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A NEUROCOGNITIVE ANALYSIS OF IDIOSYNCRATIC SEMANTIC BORROWINGS IN THE DISCOURSE OF BILINGUAL ROMANIAN IMMIGRANTS IN SPAIN

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ABSTRACT. ***A Neurocognitive Analysis of Idiosyncratic Semantic Borrowings in the Discourse of Bilingual Romanian Immigrants in Spain*.** In this paper we look at the semantic borrowings that spontaneously emerge in the oral discourse of bilingual Romanian immigrants who live in Spain, and we analyze them from a neurocognitive perspective. Also known as Relational Network Theory, this approach conceives language as an interconnected relational network composed of nodes and lines. Linguistic processing is a result of spreading activation through the network. We use this approach to explore the mechanisms underlying the oral production of semantic borrowings selected from corpora of Romanian spoken in Spain, and we model them, using the NeuroLab tool, in relational network terms. The network modeling shows that these hybrid forms emerge naturally from the properties of the system and can be explained in terms of shared parts of either phonological or semantic subnetworks involved in the production of analogous forms. It also delivers additional explanation to the proliferation of mixed meaning and sound induced semantic borrowings in the form of a higher pressure for rewiring coming from two different parts of the system.

Keywords*: relational network theory*, *semantic borrowing, Romanian, Spanish, Rumañol, neurocognitive linguistics.*

REZUMAT. ***O analiză neurocognitivă a calcului semantic spontan în vorbirea imigranților români bilingvi din Spania*.** În această lucrare, ne ocupăm de cazurile de calc semantic care apar în mod spontan în vorbirea imigranților români din Spania și le analizăm dintr-o perspectivă neurocognitivă. Cunoscută și sub numele de Teoria Rețelelor Relaționale, abordarea neurocognitivă concepe limbajul ca pe o mare rețea relațională interconectată, compusă din linii și

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noduri. Procesarea lingvistică este rezultatul răspândirii activării prin reţea. Folosim această abordare pentru a explora mecanismele interne care stau la baza apariţiei unor cazuri de calc semantic, selectate din corpusuri de limbă română vorbită în Spania şi le modelăm, cu ajutorul aplicaţiei NeuroLab, sub forma reţelelor relaţionale. Modelul de tip reţea arată că aceste forme hibride rezultă în mod natural din proprietăţile sistemului şi pot fi explicate prin faptul că reţelele distribuite implicate în producţia formelor analoage au în comun anumite porţiuni ale reţelelor fonologice sau semantice. Modelul oferă de asemenea o explicaţie adiţională proliferării formelor mixte bazate atât pe sens cât şi pe forme fonologice similare, sub forma unei presiuni mai ridicate de a se forma noi legături în reţea sub influenţa a două regiuni diferite ale sistemului.

***Cuvinte-cheie**: Teoria Reţelelor Relaţionale, calc semantic, română, spaniolă, rumañol, lingvistică neurocognitivă.*

1. Introduction. The way in which bilinguals process linguistic information has received increasing attention in recent decades. Several models have been proposed since Weinreich (1953/1974) laid the foundations of language contact studies. It has been suggested that the explanatory capabilities of those models depend on a series of properties, such as *stratification*, *connectivity* and *distributed representation* of linguistic information, and that a theoretical model combining those features would, arguably, have even higher explanatory capabilities. The RNT (Relational Network Theory) model (Lamb 1999, 2016) has been proposed for the task (Buzilă 2020). By applying the RNT model to bilingual processing, it has been argued that distinct languages should be modeled as conceptual nodes that function similarly to semantic nodes in driving lexical selection within a relational network (Buzilă 2020). In the present paper, we test this assumption by applying the model to real-life cases of semantic borrowings observed in the oral discourse of Romanian immigrants living in Spain. If the model is valid, it should be able to describe the structural properties of the networks as well as the dynamic mechanisms modifying those networks in such a way that the system leads to the production of hybrid forms like the ones we analyze.

2. Theoretical and methodological background. The examples we analyze in this paper are selected from studies on the Romanian variety spoken in Spain. Some of those studies are accompanied by substantial corpora (Buzilă 2016; Jieanu 2012), but most of them only include a limited number of examples (Munteanu Colán 2011; Uţă Burcea 2010). By selecting all cases of semantic

borrowings and gathering them in one place, we were able to put together a corpus for this analysis. In identifying relevant cases we relied mostly on Haugen (1950)'s definition of semantic borrowing as cases of using a word or a phrase in L1 with a meaning which that word does not actually have in that particular language, but which its counterpart in L2 does have. Unlike Haugen, we preferred the term *borrowing* rather than *loan*, due to its wider use in language contact studies in recent decades (Clyne 1977; Humbley 1974; Kiesler 1993; Muysken 2000, 2013). In line with Haugen (1950) 's distinctions and subsequent clarifications (Grzega 2003), we also differentiate three types of semantic borrowings:

- meaning (M) induced semantic borrowing: transfer of meaning from a word in L1 to a phonologically different word in L2 when the two words have at least one meaning in common;
- sound (S) induced semantic borrowing: transfer of meaning from a word in L1 to a phonologically similar word in L2, when there is no semantic relationship between the two;
- meaning and sound (M&S) induced semantic borrowing: transfer of meaning from a word in L1 to a phonologically similar word in L2, when the two words have at least one meaning in common.

