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DETRANSLATION: SPANGLISH FROM A NEUROLINGUISTIC POINT OF VIEW

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Abstract

Despite currently growing sociolinguistic research on Spanglish, it is a very peculiar linguistic variety, which cannot be understood without a careful analysis of its neurolinguistic background. This paper argues that a theoretical neurolinguistic view on Spanglish has to consider the cortex, where English-like words are located, the limbic system, where Spanish paradigms are stored, and the bundles of nerves that bind up both of them. Spanglish is an example of detranslation, a kind of negative translation.

Key words: detranslation, negative translation, neurolinguistics, Spanglish.

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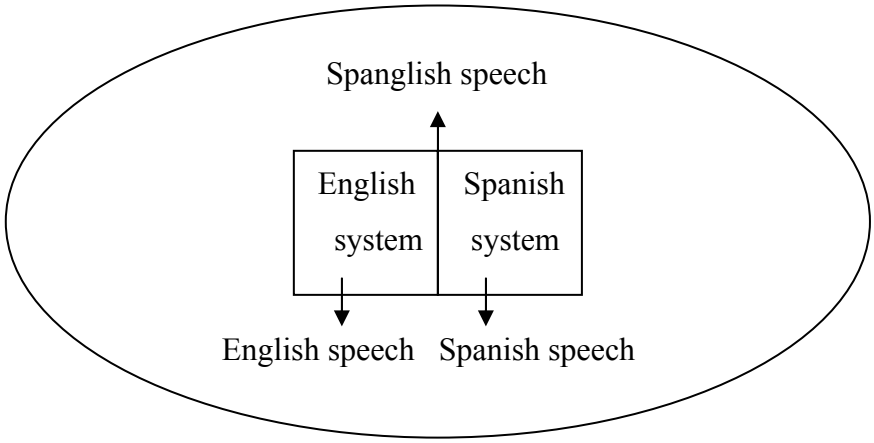
1. The neurolinguistics of Spanglish

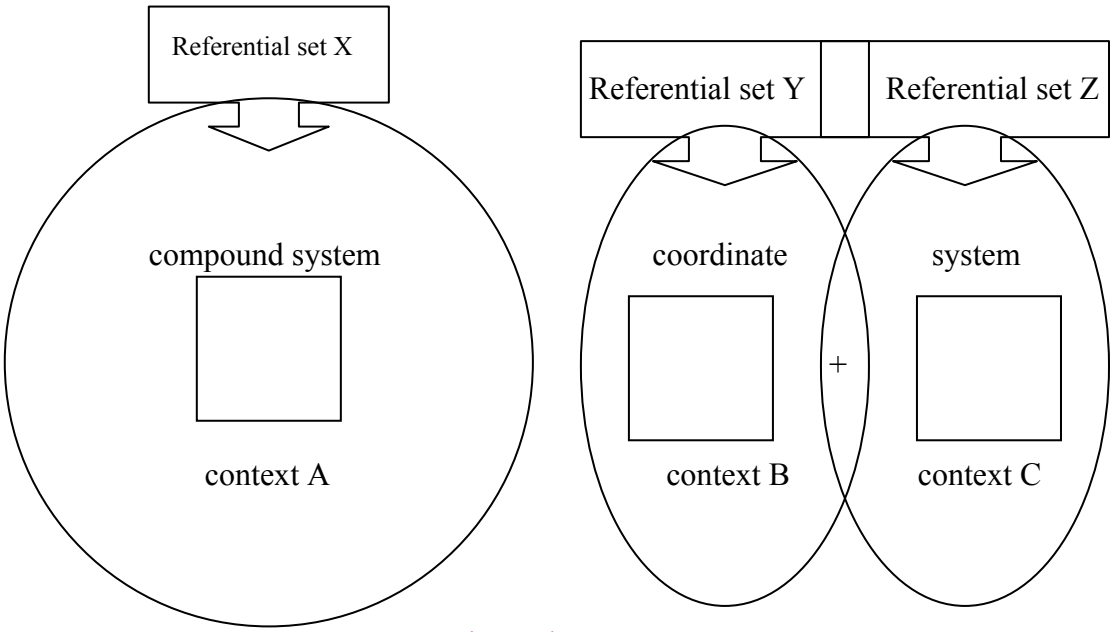
Unlike much of the work on Spanglish, which is based on contemporary data, the study of the neurolinguistics of Spanglish is necessarily confined to theoretical abstraction. We know what people that speak Spanglish do, but we ignore how they do. Neurolinguistics has certainly penetrated the limits of experimental research and nowadays it benefits a lot of experimental techniques such as PET, EEG, or fMR. However the time has not yet arrived that we can ask people to lend on a stretcher, put their head into a kind of helmet, get relaxed and begin to speak Spanglish fluently whereas a monitor registers the variation of blood quantity in some areas of the brain. This is due to the fact that Spanglish absolutely depends on the context of use for it is not a new American language, but a new American way of speaking. You can ask some test subjects to associate a list of Spanish words or a list of English words to a prompt word, but to ask them that the list be of Spanglish words is nonsense because every word is prompted by its own external circumstance. This means that Spanglish is not a linguistic competence we store by heart in the brain, but a linguistic performance we develop occasionally in bilingual contexts of the USA (also in Gibraltar or everywhere Spanish and English have met). Spanish and English are linguistic systems that have each its own performance; Spanglish is a performance that holds on the linguistic systems of Spanish and English either simultaneously or alternatively:

Figure 1



It is by no means clear how are organized in the bilingual brain the two coexisting linguistic systems represented by contiguous squares in the picture. As it is known, Ervin and Osgood (1954) distinguished two possibilities, the compound and the coordinate bilingualism. When people acquire two languages in the same context they become compound bilinguals and have compound systems, i.e., systems in which two languages simply constitute two different ways of encoding the same set of referential meanings. When people acquire two languages in separate contexts, however, they become coordinate bilinguals and have coordinate systems i.e. systems in which the referential meanings encoded in the two languages differ to a considerable extent:

