

THE LEXICAL PARADOX OF *BOOMERANG* TERMS: TERMINOLOGICAL DEPENDENCY OF MODERN GREEK IN THE ENVIRONMENTAL DOMAIN¹

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Abstract

Terminological dependency refers to the relations between the specialized terms of different languages when these relations are asymmetrical or hierarchical, i.e. linguistic subordination. In EcoLexicon (<http://ecolexicon.ugr.es>), a multilingual environmental knowledge base, and in its lexicographical counterpart MeteoTrad (www.meteotrad.com), there is a dependency relation between English and the rest of the languages.

In this paper, we analyse the degree of dependency of a series of specialized English terms in relation to other terms in Modern Greek. These examples reflect the impact of English on the Greek language in certain subdomains of the environment. Paradoxically, Greek is still used to designate new concepts that the Greek community itself imports (*αντιδάνεια*, *Rückwanderer*, or “remigrant terms”). In Greek, this leads to morphological and conceptual adaptations as well as clashes in both general language words and specialized terminology.

An explanation of this phenomenon is important for terminology theory since it can shed light on the specification and evaluation of hierarchical relations that underlie conceptual structure in different languages.

Keywords: Modern Greek, terminological dependency, terminological knowledge bases, environmental science, neology, EcoLexicon, MeteoTrad.

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1. Framework: Terminological dependency in EcoLexicon and MeteoTrad

Terminological dependency is the study of the relations between the specialized terms of different languages when these relations show asymmetrical or hierarchical aspects, i.e. linguistic subordination. This phenomenon is seen in languages used by a privileged or hegemonic community (from a social, economical or cultural perspective). Such languages export lexical units and/or concepts to another language. Consequently, this second language and its community become dependent on a foreign code to designate new concepts (Sánchez-Ibáñez 2013). This phenomenon has been studied by different authors, starting with Portelance. She was the first to state that in order to obtain a terminological fertilization, it was important to imitate the dynamics of the different nomenclatures so as to insert new terms in a specific domain (1987: 359).

We can say that terminological dependency is a consequence of the new global relations. At the same time, it can also become a triggering factor for those relations as globalisation related to linguistic communication is associated to processes in which some languages are more used than others (Garrido, 2010: 71). This linguistic globalization is caused by a range of influential elements, which finally lead communication to situations of asymmetry. According to Sánchez Ibáñez (2013: 249), those elements regard the following aspects:

Language: as a catalyser of the elements defining the idiosyncrasy of every linguistic community, its development goes on a par with the realities it represents.

Education: this element encompasses all the aspects regarding the way a linguistic community organizes the relations among its individuals and their access to higher education and, in consequence, to specialized knowledge.

Demographics: this criterion *per se*, even if it can reveal a lot of useful information, may be insufficient if it is not contrasted with other parameters. Thus, it should not be considered as a referential factor to presuppose the success in using a specific language in a specialized context.

Economics: this element can be studied in this context under two different points of view. First, as the main triggering factor of the asymmetries causing the gap in the transfer of knowledge between two communities, primarily due to the differences regarding economic activity in the different world areas. Secondly, it is important to take into account the importance of languages as economic agents (the so-called “language industries”). Those agents activate economic sectors and thus modify the general situation of their speakers.

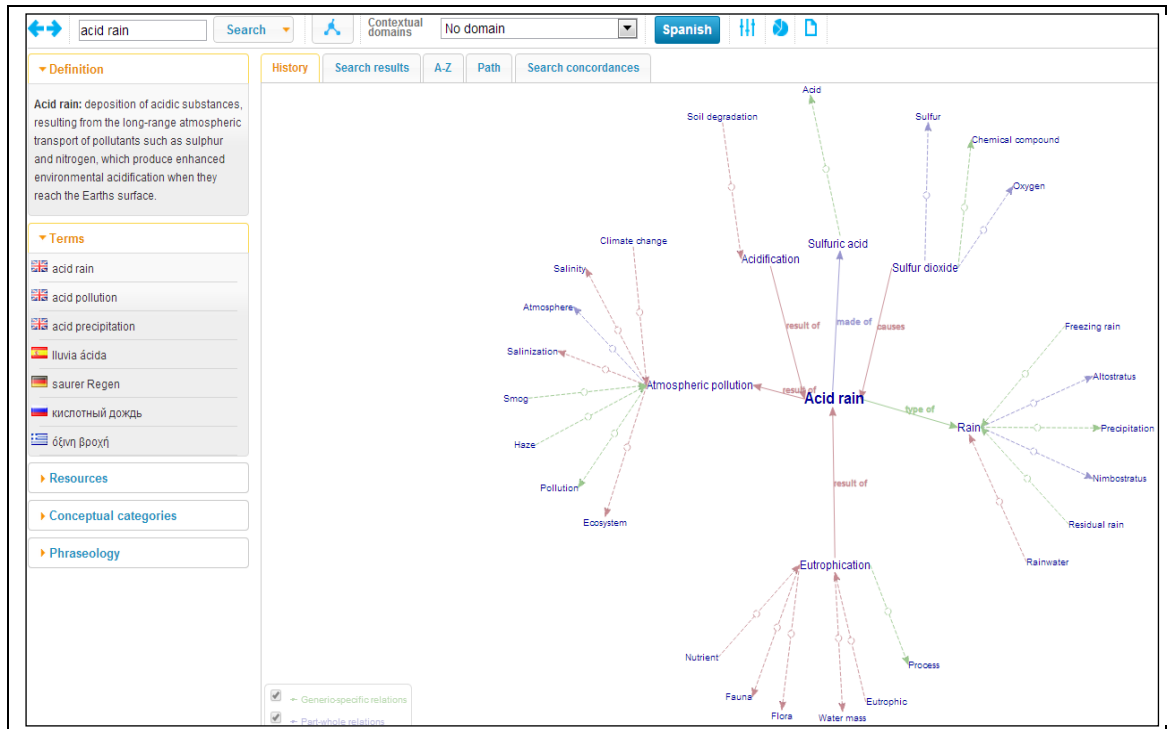
Scientific communication nowadays is conditioned by all these factors and imposes its own rules of use for specialists, which are marked by three main facts:

- High-speed and easy broadcasting of any kind of information: the development of the new technologies has made scientific communication be almost instantaneous. This means that the geographical factor is not important anymore in order to share and transfer specialized knowledge. In words of Giddens, (1990: 64) “Globalization can be defined as the intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa”.
- Use of English as a *lingua franca*: scientific monolingualism conditions the publication of specialized papers, books and journals in the non English-speaking communities.
- Importance of the publication of scientific results and discoveries in accordance with a range of legitimating standards which must be followed. Otherwise, the published contents end up losing prestige and credibility.

In EcoLexicon (<http://ecolexicon.ugr.es>), a multilingual terminological knowledge base on the environment (Faber et al. 2007, 2008, 2011; Faber 2012; León-Araúz et al. 2010; García-Aragón 2011), there is a dependency relation between English and the rest of the languages included. EcoLexicon is a frame-based terminological knowledge base on the environment which targets the cognitive and communicative needs of different user groups, such as specialized translators and trainee translators in the following six languages: Spanish, English, Modern Greek, German, French, and Russian. This terminographic resource has a related lexicographic resource, MeteoTrad, which is being designed based on similar premises.

EcoLexicon represents the conceptual structure of the specialized domain of the Environment in the form of a visual thesaurus in which environmental concepts are configured in semantic networks. This information is displayed in a multimodal interface in the form of networks with more information available in side windows, pop-up windows, and scroll-downs. EcoLexicon includes a definition for each concept and also provides graphical resources that illustrate it. It also lists the terms that designate the concept in different languages. In addition, for each term, EcoLexicon provides information concerning its grammatical category (noun, noun phrase, verb, adjective or adverb); term type (main term, synonym, geographical variant, and acronym); gender (masculine, feminine, and neuter); contexts of use, and recently phraseology (Buendía 2013).

Figure 1. Entry for ACID RAIN in EcoLexicon (concept in the center, surrounded by relations to other defined concepts. Definition, terms and resources at the left side of the interface)



As previously mentioned, EcoLexicon is the practical application of frame-based terminology, which specifies the conceptual system of the domain by means of an integrated top-down and bottom-up approach. This approach is *top-down* because information was collected from specialized dictionaries and other reference materials, and subsequently validated by experts. However, it is also *bottom-up* because data were also extracted from a domain-specific multilingual corpus of texts.

It is assumed that potential users of EcoLexicon have a fair command of scientific language, of English or Spanish since these are the interface languages, and optionally of one of the other languages in the knowledge base (López, Buendía, & García 2012: 62). EcoLexicon is thus designed to meet the needs of different user profiles, such as students of environmental science who wish to acquire specialized knowledge, translators seeking translation correspondences, and specialists interested in text production. As such, following Sager (1990: 197-199), Pearson (1998: 35-39), and Bergenholtz & Tarp (2010: 34–35), there are three user profiles: laypeople, semi-experts and experts.

Recently, EcoLexicon has become a powerful resource for Modern Greek environmental terminology. As such, it has 3,524 concepts linked to 18,583 terms, 4,969 of which are in Modern Greek. This amounts to 27% of all terms and variants (León, Reimerink and García-Aragón 2013). In EcoLexicon, searches can be carried out either by concept or by term. Moreover, long lists of concordances can be displayed in order to show the behavior and usage of the search term:

Figure 2. Extract of concordances for the term *όξινη βροχή*

Term:

... υπο. Το 1982, σε ειρική συνομιλία των Ηνωμένων Εθνών, η **όξινη βροχή** αναγνωρίστηκε ως ένα από τα σημαντικότερα προβλήματα ...
... οξειδώνεται σε SO2. Οι κύριοι ρύποι που δημιουργούν την **όξινη βροχή** είναι το διοξείδιο του θείου και τα οξείδια του αζώτου...
... από παραγωγής τους. Η πιθανότητα να δεχθεί μια περιοχή **όξινη βροχή** εξαρτάται κυρίως από την προέλευση και την τροχιά των ...
... εριοχές που αντιμετωπίζουν έντονα προβλήματα από την **όξινη βροχή**, χωρίς οι ίδιες να έχουν σημαντικές εκπομπές οξειδίων ...
... , «εξάγοντάς» τους **όξινη βροχή**. Στην Ελλάδα, κατά κανόνα, το μεγαλύτερο ποσοστό των β...
... όξινος βροχής στο περιβάλλον Έχει διαπιστωθεί ότι η **όξινη βροχή** επιδρά σ' όλα τα συστατικά της βιόσφαιρας : στο έδαφος...
... κτήρια. 6.2.1. Επιπτώσεις της όξινος βροχής στο έδαφος Η **όξινη βροχή** απομακρύνει από το έδαφος πολύτιμα μέταλλα, όπως το μα...
... μός των ψαριών και άλλων ειδών υδρόβιας ζωής. Επίσης, η **όξινη βροχή** ενεργοποιεί το αργίλιο στο νερό και στον πυθμένα των λ...
... 6.2.4. Επιπτώσεις της όξινος βροχής στα αρχαία μνημεία Η **όξινη βροχή** διαβρώνει υλικά όπως τα οικοδομικά υλικά (μάρμαρο, γρα...
... λοί λόγοι ανησυχίας για την υγεία του ανθρώπου από την **όξινη βροχή** επιδρά σ' όλα τα συστατικά της βιόσφαιρας επηρεάζον...

As previously mentioned, even though searches in EcoLexicon are adapted to user needs, there is also an online dictionary project (MeteoTrad, www.meteotrad.com) that will exploit the fact that languages can represent concepts differently, depending on their evolution and context (cf. Yong and Peng 2007: 136-139, García-Aragón 2012). Therefore, lexicographical entries are also being designed that will better fit translators' expectations regarding specific language pairs, following the Function Theory of Lexicography (Bergenholtz and Tarp 2003, 2004, 2010; Tarp 2008, Nielsen 2010) (Figure 3).

Figure 3. Beta entry for the term *wet acid deposition* from English to Modern Greek in MeteoTrad

Home > Equivalent > wet acid deposition

English English

Equivalent of *wet acid deposition* in Greek

Recommended equivalent: • **υγρή όξινη εναπόθεση, ο**

Other equivalents: • **όξινη υγρή εναπόθεση** [Λιγότερο συχνός όρος]

• **όξινη κατακρήμνιση** [Κατακρήμνιση θεωρείται οποιοδήποτε προϊόν της συμπύκνωσης των υδρατμών της ατμόσφαιρας που πέφτει στο έδαφος λόγω της βαρύτητας, π.χ. ψεκάδες, βροχή, χιονόνερο, χιόνι, παγόκοκκοι, χαλάζι. Πηγή: "Precipitation". Glossary of Meteorology. American Meteorological Society. 2009]

• **υγρή όξινη απόθεση** []

Acronyms: • *unknown*

Variants: • **όξινη βροχή** [Κοινός όρος που αναφέρεται στην απόθεση υγρών όξινων ουσιών (δλδ. μέσω της βροχής, του χιονιού, του χιονόνερου, της ομίχλης, της πάχνης και του δρόσου) ή και ξηρών όξινων ουσιών (δλδ. μορίων και αερίων)]

• **υγρή εναπόθεση** [Εννοείται το επίθετο "όξινη"]

▼ Usage

2. Terminological dependency

Currently, the role of the Greek language as a vehicle of knowledge transfer is different from what it formerly was. Greek is currently a receiver of terms and

concepts. This is especially true for in the case of specialized language. This unidirectional knowledge transfer requires the establishment of dependency roles. In this sense, terminological dependency is a linguistic phenomenon that arises from a unidirectional transfer of specialized designations from one language to another (in this case English and Greek). At the same time, this terminological dependency is both a cause and consequence of asymmetries between both communities of specialists (Sánchez-Ibáñez 2013: xiii). This claim is supported by theoretical elements and data from conceptualization, specialized neology, and specialized translation.

It was Sager (1990: 57) who first differentiated primary term formation from secondary term formation, thus paving the way for the inclusion of contextual and situational elements in the creation of specialized lexical units (specialized neology). Primary term formation is motivated by scientific innovation, through which new concepts are introduced to a community who needs (and thus creates) a designation for them. These specialized neologisms correspond to Rondeau's (1981) *néonymes d'origine* [original neonyms].

Secondary term formation however occurs as a result of a previously existing terminology in a language, or as a consequence of term transfer from a different language code. These specialized neologisms correspond to Rondeau's *néonymes d'appoint* [back-up neonyms].

There are also cultural theories of terminology, such as Rajaspera's (1996), Lara's (1999, 2001) and Diki-Kidiri's (2000, 2008, 2010), which place culture at the heart of terminology itself. This means that terminology reflects the convergence of a community's experience, accumulated knowledge, and production. These factors account for the community's articulation of reality and linguistic code (Diki-Kidiri 2000: 29; Sánchez-Ibáñez 2013: 247-248). In line with this assertion, there are also extralinguistic elements that influence terminology and specialized neology. Such socioeducative, demographic and economic elements clearly place Greece, Cyprus, and the rest of the hellenophone communities in a subordinate relation to English speaker communities. Iordanidou's (2008: 3) writes:

η γλώσσα συνδέεται αναπόσπαστα με το ευρύτερο ανθρωπογεωγραφικό περιβάλλον. Οι ιστορικές συνθήκες, όπως επιδρούν στην κοινωνία και στον πολιτισμό, εγγράφονται και αποτυπώνονται στις γλώσσες

An explanation of this phenomenon is important for terminology theory since it can shed light on the specification and evaluation of hierarchical relations that underlie conceptual structure in different languages. It can also be used to predict certain problems and behavioral aspects of neologisms in Modern Greek. According to Sánchez-Ibáñez (2013), a more detailed dependency analysis could be performed by looking for the following terminological dependency traces:

- Morphosyntactic traces or the way in which way prefixes, suffixes, and roots move from one language into another.
- Terminological usage or the link between the stability and subsequent embedding of terms in Modern Greek and their dependency upon English.
- Cognitive adaptation or the extra term information (explanations, synonyms, hyperons, hyponyms) needed by users as well as the potential dependency reflected in this variation.

