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Non-native Perception of English Tonicity: An Experimental Study Involving Catalan Learners of English



Departament de Filologia Anglesa i Germanística

TREBALL DE FI DE GRAU

Aixa Traoré Reig

Supervisor: Dr Juli Cebrián

Grau d'Estudis Anglesos

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Abstract

This study examined the perception and interpretation of English tonicity by non-native speakers of English, and the potential influence of their first language in terms of prosodic transfer. In order to elicit data, three experimental tests (a *discrimination* test, a *focus interpretation* test, and a *focus identification* test) were designed and later administered to forty-one Catalan learners of English. Also, auditory stimuli for the tasks were created. The number of participants who met the requirements –selected from a background questionnaire– was eventually twenty. The results of this experimental study revealed that the subjects found more difficulties in interpreting meaning conveyed by different tonicity patterns –with contrastive or corrective function– than in discriminating and identifying these patterns. Contrary to expectations, the findings of the study suggest that Catalan learners of English use phonetic/phonological focus to a significant degree, and consequently there is positive transfer in perceiving the prosodic features in English. In this respect, the results also suggest that having access to the same prosodic features in the first language (which may be used to a higher or lesser degree) has a positive influence on the perception of phonetic/phonological focus in the second language, although not necessarily in its interpretation. Nevertheless, the study also presents some limitations that should be considered for future research. In addition, an implication derived from this study is that further research on intonation as communicative skill should be conducted.

1. Introduction

Intonation still remains one of the most neglected areas of second language (L2) learning and teaching. Cruz-Ferreira (1989:24) asserts that intonation remains the last barrier of a foreign accent in any L2, and she also observes that this affects even those proficient or almost proficient speakers who command the phonetics of the L2. As Atoye (2005) points out, the main problem of intonation for learners of English as a second language has been accounted for in a variety of ways. Amayo (1981, cited in Atoye 2005:27) mentions that “the supra-segmental features, of which intonation is a major component, are generally more elusive than the segmental and are therefore more inherently difficult to learn for foreign learners”. Amayo (1981) also observes that suprasegmental aspects are in general less researched and therefore less frequently taught than segmental features of English. Furthermore, another potential reason that may account for the difficulty in acquiring or learning English intonation by L2 learners is the prosodic transfer from the L1. In other words, the intonation patterns found in the L1 may affect the realization and perception of the L2 speech (Cruz-Ferreira 2003).

It is necessary to consider that these difficulties apply not only to the production of English intonation by L2 learners but also to the perception of intonation patterns in interactional encounters between native and non-native speakers of English. Consequently, the inappropriate use of English intonation by non-native speakers will probably give rise to intelligibility barriers and the wrong perception of intonational changes will most likely result in misinterpretations (Cruz-Ferreira 2003; Atoye 2005; Wells 2006). For instance, a non-native speaker of English may fail to perceive pitch prominence in the course of an interaction with a native speaker and this may result in a disruption in communication that could lead to misunderstanding. Therefore, a way of approaching this problem and contributing to the improvement of second language

learning strategies and techniques –for both L2 students and teachers of suprasegmental phonetics and phonology– is carrying out research on either the production or perception of English intonation by L2 learners.

In this paper, the difficulties that L2 learners may encounter in perceiving certain patterns of English intonation, and particularly in perceiving English tonicity (i.e. sentence stress or pitch prominence in the utterance), are examined. As far as L2 perception of tonicity is concerned –and considering semantic shift by means of tonicity– the present study evaluates the assumption that failure to identify sentence stress of the target language may entail potential misunderstanding. In addition, the matter of the potential influence that the L1 prosody might have on perceiving the tonicity patterns of the L2 is taken into account –thereby a brief contrastive analysis of some of the prosodic features of the L1 and the L2 will be provided.

1.2. Literature Review

The notion of *intonation* refers to the prosodic or melodic movement patterns that the speakers of a language use in uttering sentences (Dauer, 1993; Wells, 2006; Prieto & Cabré, 2013). In this respect, intonation may also be understood as the pitch movements that convey different meanings found at the sentence level (O'Connor & Arnold, 1976; Cruttenden, 1986; Ladd, 1996; Wells, 2006; Estebas-Vilaplana, 2009). Depending on the language, intonation can perform different functions and/or can be used with different purposes. Partly, that is the reason why in the literature the concept of intonation has been described and analyzed in a variety of ways.

The need for a descriptive phonological framework on intonation is emphasized in Ladd's *Intonational Phonology* (1996). Ladd (1996: 6) defines intonation as “the use of suprasegmental phonetic features to convey ‘*post-lexical*’ or *sentence-level* pragmatic

meanings in a *linguistically structured way*". Along the same lines, Estebas-Vilaplana (2009: 9) defines intonation as "the use of pitch patterns to convey *non-lexical* or *sentence-level* meanings" and describes pitch as "the perceptual sensation of *fundamental frequency* (F0), which is the acoustic correlate of the repetition rate of vocal fold vibration".

Several studies (e.g. Halliday, 1970; Cruttenden, 1986; Cruz-Ferreira, 2003; Wells, 2006) agree that the concept of *intonation* can be split into three different intonation choices of the speaker –depending on the function and/or meaning of a given intonation pattern. These are (1) *tonality*: division of speech into tone groups or intonation phrases –phrasing function; (2) *tonicity*: placement of the tonic or nucleus – focusing function; and (3) *tone*: the different melodic contours which can be used – attitudinal and grammatical function. These choices are also known as "the three Ts" (Wells 2006). In this paper, it is assumed that a change in one of the three Ts (and particularly a change in the placement of the tonic) is also a change in the meaning of the utterance and that this applies to both production and perception of English intonation.

