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INFORMATION STRUCTURE IN UNIVERSITY LECTURES IN ENGLISH AS A FOREIGN LANGUAGE IN ARGENTINA

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University lectures have long been the focus of research due to their paradigmatic importance as the main channels of instruction at this educational level. In the context of this study (i.e., the teacher and translator training courses at Universidad Nacional de Córdoba, Argentina), English is the medium of instruction. Although this is very convenient for students, it poses a great challenge for the L1 Spanish-speaking professors, who need to be linguistically competent so as to provide students with a good model in the foreign language and to assist learners to meet the challenge of comprehension. This expertise also comprises the level of phonology, a key aspect to understanding in oral communication. The aim of this paper is to present a phonological analysis of the structure of information in discourse of two extracts of teaching presentations delivered in English by Spanish-speaking lecturers. The results are matched against characterizations of the Spanish and the English prominence and tone systems and are discussed in light of previous research.

INTRODUCTION

It is generally believed that university professors are proficient enough to lecture in English if they have vast knowledge of the disciplinary field being taught, good classroom management techniques, and an excellent command of the foreign language (FL), the latter generally associated with wide vocabulary and morphosyntactic accuracy at receptive and productive levels. However, it has been empirically demonstrated that prosody also plays an important role to convey discourse meaning (e.g., Martín del Pozo, 2017; Pickering, 1999, 2001; Wennerstrom, 1997; Wichmann, 2014). This paper analyzes how Spanish-speaking university professors considered efficient by Spanish-speaking university students of English structure information in discourse when they deliver instruction in English. To achieve that aim, two extracts of English as a medium of instruction (EMI) teaching presentations were analyzed. The results are interpreted considering the phonological characteristics of Spanish and English and are compared and contrasted with previous findings. The following literature review presents the theoretical background that motivated the study.

Background

Previous research reports strong agreement that prosodic cues are essential comprehension aids in English since they indicate structural relationships between parts of discourse. Coulthard and Sinclair (1975) examined the prosodic features systematically exploited by teachers and students during classroom interaction. As regards tonal composition, for example, these authors found that, “as teachers are usually primarily concerned with communicating new informational content" (Pickering, 2018, p. 53), there is generally a high percentage of falling tones.

Coulthard and Sinclair's (1975) findings have later been confirmed by other studies (Barr, 1990; Pickering, 1999, 2001; Wennerstrom, 1997). Barr (1990) analyzed six lecture extracts produced by native speakers of English and focused on the role of prosodic features in lecture organization and comprehension. A comparison between the performance of an efficient lecturer and another considered difficult to understand revealed that the clear lecturer used falling tones to introduce key terms and made them prominent several times until he felt the item could be easily retrieved from memory. The less efficient lecturer did not exploit prominence in that way. Wennerstrom (1997) analyzed the intonation of Chinese speakers of English in three different genres of spoken discourse (academic lectures, conversations, and oral narratives) and compared their performance with native-speaker data. In academic lectures, Wennerstrom's conclusions were similar to Barr's. Native speakers deliberately restate information and present it as new.

In her doctoral dissertation, Pickering (1999) explored the systematic use of pause and pitch variation in a corpus of 56 minutes of data from university teaching presentations delivered by native and non-native speakers of English. Although Pickering did not conduct comprehension tasks, she concluded that there exist significant differences between the ways native and non-native speakers of English prosodically encode information. While native speakers use intonation systematically to structure information and to "project informative content" (p. 104), non-native speakers show minimal tonic segments, split tone units and "a limited use of the tonal system" (p. 68). Pickering (2001) confirmed those findings. In this study, there was a prevailing use of falling tones, typical of instructional discourse, in the native and non-native presentations. However, it was the high number of level tones, the scarcity of rising tones, and the unexpected pause patterns in the non-native discourse that "obfuscated the informational structure" of discourse (Pickering, 2001, p. 233).

A study that aims at describing the use of prominence and tones to structure information in EMI lectures delivered by Spanish-speaking professors is necessary to better understand non-native prosody.

Contrasts between Spanish and English at the level of prominence and tones to structure information

Cruttenden (1993), Ortiz-Lira (2000), and Cole et al. (2019) refer to the prosodic characteristics of Spanish and English and point out similarities and differences. In a cross-linguistic analysis involving eight languages, Cruttenden (1993) concluded that Spanish favors reaccenting (i.e., the assignment of prominence to given information), while English disfavors that. Ortiz-Lira (2000) analyzed the oral performance of Chilean Spanish speakers reading aloud in English and concluded that "failure to deaccent re-used material will be a constant source of mispronunciation" (p. 5) for Spanish speakers, since it results in a weak connection between prominence and discourse meaning.