After compiling our corpus, a quick quantitative analysis was performed with the aim of identifying the most frequent cases in each category, so that we can perform the RNT modeling on the most typical cases. Out of the 204 cases (tokens), representing 102 unique forms (types) of semantic borrowings, M&S cases make up for more than 85% of our corpus[2], whereas S cases represent around 10% and M borrowings only about 5%. While some of the reasons for this distribution might be intuitively evident (e.g., the two languages have many common etymologies due to being genetically related) it will be interesting to see if the RNT analysis can offer additional explanation for these figures. In all three categories we chose to focus on cases that could be found in more than one source (which would account for their relatively successful spread in the immigrant population).

The top M&S case in our corpus is the use of Rom. *examen* ('exam') with the additional meaning of Sp. *examen* 'test'[3]. This case appeared 14 times in three different sources. The next most common cases are Rom. *a proba* ('to try on a garment') with the additional meaning of Sp. *probar* 'to taste/to try

[2] Percentages are very similar for both type and token measurements, so we are offering the average relative frequency for each category.

[3] A full explanation of the difference between the two meanings is provided in section ***3.3.***, before the actual RNT analysis of this case.

food', which appears only 4 times, but in 3 different sources, and Rom. *a aproba* ('to approve') with the additional meaning of Sp. *aprobar* 'to pass an exam', which appears five times, but in two sources only.

In the case of S borrowings, there is only one case appearing in more than one source, and that is Rom. *turn* ('tower') with the meaning of Spanish *turno* 'turn/shift'. The only M case appearing in more than one source is Rom. *a rămâne* ('to stay/to remain') with the additional meaning of Sp. *quedar* 'to meet'[4].

We used the NeuroLab application (Tisher 2010) to model in RNT abstract notation (Lamb 1999) the mechanisms involved in these contact phenomena. First, we represent the relational network underlying the correct production of the linguistic forms involved, and then, we pinpoint the changes in the connectivity of the network leading to the production of hybrid forms.

3. Semantic borrowings in RNT. RNT conceives language as a huge interconnected relational network containing no linguistic units, but nodes and lines (Lamb 1999: 59-60). Any linguistic phenomenon should be explainable in terms of activation being propagated through nodes and lines. The system is purely relational, but it does interfaces with other systems. At the bottom[5], it interfaces with the muscular system at the output (for linguistic production) and the sense organs at the input (for perception). At the upper limit, it interfaces with the overarching conceptual system, which is a multimodal cognitive system (Lamb 1999:146; 2016). It has been shown, indeed, that this relational view of language can successfully describe and explain real and inferred linguistic behaviors, both well-formed and erroneous[6] (García 2015; Gil 2016; Lamb 1999: 60, 69, 98, 143; Sullivan 1998, 2001, 2017; Sullivan & Tsiang 2017).

When applying the model to bilingual processing, it has been suggested that distinct languages can be represented as cardinal nodes participating in lexical selection (Buzilă 2020). In that view, a language, just like any other conceptual information, has both a local representation and a distributed one. This conception is represented in Figures 1, 2 and 3. In 1, semantic information (MALE / FEMALE) is modeled as nodes providing additional activation for successful discrimination between *man* and *woman*, as the upward 'and' nodes require that additional activation.

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[4] The actual meaning is 'to be in agreement'. It is frequently used for establishing meetings, and indeed, in the examples we found, it is pragmatically equivalent to 'meet'. A case like Sp. *quedamos a las tres* means *[we are in agreement that] we meet at three o'clock.*

[5] 'Up' and 'down' are notational conventions, with the upward direction going towards meaning and the downward one going towards expression.

[6] It is also worth mentioning that the model is strongly supported by neurological data (García 2017: 57-75; Lamb 1999: 320-369; Lamb 2016).

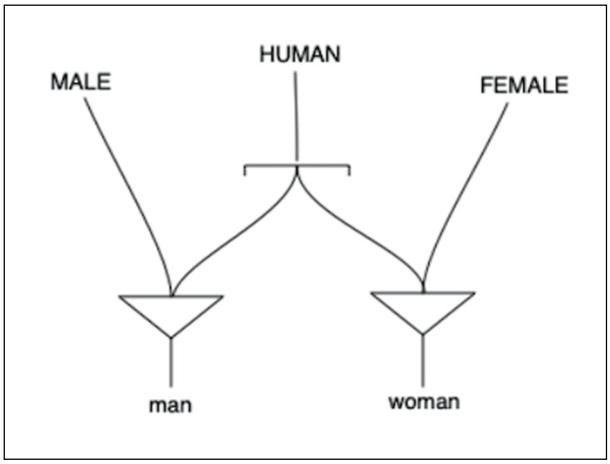

Figure 1. Lexical selection depending on semantic information.

In figure 2 contextual information (FORMAL / INFORMAL) is represented as the same kind of conceptual nodes providing additional activation for selecting *man* or *guy*. In the same way, figure 3 shows that languages can be conceived as conceptual nodes providing additional activation for successfully selecting between *man* and *hombre*. Therefore, a language can be understood either as a cardinal node in the network (local representation), or as a subnetwork composed of all nodes and lines connected to that cardinal node (distributed representation).