The literature concerning *accentual focus*¹ usually examines the three Ts of intonation combined. However, this study is mainly concerned with tonicity, and thus with how pitch accents are distributed across the utterances to convey new information. To this end, the central aspect investigated in this paper is the perception of *accentual focus* in English by non-native speakers.

The term *focus* in isolation can be understood from a variety of perspectives, but this study will consider two of them. Regarding the phonetic/phonological perspective, the term *focus* is related to the allocation of prominence at the sentence level, which

¹ In this paper the terms *accentual focus*, *focus*, *nuclear accent* and *pitch accent* are used indistinctly with the same meaning.

involves the recognition of stress patterns in sentences and its subsequent association to specific intonation or pitch patterns (Ladd, 1996; Estebas-Vilaplana, 2009). However, a semantic-pragmatic approach should also be taken into consideration given that focus is also determined by contextual factors and by the communicative goals of the speaker (Estebas-Vilaplana 2009).

In English, one of the main uses of intonation is highlighting the most informative item of an utterance (i.e. the item that bears new information), which is done by means of focus (Finch & Ortiz, 1982; Roach, 1983; Estebas-Vilaplana, 2009). Ladd (1978) introduced the terms *broad focus* (i.e. when the whole intonation phrase is brought into focus and the pitch accent is placed on the last lexical item to indicate that the whole sentence is new information) and *narrow focus* (i.e. when only a particular part of the intonation phrase is brought into focus so as to indicate that the rest of the sentence is old information). As Pierrehumbert (1980) observes, pitch accents do not happen after the nuclear accent. For instance, in the utterance (1) –an example of narrow focus–, the nuclear accent falls on the first item of the utterance and consequently the stresses after the tonic are deaccented.

(1) “SUSAN bought you a present”²

Focus can have various functions, such as correcting or emphasizing a piece of information in an utterance (Wells 2006). Different languages use different devices to signal focus. Whereas some languages (mostly Germanic) tend to signal focus by means of accentuation, other languages (mostly Romance) need other strategies such as syntactic movement (Ladd, 1996; Wells, 2006; Estebas Vilaplana, 2009). The present study also enquired into the effects of this cross-linguistic variation. To this end, the study investigated the non-native perception and interpretation of English tonicity.

² In this paper, focus is indicated in capital letters and the most prominent syllable is underlined.

2. The Study

This study was carried out to provide new research data in suprasegmental features of English Phonetics and Phonology. An experiment on perception involving Catalan learners of English was conducted for that purpose.

The present study set two main aims: first, to confirm that intonation –particularly tonicity– plays a crucial role in conveying and understanding meaning and that, consequently, failing to perceive pitch accents is likely to lead to misinterpretation. Therefore, the study considers that interpretation should be regarded as an implicit correlate of perception, since a shift in any aspect of the speaker’s intonation will frequently imply a change in the meaning of the utterance. The second aim of this research is to widen the scope of cross-linguistic studies through the data collected from this experiment and an in-depth analysis of its findings.

The experiment consisted of three tests: a perception test, an interpretation test and an identification test³. In order to elicit more specific data, the experiment focused on the non-native perception of English tonicity and particularly on declarative sentences with default (i.e. broad focus) and non-default (i.e. narrow focus) sentence stress with emphatic function –corrective and contrastive.

The findings were contrasted with previous expectations of the results, based on the theoretical framework of the first language (L1) prosodic features discussed in the next section. Therefore, the present study poses two research questions:

- 1) To what extent does the non-native perception of English tonicity affect the interpretation of the meaning conveyed?
- 2) How do the intonation patterns of the L1 interfere with the perception of the tonicity in the L2?

³ The three tests are described in detail in the Methodology section. Tests materials are provided in Appendix I, II, and III.

The hypothesis proposed in this study is that a shift in the accentual focus of an utterance will imply a potential reason for misinterpretation whenever a non-native speaker of English fails to perceive the placement or displacement of the nuclear accent in the utterance. On that account, the data obtained from the three tests was analyzed in order to validate this hypothesis –as well as to answer the two research questions and to inquire into its further implications.

3. Catalan and English Intonation

As observed by Raiser and Hiligsmann (2007: 42), back in the 1950s “behaviorist psychology regarded L2 learning as a process of linguistic habit formation that was systematically influenced by the learners’ L1” and thus contrastive analyses had to be carried out so as to predict the L2 linguistic patterns that would be difficult and problematic for L2 learners. According to Wells (2006), when the intonation habits of the L1 are transferred to the L2 there might be *positive* or *negative transfer*, depending on the degree of linguistic similarity between both languages. The *positive transfer* applies whenever the same intonational elements are present in both languages. On the other hand, the *negative transfer* applies whenever there is interference of the L1 and consequently a transfer of inappropriate intonational elements into the L2.