Ramírez Verdugo (2006) made a cross-linguistic comparison of the prosodic realization of focus by Spanish learners and native speakers of English. She analyzed 290 utterances from scripted dialogues that include the speech role of giving information. The results confirm previous findings in connection with Spanish learners of English: "a broad focus default position is overgeneralized to most of the utterances even when the immediate linguistic context indicates a different word should be selected as tonic instead" (p. 20-21). As regards tones, Ramírez Verdugo's analysis

revealed native and non-native speakers generally use a falling contour when giving information. She noted, however, that the falling tone is much steeper in the native intonation units than in the non-native discourse, in which the falling is perceived as "level or shallow" (p. 23).

Through an auditory rating task performed by native speakers of French (Lyon), Spanish (Valladolid) and English (Illinois) with conversational speech, Cole et al. (2019) analyzed the influence of acoustic cues and non-acoustic contextual factors on listeners' perception of prominence in French, Spanish and English, languages that differ in the association of prominence with information structure. As to Spanish and English, Cole et al. said that in Spanish, prominence is generally assigned to the stressed syllable of every content word in a tone unit. English, however, exhibits "a certain degree of elasticity" (Finch & Lira, 1982, p. 98) since information status is a determining factor when making a word prominent. Another difference is the location of the tonic syllable. Despite the fact that the tonic syllable is an obligatory element of the tone unit in both languages, in Spanish, it is fixed on the last prominent syllable in the tone unit. In English, however, it can be moved to an earlier position for contextual reasons. The results confirm the existing characterizations of Spanish and English in relation to prominence and nucleus placement. Acoustic and meaning criteria converge on very similar prominence ratings in English, a language in which prominence is used to convey meaning related to information structure. In Spanish, as prominence plays a lesser role in signaling information structure, the acoustic stimuli seem to play a more important role in the perception of prominence.

The studies mentioned have found prosodic differences between Spanish and English in terms of prominence density, nucleus placement and the realization of tones. Although none of them dealt with Argentine Spanish or explored university lectures, it can be argued that the discourse of Argentine Spanish-speaking EFL professors lecturing in English will display similar prosodic differences.

Research questions

The following research questions (RQs) are addressed in this study:

1. Do Spanish-speaking EFL professors show Spanish-like high prominence density (compared to English values) during EMI lectures?
2. Do Spanish-speaking EFL professors show a Spanish-like fixed nucleus placement (compared to English) during EMI lectures?
3. Do Spanish-speaking EFL professors show a limited use of the tonal system (compared to native speakers of English) during EMI lectures?

If our hypothesis is confirmed, we expect our findings to align with previous research. Such a finding would convincingly show the oral academic genre of lecture also follows the specificity of non-native prosody realization to structure information.

METHODS

Database and participants

The analysis was based on 40.37 minutes of recorded and filmed data collected by the researcher from two lectures delivered in English in which the professors developed a new topic from the courses' syllabi. One of them was about the French Revolution (History); the other one was on problem-solution essay writing (English Language). The presentations under analysis were delivered by two female Argentine Spanish-speaking EFL professors, selected on the basis of a survey administered at the end of the presentations, through which students judged their clarity and organization as presenters. The presentations were delivered to groups of 50 undergraduate students near the end of the academic year. The lecturers whose presentations were analyzed hold a university EFL teaching degree, received phonological instruction during the first three years of their teacher training, and have an advanced level of English.

Data Analysis

After collecting the data, the extracts to be analyzed were transcribed orthographically. Annotated scripts were derived from auditory analysis of prominence and tones following discourse intonation (Brazil, 1985; Brazil et al., 1980). In order to enhance the reliability of the results, this analysis was supplemented with acoustic measures of pitch and intensity using Praat (Boersma & Weenink, 2018). The first 200 tone units of each presentation, plus any parts of each sample about which the researcher had doubts, were analyzed acoustically. In case of incongruities between the researcher's perception and the software's analysis, the information rendered by Praat was used. As there was a high degree of agreement (95%) between both analyses, the researcher considered it unnecessary to continue analyzing the rest of the samples acoustically.