Figure 2

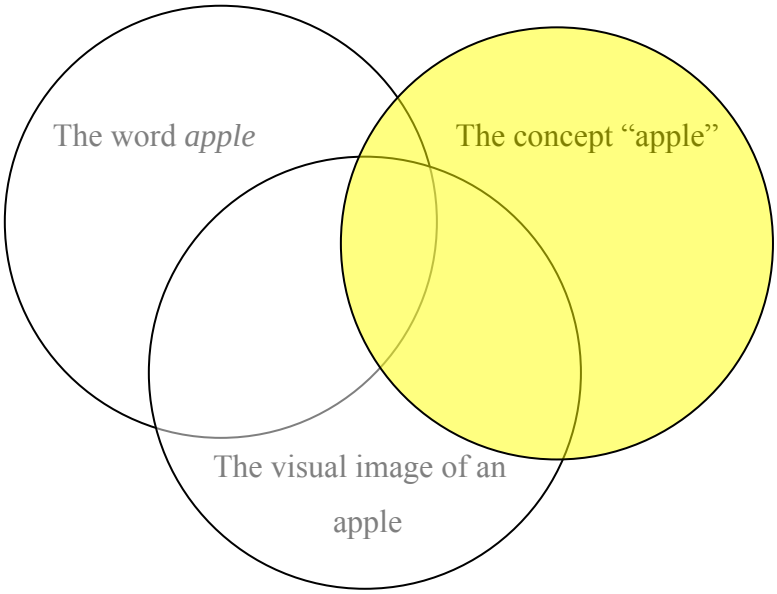


The distinction by Ervin & Osgood emphasized the acquisition settings, but did not explain how should the respective minds of the bilinguals look like. Since then many proposals have been made in order to think them up. Penfield and Roberts (1959) supported the *critical period hypothesis* that establishes a sharp distinction between first language acquisition and second language acquisition, and states that after the crucial time in which children acquire their first language, they will never achieve a full command of language, which has been shown by many experimental findings and case studies (Genesee, 1982; Johnson & Newport, 1989; Birdsong & Molis, 2001). As a consequence, first language ought to exhibit a mental organization which does not coincide with that of second language. This topic is related to brain lateralization. It has been supposed that the differences between L1 and L2 are due to the brain hemisphere where each linguistic ability is settled, L1 being supposed to belong to the dominant (generally the left) hemisphere, L2 to the dominated (usually the right) hemisphere (Albert and Obler, 1978). Some counterexamples challenged this hypothesis –Proverbio & Mado (2011) showed that linguistic functions are less lateralized in poliglots than in monolinguals– and, anyway, lateralization hypothesis does not allow us to figure out the neural patterning of coordinate brain vs. the neural patterning of compound brain.

2. Memory

A set of neurological mechanisms has been investigated in order to understand the neurobiological foundations of memory. However, the interesting thing here is to point out that at the same time they fulfil a crucial role in *categorization*, since in order to mentally construe a category, beforehand we need to have stored various similar stimuli in memory. A conceptual category is the result of abstracting what the elements of a group of stimuli have in common thus constructing a proto-stimulus. Said proto-stimulus could be a visual image – the general image of what an apple is, – a concept – the idea of ¨apple¨-, a word – the word *apple-,* etc. And yet more: the mental category that supports the word *apple* shares several neural connections with the mental category that supports the idea of "apple" and with the mental category that supports the general visual image of apple:

Figure 3



The visual image of the apple is the result of receiving successive visual images of concrete apples: the first of which did not produce a category (probably a wider category was built which also included pears, oranges or peaches), but soon the category was formed. Thanks to said categories we are capable of recognising what I see as an apple, the idea I am forming in my mind as the concept "apple" or the sounds I hear as a realization of the word *apple*. In all of these cases the stimulus was acquired along with a stronger stimulus, but then, without this stronger stimulus, it was enough to simply evoke the context in which it occurred. Consider the following photograph of an apple:

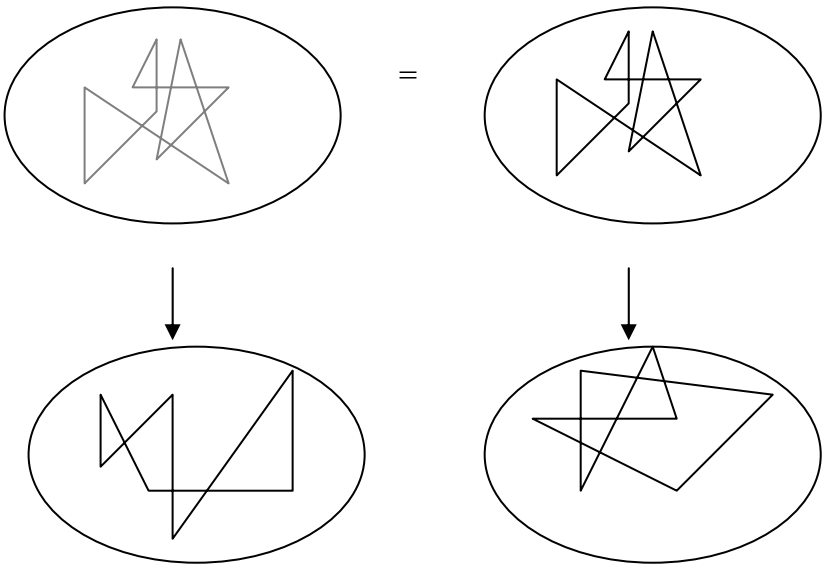
Figure 4: A perceived apple

How, in fact, do we know we are talking about an apple when we have not seen this exact tree and piece of fruit before? Probably because, compared to what happens with

many other types of wild fruit that we happen to see as we are walking in the countryside and whose names we do not know, our retinas have been exposed many times to apples, associating them with strong stimuli throughout our lives: the mother who gave us an apple for an afternoon snack, the garden we used to play in and where we picked up apples from the ground, and the supermarket shelves when we used to go shopping, etc. The result of all of this is that visual images of apples have been reinforced and have become recorded in memory as a proto-image of an apple. Similarly, proto-concepts and proto-words are formed.

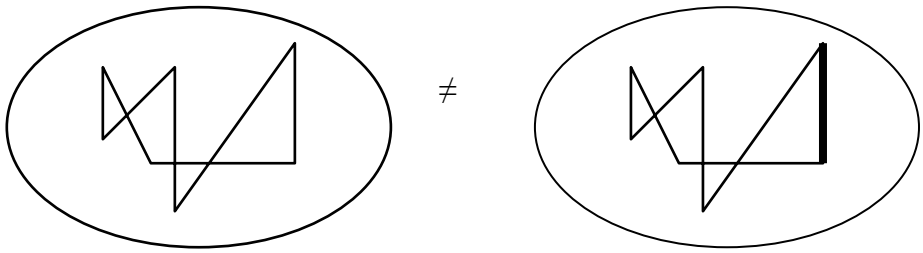
Edelman's (1987, 1988) TNGS (the *Theory of Neuronal Group Selection*) constitutes a plausible hypothesis about how these proto-images form. Its empirical foundation is built on the well-known observation that, often, neighbouring cells which have received the same stimulus establish a synaptic correlation between themselves (Singer, 1979), which demonstrates that proximity contributes to the formation of webs. However, it is also the case that two isogenic daphnias (Macagno et al., 1973) with the same number of neurons were very different as regards their connectional ramifications, which brings to mind the case of the twins which, despite having the same genotype, developed in completely different ways phenotypically. Edelman concluded that the neurons organised themselves in primary records consisting of groups of neurons in whose interior webs of variable neurons were established by processes of migration, adherence or neuronal death, similar to those of Darwinian natural selection (here termed neuronal selection):