- Semantic traces or the correlation between the concepts underlying the imported terms and their degree of dependency.
- Modes of translation or the strategies used to re-translate the imported terms and adapt them.

Regarding morphosyntactic traces, Álvarez de Mon and Rosado (2012) state that there has been a shift from hellenisms to anglicisms in new technologies, such as in the field of measuring instruments, analysis, environmental data recording, etc. These authors point out that this may be due to the following: (i) anglicisms promote and facilitate international communication; (ii) anglicisms lend a professional aura to discourse (at least in Spanish); (iii) anglicisms are regarded as natural in specialized discourse; (iv) there are no accurate translation equivalents in the receiving community, etc.

In contrast with other languages such as Spanish, the specialized Modern Greek texts in the EcoLexicon corpus have a wide range of possible and complementary translations (*συμπληρωματικές μεταφράσεις*) (i.e. anglicisms inserted in a Modern Greek text in parentheses following a translation correspondence in Modern Greek, or vice versa). This may be due to the fact that the new term is semantically opaque and thus not easily understood in the receiving community (Álvarez de Mon and Rosado 2012). This strategy can also be used to eliminate disambiguation. Examples of such complementary translations are the following:

*Αλλά τί είναι τηλεπισκόπηση (**Remote Sensing**) ή μακροσκοπικό αισθητήριο όπως ακριβώς μεταφράζεται ο αγγλικός όρος; Είναι η επιστήμη που χρησιμοποιεί ...*

*Οι υποψήφιοι θα πρέπει να έχουν ένα δυνατό υπόβαθρο στην ποσοτική τηλεπισκόπηση (**quantitative remote sensing**), εκτενή εμπειρία στην ...*

*Η τηλεπισκόπηση ή τηλεανίχνευση (**remote sensing**) είναι η επιστήμη και η τεχνική που ασχολείται με τη συλλογή πληροφορίας σχετικά με ένα αντικείμενο, μια περιοχή, μια ...*

*Η Τηλεπισκόπηση (**Remote Sensing**) και τα Συστήματα Γεωγραφικών Πληροφοριών. (**Geographical Information Systems/GIS**) παρέχουν ασφαλή και οικονομικά ...*

*η τηλεανίχνευση ονομάζεται τηλεπισκόπηση. Στην Αγγλική βιβλιογραφία χρησιμοποιείται ο ευρύτερος όρος **remote sensing (τηλεαίσθηση)**, και στη Γαλλική ...*

All these “complementary translations” reflect, in conclusion, a re-denomination process of the specialized knowledge. A knowledge which, in this case, is closely linked to the translation process and can cause polysemy or variation of different kinds.

Re-denomination can reveal a great deal of extralinguistic information but it is very difficult to analyse systematically. Nevertheless, we could venture to consider the cognitive adequacy which lies behind those denominative solutions as a significant trace of terminological dependency. This reliance would be rooted in the way all those reformulations somehow refer to information which is not present in the text. As Kocourek said (1992: 24), external criteria to linguistics constitute an important starting point for the analysis of specialized texts.

Both Kocourek² (1992: 25) and Ciapuscio (in Brumme, 2001) consider (the) reformulation to be a sort of *continuum*, and not just a one-way transfer between specialists with different cognitive levels. In particular, Ciapuscio (*ibid.*) explains that the first phase of the adequate process would be the scientific paper and the last one, the divulgative article. However, she also says that the latter can have some influence on new specialized texts regarding the same topic and, thus, re-start the whole cycle. Re-denomination would be, in consequence, a cyclical process of intertextual retroalimention. This may be caused by the need of discursive adaptation in order to reduce cognitive asymmetries.

Dependency would arise if this cycle was somehow interrupted³. There are different factors which would cause this: first, the fact that the adaptation was not just cognitive, but also linguistic; and secondly, that the links between both codes involved in the process would be somehow asymmetrical. This would imply that the influence of the texts written in the dependant code (in this case Modern Greek) on those in the more prestigious language (in this case English, the *lingua franca* for scientific exchanges) would be reduced. This would reveal that the linguistic transfer between both codes would prevail over the adaptation of the cognitive content, with all the implications which it entails.

Despite the apparent unidirectional nature in English and Greek term transfer, “boomerang” terms exist since the Greek language is still used to designate new concepts in the English-speaking world. Paradoxically, these terminological designations are subsequently imported by the Greek community. This means that English is linguistically dependent upon Greek for terminological designations, whereas Greek is conceptually dependent upon English for new specialized concepts.