RESULTS

Prominence Density

RQ1 aimed at exploring whether Spanish-speaking EFL professors show Spanish-like high prominence density (compared to English values) during EMI lectures. To answer that question, the speaking rate of both samples was calculated (see Table 1). Considering the broad rules of thumb of what constitutes slow, average and fast speech provided by Cauldwell (2013), both lecturers have a rather slow speed of delivery. Next, the number of words and prominent syllables were used to compute the prominence rate of each sample. If the "typical structure of the tone unit in English [comprises] three to seven words and [contains] one or two prominences" (Pickering, 2018, p. 23), the prominence rate in both samples indicates high prominence density. In Lecture 1, 59.25% of the tone units are single-prominence tone units, and 43% of those are made up of one word that, in many cases, does not form a meaningful idea. Even a higher percentage is obtained from the analysis of Lecture 2: 53.78% of the tone units display single-prominence and 69.24% of them are made up of one word. This could explain the prominence rate in both samples.

Table 1
Speaking and prominence rate of the university lectures under analysis

	Number of words	Prominent syllables	Prominence rate	Words per minute
Lecturer 1	2489	1157	2.15	122.6
Lecturer 2	2297	1277	1.79	110.9

It is interesting to analyze the kinds of words that are made prominent by the lecturers in the two samples. In English, the occurrence of prominent and non-prominent syllables "is a meaningful choice by the speaker[s]" (Pickering, 2018, p. 35) and is related to their "ideas of what they need to do in the context to make their meaning clear to the audience" (Cauldwell, 2013, p. 30).
Examples (a) and (b) show the presenters highlight function words, which tend to be non-prominent in English and Spanish (Ortiz-Lira, 2000). This may be due to lack of fluency, which results in the occurrence of tone unit boundaries "in the middle of natural semantic and syntactic units" (Pickering, 2018, p. 22).

(a) (*speaking about problem solution essays*) //↘↗they're GOing to be PUblished//↗mm //eh//↗or USED//→IN//→MAgazines//→IN//→BOOKS//→ OR//↗periODicals// ↗THAT //↗ARE supPOSED to BE//↘proPOsing solutions to a problem//

(b) //↘↗WHY is it NEcessary//↘↗ TO//↗LOOK a little bit AT //↘the FRENCH RevoLUtion//

English, as opposed to Spanish, strongly disfavors assigning prominence to given information. Only the syllables of words the speakers believe cannot be recovered from context are generally highlighted, while the rest are not. Examples (c) and (d) present instances of given information (in bold type) made prominent at the end of tone units, something consistent with Spanish but not English (Cruttenden 1993; Ortiz-Lira, 2000; Ramírez Verdugo, 2006).

(c) //→**HANoverian** eh//↘ **ENgland**//↗all RIGHT//↗this is PART of **HanoVErian ENgland**//→ and to WHAT SECtion of that **HanoVErian ENgland**//→ which is the NINEteenth CENtury//↘ WE ALso CALL the VicTOrian Period//

(d) //↗for example **eLECtric CARS**//↗or the MASsive USE of **eLECtric CARS**//↗will DEFinitely//↘↗LOWer//↗or reDUCE//↘AIR pollution//

Nucleus placement

RQ2 aimed to delve into whether Spanish-speaking EFL professors show Spanish-like fixed nucleus placement (compared to English values) during EMI lectures. Examples (c) and (d) illustrate this Spanish-like tendency present repeatedly in both samples. However, it is interesting to point out the extracts also present occasional instances in which the lecturers follow the English inclination to show flexibility in the location of the tonic syllable. In examples (e) and (f), given information (in bold type) is not made prominent, contrary to what would be expected in Spanish. The lecturers move the tonic to *one, which* and *very*, which would be unusual choices in their L1.

(e) //↘because there are MAny different TYPES of problem solution essays//↗we are GOing to study JUST//↘ONE today//↘toDAY//↗and and this YEAR//↘↗you're GOing to STUdy//↘ONE type of **essay**//

(f) *(talking about Edmund Burke)* //↘the NAME of what he proDUCED//↘↗AND//↘AND his poSItion as a THINKer//↗oK//↘his poSItion as a thinker was WHICH **position**//↘a conSERvative//↗oK//↘VEry **conservative**//