In order to examine whether the L1 prosodic features have a noticeable effect on the perception of the L2 tonicity, a brief comparison between the two languages under study –namely Catalan and English– is provided in this section. The variety of Catalan studied in this paper is Central Catalan (i.e. the variety of Catalan which is spoken in the provinces of Barcelona, Girona and part of Tarragona) (Estebas-Vilaplana, 2009; Prieto & Cabré, 2012). With regards to English, the variety studied is Received Pronunciation (RP), which is the accent typically associated with British Standard English and widely taught to speakers of English as a foreign language (Trudgill & Hannah 2008). In

agreement with Wells (2006), Germanic languages such as German or Dutch have a very similar intonation system which allows positive transfer to take place, and consequently English tonicity is an area which is already known in these languages. Yet, Romance languages such as Catalan or Spanish that barely use tonicity have a more negative transfer from their L1.

As described above, tonicity is used in English in order to highlight a certain part of an utterance that contains a piece of information that the speaker wants to emphasize so as to convey additional meaning (e.g. contrast). This is done by means of placing the accentual focus on the element that carries new information –as well as distributing different pitch movements across the utterance. When the whole utterance is new information, the accentual focus falls on the last lexical item. In this sense, the strategies used in Catalan have a positive transfer since the accent tends to fall on the last item of the utterance, although it is not necessarily the last *lexical* item (Estebas-Vilaplana, 2009; Prieto & Cabré, 2013).

According to Estebas-Vilaplana (2009), English and Catalan use different strategies when a particular part of the utterance –which is not the last lexical item– is new information and the rest has already been mentioned. In English, the new item is highlighted by means of narrow focus. Thus, in the example provided below (2), a reorganization of the tonicity pattern is needed in order to emphasize the element which is in the Subject position:

(2) “PETER brought you a cake”

Thus, it is usually thought that English prefers to signal focus by means of alternations in the phonological structure of the sentences, whereas Catalan tends to maintain the pitch pattern and alters the syntactic structure instead (Estebas-Vilaplana 2009). Then, if the speaker wanted to emphasize the subject in the example (3), the first item would be moved at the end, and a syntactic reorganization would be needed (4):

- (3) a. “En Pere va portar un PASTÍS”
 b. (Peter brought a CAKE)
- (4) a. “El pastís el va portar en PERE”
 b. (*The cake it was brought by PETER)

However, Estebas-Vilaplana (2009) also argues that accentual focus can be used in Central Catalan in a variety of contexts and suggests that the choice of syntactic and intonational strategies to convey focus is rather flexible. Along the same lines, Prieto and Cabré (2013) explain that when Catalan speakers want to express contrast, they use strategies such as moving the focused element within the sentence (to the left periphery). In the following examples from Prieto and Cabré (2013: 20), the Direct Object has been moved to the left in order to occupy the Subject position and thus be syntactically emphasized:

- (5) a. “*Els va posar al calaix, els ganivets*”
 b. (*He put them in the drawer, the knives)
- (6) a. “*Els ganivets, els va posar al calaix*”
 b. (*The knives, he put them in the drawer)

Yet, Prieto and Cabré (2013) also point out that this syntactic movement entails different intonational patterns that differ from the typical intonation used for (unmarked) declarative sentences. In the example provided below (7), also from the work of Prieto and Cabré (2013:20), there is again the syntactic displacement of the Direct Object, although this time accompanied by different intonational contours for emphatic reasons:

- (7) a. “TARONGES, vull! (i no pas peres)”
 b. (*ORANGES, I want! (and not pears))

Therefore, in the works of Estebas-Vilaplana (2009) and Prieto and Cabré (2013), it is claimed that focus in Catalan also plays an important role as part of the prosodic

features of Catalan. The findings of the present study suggest that focus plays a role in Central Catalan indeed, although in a different degree than in English.

The predictions for the results of this study –based on the potential influence that the L2 learners’ mother tongue might entail– were that the subjects would perform well in discriminating different tonicity patterns, but would have problems with the interpretation and, to a certain extent, with the identification of different pitch patterns. The predictions were based on the fact that Central Catalan tends to use syntactic strategies such as word movement to signal focus (usually using focus on the last item of the utterance), even though phonetic/phonological focus is also present in Catalan (Estebas-Vilaplana, 2009; Prieto & Cabré, 2013). As a consequence, difficulties with interpreting tonicity are likely to arise. Another prediction was that sentences with broad focus were likely to be less problematic than those with narrow focus, since in that case both Central Catalan and English tend to use similar patterns.

4. Methodology

4.1 Participants

Initially, a group of forty-one undergraduate students from an English degree at the *Universitat Autònoma de Barcelona (UAB)* were tested. Twenty out of forty-one were selected for the study, since some requirements were established in order to recruit as homogenous a group of learners as possible.

The subjects of the study were required to be Catalan-dominant bilingual speakers of Catalan and Spanish, learners of English as a second language and first-year university students of a degree in English Studies (or English Studies combined with another degree). An advanced or intermediate level of English was also required.

Finally, another requirement was that the students had not taken any course in English Phonetics and Phonology.

The participants' language background was assessed by means of a background questionnaire provided at the end of the experiment. The background questionnaire was used to gather data about the participants' linguistic background which could be relevant to the study, and also to select those subjects who met the requirements.

Most participants had been abroad in an English-speaking country but the great majority had spent a short time in the country (days, weeks or a few months) except for two cases in which the subjects had spent one year or more in England. The starting age of learning English varied between six and ten years old, except for one case in which the subject had been learning English since the age of three. All of the subjects were regularly in contact with English (in most cases at university and in few cases with friends). Seven participants claimed to be acquainted with sentence stress, but at the same time they claimed they were not acquainted with any aspect of English intonation –possibly due to the ambiguity of the question (see Appendix IV).