3. Degrees of dependency: Greek wanderers and boomerangs

Although such specialized terms are often called *αντιδάνεια* or *αντιδάνειες λέξεις* in Modern Greek, meaning “re-loan”, from the German *Rückwanderer* (Babiniotis 2010: 153), which in English could be translated as “remigrant or repatriated words”, this phenomenon does not exactly apply to specialized language. Babiniotis (2002: 203) describes *αντιδάνειο* as follows:

το στοιχείο (συνήθ. λέξη) μιας γλώσσας που, αφού εισαχθεί ως δάνειο σε άλλη γλώσσα και προσαρμοστεί φωνολογικά και μορφολογικά στο σύστημά της, επιστρέφει συνήθως αλλοιωμένο στη γλώσσα από την οποία ξεκίνησε π.χ. καλέμι < τουρκ. kalem <αραβ. kalam < ελλην. κάλαμος.

δάνεια λ.χ. της Ελληνικής από ξένες γλώσσες που και αυτές τα έχουν πάρει παλιότερα από την Ελληνική. Πρόκειται για «φαινομενικά δάνεια», αφού οι

² When he talks about the functions held by a terminologist, (*ibid.*: 1992), Kocourek refers to the importance of contexts when detecting terms and defines the different ways in which, according to him, texts emphasize the meaning of the terms: *définition, contexte encyclopédique, contexte explicatif ou associatif, collocations, synonymes* and *exemples*. What this author considers processes for the insertion of terms in scientific discourse are actually a group of reformulative and clarifying strategies which ease the cognitive transfer.

³ For a more detailed analysis of the cohesive recourses in terminological content-adaptation, see López Rodríguez (2000: 509), where the most common linguistic strategies used to give consistency to divulgative texts are specified.

γλώσσες που δανείζουν τις δεδομένες λέξεις τις έχουν οι ίδιες αντι-δανειστεί από τη γλώσσα στην οποία φαίνονται ως δάνεια. **Οι Γερμανοί αποκαλούν τέτοια δάνεια «Rückwanderer», περιπλανώμενες λέξεις που επιστρέφουν στον τόπο τους!**

In the words of Iordanidou (2013: 9):

*Μια ξεχωριστή κατηγορία δανείων είναι τα αντιδάνεια. Είναι λέξεις που «ταξίδεψαν» από τα αρχαία ελληνικά σε άλλη γλώσσα ή σε άλλες γλώσσες (συνήθως λατινικά και ιταλικά, γαλλικά κτλ.) και επανήλθαν στα νέα ελληνικά με τη μορφή δανείων. **Με το πέρασμά τους από γλώσσα σε γλώσσα άλλαξε η μορφή τους σε τέτοιο σημείο, ώστε πολλές από αυτές να μην ξεχωρίζουν από τα λεξιδάνεια...***

Η ελληνική γλώσσα ταξιδεύει... μέσα στο χώρο και στο χρόνο... όπως και ο λαός που τη μίλησε και τη μιλάει, οι Έλληνες. (Iordanidou 2008: 3).

As both Babiniotis (2002: 203) and Iordanidou (2013: 10) affirm, remigrant words return to Modern Greek in an altered form. According to Iordanidou (2013) αντιδάνεια are “foreign words with Greek origins” (ζένες λέξεις με ελληνική καταγωγή), but are still, foreign words. She maintains that words formed in another language from two or more Greek components are not αντιδάνεια, but “internationalisms” (διεθνισμοί) (2013: 10). As an example, she gives ψυχομετρία from the French *psychométrie*.

Similarly, the terms in the EcoLexicon Greek corpus has been readapted to Modern Greek both phonologically and morphologically so that they seem Greek. Despite the Greek etymology of these terms, the fact that they were formed in another language means that they are not αντιδάνεια. However, it is strange that they are called *internationalisms* since many of them are extremely rare and are not internationally used. The application of the previous dependency and neological criteria to the Modern Greek environmental terminology in EcoLexicon and Meteotrad can be used to establish a typology of Greek loans within in Modern Greek or “Greek wanderers” (ταξιδεύτρες λέξεις according to Triandafyllidis 2001, λέξεις μετανάστες according to Iordanidou 2008: 5). This helps to categorize and evaluate the degree of dependency.

Table 1. Typology of Greek wanderers (i. e. Greek loans in Modern Greek)

- | |
|---|
| <ol style="list-style-type: none">1. <i>Αντιδάνεια</i> or <i>remigrants</i>: authentic Greek wanderers who changed, returned home, and stayed.2. <i>Internationalisms</i>: foreign Greek wanderers who returned home without changing significantly, and remained.3. <i>Failed boomerangs</i>: foreign Greek wanderers who tried to return home, but did not make it.4. <i>Real boomerangs</i>: foreign Greek wanderers who returned home, but did not stay because they were not accepted/needed, or were replaced by anglicisms.5. <i>Potential boomerangs</i>: foreign Greek wanderers who have not yet returned home, and which may eventually become internationalisms, failed boomerangs, or β boomerangs). |
|---|

If we analyse the potential boomerangs (category 5) under the terminological dependency approach, we can conclude that it reveals a great deal of information about linguistic asymmetry. Before importing the boomerangs, the depending code tends to develop its own provisional denominative strategies to name realities. These can be classified depending on different facts (Sánchez Ibáñez, 2013: 295):

- The elements naming the new reality appear close in the text.
- There is some kind of evident semantic correlation between the periphrasis in Greek and its equivalent potential boomerang.
- The formal structures are stabilized and its use is recurrent.