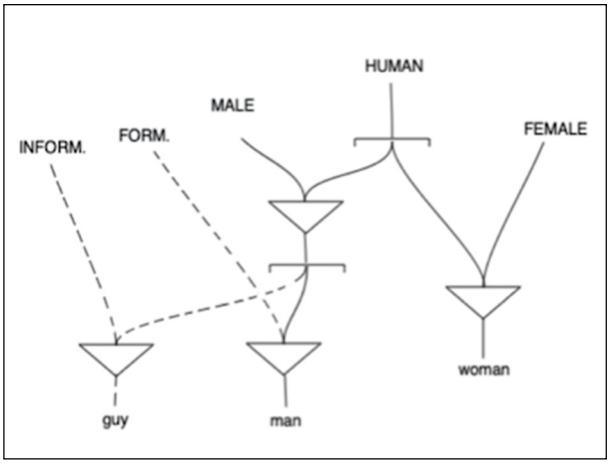

Figure 2. Lexical selection depending on contextual information.

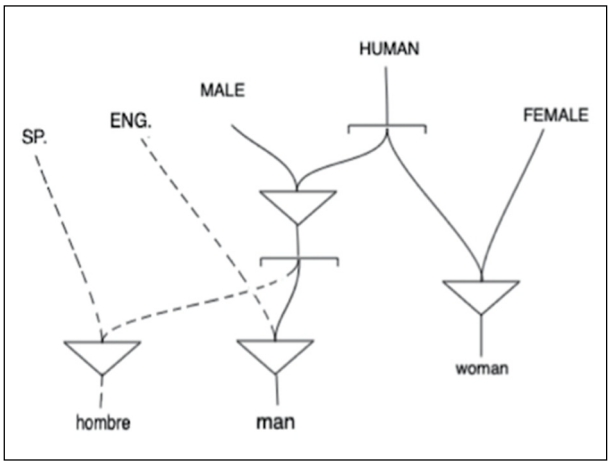

Figure 3. Lexical selection depending on language information.

If we want to understand the mechanisms leading to the emergence of hybrid forms, we need to consider the cases we analyze as being innovative, i.e., as appearing spontaneously in the discourse of individual speakers, for the first time. This clarification is an important one because it means that we will be examining the dynamic side of language processing, i.e., the kind of operations that alter the form of the network, rather than simply looking at the static network structure which allows activation to pass through already established connections (Lamb 1999: 183). The type of representations will be more similar to the ones presented in Figures 2 and 3, where dotted lines represent new connections being established within the system. That means that we will treat the cases under analysis as phenomena occurring spontaneously, in an innovative fashion in the discourse of bilinguals. It is true that we don't know if that is the actual process, i.e., we don't know if the cases recorded in the sources we used to build our corpus were actually produced in this innovative way, for the first time, at the moment of their recording. Wether that was indeed the case or not would only be relevant for a sociolinguistic analysis, but not for our approach. As far as we are concerned, there must have been a first time when a bilingual speaker produced a particular hybrid form, regardless of what happened later, if it became a part of the local norm or not. We treat all cases as if they were produced for the first time because that is actually what we are interested in: verifying if the RNT model can account for the emergence of such innovative phenomena. The way in which they spread or not in a given population, i.e., if they are adopted from speaker to speaker, is a different topic and it is not in the scope of this paper.

In section **2** we made a distinction between three types of semantic borrowings and we coded them M (meaning induced), S (sound induced) and M&S (meaning and sound induced). A good place to start our analysis would be to clarify what this difference actually means and how it can be represented in network notation. The two starting assumptions are the following:

1. Bilingual systems are nor qualitatively different from monolingual systems (Paradis 2000), so we have no reason to believe that the relational networks behind bilingual productions function differently from those accounting for monolingual productions. They will have different patterns of connectivity, but should rely on the same basic principles of network operation.

2. What we consider as distinct languages are actually subnetworks which overlap partially and which are each connected directly or indirectly to a distinct cardinal node. These cardinal nodes are connected to those lexical nodes which we call the lexicon of a particular language, and therefore they drive lexical selection (Buzilă 2020).

M cases rely on common meaning, and common meaning in a bilingual system should have the same network representation as it does in a monolingual one. We know that in monolinguals we refer to common meaning as synonymy. Therefore, we will be able to represent M cases in a way similar to that involved in synonymy in a monolingual RNT account. We don't claim that the situations should be necessarily called by the same name, but we do believe that the mechanisms and the patterns of connectivity are fundamentally identical. Synonymy and polysemy go hand in hand because sharing some meanings usually involves not sharing others, out of all the meanings that a word has, so polysemy is implied. Lamb (1999:143) showed that synonymy and polysemy are readily represented in network notation. Figure 4 is an adaptation of such a representation, with some Spanish lexemes added to the same structure, representing part of a bilingual system. Synonymy is a matter of two lexical nodes being connected to the same conceptual node (shared meaning), for example *hard* and *difficult*, both connected to DIFFICULT, but also *difficult* and *difícil*, both sharing that same meaning. Polysemy, on the other hand, means two conceptual nodes connected to the same lexemic node, for example HARD and DIFFICULT are both meanings of the lexeme *hard*. At the same time, they are also meanings of the lexeme *duro*. So both *hard* and *duro* are polysemous words, but they can also be considered synonyms[7].

