The Impact of Computer Science on Computer Scientists' Daily Speech

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Abstract
Since the 1960's, serious investigations have been undertaken within the field of language variation. In addition to its association with social variables such as age, gender, social class, ethnicity and social network, language is sensitive to context. Occupation is a contextual situation according to which language varies as well. Distinct varieties are related to distinct occupations. Occupational varieties are known as registers. Because of the inescapable impact of occupation on the human behaviour, the specialist's behaviour is linguistically influenced by his occupational field; the use of registers, although temporary, affects the speaker's daily speech. This paper tackles the case of computer scientists who tend to employ, out of the context of their work, technical terms in their ordinary conversations. It also supplies a sociolinguistic description to the point.

Introduction:

The fact that language and society are interrelated is indisputable. Sociolinguists believe that this interrelationship results in the exertion of influence in both directions. The effect of society on language makes the latter variable. Language intrinsically varies because society is characterised by variation. Language variation corresponds to social variation in the sense that language manifests in different forms within society. The social difference between speakers is reflected in their ways of using language. Within a weak social network group, the way language is modelled differs from that of a strong social network. The form of language used

determines whether the speaker is a woman or a man; a child or an adult; a city or countryside dweller; a physician or a linguist. Physicians and linguists employ, indeed, different registers. Not only physics or linguistics has its proper variety but any occupational field possesses a distinct register. Register distinctiveness increases with the specialization of the field. That is, "the more specialized the occupation, and the more senior or professional the post, the more technical the language is likely to be" (Crystal, 1999: 370). The science of computers is a point in case. Needless to say that this field has become a pre requisite to any other discipline. No disciplinary advance could be made without the intervention of a computational methodology. Further, computers have dramatically invaded academic and familiar buildings for the purpose of technology and intercommunication (e.g. Internet). Those machines and their science have, in brief, constituted a crucial ingredient of human life and prompted their ineluctable influence over their users. The goal of this paper is to deal specifically with the linguistic (or exactly lexical) affect of computer science on its specialists who are supposed to face computers the most. A ten-period of teaching at the Department of Computer Science, University of Oran, has allowed me to get involved in this community and take advantage of an ethnographic approach: long-term participant observation (Milroy and Gordon, 2003). I have compiled the present data and split it into functional lexical categories. Each category has been outlined, described and compared to its counterpart in daily speech. The lexical items collected are either individually or commonly produced. But, most of them are common among computer scientists.

2. General Definitions:

A register is a form of language which varies according to occupation or any specialized field. Occupation is a very

exemplary social variable which has impact on language. The notion of occupational varieties "…, has to allow for people who are 'always on the job' – whose work is so much a part of their personality that it permanently influences their behavior, linguistically and socially" (Crystal, 1999: 370). This impact is exercised at different levels. Crystal (1999: 372) continues: "First impressions of the language of science are that its distinctiveness lies in its lexicon". The latter may play a crucial role in identifying the occupational field (ibid: 370).
As for any other field, there is an available register for computer science. *Cambridge Advanced Learner's Dictionary*[1] provides the following definition to this discipline, "the study of computers and how they can be used", whereas it defines the computer as "an electronic machine which is used for storing, organizing and finding words, numbers and pictures, for doing calculations and for controlling other machines" (ibid). Computers consist of hardware and software. The hardware refers to the physical elements of a computer. The software, by contrast commonly known as programs, consists of all the electronic instructions that tell the hardware how to perform a given task. Obviously enough, the hardware and software can be two subfields of computer science. The way computer register is used for the hardware differs from the way it is employed for the software. Again, this difference lies principally in vocabulary.