4.2 Test materials

4.2.1 Tasks

Three tests were designed with the aim of examining whether the participants were able to perceive and interpret English tonicity correctly:

- a) A *discrimination* test
- b) A *focus interpretation* test
- c) A *focus identification* test

The design of the tests took into account some of the criteria presented by Cruz-Ferreira (1989) and Wray, Trott & Bloomer (1998). Cruz-Ferreira (1989) proposes a general test

of intonational comprehension of English that can be used by speakers of any native tongue. Wray, Trott & Bloomer (1998) propose a series of conventions and methods for research projects in linguistics that aim at gathering meaningful data.

The first task was the *discrimination* test, which contained twelve sentences that would be uttered with two different focuses. Thus, the participants would hear two different talkers uttering the same sentence which may or may not have the same tonicity pattern. The reason why each sentence was uttered two times by two different talkers was to add complexity to the task. Then, the subjects were asked to determine whether they perceived prominence differences or not in contrasting both utterances. In the example provided below, sentence (8) contains different pitch patterns in the two utterances (focus is on PETER in the first utterance, and on HIGHEST in the second utterance) whereas (9) contains the same pitch patterns (the focus is on ALWAYS in both utterances). The correct answer would be chosen by adding a cross in the square (see Appendix I):

	<u>Same</u>	<u>Different</u>
(8) Peter has the highest salary.	<input type="checkbox"/>	<input type="checkbox"/>
(9) I've always voted Labour.	<input type="checkbox"/>	<input type="checkbox"/>

The second task consisted of an *interpretation test* in which the participants would hear twelve utterances that would be uttered once by one of the talkers. All the utterances had different tonicity patterns (some of them already used for the first task). The subjects were given three possible contextualization cues or explanations and they had to choose the most suitable option. They would have to choose between the best explanation as in example (10) in which the focus is on I, or the best previous context as in example (11) in which the focus is on THREE. The number of alternative interpretations of each utterance was three in order to reduce guessing chances, and thus

add reliability to the test. The tonicity patterns were used as sentence variables that could involve a change in the meaning of the sentence as in (10), or a corrective or emphatic meaning in a given context as in (11) (see Appendix II and Appendix VII; Table 3).

(10) A: I thought your sister was in Paris.

- a) (A) It was me who thought your sister was in Paris. (best explanation)
- b) (A) I thought it was your sister who was in Paris, but it was someone else.
- c) (A) I assumed you were in Paris.

(11) A: Andrew will be three in November.

- a) B: When's Andrew going to be three?
- b) B: Who's going to be three in November?
- c) B: How old will Andrew be in November? (best previous context)

Finally, the third task consisted of a *focus identification test* containing twelve of the utterances used in the first and second tests (see Appendix III). In this case, the task involved identifying the most prominent word in each utterance, and writing it down as illustrated in example (12).

Prominent word

(12) Peter has the highest salary. _____

A total of sixteen sentences were used for the tests. The sentences were selected mostly from Estebas-Vilaplana's work *Teach Yourself English Pronunciation: An Interactive Course For Spanish Speakers* (a total of thirteen sentences). One sentence and its three possible contextualization cues were extracted from Cruz-Ferreira's work "A Test for Non-Native Comprehension of Intonation in English". Two sentences –and the majority of the contextualization cues for the second task– were especially created for this experiment by the researcher (the exact sentences and their respective sources are

provided in Appendix V). As exemplified above, the selection consisted of a set of declarative sentences in English that would contain different prominence patterns in terms of tonicity. From this selection, a total of thirty-three utterances with different tonicity patterns were recorded.

Finally, the background questionnaire was also created by the researcher – following the model that Cruz-Ferreira (1989) used in her general intonation comprehension test. The questionnaire was designed so as to inquire into further data which could be relevant to the results from the tests.

4.2.2 Creation of the stimuli

In order to elicit data, auditory stimuli were created for the three tests. Two female native-speakers of English were asked for voluntary participation in a linguistic research project. Both speakers are currently Erasmus exchange students living in Barcelona. Speaker A⁴ is from southern England, whereas Speaker B is from northern England (thus, they speak two different varieties of British English: Southern British English and Northern British English). The speakers agreed to participate in the study and signed a consent form (see Appendix VIII).

The stimuli were created and collected by means of audio-recordings performed by the two talkers in a soundproof room. The talkers were asked to utter a total number of thirty-three sentences (Speaker A: seventeen utterances; Speaker B: sixteen utterances). Also, both talkers were asked to utter the sentences with a specific focus indicated in bold capital letters, and by underlining the stressed syllable. Both talkers were given a sheet of paper with the utterances and they were asked to read it aloud, adding emphasis to the indicated words (see Appendix VIII for the elicitation list). Also,

⁴ The talkers will remain anonymous throughout this paper, and pseudonyms (Speaker A, Speaker B) are used to refer to them.

the talkers were asked to read it as natural as possible. Before starting with the recordings, the two native speakers were asked to rehearse the utterances in loud voice and confirm whether the focus sounded natural or not. The focus in one of the utterances had to be rearranged since it did not sound natural to one of the two speakers. The rest of the utterances sounded natural to both speakers. Finally, the extraction of the sentences as individual sound files was carried out by means of the free software *Praat* (Boersma & Weenink 2014).

4.3 Procedure

First of all, the three tests were piloted with a volunteer university student with an advanced level of English. The conclusions from the pilot experiment were that the instructions and the sound files were appropriate, and that the estimate testing time was twenty minutes.