Figure 5: Primary records



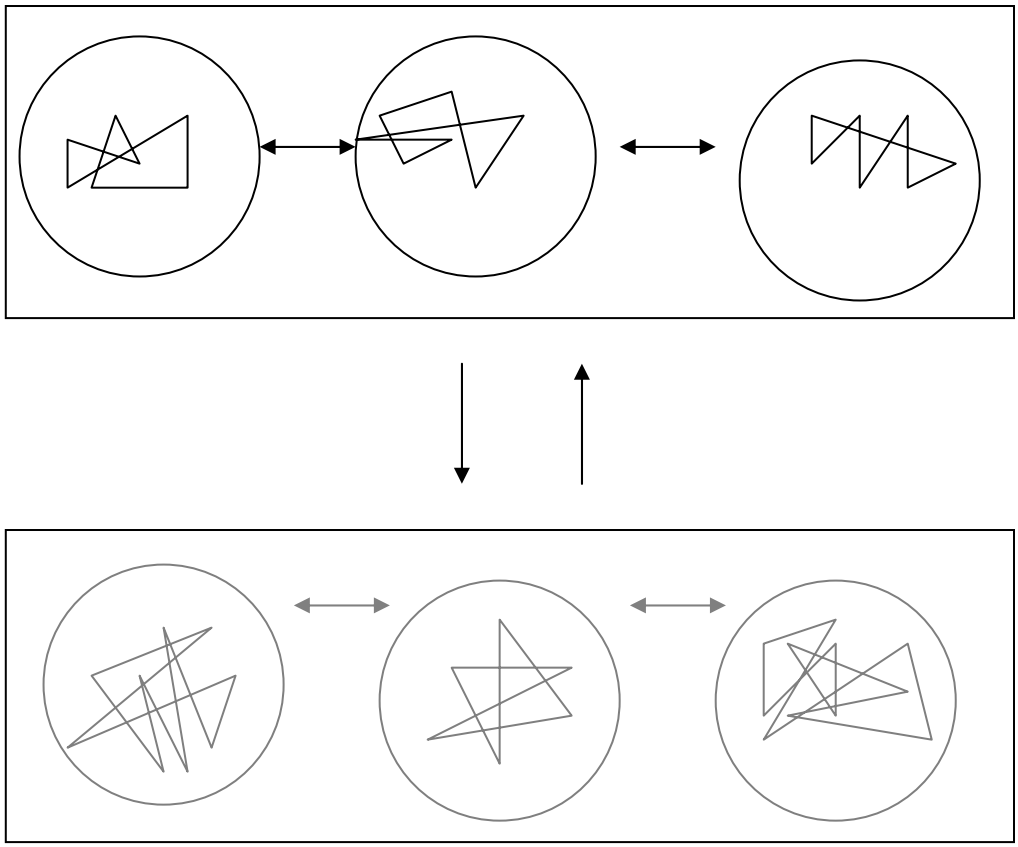
The next step is the reinforcement of some of the synapses. Following on from the numerous experiments carried out by Hubel and Wiesel (1969), the stimuli in the surrounding area can induce a selective response to the primary records, each of which is sensitive to a determined type of stimuli: hence we get to the *secondary records*, which are characterised by certain neuronal connections which are especially sensitised to determined stimuli:

Figure 6: Secondary records



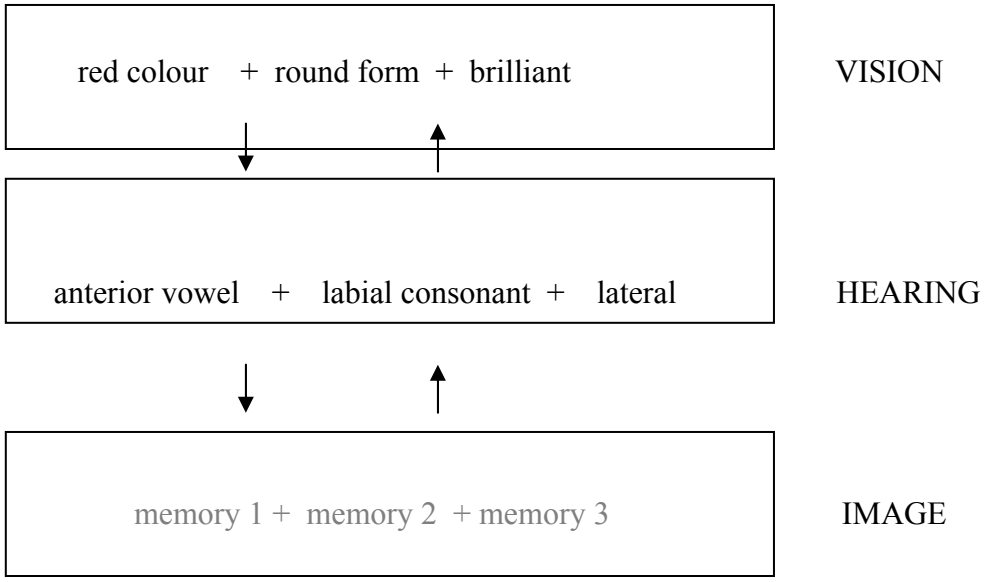
Up to this point, Edelman's hypothesis has been experimentally confirmed. But the most interesting thing lies in the third step for which, unfortunately, there is no direct empirical evidence: *topographical maps*. Topographical maps would be sets of groups of neurons which work at the same time and are bound by parallel reciprocal connections, termed the *re-entries*. However, according to Edelman (1992), indirect evidence exists: he believes that the retinoscope shows that in the visual perception of objects different groups of neurons collaborate, of which one deals with colours, another with movement and so on:

Figure 7: Topographic maps



Up to recently, Edelman's theory was only a suggestive hypothesis to explain the process of neuronal integration of the codification of cerebral areas which produced a mental image. For example, related to the apple mentioned before, what would happen is that its form would excite a specific group of neurons, its colour a different one, its sheen another, etc., thus resulting in a topographic map. At the same time the sense of hearing would produce a second topographic map based on exciting groups of neurons which specialize in labial sounds, in anterior vowels, etc. A third topographic map would be made up of the mental image ¨apple¨, which is the result of previous experience with this fruit, and so on:

Figure 8: APPLE

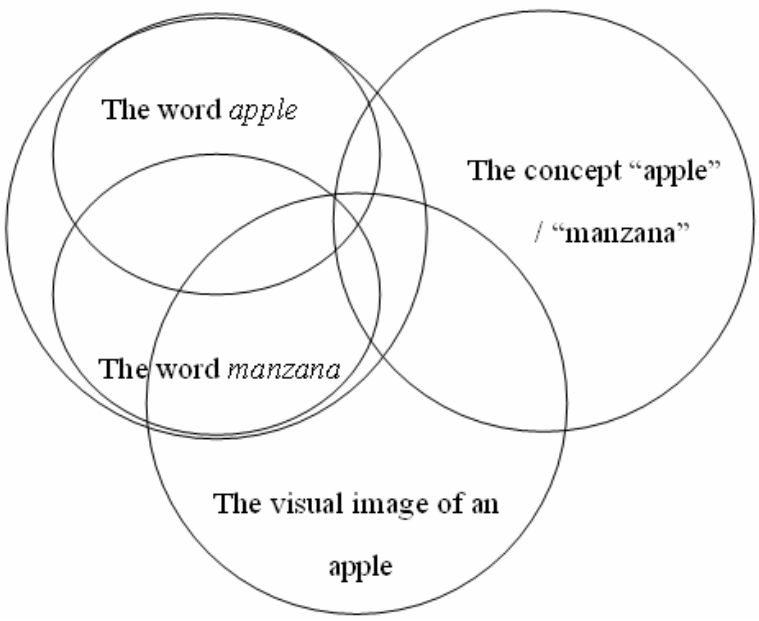


The problem which Edelman faced is that in strictly localizationalist terms this hypothesis has only proven visual perception, it has hardly proven the other senses, and of course, it has not provided any proof of other faculties which are less bound to physiology such as remembering visual images or, even more so, thought (the concept ¨apple¨) or language (the word *apple*). However, the relevant fact of this theory is that associations are not embodied in specific combinations of neurons. On the contrary, the vast amount of neuronal net-works are functionally degenerate, so any single function can be carried out by several non-identical neuronal configurations. This model enables us to bridge the gap between cognition and verbalization. While the genetic code provides for the anatomical topography of the brain, and stimuli overlap, linguistic wiring pathways presumably reorder these groups according to every particular verbal pattern. Instead of identifying the cognitive and the linguistic scene, the TNGS allows us to figure out the speech activity as a dynamic global activity, the so-called Recursive Synthesis, where the previously abstracted information, the concept, continuously receives re-entering linguistic maps forming a global mapping.

The explanation above excludes that coordinate bilingualism can be right. If the mental networks that underlie visual images, concepts and words are partially similar, it stands

to reason that the mental network corresponding to *apple* and that corresponding to *manzana* have to share most of their connections:

Figure 9



However, surprisingly enough, the idea of coordinate bilingualism is not necessarily wrong. We know that people who are beginning to learn a second language usually think over in their first language the proposition they are trying to say, and finally give off a second language utterance, which inevitably exhibits some mixed linguistic features. The question now arises why coordinate bilingualim succeeds, although it should not.

3. Lexicon-syntax interface

The lexicon-syntax interface is one of the most controversial issues within grammar topics. Obviously, a word cannot be combined with any other word, thus certain lexemes determine others. For example, it would appear that a verb like *eat* can only lead prototypically to a direct complement defining something that can be eaten, such as *apple*, and take a subject like a human or an animal, for example, *the girl*, which gives us the sentence *the girl is eating an apple* and excludes **the sun is eating an apple* or

**the girl is eating freedom*. Given *the girl* and *an apple* have an independent referential entity, which *is eating* lacks, it is agreed that *is eating* governs the ordered pattern /animate subject...edible object/ in which the aforementioned terms are inserted *the girl* and *an apple* and not the reverse, although we could also draw up a list of verbs that can follow *the girl* as a subject in English. However, "prototypically" means that deviations are possible, ranging from what we usually call a *collocation* to the pure and simple *idiom*. The expression *she eats money* would be an extension of prototypical use of *eat* and we consider it to be a collocation because the variation of subject is quite limited as is the object (*my car eats petrol, he eats books*…). By contrast, the expression *to eat one's heart out*, in which lexical possibilities are even smaller, is considered an idiom.

With respect to the lexical-syntactic relationship the proposals made conform to the aforementioned pattern. The syntax is a combination of terms and, naturally, to form the sentence *the girl is eating an apple* we must choose the lexemes *girl, to eat,* and *apple* from a store in our memory, check their mutual compatibility, and insert them in a suitable abstract sequence that is in turn compatible with the circumstances of the utterance, enabling this formal sentence to become a statement.

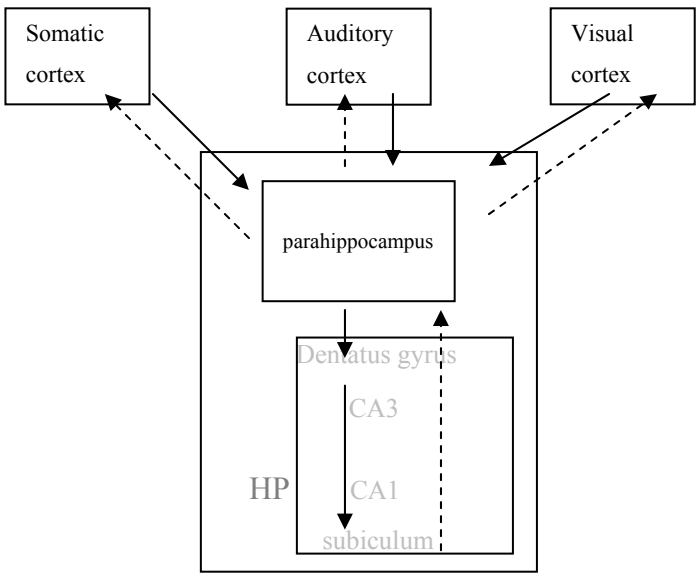
To understand how interface processes can work neurologically we must consider the structure of memory (López-García, 2011). Basically there are two types of memory (Baddeley, 1982) that were differentiated by a number of experimental tests with further subdivisions in each: short-term memory (STM) and long-term memory (LTM). The first retains information for a few seconds whereas the second retains information for long periods that can last a lifetime; however, while STM reproduces the original accurately (enabling us to capture in our brain the image of a landscape from our retina or the melody of a song we hear), LTM is a mental process that can sometimes seriously alter the original perception. Obviously both lexicon and syntax belong to long-term memory, as the speaker resorts to mnemonic stores to choose a particular syntactic-semantic pattern and certain suitable lexemes. Likewise, the listener breaks the message into its component parts, pattern and lexemes, and remembers them in the LTM. Naturally, this does not prevent the specific emission from lasting a few seconds in the STM for both interlocutors when the sentence is uttered.

Another type of empirical determination enabled the differentiation within LTM of the

so-called implicit memory (non declarative) and explicit memory (declarative). Findings revealed that patients, mostly epileptic, who had undergone a lobotomy of the temporal lobe, particularly if it affected the hippocampus, were unable to recall facts and knowledge about the past, but were able to learn new skills, although they failed to remember when they did so. Something similar happened with amnesic patients or those with Alzheimer's who were able to recall a list of words when provided with the first syllable of each (priming) beforehand, but were unable to do so by making the conscious effort to remember them alone. This led to contrast two subtypes within long-term memory, explicit and implicit memory (Squire & Kandel, 1999).

