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The role of translation in secondary term formation

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The role of translation in secondary term formation

Il faut dire aussi que le calque est en train de s'avérer l'un des facteurs les plus dynamiques, perméables et réceptifs de la langue [...]

(Santoyo 1987: 244)

[...] dans le contexte actuel de l'internationalisation de la science et de la technique, le recours au calque comme procédé de traduction est devenue une nécessité dans toutes les langues

(Loubier 2003: 40)

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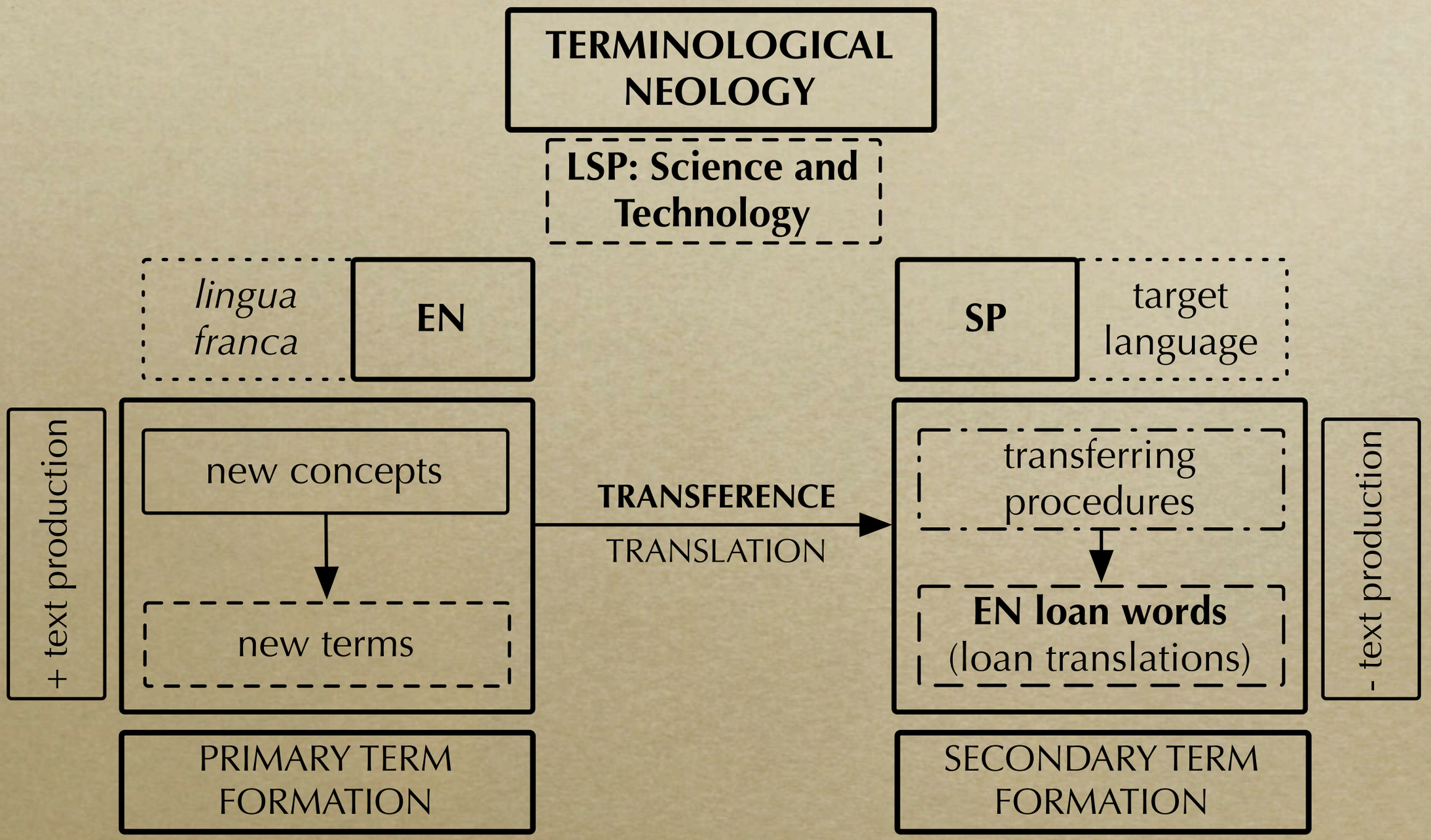
Contents