Tonal composition

RQ3 aimed to explore the use of tones to structure information by two Spanish-speaking EFL professors during EMI presentations. The tonal composition of the two extracts was calculated and turned into percentages (Figure 1). A predominance of falling tones was expected since teaching presentations are discourse genres in which the speakers are "primarily concerned with communicating new informational content" (Pickering, 2018, p. 52). Although that is the case for Lecture 2, the tonal composition of Lecture 1 shows the referring tones were more frequently used than the proclaiming ones. Considering the pragmatic assumptions associated with the referring tones, this seems to indicate that a significant amount of the information was presented as being part of the common ground between the speaker and the audience. Textual analysis reveals that Lecture 1 presents a high frequency of "solidarity markers," which are produced with a rising intonation and "indicate to the hearer that the speaker is aware of her audience and imply that the speaker is directly confirming common ground" (Pickering, 1999, p. 92). Although the presence of these markers creates convergence and establishes rapport with the audience, something desirable in classroom interaction, deep analysis of Lecture 1 seems to reveal that an important number of these markers occur "in the middle of natural semantic and syntactic units" (Pickering, 2018, p. 22), as illustrated by examples (g) and (h). That interrupts the flow of information and may obscure the transmission of ideas.

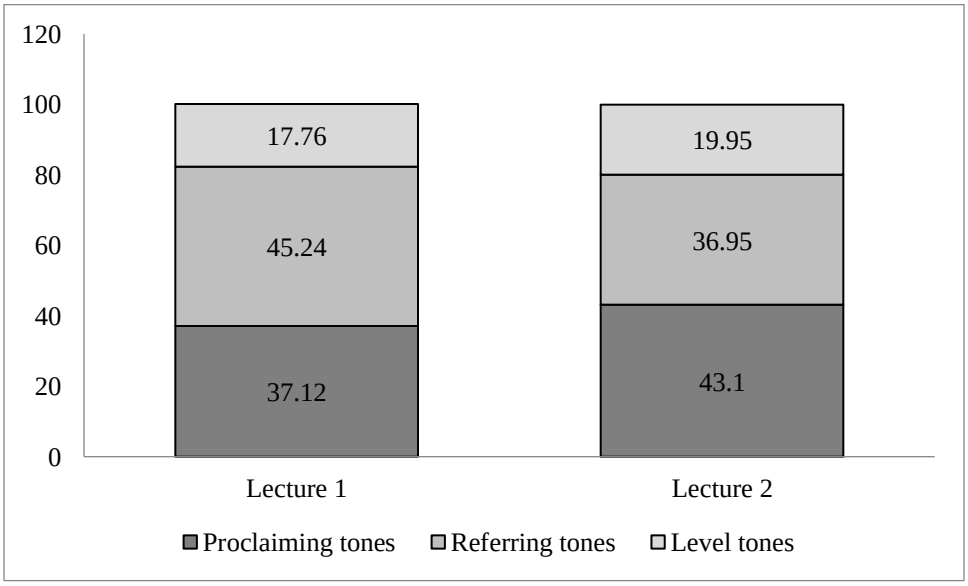

Figure 1. Tonal composition (%) of the university lectures under analysis.

(g) //→the STATEment//↘or presenTAtion of the PROblem//↗o**K**//↘is imPORTant//

(h) //→WORKing in in in GROUPS//↗o**K**//↘deCIDing//↗**oK**//→FOR//↘eh the COUNtry//↘eh collectively//

The least common of all the tones used in both lectures was the level tone. In comparison to previous research (Pickering, 2001), its frequency of occurrence (expressed in percentages) is higher. Textual analysis reveals that, to a great extent, this percentage results from recurrent "problems with linguistic coding" (Pickering, 1999, p. 102). Examples (i) and (j) illustrate that careful attention to the language seems to impact the information structure of the presentations. In example (i), the lecturer is presenting new information related to where the kind of texts the students are learning to write can be published. Example (j) illustrates how information that has been previously presented, signaled by *remember when we saw*, is incorrectly cued through the use of a neutral tone. These examples reveal that neither of the lecturers seems to signal the nature of the information they are presenting through the tone choice since the level tone marks information "as outside the communicative value of the message" (Pickering, 2018, p. 51).

(i) //→so THESE texts//→are VEry TYpical//↗OF//↘ SOcial action//↗RIGHT// →TYpical of//→SItuAtions//→or TYpical of//→ THAT is//↘↗they're GOing to be PUBlished//↗MM//eh or ↗USED//→IN//→MAgazines//→IN//→BOOKS//→OR //↗periOdicals//↗ THAT//↗ARE supPOsed to B //↘proPOSing solutions to a problem//

(j) //→ reMEMber when we SAW//→ the Middle Ages//→ and we MENtioned FEUdalism// ↗alRIGHT//→ and WE//→comPARED and conTRASTed//→and we SAW how the FEUdalism that had deVEloped in FRANCE//

DISCUSSION

This study investigated the use of prominence and tones to structure information in teaching presentations in English by Spanish-speaking university professors. In this section, the findings are discussed considering previous related studies. This analysis allows us to derive some strengths and weaknesses of the extracts analyzed, as well as implications for further research and instruction.