Forty-one undergraduate university students from the UAB (eighteen from one class and twenty-three from another) were administered the three tests on different sheets of paper. The tests were conducted during English class with the permission of the teachers. First, the students were asked for voluntary participation in a study that was being conducted as a final project in a bachelor's degree in English Studies at the UAB. The students were not told the aims of the study nor the topic investigated in order to avoid any influence on their answers. The participants were given some time to read the instructions for each task. The sound files for each task were played just once. For the first task (discrimination test), the participants were asked to listen and to choose whether the two utterances that would be played to them seemed to be uttered in the same or different way by the two different talkers. For the second task, the participants were asked to relate the utterance to the most suitable interpretation (which

could be the best previous context or the best explanation) of each utterance. For the third task, the participants were asked to identify the most prominent word in the utterance. In addition to the tree tests, the background questionnaire was provided at the end of the experiment. Eventually the approximate duration of the experiment was seventeen minutes.

5. Results

Once the experiment had been conducted, the results and the background data were analyzed for discussion. The number of correct responses was calculated for each test and for each subject in two different analyses. The first analysis was based on the correct/incorrect answers per sentence (represented in percentages) so as to examine whether most of the participants had encountered special difficulty with specific pitch patterns. The second analysis was based on the individual performance of the subjects, and the data was represented on a scale from zero to ten.

The results in the first analysis reflected that the subjects' performance in the discrimination task varied depending on the intonation patterns of each sentence (see Table 2 in Appendix VII). Thus, the subjects did relatively better in distinguishing those sentences in which the focus was the same (69% of correct answers), whereas sentences with different focus were slightly more difficult for the subjects (54% of correct answers). The results in the interpretation task showed that the subjects performed relatively well in those sentences that involved a change in meaning (61.25% of correct answers) – and particularly in the sentence “I know THAT sheep can swim” (see Table 3 in Appendix VII). Finally, the results in the identification task showed that students performed relatively better in those sentences with narrow focus (56.11% of correct

answers) and particularly in the sentence “I thought YOU spoke Spanish” (see Table 4 in Appendix VII).

Table 1. *Test scores and descriptive statistics for the three tests*

Subjects	Discrimination Test	Focus Interpretation Test	Focus Identification Test
Subject 1	5.0	5.0	5.0
Subject 2	7.5	0.8	4.2
Subject 3	5.8	5.0	4.2
Subject 4	5.0	5.0	5.0
Subject 5	6.7	0.8	2.5
Subject 6	5.0	8.3	0.8
Subject 7	5.8	3.3	3.3
Subject 8	6.7	0.8	5.0
Subject 9	5.8	3.3	2.5
Subject 10	7.5	5.0	5.0
Subject 11	7.5	5.0	8.3
Subject 12	3.3	5.8	7.5
Subject 13	5.8	8.3	8.3
Subject 14	5.0	4.2	8.3
Subject 15	3.3	4.2	6.3
Subject 16	6.7	7.5	8.3
Subject 17	6.7	7.5	7.5
Subject 18	5.8	3.3	5.8
Subject 19	6.7	5.0	6.7
Subject 20	7.5	0.8	4.2
Mean	6.0	4.5	5.4
SD	1.2	2.4	2.2
Range	3.3—7.5	0.8—8.3	0.8—8.3

The results from the grades of the subjects in each of the tests are shown in Table 1, which shows the individual results of the subjects’ performance (*test scores*) in the three tests on a scale from zero to ten. In addition, the statistical data concerning *mean*, *standard deviation (SD)* and *range* is provided. The Catalan learners of English performed best in the discrimination test (average score: 6.0), followed by the identification test (average score: 5.4), and they performed worst in the interpretation test (average score: 4.46). However, the range varies considerably in each test. The range in the discrimination test is 3.3—7.5; in the focus interpretation test 0.8—8.3; and

in the focus identification test the range is also 0.8–8.3. In relation to the mean, the standard deviation is relatively large (discrimination test: 1.25; focus interpretation test: 2.39; focus identification test: 2.21). Therefore, there is a fair amount of variability in the results of the tests –particularly in the focus interpretation and focus identification tests –which indicates that the results are not consistent among the subjects.

The background questionnaire included an item about the difficulty of the tasks to examine any linear relationship with the scores. The interpretation test was considered difficult by 65% of the subjects, whereas 10% of the subjects found the test easy. With regards to the discrimination test, 35% of the subjects considered the test difficult, whereas 50% of the subjects found the test easy. The identification test was found difficult by 15% of the subjects, whereas 35% of the subjects found the test easy.

Correlational analyses were performed in order to detect any significant relationship among the pitch perception abilities tested in the three tests – discrimination, interpretation and identification, respectively. The analyses indicated that there are no significant correlations among any of the three tests. The levels of correlation were not enough strong (discrimination test & interpretation test: -0.31; discrimination test and identification test: -0.05; interpretation test and identification test: 0.38). In sum, there is no linear relationship –either positive or negative– among the abilities tested.