The same reasoning is valid for S cases. They rely on similar or identical phonologic forms. In monolinguals, two words having the same or almost the same

[7] As explained above, we do not imply that they should necessarily be called synonyms in a traditional way, but that the underlying mechanisms are similar to those underlying synonymy.

phonologic form are called homophones[8]. Therefore, the network representation of S cases will be similar to the network representation of homophones.

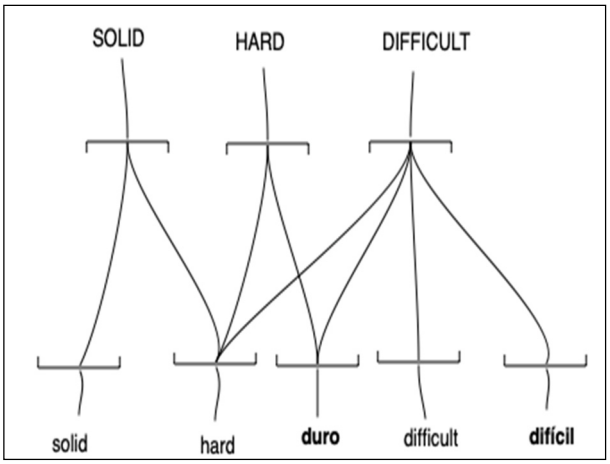

Figure 4. Synonymy and polysemy in a bilingual system (adapted from Lamb 1999: 143).

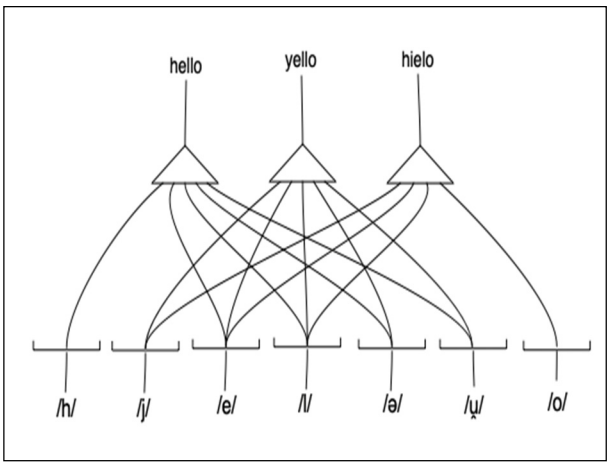

Figure 5. Homophones in a bilingual system.

[8] Perfect homophones are not that common, so technically speaking it's more a case of paronymy, but bilingual studies traditionally calls them homophones even when there is a slight difference in pronunciation (Lijewska 2020).

Figure 5 shows how most of the nodes representing phonemes are shared by the three common words very likely to be part of the lexical repertoire of a Spanish-English bilingual speaker.

Now we are ready to use the same approach for the examples selected from our corpus. We mentioned in section **2** that M&S semantic borrowings were, by far, more numerous than the other two types. From the point of view of the mechanisms involved, we can already predict, based on the previous explanations for synonymy and homophony, that the less common ones rely on mechanisms that we will find combined in the more frequent type. Therefore, we will analyze M and S cases first and the mixed M&S cases afterwards.

3.1. Meaning induced semantic borrowings. The example that is the most representative for an M semantic borrowing is the use of Rom. *a rămâne* 'to stay/to remain' with the additional meaning of Sp. *quedar* 'to meet' ('to be in agreement about a meeting' usually). It is a meaning induced borrowing for several reasons. First, the two lexemes are partial translation equivalents. The first listed meaning in the two main monolingual dictionaries, *Diccionario de la lengua española* (DLE) and *Dicționarul explicativ al limbii române* (DEX), refers to 'remaining in a place or a state' and several other meanings are similar, if not directly equal. However, meanings 7 and 8 in DLE refer to 'agreeing on a meeting' or 'meeting / hanging-out' with somebody, which in Romanian would be expressed by the verb *a se întâlni*. Although the real meaning of this verb is actually 'to agree on a meeting' or even 'to establish a meeting', the verbs that should be pragmatically used to translate the contexts in which the verb was found in our corpus, have the basic meaning of 'to meet', which is why we chose to use the tag MEET in the network notation. Here are some of the contexts in which this semantic borrowing was observed. As Rom. *a rămâne* does not have the intended meaning, we try to suggest the "error" by offering the standard translation of that verb, in English.

(1) *Atunci ****rămânem*** *mâine la opt.*
'Then we ***remain** tomorrow at eight'
('meet')

(Munteanu Colán 2011)

(2) [într-o zi obișnuită] *Păi, mă trezesc, poate ****rămân*** *cu prietenele să bem ceva…*
[on a regular day] 'Well, I wake up, maybe I ***remain** with my friends for a drink.' ('meet')

(Buzilă 2016)

(3) *Îmi place să **rămân** cu un prieten de-al meu p-afară, la el acasă, sau la mine acasă.*
'I like to *__remain__ with a friend of mine outside, at his place, or at my place'
('hang-out')

(Buzilă 2016)

According to our observations in the previous section, we can represent this situation as a relationship between synonyms and polysemous words and their meanings just like in Figure 6.