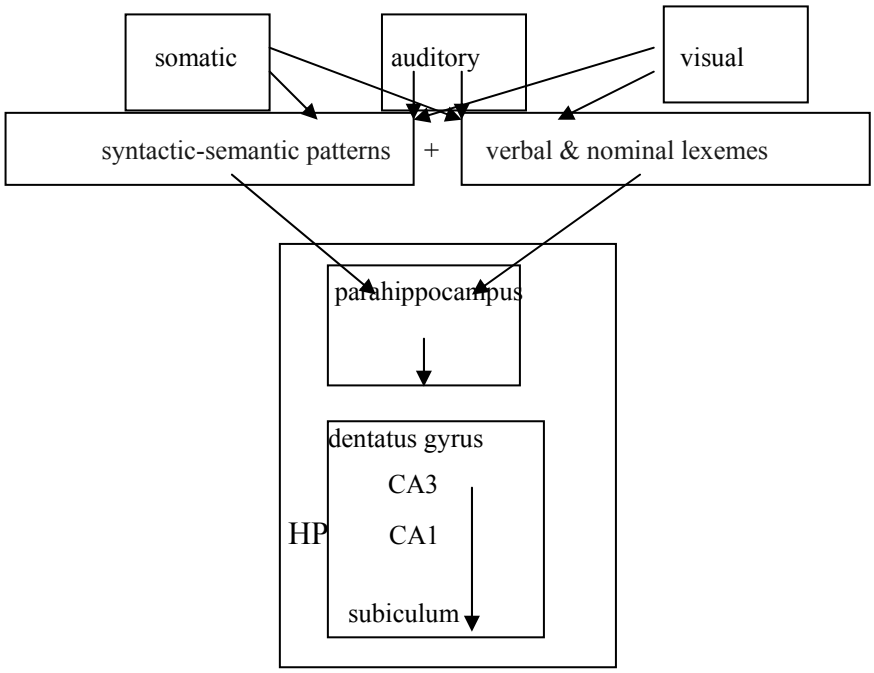
With respect to explicit memory, its neural connections are fairly well known (Suzuki & Amaral, 1994). The hippocampus and parahippocampus make up the mnemic system of the medial temporal lobe, which belongs to the limbic system and, as such, is not part of the neocortex. The parahippocampus or rhinal cortex integrates multifunctional impulses (visual, auditory and somatic) carrying a single signal to the hippocampus (HP) where it is reprocessed by three successive layers (the dentatus gyrus, CA3 and CA1) to reach the subiculum, which re-dispatches the signal once more to the parahippocampal area and from there to the neocortex (Le Doux, 2002, 104):

Figure 10



All these data come from research conducted on monkeys to test the processing of visual or acoustic stimuli and storage in the memory of visual images or melodies. This information has been extrapolated to humans because the experiments (which often maim the animals) are naturally forbidden on ethical grounds. The problem is how to proceed in the case of syntactic patterns and the words which fill them. When we acquire our native language patterns we mentally incorporate the lexemes at the same time. For example, the sentence *the postman put the letter in the mailbox* provides us with an actantial outline of the type "Agent - Object - Place", a verb *put* subcategorized specifically as *put*Ag, Obj, Pl and three nouns *postman*Animate, which is a good candidate for the Agent, *letter*inanimate, which is a good candidate for the Object, and *mailbox*place to store things, which is a good candidate for Place. Initially these subcategorizations have a referential contextual basis, that is, they despatch to the visual, the auditory and somatic cortex although, with time, this is also established co-textually. All this information is processed by the hippocampus (HP) following similar steps to those outlined in the figure above and is stored for a while in the limbic system:

Figure 11



However, the patterns and lexemes do not follow the same course in the retrospective phase. Lexemes represent a type of knowledge that requires conscious cognitive effort to be retrieved, something that is not always achieved or achieved in varying degrees,

depending on the ability of the subject (compare the retrieval of a writer with that on ordinary speaker) or the inspiration of a given moment. By contrast, patterns are automatic, we extract them from our memory store as we need them and, furthermore, all native speakers of a language do it in the same way. All Spanish speakers have the same set of syntactic-semantic patterns, which has been inventoried as a paradigm, but not the same lexical availability with respect to lexemes. The same happens to English speakers in relation to their language. Hence it follows that the subiculum sends lexical information back to the neocortex, where it is stored, but not the information about syntactic semantic patterns. The latter face the same fate as other automatic-type cognitive and motor abilities, like riding a bike or recognizing the faces of friends, which are maintained by implicit memory and learnt by behavioural conditioning.

All this leads us to assume that syntactic-semantic patterns are either processed by the hippocampus along with lexemes, but are then stored in parts of the limbic system unconnected to the cerebral cortex, or are deposited directly in the latter. However, even though patterns are automatic, the speaker has some control over them, because throughout one's life some can change or their variational possibilities increase. Hence the first option seems the most reasonable. The patterns are similar in their memory function to the so-called habitual memory (deeply-rooted habits: Dudai, 1989) and thus presumably stored in the caudate nucleus:

Figure 12

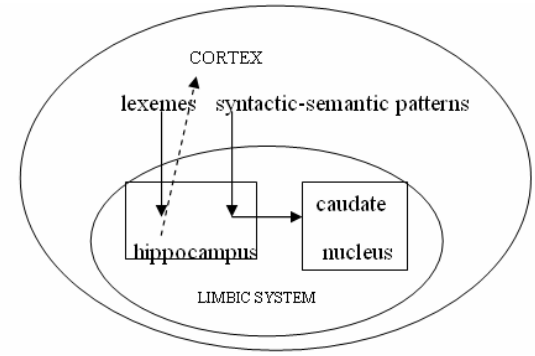


Figure 12 above explains how two languages interact when they meet in the same bilingual brain. Since lexemes and syntactic-semantic patterns are separately kept in the monolingual mind, no wonder that they continue this way in the bilingual one. For example, if these languages are English and Spanish, a theoretically attainable disposition would be as follows:

Figure 13a

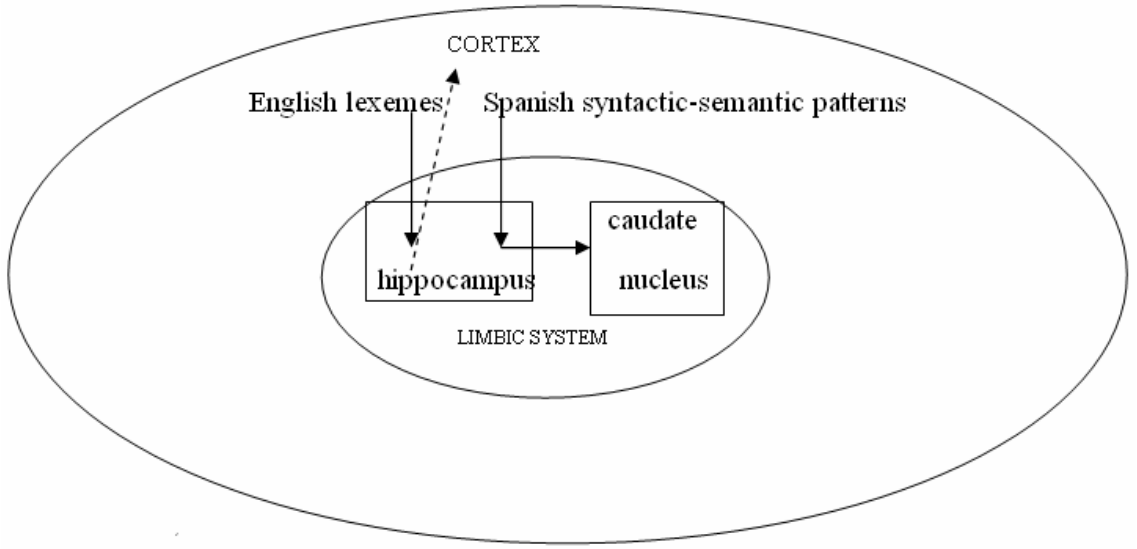


Figure 13a represents a bilingual pattern where the functional slots of a Spanish grammatical pattern are entirely filled in with English words, something like **to my mother her saw in the bakery*, which consists of:

[a mi madre la vi en la panadería]

to my mother her saw in the bakery

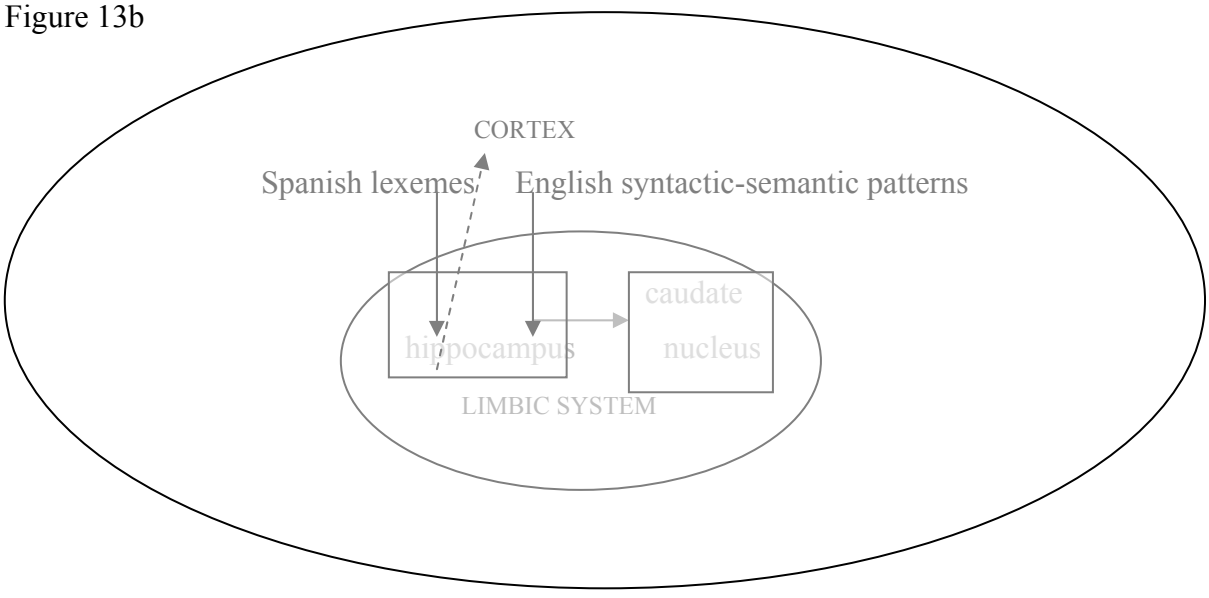
instead of the English well formed sentence *I saw my mother in the bakery*. The opposite mixed pattern would be **yo vi mi madre en la panadería,* where the functional slots of an English grammatical pattern are filled in with Spanish words, as in:

[I saw my mother in the bakery]

yo vi mi madre en la panadería

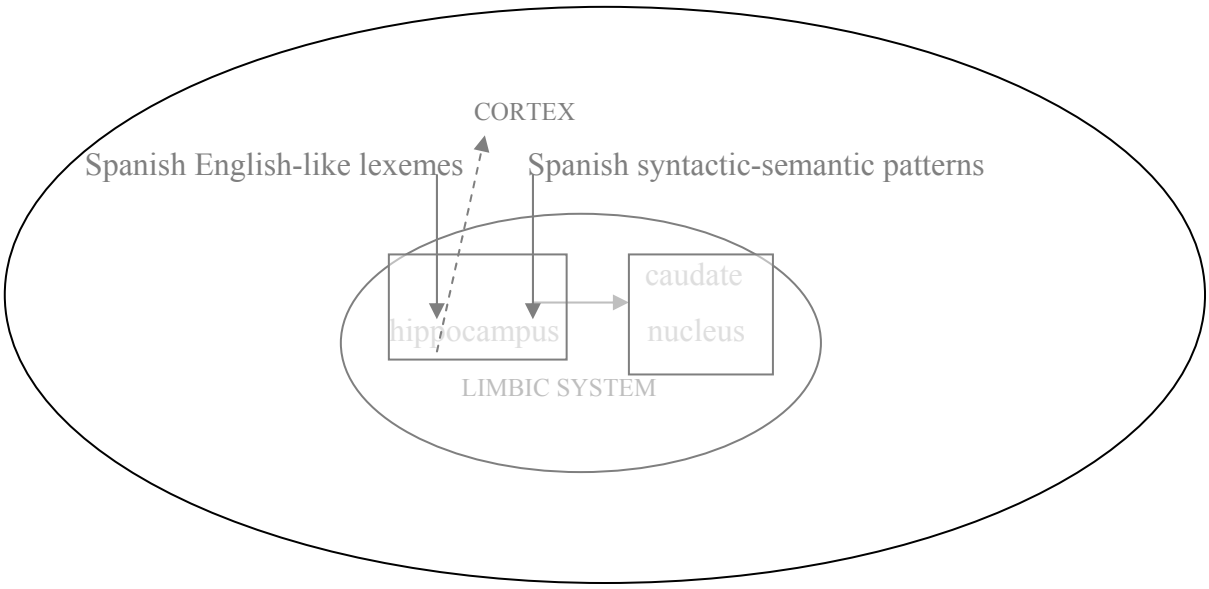
which can be represented by figure 13b:

Figure 13b



Needless to say that Spanglish, as a prototypical type of Spanish and English language contact, exhibits either tokens that approach 13a, like *deliberamos groserías* ("[we] deliver groceries"), or tokens that approach 13b, like *ahorita te llamo pa'trás* ("I call you back right now"). Nevertheless type 13a does not exhibit real English lexemes inserted in Spanish patterns, but rather Spanish anglicisms inserted in Spanish patterns. This is due to the fact that Spanglish is a porous dialect of Spanish (López-García, 2010), not of English, and people that speak Spanglish are aware that they yet remain inside the domain of the Spanish language despite their attempt to approach English as a L2. The most accurate representation of 13a would be then 13a':

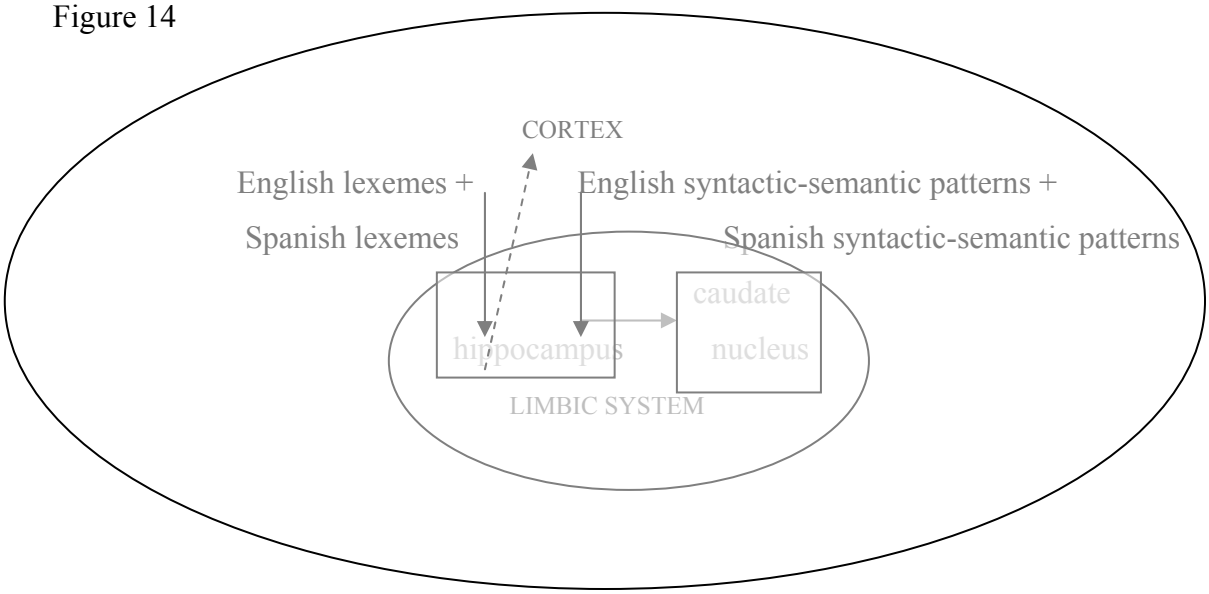
Figure 13a'



4. Coordinate and compound bilinguals

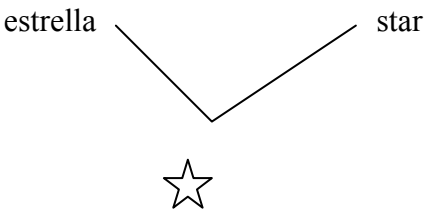
Figures 13a' and 13b represent typically coordinate bilingual situations because the speakers do not master the English language. But the word "Spanglish" also refers in the literature to the code switching practiced by compound bilinguals who have a good knowledge of both languages. In this case there is a unique lexicon consisting of Spanish and English words and a unique set of grammatical patterns of both languages in spite of the speakers' awareness that they are employing two languages:

Figure 14



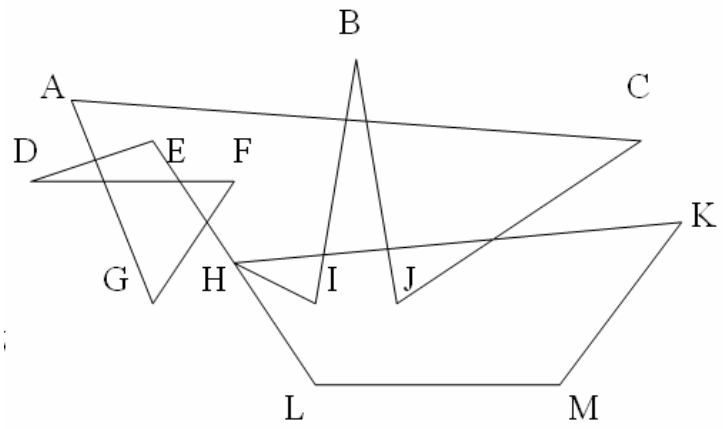
Compound bilinguals do not store two separate lexicons in their brain because, as said above, words are not attached to its referent as a whole, but they rather belong to networks of features where perceptual and cognitive features are related to phonic labels. The organization of mental networks that include lexical items in the bilingual brain does not look like figure 15:

Figure 15



but it rather looks like figure 16:

Figure 16



where A, B, C… are neural nodes that support whichever cognitive feature, be it perceptual –"bright"–, intellectual –"brilliant"–, or phonological –/estrélya/, /stár/–.

Thus, an amazing contradiction arises: *compound bilinguals* [call them "Spanglish speakers I"], who practice Spanglish by means of code switching, *are convinced they possess the two languages, English and Spanish, separately*; on the contrary, *coordinate bilinguals* [call them "Spanglish speakers II"], who do not master the English language and who practice the filling of grammatical slots of one of the two languages with lexemes of the other, sometimes *think they are speaking English* and have a unique language in their brain any way. This contradiction is born because speakers have a metalinguistic awareness that does not necessarily fit their linguistic behavior. The situation can be summarized as follows:

Figure 17

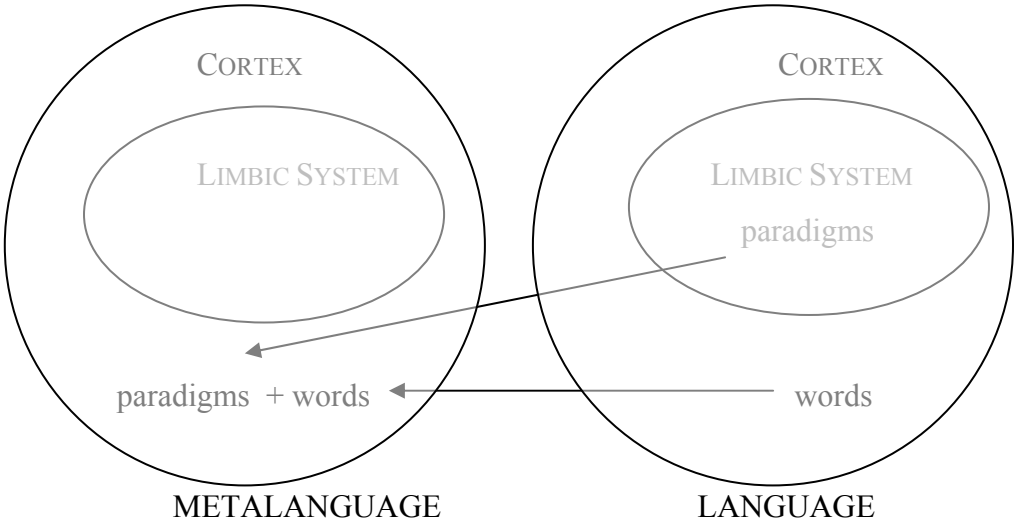
	Type of discourse	Metalinguistic awareness	Linguistic behavior
Compound bilinguals	Code switching	Two languages	One neural network
Coordinate bilinguals	Language mixing	One language	Two neural networks