As seen in Table 1, the results reveal a rather slow speaking rate. Considering the discourse genre under analysis, this may not be considered negative since professors generally aim at clear message transmission. However, it may be one of the factors leading to unexpected prosodic choices, considering English native-speaker norms.

Some of these choices are connected with prominence and the segmentation of speech. The high density of prominent syllables in the samples analyzed – examples (a), (b), (c) and (d) – echoes Cruttenden's (1993) and Ortiz-Lira's (2000) findings. Although Pickering (1999) analyzed classroom discourse in English of university lecturers whose L1 is Chinese, she reports similar results in terms of prominence placement. The researcher states that a mismatch between the knowledge state of the hearers and the one projected by the speaker requires the former to adjust

retrospectively, resulting in a "weak connection between prominence and discourse meaning" (p. 116). Pickering also reports incorrect segmentation of the speech stream in the non-native discourse, which does not help the "the hearer to organize the stream of speech into separate, meaningful parts" (Pickering, 2018, p. 34). The findings of this study are in line with Pickering's. Consequently, correct segmentation of information and a decrease in prominence density should be considered when training non-native speakers to deliver presentations in English.

The second prosodic choice that moves away from native-speaker norms is nucleus placement. In line with Ramírez Verdugo's (2006) results, the lecturers in this study might be overgeneralizing the broad focus default position typical of both Spanish and English, overriding the fact that the tonic syllable in English can be moved to a word in an earlier position for contextual constraints (Cole et al., 2019; Ortiz-Lira, 2000). As reported in the Results section, those instances that do resemble the performance of native speakers of English – examples (e) and (f) – might reflect the lecturers' regular exposure to native varieties of English, as well as their remote phonological training in English during their undergraduate studies. Further research should be carried out to confirm this conjecture.

Regarding the extracts' tonal composition, the findings of this study yield similarities and differences with Pickering (1999, 2001). Lecture 2 provides corroboration for Pickering's findings considering the proclaiming tones; they are the most frequently used (see Figure 1). In contrast, the percentage of rising tones in both samples is higher than in the studies mentioned above, which indicates an approximation to native-speakers' norms. In Lecture 1, the percentage of rising tones is even higher than the percentage of falling tones. As reported in the Results section, "solidarity markers" (Pickering, 1999, p. 92) pervade the lecture, often producing split tone units. Once again, correct segmentation of information seems to be a top teaching priority.

The high percentage of level tones found in the samples mirrors previous results (Pickering, 2001; Ramírez Verdugo, 2006). Either because of "problems with linguistic coding" (Pickering, 1999, p. 102) or "narrow pitch range" (Ramírez Verdugo, 2006, p. 23), the samples analyzed reveal that the lecturers have, at times, difficulties signaling the nature of the information they are presenting through tone choice. The discrepancies between the two samples and the mismatch with previous results regarding tonal composition suggest a need for further study to find out whether the results of this study reflect idiosyncratic linguistic features or systematic tendencies.

Our hypothesis is partly confirmed since the answer to the first two RQs is affirmative. However, the results related to RQ3 do not lead us to confirm that the tonal composition of the samples analyzed is limited, as other studies have shown. This might mean that Spanish-speaking university professors exploit a wide repertoire of pitch contours when lecturing in English, despite the overuse of level tones.

CONCLUSIONS

In spite of the small number of speech samples analyzed on this occasion, which should be enlarged in future studies, we may derive preliminary conclusions from the analysis that can help us identify top priorities for future instruction.

First, training of future L1 Spanish-speaking lecturers in English should include a phonological component since this study and previous research support the central importance of prosodic cues "for comprehensible spoken discourse in English" and "for the development of effective discourse competence in L2 learners" (Pickering, 1999, p. 10). Second, the findings suggest that phonological training for L1 Spanish-speaking lecturers should aim at correct segmentation of the speech stream, at decreasing the density of prominent syllables, at increasing the flexibility when placing the tonic syllable in tone units, and at using the tone system more effectively to signal the nature of the information being presented.

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