Thus, we could define a scale of “denominative periphrases” based on the degree of terminological dependency which can be implied from them. We would start with those whose meaning is still obscure and not very stabilized and continue with those with close, recurrent elements where terminological dependency is much less significant. According to this data, we could imply that potential boomerangs are more likely to go back to Greek when the degree of terminological dependency of their provisional equivalent denominative periphrasis is higher.

As shown, the only family of authentic Greek wanderers is composed of terms that originated in Greece, but which had changed by the time they returned to Greece. Accordingly, there are many foreign Greek wanderers, all of which originated outside of Greece. However, not all of them returned or stayed for good. These terms have the highest potential of generating dependency on the English-speaking scientific community (especially in the case of internationalisms), since they were created outside of Greece with foreign conceptual content and were accepted. The rest of the Greek wanderers are classified as *boomerang terms* for the following reasons:

- These terms have Greek etymology.
- Since they were generated in a foreign context to designate new concepts, they are not of Greek origin.
- Their form has not been modified in the transfer from one language to another, and therefore, they are not *αντιδάνεια* or remigrants.
- They are neither internationalisms because they are not known world-wide, nor are they newly created neologisms;
- They are the source of semantic problems, clashes or paradoxes in Greek in both general and specialized language (cf. García-Aragón 2012);
- Sometimes they appear only temporally in Modern Greek.

Figure 4. Screenshot from an internal report showing the Greek wanderers in EcoLexicon and Meteotrad

3052	ENZIMA					
3053		ένζυμο	gr	término principal	nombre común	neutro
3054	EÓLICO					
3055		αιολικός	gr	término principal	adjetivo	masculino
3056	EPIBIONTE					
3057		επιβιότης	gr	término principal	nombre común	masculino
3058	EPICENTRO					
3059		επίκεντρο	gr	término principal	nombre común	neutro
3060	EPIFAUNA					
3061		επιφανίδα	gr	término principal	nombre común	femenino
3062	EPIFITISMO					
3063		επιφυτισμός	gr	término principal	nombre común	masculino
3064	ΕΠΪΦΙΤΟ					
3065		επίφυτος	gr	término principal	adjetivo	masculino
3066	ΕΠΪΓΕΟ					
3067		εδαφικός	gr	término principal	adjetivo	masculino
3068	EPI LIMNIO					
3069		επιλίμνιο	gr	término principal	nombre común	neutro
3070	EPIPELÁGICO					
3071		επιπελαγικός	gr	término principal	adjetivo	masculino
3072	EPIPLANCTON					
3073		επιπλαγκτόν	gr	término principal	nombre común	neutro
3074		επιπλαγκτό	gr	sinónimo	nombre común	neutro
3075	EQUILIBRIO ADIABÁTICO					
3076		αδιαβατική ισορροπία	gr	término principal	SN	femenino

Another important category that could be interesting for further analysis are translation loans (*μεταφραστικά δάνεια*), in which a language borrows the meaning, though not the form of a foreign word. E.g. *ιστιοσανίδα* (surfboard), *λογοπαίγνιο* (jeu de mots), *κοσμοθεωρία* (Weltanschauung), etc. (Jordanidou 2013: 10), which once again opens a new door for the study of terminological dependency. As we have already mentioned, the different strategies chosen to translate terms from one language into another can reveal useful information on the asymmetries lying behind the pair of codes involved in the process. However, if we take translation as a trace of terminological dependency, it is important to shift our traditional approach regarding this activity: we face a cognitive, textual and communicative transfer which reflects a specific extralinguistic reality. In consequence, the traditional roles of emitter, receptor and mediator get blurred and some of them may be concentrated in one single subject. It is not strange to find texts where specialists translate themselves, or where the code is chosen in accordance with premises far from the linguistic competence of the person writing the text.

If we consider all these questions, we can easily conclude that the traditional translation schema does not meet the specific situation of the terms included in this study: the emitter, the recipient and the translator of all those units are not aware of the transferring process they are involved in. Therefore, translation in this case is rather a consequence of the work carried out by specialists who choose one language in particular to express their discoveries (and publish them). Thus, they do not carry out an activity defined enough to embody the process of information transfer between different linguistic communities. The absence of this “translation awareness” prevents the agents involved in the process from being conscious of the importance of translation as an activity able to enlarge or reduce the gap between dependant and referential linguistic communities.

To sum up the analysis of translation as a trace of terminological dependency based on the information given by our translation loans does not coincide with the

traditional translation schema. It must be conceived as a flexible strategy which makes use of different means to transfer units from one code to another and to establish equivalences between them. However, we will focus only on clear “Greek loans in Modern Greek” in this study, due to the extensive variety presented by this category.