Registers differ from dialects because a register, as mentioned earlier, is an occupational variety while "the term dialect refers to the language varieties characteristic of regional or social groups. Partly through a dialect we recognize a person's

[1] *Cambridge Advanced Learner's Dictionary* (2004) 3rd Ed. Cambridge University Press. p. 249

regional, ethnic, social, and gender affiliation." (Finegan, 1999: 371). The use of registers is temporary while it is permanent for dialects in daily life. The constant use of one's register at work tends to affect the specialist's dialect. It may happen that the same lexical item exists in both the dialect and register but with a different meaning in each variety. For examples, the French phrase *problem de la famine* refers to 'process management' in computer science while it means 'starvation problem' in daily speech. This may hinder comprehension especially if conversation is held between a computer scientist and an outsider. Since both the register and dialect are presented in this article within the Algerian speech community, it seems worthy of consideration to give a brief outline about the language situation in Algeria.

3. The Algerian Language Situation

Algeria is a multilingual speech community where different language varieties prevail. In addition to Classical Arabic- the official and first national language in Algeria, and Berber- the second national language of the country, Dialectal Arabic (henceforth, DA[1]) and French (henceforth, Fr) are used in everyday speech of the Algerians. More importantly, DA is the native language variety of their majority because it is naturally acquired. It ranks the first in daily conversations whereas French, which has the status of foreign language, interferes in DA interactions as a result of contact-induced phenomena, such as code-switching and borrowing. Code-switching is "changing back and forth between two language varieties, especially in a single conversation" (Trask, 2004: 36). But,

[1] Many computer science specialists at the Department of Computer Science, University of Oran, come from different Algerian regions. Therefore, the use of DA, here, is general and does not design any specific Algerian dialect.

borrowing refers to "the incorporation of words (or some other characteristic) from one language into another language" (Demers et al, 2001: 573).

The prevalence of French in ordinary conversation, via code-switching or borrowing, results from the fact that it still enjoys a prestigious status in Algeria. "French in present Algeria does not seem to be losing its importance and prestige four decades after the independence of the country" (Benali, 2007: 26). For the Algerians, it is considerably viewed as the language of science and technology. As a point in case, scientific and technical fields, including computer science and research at university are carried out in French. Although "...English is gaining ground in Algeria as a world language associated with advanced technology and scientific research, international economy and trade..." (Dendane, 2006: 76), it is still in its infancy in comparison with French (ibid). The accumulative effects of use of computer science register by its specialists at work leads to interference of their technical French via code-switching and borrowing into their ordinary conversations. Their regular contact with computers drives them, sometimes, to talk, using some technical French items, with their conversants as if the latter were computers. In other words, while conversing, computer specialists may tend to computerize their listeners. Both language contact phenomena are clear-cut at the lexical level. Computer scientists tend to play a double role: code-switchers and borrowers who rely, in their speech production, on hardware and software terminologies. The emergence of language contact phenomena is not necessarily because DA lacks some lexical items to convey a given meaning. But, this is only one manifestation of language behavior sensitiveness to context. Of course, the Algerian computer scientists are familiar with their mother tongue (DA); but like any other scientific specialists, they have

the ability to substitute ordinary lexical items for their specialized vocabulary to convey the same meaning under the linguistic impact of their habitual work.

A long constant and careful observation to computer scientists' daily speech reveals that the main lexical elements which are implied in code-switching and borrowing function grammatically as verbs, nouns, adjectives and phrases. Their reference is contextual since their meaning is detected only through the context of the conversation in which they are involved. For example, the verb *formatter* 'to format' has more than one meaning in DA: χ□□□h jansa; ja□l□□ bazaf "he needs to forget; he makes a lot of mistakes". This is determined by its contextual use.

On the other hand and as mentioned earlier, the hardware and software are both entailed in the terminology that interferes in computer scientists' daily speech. As for the hardware, it is lexically not exhaustive. Most of the recurring items and phrases come rather from the software. The underlying motivation may emerge from the fact that university computer studies in Oran focus on the software rather than the hardware.