6. Discussion

Accordingly to the predictions of this study, students performed better in the discrimination and identification tasks, and worse in the interpretation task. That could be interpret as an indicator that Catalan learners of English –intermediate and/or advanced learners– will encounter difficulties in interpreting the information given by certain pitch patterns in English, but they will find less difficulty in perceiving and

identifying different pitch accents. Still, this does not entirely prove that the wrong perception of tonicity will most likely imply potential misinterpretation –which was the hypothesis of this study–, due to the lack of correlations in the results. However, it should be taken into account that the standard deviation for each test was relatively high (discrimination test: 1.25; focus interpretation test: 2.39; focus identification test: 2.21), which means that students' scores were considerably variable, and thus the results were not consistent enough among the participants. The descriptive statistics in Table 1 above show that the averages obtained in the three tests do not differ considerably among them and they are low (average scores in the three tests, respectively: 6.0, 4.5, and 5.6). This reflects that the subjects did not really master tonicity.

The absence of significant correlations among the speech perception abilities tested –discrimination, interpretation and identification– reflects that, on the grounds of tonicity, accentual discrimination, accentual interpretation and accentual identification are not mutually dependent. This implies that a Catalan learner of English can discriminate different pitch accents independently from their meaning and placement. At the same time, a Catalan learner of English may be able to identify the tonic syllable in an utterance independently from the meaning of the pitch accent.

With regards to language transfer, the subjects performed worse in interpreting the meaning conveyed by non-default phonetic/phonological focus with emphatic function, which was used for correcting and contrasting (see Appendix VII; Table 2). This may be explained partly by the fact that Catalan is a Romance language and thus it *tends* to use syntactic devices instead. However, another potential explanation is that Catalan learners of English have also access to phonetic/phonological focus. Therefore, the prediction that the subjects would perform better in sentences in which broad focus is used was not confirmed, since the scores show a fair amount of variability in utterances with both narrow and broad focus. On the other hand, the prediction which

was confirmed was that the subjects would perform better in the discrimination test, since the phonetic/phonological focus is also present in Central Catalan –although used along with syntactic focus and to a different degree than in English.

It is important to remark that this experimental study has certain limitations and implications. The first limitation lies in the fact that the twenty subjects that participated in this study were perhaps a small number for the results to count as sufficient evidence. Moreover, the subjects were in their first year of a degree in English, which might be the cause for the large amount of variation shown in the results –considering that the subjects had achieved different levels of English at the end of the course. Another limitation is that the use of sheets with the complete utterances written for the tests might have been a visual cue. Finally, the fact that this study disregarded *tone* and *tune* in order to focus on *tonicity* may have been a constraint for a comprehensive analysis of the data. A possible implication of this study that could be examined in future research –based on the results of the interpretation tests– is that intonation patterns concerning *tonicity* should be regarded and developed at the level of communicative skill for L2 learners to be able to follow a wide range of communicative situations and avoid communicative conflicts. In this respect, this study also implies the need to emphasize these skills in the process of L2 learning.

In sum, the data collected from the tests shows that non-native perception of *tonicity* might have an effect on the understanding of the meaning conveyed by the focus. However, this effect is likely to be affected by the prosodic features available in the L1 of the L2 learners. In this respect, the results answered the two research questions posed at the beginning of this paper; the first concerned with the extent to which the non-native perception of English *tonicity* could affect the interpretation of the meaning conveyed, and the second concerned with the interference of the L1 prosodic features in perceiving and interpreting the L2.

7. Conclusions

This study tried to confirm whether non-native listeners who are not capable of perceiving correctly certain tonicity patterns will probably miss relevant information and/or the attitudinal meaning implied –hence assuming that non-native listeners who perceive those patterns correctly will have a better understanding of its intended meaning. At the same time, the study took into account the potential influence of the first language in order to account for prosodic transfer. To that end, three tests were designed and conducted for evaluating non-native perception of English tonicity. Thus, data was elicited from the group of twenty Catalan university learners of English who were tested on their perceptive and interpretative skills. The findings of this experimental study revealed that the subjects had more difficulties in interpreting meaning conveyed by different tonicity patterns –with contrastive or corrective function– rather than discriminating and identifying those patterns. Although Romance languages like Catalan are thought to prefer the use of syntactic devices instead of phonetic/phonological devices to signal focus, to a certain extent the results of this study appear to account for positive prosodic transfer in the case of Catalan and English. Therefore, the findings suggest that Catalan speakers also use focus to a significant degree, and for that reason the subjects performed better in perceiving pitch differences in English. In this respect, the findings also suggest that having access to the same prosodic features in the L1 (even though they may be used in a higher or lesser degree) has a positive influence on the perception of the L2 phonetic/phonological focus, although not necessarily in its interpretation. Nevertheless, the study also presented some limitations that should be taken into account for future research. Thus, the main implication of this study is that further research should be conducted on intonation as communicative skill.

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Appendix I. Focus Discrimination Test

TEST 1 – DISCRIMINATION TEST

You will hear each of the following sentences twice. In each case, the sentence will be uttered by different talkers. The sentences may or may not be uttered the same way. Indicate on this sheet of paper whether you think the utterances are the same or whether they are different by writing a cross in the appropriate box.

E.g.

Peter has the highest salary.

Same

☐

Different

☐

I've always voted Labour.

☐
☐

Same

Different

1. Amanda hates driving.

☐
☐

2. Andrew will be three in November.

☐
☐

3. I know that sheep can swim.

☐
☐

4. Take the blue pack.

☐
☐

5. I asked John about the meeting.

☐
☐

6. The concert was awful.

☐
☐

7. John's going to the theatre on Monday.

☐
☐

8. Mary's reading a book in the library.

☐
☐

9. We might meet Paul at the station.

☐
☐

10. The final marks will be reviewed by three teachers.

☐
☐

11. Nice to meet you.

☐
☐

12. I thought it was Peter.

☐
☐

Appendix II. Focus Interpretation Test

TEST 2 – FOCUS INTERPRETATION TEST

You will hear each of the following sentences once. A and B represent two different speakers (in some cases, they are supposed to be interacting with each other and in other cases they are explaining themselves). Indicate which previous context or which explanation below is the most suitable for each utterance by adding a circle. The sentences are repeated and they will be uttered by different talkers, but the context or explanation does not need to be the same.