3.1 *Αντιδάνεια or remigrants*

According to Iordanidou (2013), certain terms contained in or eligible for inclusion in EcoLexicon and Meteotrad can be considered *αντιδάνεια*:

botany: αφιόνι, γαρίφαλο, εστραγκόν, κανέλα, καρότο, λάβδανο, μαϊντανός, μαργαρίτα, μέντα, μοσχάτο, μπιζέλι, νεκταρίνι, ορχιδέα, φιστίκι, φουντούκι

zoology: αντιλόπη, γαλιάντρα, καλαμάρι, κροταλίας, λεοπάρδαλη, ταρταρούγα, τόνος

meteorology: μπόρα, μπουρίνι, γρέγος, κάλμα

chemistry: ναφθαλίνη, όζον, ορμόνη, σπαρματσέτο

geology: βασάλτης, διαμάντι, πλαζ

miscellanea: λιμάνι, βάρκα, γόμα, λάστιχο, καλάρω, καλούπι, καμινάδα, καρίνα, παλάγκο, σιφόνι, φρίζα, σπιράλ, δράμι

It goes without saying that these terms are extremely general, and are mentioned here as examples of phenomenon that may be semantically opaque to Modern Greek speakers. There are many others considered *αντιδάνεια* in the Greek language, which could be included in an environmental terminological resource, such as *αμμωνία*, *αμμωνίτης*, *βακτηρίδιο*, etc. (Iordanidou 2008). As Sarandakos (1998) asserts:

Αντιδάνεια απαντούν φυσικά σε πολλές γλώσσες, αλλά η ελληνική, λόγω της μακραίωνης ιστορίας της και λόγω της τεράστιας επιρροής των αρχαίων (και λιγότερο των βυζαντινών) ελληνικών, βρίθει κυριολεκτικά από αντιδάνεια.

3.2 *Internationalisms*

In contrast to the morphological and etymological opacity of *αντιδάνεια*, internationalisms (*διεθνισμοί*) show a high degree of transparency to a Greek-speaking audience in touch with environmental science. Examples of such terms include the following:

ακτινομετρία (actinometry), αβιοτικός (abiotic), αδιαβατικός (adiabatic), γεωστροφικός (geostrophic), αγεωστροφικός (ageostrophic), αεροβικός/αερόβιος (aerobic), αεροβιολογία (aerobiology), αεροβίωση (aerobiosis), αερολογία (aerology), αερονομία (aeronomy), αγροκλιματολογία (agroclimatology), δυστροφικός (dystrophic), μαγματικός (magmatic), μεταμορφικός (metamorphic), σηπτικός (septic), τροπικός (tropical), αλλόχθονος (allochthonous), πιεζομετρικός (piezometric), αναερόβιος (anaerobic), άφωτος (aphotic), αναεροβίωση

(anaerobiosis), γεωμορφολογία (geomorphology), μορφομετρικός (morphometric), ανεροειδές βαρόμετρο (aneroid barometer), ανεμόμετρο (anemometer), ανεμοκλιόμετρο (anemoclinometer), ανεμογράφος (anemograph), ανεμογράφημα (anemogram), ανισοτροπία (anisotropy), ανοξικός (anoxic), κυκλωγένεση (cyclogenesis), αντικυκλωγένεση (anticyclogenesis), ασθενόσφαιρα (asthenosphere), αυτότροφος/αυτοτροφικός (autotrophic), αζωνικός (azonal), βαθυμετρία (bathymetry), βαθυπλαγκτόν (bathylankton), βενθικός (benthonic), βιοκλάστης (bioclast), βιοαιθανόλη (bioethanol), νεφελοειδής (nepheloid), κυανοβακτήριο (cyanobacteria), κλιόμετρο (clinometer), θερμόαλος (thermohaline), κολλοειδές (colloid), κρυολογία (cryology), κρύοςφαιρα (cryosphere), διάτομο (diatom), διαμικτίτης (diamict), διατομίτης (diatomite), ατμοσφαιρική δυναμική (atmospheric dynamics), λιμναία οικολογία (limnic ecology), έκδυση (ecdysis), υψομετρικός (hypsometric), εδαφολογία (edaphology), ενδοβιότης (endobiotic), επιβιότης (epibiotic), ευρύαλος οργανισμός (euryhaline organism), ευρύθερμος (eurytherm), etc.

3.3 Failed boomerangs

The following examples are considered *failed boomerangs* because they were formed in a foreign language with Greek elements, but were not accepted in the speaker community. For example, *aerograph* is translated as *μετεωρογράφος*, instead of “αερογράφος”, and *anatexia* as *ανάτηξη* instead of “ανατηξία”. Something similar happened to *biocenosis*, translated as *βιοκοινότητα* or *βιοκοινωνία*, since *βιοκοίνωση* was discarded; and also to *taxocene*, translated as *ταξινομική ομάδα* instead of *ταξικοίνωση*. The biota (species of animals and plants occurring in a given habitat) was translated as *βιόκοσμος*, and a possible *βιότητα* was discarded. The biome (largest geographic biotic unit) was translated as *μεγακοινότητα*, whereas *βίωμα* was discarded because it simply means “life experience”. Chironomids are non-biting midges, but instead of *χειρονομοειδή*, the term for them was formulated as *μη αιμομυζητική σκνίπα*.

The term *εκτοσυμβίωση* was discarded for *ectosymbiosis*, and *εξωσυμβίωση* was preferred. Again, it depends on the margins established when it comes to determining whether a boomerang has failed. For example, *λιμνογράφημα* for *limnigraph* instead of the non-existent *λιμνίγραφο*, or *ταξινομία* for taxonomy.