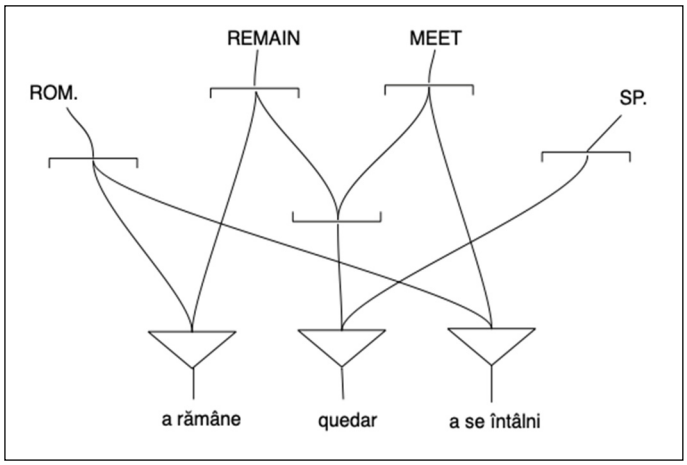

Figure 6. Sp. *quedar* and Rom. *a rămâne* and *a se întâlni* as synonyms and polysemous words.

This network structure represents the system that allows a bilingual to use both Romanian and Spanish lexemes to successfully transmit one of the two meanings REMAIN and MEET. This is accomplished by the way in which lexemes are connected to those two conceptual nodes but also to the language nodes ROM. and SP. When REMAIN is active, activation will travel downwards through the 'or' node to both lines going to *a rămâne* and *quedar*, but in order to activate either of the two, additional activation is needed, otherwise the ascendent 'and' node will not be activated. The additional activation comes from contextual/language information represented by the language nodes. In other words, if the meaning REMAIN is active, and if, due to all kinds of contextual factors (physical location, previous utterances in Romanian, speaker's intentions, etc.) the language node ROM. is also active, the activation will only continue towards the production of *a rămâne* and, on the other line, activation will die out before reaching *quedar*. Conversely, if SP. node is active,

it will ensure activation of *quedar*. The same is valid for the production of *quedar* vs. a se *întâlni* when the MEET conceptual node is active. Only one of the lexemes will be successfully activated, depending on the language node being simultaneously active. Also, it can be observed that any of the the two conceptual nodes can activate the lexeme *quedar* as it is a polysemous word.

Figure 6 shows how a network structure might be interconnected for the correct selection of the three lexemes, but it tells nothing about the production of the "erroneous" semantic borrowing we are trying to understand. There is no connection in this system linking MEET to *a rămâne*. In order to explain how that emerges, we need to add the dimension of time, and think what might happen within this system as activation travels repeatedly through it. Whenever REMAIN is active, it will send activation to both *a rămâne* and *quedar*. Whenever MEET is active, it will send activation to both *quedar* and *a se întâlni*. In both cases, the ascendent 'or' node in the middle of the diagram will be active. So, not only will it get stronger compared to other parts of the system, but there will also be a lot of occasions in which this particular node will be active at the same time when *a rămâne* is active. According to the abundance hypothesis (Lamb 1999: 212-214, 2016) and to the Hebbian principle[9], the latent connections between these two nodes will get strengthened[10]. Latent connections are not usually represented in diagrams so the updated model (Figure 7) will look as if a new connection appeared, but it is actually just showing a process of learning by analogy, which relies on the strengthening of a latent connection between nodes that are constantly and consistently co-activated.

The new connection creates a new situation of synonymy between *a rămâne* and *a se întâlni* because now, both nodes can be activated by MEET, since both nodes receive additional activation from ROM. language node. But that is not really a problem for a network structure. As any case of monolingual synonymy this will be typically be resolved by the strength of connections (stronger pathways will activate its nodes and will inhibit competitors), or by contextual information coming from other parts of the network. In time, this contextual criterion may prove functional or not. On the other hand, depending on the relative use of the two pathways for *a rămâne* and *a se întâlni,* one of them might receive less and less activation and connections might fade out. The speaker might start using more and more the new pathway, or the newly formed connection might die out after a few uses. These are all possible outcomes that would need further investigation with other methodological approaches.

[9] Cells (in our case nodes) that fire together, wire together (Shatz 1992).

[10] For a longer discussion on how learning is represented in relational networks, based on the abundance hypothesis, the proximity principle, feedback activation and Hebbian wiring, see Lamb (1999: 162-179).

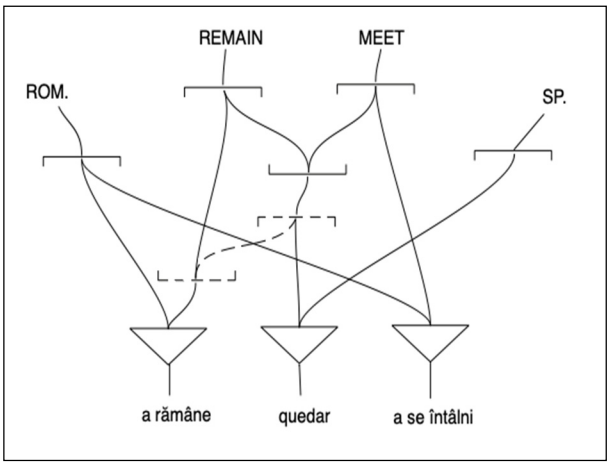

Figure 7. New connection inducing the production of *a rămâne* for MEET.