4. Code-switching to Technical Terminology

4.1. Nouns

While considering the hardware, it is noticed that many computer specialists have the tendency to switch to nouns, such as *processeur* which is the equivalent of m□χ in DA 'brain' and phrases, such as *disque dur*, which refers to the French word *mémoire* (frequently used in DA) 'memory'. In the case of software, there are lists of nouns, adjectives and phrases. Within the list of phrases, we find general expressions, abbreviations, idiomatic expressions and proverbs. They are all used to express for example: relationship, state, action or

possession. As for French nouns, some examples (including *requête*; *algorithme*; *compilateur*; *parallelism*; *formatage*; *débit*; *interface*; *simulation*; *abstraction*; *interruption*; *programme*; *parefeu* respectively) are stated in the following table,

Example	**Ordinary Speech**	**Translation into English**
ħ□□et *requête*	ħ□□et demande	I have made an application.
taba□t *un algorithme*	f□t □la des étapes waħda m□r l□χra tafham bas□f	I followed subsequent steps
□andak *compilateur* tq□l/		You don't understand easily.
□ajan nd□r ∂l *parallélisme*	nd□r swalah f□ raħba	I do many things at the same time.
χ□□□h *formatage*	χ□□□h jansa/ ja□l□□ bazaf	He needs to forget/he makes many mistakes.
		I am very well.
□and□ *débit* □□l□□	ran□ □aja	I do not feel well.
□and□ *débit* hawad	maran□□ ml□ħ	She is beautiful.
□andha *interface* □aba	h□ja □aba	I pretend.
		Never mind!
nd□r *simulation*	nd□r □□□l	
d□r □l□ha *abstraction* !	f□tha !	I want to say something!
interruption !	ng□l kalma !	I make him understand.
nd□rlah *programme* ta□ fhama	nra□□ah jafham	We design him a security guard.
nħ□□o *parefeu*	nħ□□o □asas	

Table 1: Code-switching to Technical Nouns

4.2. Adjectives

Relatively speaking, a fewer number of technical switched adjectives can be heard among computer specialists. As examples, the French adjectives *compatible*; *executable*; *booléen* may be used as follows,

Example	Ordinary Speech	Translation into English
ana w□jak *compatible* flan *executable* ana *booléen*	ana wijak natfahm□ flan jd□r □walaħ bla ma jχamam ana nafham n□□an !	We go together well. Sombody acts without thinking. Call a spade a spade!

Table 2: Code-switching to Technical Adjectives

4.3. Phrases

4.3.1. General Phrases

As regards phrases, they are numerous. The table below embodies some of them (*mise à jour*; *base de donnée; réseau fibre-optique; fichier caché; fin de session; une fil d'attente*; *débit faible*; *état puit*; *par défaut*; *hors ligne*; *logique flue* respectively). They are in the form of a number of lexical items which are together.

Example	Ordinary Speech	Translation into English
ka□ *mise à jour*? nagal□ak m∂l *base de donnée* b□natna *réseau fibre-optique* nra□□ah *fichier caché*	ka□ □d□d? nagal□ak m∂n □ma□t□ nafahm□ ba□□□n□ nχab□h sar	Any news? You do not belong to my band anymore. We understand each other. I keep it a secret.

fin de session !		We have finished!
kajn *une fil d'attente*	kamalna ! kajn qola	There is a queue.
waħ∂d □andah		Somebody is tired.
débit faible	waħ∂d □ajan	You are a thief.
nta *état puit*		This is obvious.
had□ *par défaut*	nta χajan	We have not seen you for ages.
rak□ *hors ligne*	had□ ħa□a bajna	You are not talking clearly
had□ *logique flue*	marak□□ tban□	
	hadartak ma□□ bajna	

Table 3: Code-switching to Technical Phrases

4.3.2. Abbreviations

Switching to technical abbreviations is also considerable. Some of them, such as *Alt, Z, F9*, are mentioned on the keyboard buttons,

Example	**Ordinary Speech**	**Translation into English**
Control, Alt, Supprimer!	barka mata□kal	Nonsense!
Contrôle, Z!	f□tha	Never mind!
Contrôle, F9!	□□b□q	Execute!
narsalak *ACK*	nχabrak bal□ w□□latn□	I will inform you about its reception.
d□r □l□h *Shift, Supprimer* !	nsah ga□	Forget about him! Do not listen to only one person!
baddal *ventilo*!	matasma□□ □□ lwaħ∂d!	