E.g. A: I thought your sister was in Paris.

- d) (A) It was me who thought your sister was in Paris. (best explanation)
- e) (A) I thought it was your sister who was in Paris, but it was someone else.
- f) (A) I assumed you were in Paris.

A: Andrew will be three in November.

- d) B: When's Andrew going to be three?
- e) B: Who's going to be three in November?
- f) B: How old will Andrew be in November? (best **previous context**)

1. A: Mary's reading a book in the library.

- a) B: Mary's reading a book in the garden, right?
- b) B: Mary's reading a magazine in the library, right?
- c) B: Martha's reading a book in the library, right?

2. A: I know that sheep can swim.

- a) (A) I know one particular sheep that can swim.
- b) (A) I know that all sheep can swim.
- c) (A) I know that some sheep can swim.

3. A: We might meet Paul at the station.

- a) B: Where might we meet Paul?
- b) B: Who might we meet at the station?
- c) B: Are we finally going to meet Paul at the station?

4. A: Mary's reading a book in the library.
 - a) B: Mary's reading a book in the garden, right?
 - b) B: Mary's reading a magazine in the library, right?
 - c) B: Martha's reading a book in the library, right?
5. A: I asked John about the meeting.
 - a) B: I thought you had asked Susan about the meeting.
 - b) B: Did you ask John about the interview?
 - c) B: Did you tell John about the meeting?
6. A: The final marks will be reviewed by three teachers.
 - a) B: Will the final marks be reviewed by two teachers?
 - b) B: Will the mid-term marks be reviewed by three teachers?
 - c) B: I heard that the final marks will be reviewed by three students.
7. A: I thought you spoke Spanish.
 - a) (A) I assumed you spoke Spanish.
 - b) (A) I thought it was you who spoke Spanish, but it was someone else.
 - c) (A) It was me who thought you spoke Spanish.
8. A: We might meet Paul at the station.
 - a) B: Where might we meet Paul?
 - b) B: Who might we meet at the station?
 - c) B: Are we finally going to meet Paul at the station?
9. A: I asked John about the meeting.
 - a) B: I thought you had asked Susan about the meeting.
 - b) B: Did you ask John about the interview?
 - c) B: Did you tell John about the meeting?
10. A: I know that sheep can swim.
 - a) (A) I know one particular sheep that can swim.
 - b) (A) I know that all sheep can swim.
 - c) (A) I know that some sheep can swim.
11. A: The final marks will be reviewed by three teachers.
 - a) B: Will the final marks be reviewed by two teachers?
 - b) B: Will the mid-term marks be reviewed by three teachers?
 - c) B: I heard that the final marks will be reviewed by three students.
12. A: I thought you spoke Spanish.
 - a) (A) I assumed you spoke Spanish.
 - b) (A) I thought it was you who spoke Spanish, but it was someone else.
 - c) (A) It was me who thought you spoke Spanish.

Appendix III. Focus Identification Test

TEST 3: FOCUS IDENTIFICATION TEST

You will hear each of the following sentences once. Listen to the sentence and identify the most prominent word (i.e. the word which is said louder) in each sentence.

E.g.

Prominent word

Peter has the highest salary.

Prominent word

1. Mary's reading a book in the library.

2. We might meet Paul at the station.

3. The final marks will be reviewed by three teachers.

4. I asked John about the meeting.

5. I know that sheep can swim.

6. I thought you spoke Spanish.

7. Mary's reading a book in the library.

8. We might meet Paul at the station.

9. The final marks will be reviewed by three teachers.

10. I asked John about the meeting.

11. I know that sheep can swim.

12. I thought you spoke Spanish.

Appendix IV. Background Questionnaire

BACKGROUND QUESTIONNAIRE

Age: _____

Sex: _____

Which university degree(s) are you studying? _____

Year at university: _____

Mother tongue(s): _____

Other languages you speak: _____

How long have you been studying English? With what age did you start? _____

Approximate level of English: ☐ Intermediate (B1) ☐ Upper-Intermediate (B2)

☐ Advanced (C1) ☐ Proficient (C2)

Have you ever been to an English-speaking country? ☐ Yes ☐ No

If yes, how long have you been there? _____

Have you taken pronunciation courses? ☐ Yes ☐ No

Have you taken Phonetics I or Phonetics II? ☐ Phonetics I ☐ Phonetics II ☐ None

Other courses? _____

Are you familiar with **sentence stress** (tonic placement or tonicity) in English?

☐ Yes ☐ No

Are you familiar with any aspect of English intonation? ☐ Yes ☐ No

If yes, which aspect(s)? _____

Which test(s) did you find more difficult (test 1, test 2 or test 3)? _____

Which test(s) did you find easier? _____

Did you choose some of your answers randomly? _____

Do you use English regularly? ☐ Yes ☐ No

If yes, in what frequency (once a week, three days a week, twice a month...) and with whom (friends, teachers...)?

Appendix V. Tests sentences

This appendix contains the sources of the sentences which have been used for the three tests.