3.2. Sound induced semantic borrowings. The only S semantic borrowing appearing in more than one source is the use of Rom. turn 'tower' with the meaning of Sp. turno 'turn / shift'. Here are the two examples:

(4) *Lucrez în ****turnul*** *de după-masă.*
'I work in the afternoon ***tower**.'
('shift')

(Munteanu Colán 2007)

(5) *La comedor mănânc în ****turnul*** *doi.*
'At lunch I eat in the second ***tower**.'
('shift / period')

(Jieanu 2012)

As can be seen in examples (4) and (5), the actual English translations of Rom. *turn* are 'shift' and 'period'. We consider 'turn' to be a generic meaning which can be found in several expressions in Spanish, involving the lexeme *turno*, with different English translation equivalents such as *turn* (*ser el turno de alguien* - 'to be someone's turn') *shift* (*trabajar por turnos* - 'to work in shifts'), *round (turnos de un campeonato* - 'rounds of a tournament') or *period* (*turnos para almorzar* - 'lunch periods') among others. All these meanings refer to order in a succession of events or objects, so for simplicity in diagram drawing we will use the conceptual node TURN to refer to any of these meanings.

The appropriate Romanian word would have been *schimb* 'shift' in (4), while in (5) the right lexeme would have been *tura* 'round / turn'. Rom. *turn* and Sp. *turno* are almost perfect homophones. This, in relational terms, means that they share almost entirely the subnetwork responsible for their phonologic

production. However, there is no shared meaning this time so the two lexemes share no connection to the conceptual nodes at upper levels. The situation is represented in figure 8. Besides the pair of homophones we are analyzing, this figure includes the respective translation correspondents of each lexeme so that their synonymy relationship is also illustrated. The structure is, certainly, more complex. The possible Romanian equivalents of Sp. *turno* are, just as in English, multiple (e.g. *rând*, *schimb*, *tură*…). But they also refer, in different contexts, to the order or position in a series of events, so one generic conceptual node TURN will do. We also added only one equivalent lexeme for each language, to illustrate the type of interconnections there might exist.

So, Rom. *turn* and Sp. *torre* are both linked to the conceptual node TOWER and the synonymy situation is resolved by the language nodes, just as in the previous example. The same is valid for Sp. *turno* and Rom. *tură*, both linked to the conceptual node TURN. If we focus our attention on the homophones in the middle of the diagram (*turn* - *turno*), we notice that they seem to work independently since each of them is linked to (and, therefore, activated by) a different combination of conceptual nodes. Nevertheless, as we go downwards, towards phonologic expression, we notice that the two lexemic nodes are linked almost entirely to the same population of nodes at the lower level. In other words, both lexemes activate (almost) the same portions of the phonologic expression network when being active.

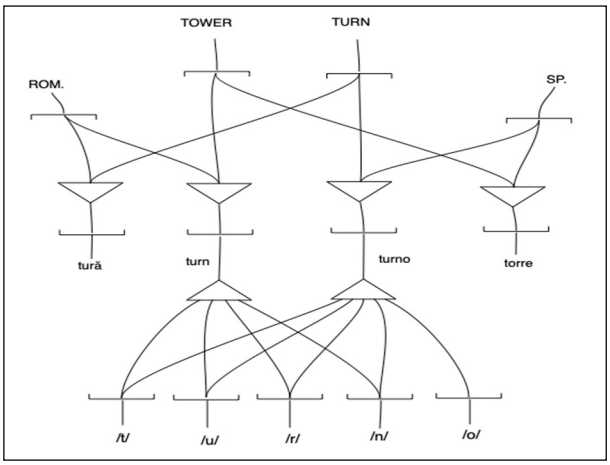

Figure 8. Rom. *turn* and Sp. *turno* as homophones in a bilingual system.

The consequences of this situation, in time, are similar to the process we described in the previous case. Each time any of the two lexemes is produced, the same phonetic subnetwork is activated. That means that, by feedback activation, a certain amount of activation arrives, from below, at the other lexemic node

as well. For example, each time Sp. *turno* is active, Rom. *turn* also receives some activation coming from below and is itself somehow (but less) active. But the lexemic node *turno* is active when the conceptual node TURN is active, so that means that whenever the latter is true, the lexemic node for Rom. *turn* is also active (although less than its competitor *turno*). By repeated occurrence of this pattern of activation, the same type of Hebbian process occurs, i.e., a new connections is being built (more accurately, a latent connection is being strengthened and becomes dedicated) linking the two nodes, simultaneously active, *turn* and TURN, as represented in figure 9.

