioral** strategies ./We note max-length **behavioral** experts. This a set of simple **behavioral** rules, **behavioral**, perceptual, and world	**Comportamental** geométrico, un modelo **comportamental** punto de vista **comportamental**, a ser dinamismo **comportamental**, plataforma **comportamental** (explosión) sugieren
	comportamentales carencias **comportamentales** de los aspectos **comportamentales** en claros problemas **comportamentales**, ya modelos **comportamentales** y de

Table 5. Translations of a term.

b) Original terms

Here, the choice was not to translate the terms used. We found

two sets of terms under this category. In some cases, the word is used in English or in Spanish indiscriminately. Examples of this are given in Table 6:

Argumentation **framework** in which relating to the/extended **framework** Dung's **framework** will be recapitulated a formal dialogue/**framework** that we abstract **framework**./Another important agent learning **framework** multi-agent **framework**./The operations extensions to the CASE **framework**. Probabilistic **framework**, and the learnt detection **framework** on videos in regret minimization **framework** enables regret **framework** deals with reactive simulation **framework** for this dynamic **framework**? where agents may compliant agent **framework**. In BDI-POMDP **framework** for multiagent	**Frame/frame**s ocupar uno o varios **frame**s. **frame**s que permite del diálogo recibe los **frame**s si en almacenamiento de **frame**s. Esta estructura
	Framework uno de los pasos de un **framework** de
	cuadro enmarcar en un **cuadro** un fragmento del **Cuadro**: Estructura del caso/ **Cuadro**: Comparación de los m
	marco un **marco** de adquisición del conocimiento mapas conceptuales en el **marco** de los nuevo **marco** de simulación para aplicaciones tarea del **Marco** Lógico para hacerla

Table 6. Original terms.

In other cases, the English word is even used to *reinforce* the Spanish term. Thus, the Spanish word appears with its English original term as a reference for other scholars as can be seen in Table 7:

Consistency of moral **consistency** on the reasoners. standard **consistency** requirement which universal **consistency**, no-regret learning define universal/**consistency** as the requirement of universal **consistency** universal **consistency** or no-regret	**Consistencia/Consistente** siguiente condición de **consistencia**: Las técnicas de **consistencia** de los sistemas el enfoque de **consistencia**/lo, uno
	Consistency **Consistencia de caja**/(i.e., box **consistency**) **constistencia de casco** (i.e., **hull consistency**)
hulls Marking **hulls** is one example of this, **hulls**. The **hull** of an AGV is the physical A series/of **hulls** then describes the physical	**hull** de **casco** (i.e., **hull consistency**) está /de **casco** (**hull consistency**) **Consistencia** de **casco**
Box	**caja** consistencia de **caja**/(i.e., box **consistency**)
Subject been the **subject** of detailed analysis the **subject** of learning algorithms	**subject** cada usuario participante (**Subject**), **Subject** Object Alumno Objetivo
Concurrent	(**CCP, concurrent constraint programming**
Concept map	Mapa Conceptual del Estudiante (**Student Concept Map, SCM**)
Taskwork	Trabajo de Tarea (**taskwork**)

Table 7. Double translation.

c) *Partial translation*

In this case, one of the terms of a compound noun is translated whereas the other remains in the original form, as can be observed in Table 8.

Feature trees	de **árboles de features**, admitiéndose
Single interface	establece una **interface única** y
Learning	**enseñanza** asistida por ordenador, (...) ***e-learning*** y al CSCL.

Table 8. Partial translation of terms.

The author does not write the Spanish word and then offer an explanation in English, but chooses to mix both languages, as though they were part of the same paradigm.

d) Coining of terms

The terms did not previously exist in the Spanish language but they become a part of the Spanish language. These have been literally translated from English texts without taking into account possible existing terms in Spanish or even morpho-syntactic recommendations, as can be observed in Table 9.

Collaborative	**Colaborativ-** Entornos **colaborativos** educacionales de aprendizaje **colaborativo**, sistemas Aprendizaje **colaborativos** en /modelos o la autoría **colaborativa** de sitios
Multi-word	**multipalabra** **multipalabra** se identificaron términos **multipalabra** que definan expresiones **multipalabra**, que pueden si una expresión **multipalabra** está en
Multi-paradigm	**Multiparadigm-** lenguaje **multiparadigmático** que programación **multiparadigmática** enfoque declarativo **multiparadigmático** in the context of **multiparadigm**

Table 9. Coining new terms.

For instance, we can cite the case of *Collaborative (Virtual)*

Environments which in Spanish becomes "entornos colaborativos". However, the correct word in Spanish grammar is "colaboradores" or "de colaboración". There is no such entry as "colaborativo" in the Dictionary of Real Academia Española.

e) Different translations for the same word

One term produces different translations depending on the text, as seen in Table 10:

Instantiation describing **instantiation**s yielding dialogue has a/satisfying **instantiation** with z=since an actual **instantiation** of any of them. various possible **instantiation**s of the term high	**Particularizar** y **particularizar** importantes obtenidas **particularizar** y ensamblar con
	Instanciación a /**Instanciación** de Componentes y La **instanciación** de los **concept**os error de **instanciación** en cualquier **lenguaje**

Table 10. Different translations for the same word.

5. CONCLUSIONS

Despite the fact that there are some institutions allegedly in charge of the translations and regularization of English words into Spanish, we have unveiled five different procedures required to complete this process. On the one hand, these institutions (ISO, AENOR, etc.) are not exclusive in their area of influence. On the other hand, they work at a different speed than is needed by the scholars who are producing the texts. In addition, the lists of terms agreed and certified are not accessible to all the scientific community, since these lists are not free, and access to them is, at times, restricted. Finally, the work, which supports the certification of the terms used and accepted on the list, is not usually philological. Indeed, these studies are much more industry-oriented than language-oriented. All these circumstances result in the uncontrolled use of new (or even erroneous) terms taken from the literature in English language.

In the results, it has been observed that authors act quite freely when translating and coining terms. They use five different strategies

to transfer information that they are familiarized with in English. The constant reference to English words in order to express concepts using the Spanish language should prove that accessible information is not available for writers when they wish to write in Spanish or even for translators when coming across a new term. Five different translation patterns were used by the authors to adapt the English terms into Spanish: new word formation; original terms; partial translation; Coining of terms and different translations for the same words. These different patterns show us clearly that authors use the communication strategies they consider most adequate and that they are not conscious of the existence of a standardised norm.

In order to guarantee that all scholars use the same words when referring to the same concepts, it would be advisable to make these lists of terms more readily accessible, and thereby, achieve a univocal interpretation of terms.

NOTES

[1] ISO is described in the documents published by the institution as such. See, for instance http://www.portofoakland.com/newsroom/pressrel/view.asp?id =51
[2] Available at: http://iate.europa.eu/
[3] Simple Concordance Program 4.09. Build 8 (2007). Alan Reed 1997-2007.

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