A) Sentences extracted from *Teach Yourself English Pronunciation. An Interactive Course For Spanish Speakers* (Estebas-Vilaplana 2009):

1. Peter has the highest salary.
2. I've always voted Labour.
3. Amanda hates driving.
4. Andrew will be three in November.
5. Take the blue pack.
6. I asked John about the meeting.
7. The concert was awful.
8. John's going to the theatre on Monday.
9. Mary's reading a book in the library.
10. We might meet Paul at the station.
11. Nice to meet you.
12. I thought it was Peter.

B) Sentences extracted from "A Test for Non-Native Comprehension of Intonation in English" (Cruz-Ferreira 2003):

1. I know that sheep can swim.

C) Sentences created by the researcher:

1. I thought your sister was in Paris.
2. I thought you spoke Spanish.

Appendix VI. Elicitation List

This appendix contains the elicitation list used for creating the stimuli. The following utterances were recorded in a soundproof room.

Speaker A:

1. Peter has the **HIGHEST** salary.
2. I've **ALWAYS** voted Labour.
3. Amanda **HATES** driving.

4. Andrew will be **THREE** in November.
5. The region is famous for its fine **WINES**. (The recording was not valid. Sentence n.16 was used instead)
6. Take the **BLUE** pack.
7. I asked John about the **MEETING**.
8. The concert was **AWFUL**.
9. John's going to the **THEATRE** on Monday.
10. Mary's **READING** a book in the library.
11. We **MIGHT** meet Paul at the station.
12. The final marks will be reviewed by three **TEACHERS**.
13. Nice to **MEET** you.
14. I thought it was **PETER**.
15. **I** thought your sister was in Paris.
16. I know **THAT** sheep can swim.
17. I **THOUGHT** you spoke Spanish.

Speaker B:

1. **PETER** has the highest salary.
2. I've **ALWAYS** voted Labour.
3. Amanda **HATES** driving.
4. Andrew will be three in **NOVEMBER**.
5. The region is famous for its fine **WINES**. (Not used in the tests)
6. Take the **BLUE** pack.
7. I asked **JOHN** about the meeting.
8. The concert was **AWFUL**.
9. John's going to the **THEATRE** on Monday.
10. **MARY**'s reading a book in the library.
11. We might meet **PAUL** at the station.

12. The final marks will be reviewed by **THREE** teachers.

13. Nice to meet **YOU**.

14. I thought it was **PETER**.

15. I know that sheep **CAN** swim.

16. I thought **YOU** spoke Spanish.

Total number of recorded utterances: 33 (Speaker A: 17, Speaker B: 16)

Appendix VII. Tables

Table 2. *Correct/incorrect answers per sentence in the discrimination test*

Sentence	Correct	Wrong	Correct answers in %	Wrong answers in %
S1	18	2	90%	10%
S2	2	18	10%	90%
S3	18	2	90%	10%
S4	17	3	85%	15%
S5	18	2	90%	10%
S6	20	0	100%	0%
S7	6	14	30%	70%
S8	3	17	15%	85%
S9	12	8	60%	40%
S10	4	16	20%	80%
S11	19	1	95%	5%
S12	8	12	40%	60%
Total	145	95	60.42%	38.58%
Same focus			69%	31%
Different focus			54%	46%

Table 3. *Correct/incorrect answers per sentence in the focus interpretation test*

Sentence	Correct	Wrong	Correct answers in %	Wrong answers in %
S1	5	15	25%	75%
S2	17	3	85%	15%
S3	8	12	40%	60%
S4	8	12	40%	60%
S5	4	16	20%	80%
S6	10	10	50%	50%
S7	8	12	40%	60%
S8	6	14	30%	70%
S9	11	9	55%	45%
S10	13	7	65%	35%
S11	6	14	30%	70%
S12	11	9	55%	45%
Total	107	133	44.58%	55.42%
■ Change in meaning*			61.25%	38.75%
■ Corrective/emphatic**			36.25%	63.75%

* Marked focus that involved a change in the meaning of the sentences

** Marked and unmarked focus that involved corrective or emphatic meaning

Table 4. *Correct/incorrect answers per sentence in the focus identification test*

Sentence	Correct	Wrong	Correct answers in %	Wrong answers in %
S1	6	14	30%	70%
S2	7	13	35%	65%
S3	3	17	15%	85%
S4	17	3	85%	15%
S5	9	11	45%	55%
S6	6	14	30%	70%
S7	15	5	75%	25%
S8	16	4	80%	20%
S9	14	6	70%	30%
S10	4	16	20%	80%
S11	6	14	30%	70%
S12	20	0	100%	0%
Total	123	117	51.25%	48.75%
■ Broad focus			36.67%	63.33%
■ Narrow focus			56.11%	43.89%

Appendix VIII. Consent Form



**Universitat Autònoma
de Barcelona**

Department of English and German

Consent form

I, _____ agree to take part in a research study investigating speech perception.

I understand that the experiment may take about 30 minutes and will occur at a convenient time and place. I understand that I will be asked to utter a number of sentences and that the investigator will record my answers.

I understand that my name and my specific answers will remain confidential and that I will not be identified in any report or presentation which may arise from the study.

I understand that while I may not benefit directly from the study, the information gained may help achieve a better understanding of the process of language acquisition and may help improve methods of language learning.

I understand what this study involves and agree to participate.

Date

Signature

Researcher: Aixà Traoré Reig (E-mail Address: aixatr23@gmail.com)