Context (1)


TERMINOLOGICAL NEOLOGY
LSP: Science and Technology
lingua franca
EN
SP
target language
+ text production
new concepts
new terms
TRANSFERENCE
TRANSLATION
transferring procedures
EN loan words
(loan translations)
- text production
PRIMARY TERM FORMATION
SECONDARY TERM FORMATION

Context (2)

- **Terminological neologisms** show some of the most noteworthy and characteristic aspects of modern scientific and technical language (García Palacios 2009):
  - arise in **communicative exchanges where two linguistic systems interact** (*lingua franca* and expert's mother tongue), showing:
    - unbalanced relations
    - positive evaluation of globalisation
    - need for writing in English in order to reach a wider audience and gain acceptance
    - expert and translator frequently meet in the same person in the TL
    - speech actors' critical unawareness
  - area of interferences or rather true **terminological dependency** in Romance languages (cf. García Palacios and Humbley 2011)
  - area of **terminological conflicts**, as the reality and the terminology generated is constantly changing
  - area where **intervention** is advisable

Objective

- Provide an **overview of secondary terminological neology** in scientific and technical discourse (expert to expert communication)
- See how target language experts, who read in English and write in English or in their own mother tongue, deal with new terms
- **How?**
  - through the analysis of the most frequent units in specialised communication, **multiword terms** (MWT), within an English-Spanish comparable corpus in a representative field of the accelerated development of scientific and technological research and its interdisciplinary nature: space remote sensing
  - **getting as close as possible to** the origin of terms (the **primary term formation** process): to their syntactic and semantic structure

Object (1)

- **Why multiword terms?**
  - **most frequent mechanism in terminological neology** (Salager-Meyer 1984, Pugh 1984, Portelance 1989, Cardero 2003, Oster 2003, Cabré y Estopà 2005)
  - **most frequent terms in highly specialised texts** (expert to expert communication) (Horsella and Pérez 1991; Quiroz 2008: 67-71)
  - **most frequent terms in remote sensing vocabularies** (approx. 80% of entry terms in several dictionaries and glossaries, EN, SP, FR)
  - **closely related to secondary term formation** (Hermans and Vansteelandt 1999)
  - **link between phraseology and terminology**
    - their presence in texts with varying levels of lexicalisation denotes the beginnings of the designation process
    - their phraseological dimension helps describe the actual functioning of terms in LSP discourse
  - **relevant in specialised translation**
    - cause problems when being transferred to the TL

Object (2)

- **What is a multiword term?**
  - **noun sequence** composed of a head noun (**nucleus**) accompanied by one or several **modifiers**, produced following **syntactical and semantic rules** –which may or may not be explicitly present–, and makes up a **single concept** within a specialised field despite there being **no graphic joint** between its elements
  - **characteristics**:
    - functions as a **unit of meaning**
    - identifies **a concept** and fits into a conceptual system
    - results from a recurrent **modification process**
    - contains a **short description** of a concept
    - **behaves like a noun** in a larger syntactic unit
    - may be **shortened** to an acronym or abbreviation
    - may be **lexicalised** or undergoing lexicalisation

Method (1)

- Bilingual English-Spanish comparable corpus

TIF Corpus	EN subcorpus	SP subcorpus
tokens	193,893	128,823
types	7,545	7,259
texts	35 (20 native; 15 non native)	38 (33 Spain; 5 Latin Am.)
domain	space electromagnetic remote sensing / forest fires / burned area mapping	
source	specialised journals and conference proceedings	
pub. date	1993-2008	
text type	research paper	

Method (2)

- **Term extraction process**

  1. Semiautomatic identification of English multiword terms with a corpus processing tool
  2. Selection of noun sequences (multiword term candidates) which comply with the characteristics previously described

     ➡ **List of 460 English multiword terms** (with different levels of lexicalisation)