Lexical variation belongs to the linguistic consciousness of the speakers of a language but does not strongly affect their feeling of forming a unique speech community. In fact, they know how to choose lexical items in order to approach the linguistic consciousness of the others. On the contrary, this seems rather difficult in syntactic variation because it

would be necessary to change the entire paradigm. Hence, intralinguistic variation especially characterizes lexical relations, whereas syntactic relations apply rather to interlinguistic variation (López-García, 2013): people are not surprised that English *table* is called *mesa* in Spanish, but are amazed when they learn that English *to fall in love with someone* is translated into Spanish as *enamorarse de alguien*. Consequently, employing lexical anglicisms, as coordinate bilinguals of Spanglish do, is conceived of as a kind of variation that distinguishes the speakers of Spanish in the US from the Spanish speaking people abroad, whereas employing alternative grammatical patterns, as compound bilinguals of Spanglish do, is considered to speak two separate languages. Consciousness, as argued by Blackmore (2003), is a delusion: in the case of Spanglish this delusion turns the empirical facts of linguistic behavior down.

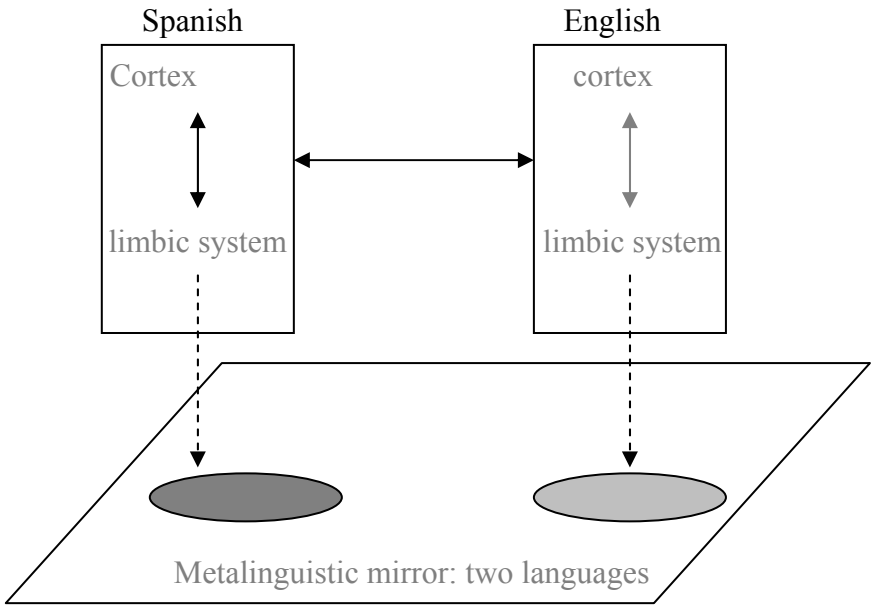
I have recently pointed out (López-García, 2012) that, although grammatical paradigms are located in the limbic system and lexical nets in the cortex, the awareness of both, that is their metalinguistic knowledge, belongs to the cortex for this is the realm of consciousness:

Figure 18



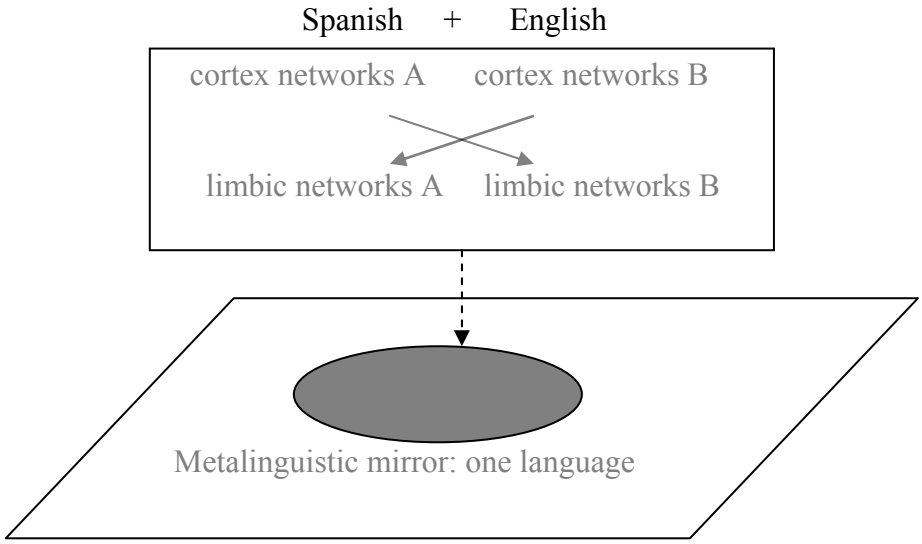
This explains the contradiction I have emphasized above. Since the neural network of perceptions, cognitions and linguistic features does not distinguish every language from one another, the performance of Spanglish speakers I, who are fluent in English and in Spanish, proceeds by changing constantly between both languages and by going from the cortex to the limbic system inside each of them. At the same time, however, this process is projected in the mirror of metalinguistic consciousness as a two languages system:

Figure 19: Spanglish speakers I (compound bilinguals)



On the contrary, Spanglish speakers II simply insert pseudo English lexical items into the slots of Spanish grammatical patterns or Spanish words into the slots of pseudo English grammatical patterns, but project a single metalinguistic image, namely that there is only a language, Spanglish, no matter they consider it to be a dialect of Spanish, as it certainly is, or even of English:

Figure 20: Spanglish speakers II (coordinate bilinguals)



5. Conclusion

To conclude: Spanglish is a token of what I would like to call *detranslation*. As it is known, *translation* derives from the Latin TRANSLATIO, which itself comes from TRANS ("across") and LATUM (the past participle of FERO, "to carry"). *Detranslation* is, then, the refusal to translate from A to B because of the assumption that both languages are compatible. Spanglish is not a new language which results of mixing two preceding languages. It is a linguistic behavior supported by the knowledge of two languages and the wish to put them together. Like translation detranslation belongs to performance, not to competence.

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