Table 4: Code-switching to Technical Abbreviations

4.3.3. Idiomatic Expressions

Many computer scientists tend, in their interactions, to substitute daily idiomatic expressions for technical words or phrases. The French past participle *déconnecté* could be employed as rah *déconnecté* to say r□□□h marah□ hna (his head is not here) 'he is miles away' which is an idiomatic expression in DA. Other idiomatic expressions are expressed through technical phrases as shown below,

Example	Idiomatic Expressions	Translation into English
rah □andh□m *disque saturé*	rash□m marah□ jarfad	They are unable to memorise. He is not intelligent.
□andah *processeur faible* *boucle infinie !*	ma□andah□ f□r□□ cercle vicieux !	Vicious cercle! He plagiarises! Don't bother yourself!
jd□r *copier-coller* d□r *copier-coller* d□r *copier-coller* □l□ja !	jnaqal ħarf bħarf mat□aj□□ r□□□k ! ng□□□□ r□ħ□ !	You are asking me to do many things at the same time! Take your time to tell me. (≠Tell me right away.) We will talk about it again.
radl□ laχbar *en temps différé* (≠radl□ laχbar en *temps réel*) *Save game* !	radl□ laχbar f□ □ardak (≠radl□ laχbar darwak) ħ□□ □andha ħa□ra	

Table 5: Technical Phrases at the expense of Idiomatic Expressions

4.3.4. Proverbs

Further technical phrases may substitute for proverbs. In the case of the dialectal proverb nar taḥt tban (fire under the hay) 'still waters run deep', some computer specialists, instead, use the set of items *cheval de trois* (which is in reality a virus that destroys computer programs) to talk about a dangerous person.

5. Code-switching to English by Computer Scientists

Code-switching to technical English words and phrases also takes place among computer scientists, though to a much lesser extent compared to French. Interestingly, the verb *overflow* is employed as an adjective (or past participle) in the sentence ran□ *overflow* to say ran□ lah□ 'I am overwhelmed'. What is meant by switching to the phrase *go to* in *go to* lhadra l□la is nwal□ lhadra l□la 'let's go back to the first discussion!'. On the other hand, switching can be directed to abbreviations. As a point in case, *FIFO* (*First in first out*) is used to talk about somebody as the first who arrives is the first who is served in a queue. *SJF* (*Short Job First*), by contrast, indicates that the one who has a smaller quantity of something (in a queue) is the one who is served first. Another example is that WIFI (WIreless FIdelity) in b□nath□m *WIFI* may replace the dialectal idiomatic expression jatfahm□ b□amza 'They understand each other without talking.'

6. When are Code-switching and Borrowing Interchageable?

It is possible to find some French technical items which are switched to or completely incorporated in computer specialists' DA. The list of verbs, according to our observations, is the most exhaustive. The use of verbs is, indeed, flexible in the sense that they may either be employed exactly in their French form or conjugated according to DA

Example	Ordinary Speech	Translation into English
redemare !	□awad man lawal!	Repeat from the beginning I find the best solution.
n?□pt□m□z□	nalqa la solution	He codes. He decodes.
jkr□pt□	lamχajra	I send you some food.
jd□kr□pt□	jk□d□	He steals.
n?□□□□□lak lmakla	jagla□ lk□d	He is just making people
jp□rat□	nab□atlak	go into the bus.
rah □□r	lmakla	He is just making people
j?omp□l□ (f∂l bus)		go out of the bus.
rah □□r *jd□p□l□*	jaχwan	Fill in the car!
k□mpr□s□ l□□□ !	rah □□r jrakab (f∂l bus)	Get things out of the car.
d□mpr□s□ l□□□ !		Think it over!
k□mp□l□ !	rah □□r jnazal	They go window-shopping
jnav□g□	(in a bus)	You remove
		You communicate
tk□p□	□ammar l□□□ !	you work slowly
t□at□□		
mat?□gz□k□ti:□	farra□ l□□□ !	
balχaf		
	χamam!	
	jatfar□□ □la les vitrines	
	tagal□□	
	tahadr□	
	nta tqe:l	
	falχadma	