  3. Search for equivalents in the Spanish comparable subcorpus

     ➡ **Found at least one equivalent for 79%** of the English multiword terms (362 out of 460; 647 Spanish denominations)

- **Term analysis process** = multiword term translation process

  - three-step process: **identification**, **comprehension**, EN-SP cross-linguistic **comparison** (production)

Method (3)

- **Multiword term database**
  - **entry term**: *vegetation index*
  - **field and subfield**: *space electromagnetic remote sensing/image interpretation and analysis/digital image interpretation*
  - **grammar label**: *n count*
  - **contextual info.**: **abs. freq.**: *78* , **text freq.**: *26* , **lemmas**: *vegetation index[66] vegetation indices[12]*, **origin**: *N[52], NN[26]*
  - **morphological structure**: *N+N*, **morphosyntactic structure**: *[N2$_{Mod}$+N1$_{Nuc}$]*
  - **semantic pattern**: *image schema / CONTENT (vegetation)- CONTAINER (index)*
  - **related terms**: *Normalized Difference Vegetation Index (hyponym), Soil Adjusted Vegetation Index (hyponym), Short Wave Vegetation Index (hyponym), spectral index (hyperonym)*
  - **cross-reference**: *VI (acronym)*
  - **equivalent**: *índice de vegetación*

Results (1)

- **Primary term formation** (EN multiword terms):
  - number of **words** (**2-8**): **71% two**, 19% three, 7% four, 3% > four
  - formation process: **93% premodification**, 6.5% postmodification, 0.5% pre- and postmodification
  - **morphological structures** (**31**): 15 represent 95%, **5 represent 87%**
    - N+N: *azimuth angle, cloud cover, mixed pixel, view angle* **43%**
    - Adj+N: *active fire, radiometric correction, spectral index* **27%**
    - Adj+N+N: *false colour composite, solar zenith angle* **8%**
    - N+N+N: *change detection algorithm, land cover class* **6%**
    - N+prep+N: *error of omission, field of view* **3%**

Results (2)

- **Primary term formation** (EN multiword terms):
  - **morphosyntactic structures** (**41**)

words	structures	morphosyntactic structures	example	MWT
2	N+N	[$N2_{Mod}$+$N1_{Nuc}$]	*active fire*	196
2	Adj+N	[Adj_{Mod}+N_{Nuc}]	*spectral index*	115
3	Adj+N+N	[(Adj_{Mod}+$N2_{Nuc}$)$_{Mod}$+$N1_{Nuc}$]	*false colour composite*	31
		[Adj_{Mod}+($N2_{Mod}$+$N1_{Nuc}$)$_{Nuc}$]	*solar zenith angle*	6
3	N+N+N	[($N3_{Mod}$+$N2_{Nuc}$)$_{Mod}$+$N1_{Nuc}$]	*fire detection algorithm*	21
		[$N3_{Mod}$+($N2_{Mod}$+$N1_{Nuc}$)$_{Nuc}$]	*MODIS fire product*	5
3	N+prep+N	[$N1_{Nuc}$+(prep+$N2)_{Mod}$]	*field of view*	10

  - **semantic patterns** (intraterm relation MODIFIER - NUCLEUS) (**36**)
    - **States** (ATTRIBUTE - MODIFIED ENTITY): **55%**
    - **Actions** (PATIENT - ACTION, PURPOSE - INSTRUMENT, etc.): **23%**
    - **Images** (PART - WHOLE, CONTENT - CONTAINER): **13.5%**

Results (2)

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Results (3)

- **Secondary term formation** (SP equivalents):
  - number of **words** (**1-12**): 2% one, **28% two, 23% three, 23% four**, 13% five, 5% six, 6% > six
  - formation process: **93% postmodification**, 5% premodification, 2% pre- and postmodification
  - **morphological structures** (**93**): 15 represent 76%, **5 represent 56%**
    - **N+Adj**: ***ángulo acimutal, incendio activo, cubierta nubosa*** **17%**
    - **N+prep+N**: ***detección de cambios, píxel con nubes*** **17%**
    - **N+prep+art+N**: ***banda del visible, actividad del incendio*** **11%**
    - **N+N**: ***imagen diferencia, píxel semilla, imagen AVHRR*** **7%**
    - **N+prep+N+Pp**: ***mapa de áreas quemadas*** **4%**
  - **semantic patterns**: (intraterm relation MODIFIER - NUCLEUS): **69% same as EN multiword term; 20% different; 6% similar; 5% non-existent** (borrowings, one-word units)