In the new configuration of the system, Rom. *turn* is in a synonymy relationship with both Sp. *turno* and Rom. *tură*. Synonymy with Sp. *turno* is readily resolved by the language nodes. Synonymy with Rom. *tură* will be, arguably, resolved by the strength of connections. Actually, we can hypothesize that the moment in which the newly established connection got so strong as to allow the production of Rom. *turn* for TURN, the "old" connection between the latter and Rom. *tură* was already weakening by lack of use and will arguably continue to become weaker and weaker with each use of the new connection due to the fact that each successful activation of a pathway will also send inhibition to its competitors.

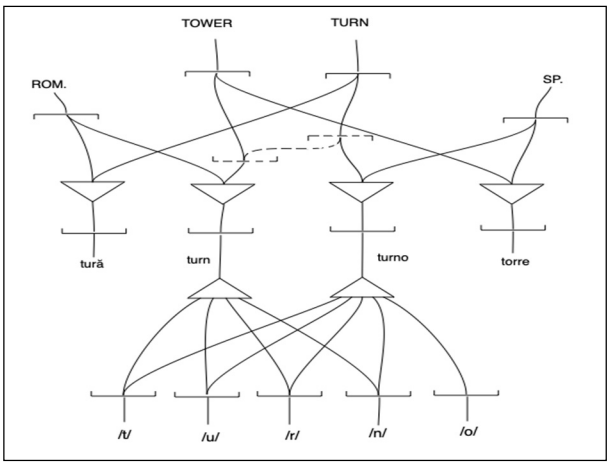

Figure 9. New connection inducing the production of *turn* for TURN.

The particular situation of Rom. *turn* vs. Sp. *turno* is actually quite peculiar. One can notice that the other two lexemes, Rom. *tură* and Sp. *torre* are also partial homophones, so one could predict that this network architecture could eventually allow for a sort of reversal of the connections in time, leading to a stable situation in which Rom. *turn* and Sp. *turno* would be both linked to TURN and Rom. *tură* will rewire, alongside Sp. *torre* to be both connected to TOWER. In both cases synonymy would be resolved by language nodes. The

confirmation of such a prediction would come from a possible future detection, within Romanian communities in Spain, of the semantic borrowing Rom *tură* with the meaning of Sp. *torre* 'tower'[11].

This network treatment of homophones illustrates how shared parts of the network at the phonological level can trigger the rewiring of the system at lexemic level, just like, in the previous case, common conceptual structure did the same. We can understand now why having a case in which this process is allowed to occur at both levels, conceptual and phonological, would lead to the same result but, arguably, more quickly and in more cases, as the pressure for rewiring comes both from above and from bellow in the system. Indeed, as we mentioned earlier, the cases of semantic borrowings induced by both shared meaning and sound are the most numerous in our corpus. We will now analyze such a case.

3.3. Meaning and sound induced semantic borrowings. As mentioned before, the M&S semantic borrowings represent almost 85% of the cases in our corpus. The case that actually appeared most often in the corpus is the use of Rom. *clasă* 'classroom' with the meaning of Sp. *clase* 'lesson'. However, this case was found in one source only, so we decided to look at the next ones on the list, which were found in more than one source. Of those, the most frequent case is the use of Rom. *examen* 'exam' with the meaning of Sp. *examen* 'test'. The two lexemes are perfect homophones and homographs. Besides that, they share the basic meaning of 'exam', i.e., a test meant to check a student's knowledge at the end of a learning period and typically, with the purpose of allowing the student to proceed to the next educational level (DEX). We will use the tag EXAM in the diagram to refer to this meaning. However, the Spanish term can also refer to school exams of less importance, that are administered not necessarily at the end of a learning period, but rather on a regular basis, and also to those administered typically at earlier educational stages such as primary or elementary school. For these situations, Romanian uses terms like *extemporal* (slightly antiquated), *lucrare* or *test* and Rom. *examen* refers strictly to the EXAM meaning previously mentioned. We will use the conceptual tag TEST in the diagram to refer to this second meaning. Some examples of this phenomenon can be seen in (6) - (8).

(6) [profesoara] *are de corectat o grămadă de* ****examene***.
'[the teacher] has a lot of ***exams** to check'
('tests')

(Munteanu Colán 2011)

[11] The phenomenon could also be favored by the fact that both Rom *tură* and Sp. *torre* also refer to the same chess piece ('rook'), so it could become an M semantic borrowing by itself.

(5) *Mâine am ****examen*** *la lengua şi trebuie să scot un şase.*
'Tomorrow I have a language ***exam** and I need to get a D'
('test')

(Jieanu 2012)

(8) *Trebe să-nvăţăm, în fiecare zi noi avem ****examene****.*
'We have to study, we have ***exams** every day'
('tests')

(Buzilă 2016)

Rom. *examen* and Sp. *examen* will be represented in relational terms as synonyms and homophones at the same time (Figure 10). Therefore, we should expect to find similarities with both figures 6 and 8. Indeed, the top part shows a pattern of connectivity similar to figure 6. The conceptual node TEST sends activation to both Sp. *examen* and Rom. *lucrare*, and the conceptual node EXAM sends activation to both Sp. *examen* and Rom. *examen*. The problem is that this last part of the statement might not be obvious at a first glance, since there seems to be only one lexemic node for *examen*, the one at the bottom left side of the diagram, connecting to the phonemes. In a way, it is true. Since the two words are homophonous, they have the same phonological representation. In relational terms, anything that is "identical" has the same representation. So there is only one node within this particular bilingual system, as far as the phonological production is concerned. However, the two ways of being connected to the conceptual and the language nodes are represented by the two ascendent 'and' nodes located just above it, which have different connectivity. Those two nodes could also be considered as representing the two lexemes. It is just a matter of deciding where to place the labels in the diagram, indicating the lexeme. But the labels do not belong to the actual structure.