Table 6: Code-switching and Borrowing Used Interchangeably

verbal paradigms. The verb *boucler* 'not to finish' can be conjugated in the imperfective nb□kl□ (I); tb□kl□ (you - she); jb□kl□ (he); nb□kl□ (we); jb□kl□ (they) or the perfective b□kl□t (I-you); b□kla (he); b□klat (she); b□kl□na

(we); b□klaw (they). Other examples (including respectively the verbs *redémarrer*; *optimizer*; *cripter*; *décripter*; *attacher*; *pirater*; *empiler*; *dépiler*; *compresser*; *décompresser*; *compiler*; *naviguer*; *couper*; *chatcher*; *executer*) are as follows,

Words with the same meaning may be used alternatively, such as *redémarrer* and *rebouter*; *compresser* and *zipper*. And as displayed above, words which are opposites are also present: *empiler* and *dépiler*; *compresser* and *décompresser*; *cripter* and *décripter*.

Some adjectives (or passive participles) are involved as well. For instance, waħ∂d *virusé* or waħ∂d *mv□r□s□* are employed alternatively to mean the same thing: rah mre□ 'he is ill'.

Last but not least, it is important to mention that the interchangeable use of switching and borrowing is not only confined to French; but, English may also get implied. This is obvious with the verb *ping*. The borrowed form *pingitah* is used instead of □□q□etah to say 'I asked him'. *jb□g□* is used to mean ja□kal! 'He talks nonsense!'. As regards the abbreviation *p to p* (standing for *peer to peer*), it is employed at the expense of the verb jaqsam 'share'.

Conclusion:

In this paper, we have seen registers as one manifestation of language variation according to context. We have presented the computer science register, as a particular case, within the Algerian speech community. As Algerians, computer scientists have the ability to be both code-switchers and borrowers; their perpetual use of computer register at work make them, consciously or subconsciously, introduce French (and to a lesser extent English) computer items at the expense of their dialectal equivalents, into their ordinary speech through code-switching and borrowing. On the basis of our collected data,

code-switching covers nouns, verbs, adjectives and phrases (idiomatic expressions, proverbs and abbreviations). Borrowing, however, alternatively occurs with code-switching at the verbal level. It goes without saying that access to computers has become worldwide and is still spreading. This results in the fact that although specialists deal the most with their specialized register, the use of computer terminology in daily speech is not restricted to them only. Non-computer specialists could also be useful subjects to the study. A further data collection among computer users (computer specialists and non-specialists) may, why not, ambitiously lead to think of building a particular dictionary for computer vocabulary used in daily speech.

References:

BENALI MOHAMED, R (2007) *A Sociolinguist Investigation of Tamazight in Algeria with Special Reference to the Kabyle Variety*. University of Oran, Unpublished Ph.D Thesis.

CRYSTAL, D (1999) *The Cambridge Encyclopaedia of The English Language*. 4th ed. Cambridge: Cambridge University Press.

DEMERS, R. A; AKMAJIAN, A; FARMER, A. K and HARNISH, R. M (2001) *Linguistics: An Introduction to Language and Communication*. 5th ed. Massachusetts: The MIT Press.

DENDANE, Z (2006) *Sociolinguistic Variation and Attitudes towards Language Behaviour in an Algerian Context: The Case of Tlemcen Arabic*. University of Tlemcen. Unpublished Ph.D Thesis.

FINEGAN, E (1999) *Language: Its Structure and Use.* 3rd ed. Fort Worth: Harcourt Brace College Publishers.

MILROY, L. and GORDON, M (2003) *Sociolinguistics: method and interpretation*. Oxford: Blackwell.

TRASK, R. L (2004) *Key Concepts in Language and Linguistics*. 2nd ed. London and New York: Routledge.