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Results (4)

- **Secondary term formation** (SP equivalents):
  - **EN-SP structure correspondences** of N+N and Adj+N

EN MWT	SP equivalents	example	EQ
N+N	N+prep+N	EN. *omission error* → SP. *error de omisión*	26%
	N+prep+art+N	EN. *infrared band* → SP. *banda del infrarrojo*	23%
	N+Adj	EN. *cloud pixel* → SP. *píxel nuboso*	13%
	N+N	EN. *difference image* → SP. *imagen diferencia*	12%
	N	EN. *composite image* → SP. *compuesto*	4%
	other (25)		22%
Adj+N	N+Adj	EN. *spectral signature* → SP. *firma espectral*	47%
	N+prep+N	EN. *omission error* → SP. *error de omisión*	10%
	N+Adv+Pp	EN. *unburned area* → SP. *área no quemada*	9%
	N+Pp	EN. *burned area* → SP. *área quemada*	8%
	N+prep+art+N	EN. *viewing geometry* → SP. *geometría de la observación*	4%
	other (17)		22%

Results (5)

- **Secondary term formation** (SP equivalents):
  - **transferring procedures for EN-SP term correspondences**

transferring procedures	example	EQ	%
complete loan translation	EN. *active fire* → SP. *incendio activo*	399	49%
complete loan rendition	EN. *active fire* → SP. *foco activo*	140	17%
paraphrase	EN. *burn signal* → SP. *señal procedente de las áreas quemadas*	103	13%
half loan translation	EN. *AVHRR image* → SP. *imagen AVHRR*	39	5%
non adapted borrowing	EN. *Normalized Burn Ratio* → SP. *Normalized Burn Ratio*	29	4%
other			12%

  - **specific transferring procedures within multiword terms**
    - **transposition**: EN. *azimuth angle* → SP. *ángulo acimutal* 26%
    - **explicitness**: EN. *colour composite* → SP. *composición en color* 18%
    - **modulation**: EN. *statistic* → SP. *índice* 17%

Results (6)

- **Primary vs. secondary term formation**
  - **more structural variation in SP equivalents,** which increases as the number of words per term goes up

words	EN MWT per morph. structure	SP equivalents per morph. structure
2	65	37
3	9	15
4	2	8
5	1	4
6	1	2
7	0	2
8	1	1

Results (7)

- Primary vs. secondary term formation
  - more denominative variation in SP equivalents

denominations per concept	EN MWT	SP equivalents
1	54%	38%
2	27%	23%
3	10%	13%
4	4%	9%
≥ 5	5%	16%

	EN MWT	SP equivalents
denominations per concept	1′85	2′84

  - lower level of lexicalisation in SP equivalents

level of lexicalisation	lexicalisation marks		EN MWT	SP equivalents
5	in dictionary or glossary		42%	11′5%
4	not in dictionary or glossary	7-8	3%	0′5
3		5-6	14%	17%
2		3-4	40%	37%
1		≤ 2	1%	34%

Results (8)

- **In short**:
  - **premodification** in EN **is transferred as postmodification**
  - most **EN multiword terms** show just one modifier (**N+N**, **Adj+N**) and **are mainly transferred as N+prep+(art)+N** or **N+Adj** structures in SP
  - **EN multiword terms with more than two modifiers** show different syntactic structures and **result in a greater variety of structures in SP**
  - **most SP equivalents are complete loan translations or loan renditions** (65%) **and paraphrases** (13%); borrowings are not frequent (4%)
  - **within multiword terms, problems arise with naturalisations** (EN. ***monitoring*** → SP. ***monitoreo***) **and false friends** (EN. ***severity*** → SP. ***severidad***), but they represent just 8% of the transferring procedures
  - **SP equivalents show greater denominative variation** due to different translations attempts and an increase in morphosyntactic variants in this language
  - the resulting **equivalents show lower lexicalisation levels**