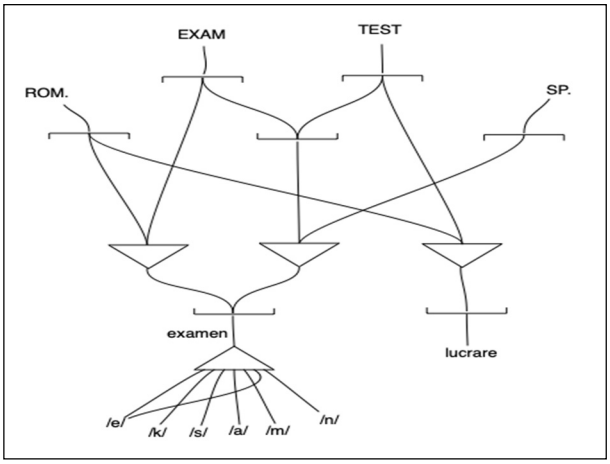

Figure 10. Sp. and Rom. *examen* as both synonyms and homophones.

More important is the way in which the subnetwork is interconnected. This one allows for the production of *lucrare* when conceptual nodes TEST and ROM. are active and it allows for the production of *examen* in three different situations: when TEST and SP. are active; when EXAM and SP. are active; and when EXAM and ROM. are active. So we see that the descending 'and' node (bottom left) for the production of the phonological pattern /eksamen/ is active in many situations, so it makes sense to assume that the lines to which it is connected will become specially strengthened in time. By feedback activation, this pathway will maintain a certain degree of activation on both ascending 'and' nodes whenever any of the conceptual nodes EXAM and TEST are active. That means that there are many situations in which the ascending 'and' node at the very left (accounting for the "Romanian *examen*") is active at the same time when TEST is active, so in time, by the same process of Hebbian wiring, the two nodes will connect (figure 11).

This type of change occurs in a bilingual system with arguably less difficulty and over a shorter period of time due to consistent activation coming from both sides of the lexemic nodes involved, which leads to an earlier and more consistent strengthening of the new connection. Also, the model predicts that such a connection will also be more stable and less likely to be lost, once established. This indeed, seems to be the case as the data confirms that these cases are actually the most frequent. The high frequency of M&S semantic borrowings compared to the other types can be, thus, explained by both the shorter time it takes for new connections to be established and by the higher strength that this connections attain because of activation maintaining them active from both sides. In other words, the new linguistic uses are more likely to emerge in individual speakers and to be maintained in the local norm, because the network structure underlying their production at individual level gets well established quickly and connections are constantly being reinforced making them more resistant to decay, once they have been added to the system.

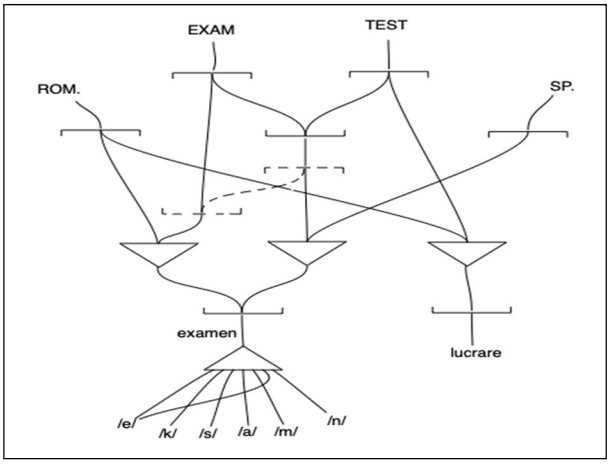

Figure 11. New connection inducing the production of *examen* for TEST in Romanian discourse.

4. Conclusions. In this paper we have used the RNT model to describe and explain the emergence of semantic borrowings in the oral discourse of bilingual Romanian immigrants living in Spain. By conceiving distinct languages as cardinal nodes connected to distinct (although overlapping subnetworks), we have shown that the three types of semantic borrowings, typically observed in the literature, can be explained in terms of shared parts of the semantic network (meaning induced cases), phonological network (sound induced cases) or both (meaning and sound induced cases). Moreover, we showed that these non-standard, hybrid forms posit no problem to the RNT model, in fact, they seem to emerge naturally from such a network based structure. This account also delivers additional explanation for the high frequency of mixed meaning and sound induced cases as the network model predicts a higher rewiring pressure when more parts of the network are shared.

We consider that the RNT model is well suited for explaining non-standard phenomena such as those described in this paper. However, we believe that more hybrid cases coming from language contact situations (lexical borrowings, syntactical and morphological calques, etc.) should be analyzed using the RNT approach in order to further test the model and determine the explanatory capabilities of this theory.

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