

## COMPUTER SCIENCE NEOLOGISMS IN BRAZILIAN PORTUGUESE: DESCRIPTION OF A TECHNICAL AND SCIENTIFIC VOCABULARY

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**Abstract:** This paper attempts to expose some results of a research about the use of computer science terminology by Brazilian technician. The research describes this vocabulary focusing the **neologism formation process** and the **monossemic** feature of the linguistic sign in the specialized techno-scientific vocabulary. Some results: 1) syntagmatic process is the more frequent neologism formation process; 2) borrowing occurs in many cases of these syntagmatic formations, but there are many unnecessary borrowings, confirming our cultural dependence upon north-american culture; 3) the monosemy is characteristic of the specialized languages, however we encounter synonymy and homonymy in the terminology of computer science.

**Keywords:** specialized languages, neologism formation process, borrowing, synonymy, homonymy.

This paper was based on my research that analyzed the computer science terminology used by Brazilian technicians, in the period from 1991-1993, in São Paulo - Brazil (Almeida, 1995).

The research was based on the language used in recorded interviews on the part of informants who work in the field of computer technology, and secondly, specialized written material from two major Brazilian newspapers: **Folha de S. Paulo** and **O Estado de S. Paulo**.

The aims of the present study, based on the spoken and written *corpus*, are to: (i) analyze the processes of formation of neologisms in the vocabulary of computer science as well as identify the more productive neologisms, (ii) to discuss the role of borrowing in linguistic and cultural terms, and (iii) to verify instances of monosemy or the one-to-one characteristic of the linguistic sign.

Following Guilbert's (1975) taxonomy, 1,747 words from the *corpus* were classified into three categories: (i) syntagmatic and (ii) semantic neologisms and (iii) loan words.

The analysis of the data indicates that the most productive neologisms are the syntagmatic ones and the loan words. The last ones become more frequent in the *corpus* because they can be part of syntagmatic process.

Cases of **syntagmatic neologisms** occur in 1,560 words, that is, in 89% of the total. Affixation, word compounding and acronymic functions, according to Guilbert (1975), are included in the category of syntagmatic neologisms.

In examples of syntagmatic neologism, the process of compounding plays a very important role. This fact confirms one substantial characteristic of compounding: the process of naming concepts and things. This is exactly what occurs in a technical and scientific vocabulary that serves primarily to designate objects, equipment, practices and new procedures.

With respect to the grammatical constituents the syntagmatic phrases, the study points to the following distribution: Noun+Adjective, Noun+Preposition+Noun, Noun+ Noun and Verb+Noun which match structures described in Brazilian Portuguese references grammars as in the following examples:

- (1) N+A — *tecnologia digital, superestrada eletrônica, processamento paralelo;*
- (2) N+P+N — *soft de apresentação, cartão de memória, processador de imagens;*
- (3) N+N — *videodisco, memória cache, programa-mãe;*
- (4) V+N — *dar boot, dar um enter, descer uma tela.*

In the affixation process, the more productive affixes are **-ar/-izar** (verbal suffixes), **-ão/-ização** and **-dor(a)/-or** (nominal suffixes):

- **-ar/-izar** joined to Portuguese bases, and **-ar** joined to foreign origin verbs: *trafegar*, *reformatar*, *hifenizar*, *digitalizar*, *linkar* (=to link + ar), *acessar* (=to access + ar), *deletar* (=to delete + ar), etc;
- **-ão/-ização** joined to Portuguese bases that refer to action or result of actions, and **-ização** joined to foreign origin verbs: *alimentação*, *compressão*, *digitalização*, *scannerização* (=scanner + ização), *renderização* (=to render + ização), etc;
- **-dor(a)/-or** joined to Portuguese bases. Suffixes that designate agent or instrument: *desenvolvedor*, *controladora*, *conector*, etc.

Based on the data, it is argued that the productivity of the suffixes described above is due to the role of technical vocabulary which serves the purpose of naming actions, of identifying processes that result from these actions, from the instruments or subjects of these same actions.

This study also pointed to the occurrence of another syntagmatic process: the formation of acronyms:

- initial letters of words:  
   Bios - **B**asic **I**nterface **O**utput **S**ystem  
   PCMCIA - **P**ersonal **C**omputer **M**emory **C**ard **I**nterface **A**ssociation  
   wysiwyg - **w**hat-**y**ou-**s**ee-**i**s-**w**hat-**y**ou-**g**et;

- union of specific phonemes in each word:  
ATDP- **A**ttention **D**ial **P**ulse  
bit - **b**inary **d**igit  
modem - **m**odulador/**d**emodulador;
- union the initial phonemes with additional phonemes that are non-existent in the word:  
RXD - **R**eceive **D**ata  
TXD - **T**ransmit **D**ata.

The 230 occurrences in this specialized technical vocabulary contribute to make the discourse concise for the purpose of saving time.

**Borrowing** is another word-formation process that is similar to the types cited above. One would indeed expect the presence of large number of foreign words in the specialized literature because the field of computer technology is fairly recent and most of equipment is imported. The large number of loan words in Brazilian Portuguese is due to the transfer of both technology and terminology. The widespread usage of foreign words in Brazil in the field of computer science mirrors the cultural and economic dependence of Brazil on the USA, the nation responsible for the creation of the technology.

What can be done to protect Brazilian Portuguese from the invasion of foreign technical terms? One solution would be to render specialized words in such a way that they conform to the sound system of this language. In addition, all foreign terms should respect Luso-Brazilian orthographic spelling conventions. Loan words should only be admitted that are absolutely necessary, particularly in cases in Portuguese where there are lexical gaps or lacunae.

**Semantic neologisms** did not occur as frequently as the other word-formation processes in the *corpus*. It is worth pointing out that the foreign terms contribute to a change of meaning of specific Portuguese lexical items and produce calques in Portuguese from (American) English: *baixar* < *download*, *levantar* < *upload*, *suportar/suporte* < *support*.

The lexical competence on the part of the informants and writers leads to the creation of some unexpected lexical items. The assignment of the feature [+animate] on the part of specialists in the field of computer to technology to the equipment they come in contact with contributes to innovative lexical items: *máquina muda*, *residente*, *migrar*, *conviver*, etc.

This study contributed to cast some doubt on the hypothesis that technical and scientific language is monossemic with a definite one-to-one relationship between words with no ambiguity. In the *corpus* there are cases of words with two meanings. One possible explanation might be that the computer field is in flux with rapid technological changes which result in the swift coining of new terms or the use of old ones with additional meanings. Another explanation for the lack of monosemy might be the type of written *corpus* examined: journalistic language and oral interviews even with specialists tend to popular and informal in register. Another surprising finding of this study is that specialized dictionaries also listed synonymous and homonymous entries:

- synonymous — *porta serial*, *porto*, *port*, *COM* and *endereço* are different terms that have the same meaning;
- homonymous — *fonte* can be different of *fonte* and *formatar* can be also different of *formatar*.

In the case of some lexical items, the specialists consulted considered a few of them to synonymous and homonymous while the specialized dictionaries did not. In still other cases, it was the other way around.

This study led to the conclusion that technicians do not always use the same language or the same term for the same concept. The research seems to suggest that there is a need for language planning in Brazil, particularly with respect to technical language in the computer field. Dictionaries should be improved and committees should be established to attempt to "fix" meanings of specialized technical terms in order to reduce ambiguity and avoid possible confusion in choice of vocabulary. Measures should be taken to construct a Luso-Brazilian technical language and attempts should be made to protect the language from the rampant importation of foreign terms that may be unnecessary.

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