The case of *epigean* is quite interesting, since it means “of or related to an organism that lives on or near the surface of the ground”, which is translated as *εδαφικός* instead of *επίγειος* (meaning mundane).

There is also *anthropic*, which was clearly influenced by *ανθρώπινος* (human) or *ανθρωπογενής* (anthropogenic). Therefore, *ανθρωπικός* was discarded as a match. According to *Merriam Webster Dictionary Online*:

- **anthropic**: of or relating to human beings or the period of their existence on earth.
- **anthropogenic**: of, relating to, or resulting from the influence of human beings on nature <anthropogenic pollutants>.

There are also other examples of failed boomerangs in other languages, such as Spanish, in which we can find *ancón*, meaning “little cove, inlet”, from Greek *αγκών*, *-ώνος*, “elbow, river bend or curve” (Corominas 2003: 50). However, it is translated as *κολπίσκος*, since *αγκώνας* only designates that part of the body (elbow).

3.4 Real boomerangs

Real boomerangs are words that originated outside Greece with Greek elements, but when they returned to Greece did not remain. This occurred because they were not accepted/needed by the discourse community, because they were confusing, or because they replaced by anglicisms. For example, we can find very few occurrences of *αποσηματισμός* for *aposematism*, *οικοκλίνη* for *ecocline*, *ευεδρικός* for *euhedral*, etc.

By using the EcoLexicon corpus or the Internet as corpus, single examples were found for the following terms: *αντικυκλώλυση* for *anticyclolysis* (one hit from an online glossary), *αυτογενή ορυκτά* for *autogenous minerals* (one hit only, displaced by *αυτόχθονα*), *βαλανός* for the genus *Balanus* similar to barnacles (for obvious reasons), *ανεροϊδής κάψουλα* for *aneroid capsule*, *εξωτροπικός κυκλώνας* for *extratropical cyclone*, *κυκλόθεμα* for *cyclothem* (a few more as *κυκλοθέματα*), *στατοσκόπιο* or *σταθμισκόπιο* for *statoscope*, *γλυπτογένεση* for *glyptogenesis*, etc.

3.5 Potential Boomerangs

Potential boomerang terms are foreign Greek wanderers which have not yet returned home, but which can eventually become internationalisms, failed boomerangs, or real boomerangs. Consequently, it was impossible to find any Modern Greek counterpart in our corpus or in the web as a corpus.

allobaric (wind): wind that is formed when the Coriolis force equals the local acceleration of the geostrophic wind.

anemobiograph: recording pressure tube anemometer in which the wind scale of the float manometer is made linear by the use of springs.

antitriptic (wind): theoretical wind produced if the pressure force balances the viscosity force, provided that those forces act upon a wind particle.

arheic: of an area in which surface drainage is almost completely lacking, or where rainfall is so infrequent that all water sinks into the ground or evaporates.

autobarotropic atmosphere: model atmosphere, initially barotropic, which remains barotropic. [Even though there are examples of *βαροτροπική ατμόσφαιρα*, there are no signs of *αυτοβαροτροπική ατμόσφαιρα*].

bioherm: ancient organic reef of mound-like form built by a variety of marine invertebrates, including corals, echinoderms, gastropods, molluscs, and others.

epizoism: act of growing or living on the exterior of a living animal without being a parasite (of a plant or animal).

haptobenthos: aquatic organisms that live closely applied to, or growing on, submerged surfaces.

hydrolaccolith: high mound raised by hydrostatic pressure in tundra or periglacial areas, where autumn freezing may trap a layer of water beneath the frozen surface and the underlying permafrost. It may later collapse leaving a hollow, which may become a small pond.

lithogenesis: phase in the geological cycle involving the formation of new soil and rocks from sediments generated by glyptogenesis as well as from new materials from inside the Earth's crust. [The term *λιθογένεση* belongs to the Medical domain, as “formation of calculi”].

lithometeor: meteorological phenomenon consisting of an ensemble of particles most of which are solid and non-aqueous; they are more or less suspended in the air, or lifted by the wind from the ground. [We have found *λιθομετέωρο* only in empty entries].

stygofauna: any fauna that live in groundwater systems or aquifers, such as some caves, fissures and vugs. [We could not find the *-πανίδα* counterpart].

4. Conclusion

In this paper we have analysed the degree of dependency of a series of specialized English terms in relation to other terms in Modern Greek. These examples reflect the impact of English on the Greek language in certain subdomains of the environment. We have also attempted to establish a typology of Greek loans in Modern Greek (“the Greek wanderers”), from “remigrants” to internationalisms, but also different types of returning wanderers, i.e. failed boomerangs, real boomerangs, and potential boomerangs.

The influence of the “Greek wanderers” is undeniable, and the different examples provided in this paper helped us confirm that the role of the Greek language as a vehicle of knowledge transfer is different from what it formerly was. Greek is currently a receiver of terms and concepts. This is especially true in the case of specialized language, such as in the environmental sciences. This unidirectional knowledge transfer requires the establishment of dependency roles, which we attempted to establish in different typologies of wanderers as cause and consequence of asymmetries between both communities of specialists. This claim is supported by theoretical elements and data from conceptualization, specialized neology, and specialized translation, but also from terminological evidence from knowledge bases and online dictionaries such as EcoLexicon and MeteoTrad.

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