Discussion (1)

- **Preference for procedures based on translation**
- **calquing** (loan translations and loan renditions) **as terminology fertiliser?**
  - **favour innovation and development** and calques are quickly accepted
  - unlike borrowing sometimes **go unnoticed** (Montero *et al*. 2001: 691)
  - seem **better than artificial creation**
    - **accessible and transparent for experts**, but for semi-experts and non experts?
    - **contribute to the internationalisation of terminologies** (Santoyo 1987)
    - **maintain a link between a TL and international terminologies** (Montero *et al*. 2001: 693)
    - **match up with native term formation** (more possibilities) (Di Spaldro *et al*. 2010)
    - **do not necessarily lead to convergence** and promote homogenisation among languages, as translation parallels to creativity
    - **but cause difficulties** due to the syntactic-semantic complexity of multiword terms, the differing syntactic natures of the SL and TL and their word formation rules, and the lack of comparative studies and sources

Discussion (2)

- **Can we still talk of word formation within this context as has been traditionally done?**, focusing on native resources and pushing foreign resources (loan-words) and transferring procedures into the background?
- **Wouldn't it be more appropriate today to focus on transferring procedures to guarantee good practices in this sense?**
  - **this arrises as a controversial point** (are we going against our own native word formation patterns, our language?)
  - **but seems to be a realistic approach** as the tendency towards English dominance in scientific and technological communication seems to go on for some time yet

Discussion (3)

- **How do traditional neology theories face this reality?**
  - from a **monolingual perspective**
  - **paying attention to native resources** (affixation and compounding), but not really to foreign resources (loan-words)
  - literature on word formation **ignores the influence of English** in this process, just literature on term formation (Rondeau 1981, Sager 1997) is more open to a multilingual approach
- **How could neology theories face this reality from now on?**
  - from an **idealistic approach**: analyse neology from a multilingual perspective bringing all languages at the same level (can derive in obsessive purism?, Lodares 2004: 134)
  - from a more **realistic approach**: considering neology from a multilingual perspective but paying attention to primary term formation in English and going deeply into secondary term formation in Romance languages, and being aware of the unbalanced situation

Discussion (4)

- **Realistic approach (objectives)**
  - **see neology from a multilingual perspective** (EN / SP, FR, IT, PORT, etc.)
  - **pay attention to primary term formation in English** (comprehension)
  - **go deeply into secondary term formation in Romance languages** (production)
  - **develop methodologies** to deal with secondary term formation
  - **redefine** and classify **transferring/translation procedures**
  - **describe the factors involved in the transferring process** (including reconceptualisation)
  - **study neologisms** and term formation patterns **in discourse**
  - **focus on multiword terms to optimise efforts**
  - **work on term formation procedures also used in the TL** (multiword term formation - loan translations)
  - **study term formation within the context of linguistic transference**
    - compounds, suffixes, etc. originate from the SL or the TL?
    - do multiword terms in the TL fit in form and meaning with multiword terms in English?
    - can we reproduce the metaphor in the TL?

Conclusions (1)

- bilingual corpus analysis shows a strong tendency towards translation-based procedures
- translation arrises as the most important procedure in transferring English multiword terms to other languages in scientific and technological communication
- the use of translation for transferring multiword terms results in calquing and paraphrases in the TL, increases denominative variation and entails lower lexicalisation in the TL
- syntactic and intraterm semantic relations help understand EN multiword term formation and help in translation but they have to be analysed in context (paying attention to variation and phraseology)

Conclusions (2)

- need to raise awareness of secondary term formation among scientists, translators and linguists
- need to redefine neology theories as regards word formation
- need to design a complex and modern theory of neology which may:
  - incorporate all factors and actors currently involved in word formation
  - consider mutlilingualism and cross-linguistic influence
  - not forget about the high percentage of multiword terms within specialised vocabularies
- need to focus on self-regulation (internal, Guespin's *normaison* 1993), leaving normalization aside (external).

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