INTERCULTURAL ANALYSIS OF ENGLISH MODAL CONSTRUCTIONS IN ENGINEERING ACADEMIC PAPERS

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Abstract: Academic English can be said to be non-emotional. However, when texts written by speakers with different mother tongues are analysed, language variation can be observed in the way some constructions are used. In this paper, a corpus of academic papers is studied to extract frequencies and examples of modal probability construction and to analyse variation in the use of this construction when employed by non-native writers of English. The main objective of this analysis is to apply the principles of Construction Grammar to language variation. Further objectives are to detect variation in the use of modal constructions and to study their functions in the specific field of engineering. For this purpose, a corpus of one hundred academic papers written in English by Spanish writers and by native English-speaking writers was compiled. The constructions made up of modal verb + infinitive that indicate probability were then identified. Examples of this English construction used in different ways to express the same meaning by researchers with different mother tongues were discussed. Finally, results were commented on and conclusions were drawn.

Keywords: constructions, intercultural communication, academic English, language variation, linguistic background.

Resumen: El inglés académico puede considerarse como que no expresa las emociones o pensamientos de los escritores. Sin embargo, cuando analizamos textos escritos por hablantes con diferentes lenguas maternas, se puede observar que existe variación en el uso de construcciones. En este artículo, se estudia un corpus de artículos académicos se estudió para extraer frecuencias y ejemplos de la construcción de probabilidad modal y analizar la variación que existe en el uso de esta construcción por hablantes no nativos del inglés. El objetivo principal de este análisis es aplicar los principios de la Gramática de Construcciones a la variación lingüística. Otros objetivos son identificar la variación en el uso de construcciones modales y estudiar sus funciones en el campo específico de la ingeniería. Para ello, se recopiló un corpus de cien artículos académicos escritos en inglés por investigadores españoles y por hablantes nativos. A continuación, se identificaron las construcciones de verbo modal + infinitivo que indicaban probabilidad. Así mismo,

se comentaron los ejemplos de esta construcción en inglés utilizada de forma diferente por investigadores con diferentes lenguas maternas para expresar el mismo significado. Finalmente, se comentaron los resultados y se extrajeron conclusiones.

Palabras clave: construcciones, comunicación intercultural, inglés académico, variación lingüística, antecedentes lingüísticos.

1   INTRODUCTION

The use of English as a lingua franca has led to an increase in the variation of language structures, due to cultural, linguistic and anthropological factors. This phenomenon can be seen, for example, in the utilisation of certain expressions which are not found in 'standard English', in the different ways in which certain words are used, and in variations in language patterns. This aspect has been pointed out by several researchers, such as Yli-Jokipii and Jorgensen (2006), Carrió-Pastor (2009, 2014, 2019a, 2019b), Schleef (2009), Carrió-Pastor and Muñiz (2012, 2015), Candel and Carrió-Pastor (2013) and Carrió-Pastor and Candel (2013).

The power to choose one word or another is restricted, with the word being chosen somehow, not only by the writer, but also by the context, due to its functional principles and the culturally established meaning of the word. Thus, researchers find themselves in a continuous negotiation with language, involved in a continuous back and forth in order to transmit meaning and to be able to interpret the cognitive aspects of language production as a combination of form and meaning (Lakoff 1987, Langacker 1987, Sandra, Östman and Verschueren 2009, Alonso Almeida and Carrió-Pastor 2015, Carrió-Pastor 2016a, 2016b, 2016c).

In this study, I examine a grammatical construction based on the frameworks developed under the umbrella of Construction Grammar (CxG) and studied by Fillmore, Kay and O'Connor (1988), Goldberg (1995, 2003, 2006), Kay and Fillmore (1999), Croft (2001) and Croft and Cruse (2004). As Goldberg and Casenhiser (2007: 1) explain, "[…] the term *construction* refers to classes of actual expressions, that is to grammatical patterns […] that have unusual quirks in either formal properties or their semantic interpretation that make them ill suited for universal status". In this paper, my intention is to identify a construction and analyse whether variation can be observed when comparing texts written by researchers with different linguistic backgrounds.

First of all, I take into consideration the fact that grammatical constructions have been labelled in different ways by researchers analysing different unique aspects of language. As an example, Goldberg and Casenhiser (2007) identify the following constructions:

- time away construction,
- incredulity construction,
- covariational conditional construction,
- stranded preposition construction,
- NPN construction.

Other researchers, such as Hoffmann and Trousdale (2011) employ:

- word construction,
- idiom construction,
- comparative construction,
- resultative construction.

In this study, I have focused on modal construction, as I believe this grammatical pattern can have different semantic interpretations depending on the context or writers' intention, as researchers (Alonso and Carrió-Pastor 2015, Carrió-Pastor 2016a, 2016b, 2016c) have identified in some constructions or by comparing different languages. I also think that this pattern changes depending on the cultural background of the writer as result of synchronic intercultural communication. I labelled the construction under study 'modal probability construction', as it only included the modal verbs that imply probability, did not follow the general principles of the meaning of modal verbs and had multiple interpretations whose patterns I considered it important to analyse and identify.

In this sense, my main objective was to use the principles of CxG to identify the patterns of language variation. A further objective was to detect and analyse the variation of some constructions used to express modality in English by non-native English speakers (NNES) and by native English speakers (NES). Finally, I examined whether NNES prefer to use different ways to express the same modal probability construction (if form and meaning are used in the same way), the gradual nature of constructional variation and the importance of context.

This study is based on particular developments of CxG. Specifically, I focus on the aspects related to:

- the usage-based approach (language use is relevant to the determination of the rules of language, Holme 2010),
- the Radical Construction Grammar framework (the cross-linguistic factors of language production, with all grammatical categories being language-specific and construction-specific, defended by Croft, 2001), and
- the Cognitive Construction Grammar framework (CCxG, the semantic content of constructions: the form is determined by the meaning of constructions, identified by Boas, 2013), amongst others.

Each of these theories or linguistic approaches share several features that I considered important for this study of variation in a synchronic corpus, as Dufter, Fleischer and Seiler (2009) and Hoffman and Trousdale (2011) also pointed out.

Secondly, the notion that form and meaning are paired in communication is important in order to understand the way in which speakers with different linguistic backgrounds use constructions to transmit information, although diachronic analysis has also been of interest to researchers such as Fried (2009). That is, researchers and academic writers find themselves in constant negotiation with the cognitive aspects of language, and are involved in a continuous back and forth in order to transmit meaning. As a consequence

of the cognitive variability of language, some constructs are used more or less frequently than others, depending on the mother tongue, culture and academic background of the researcher or the genre for which the text is written (Wee and Ying 2008, Antonopoulou and Nikiforidou 2011).

Language and cognition mutually influence one another and are both embedded in the experiences and environments of language users. A grammatical construction, regardless of its formal or semantic complexity and make up, is a pairing of form and meaning. Meaning is understood to include semantic, pragmatic and discourse phenomena (Fried and Östman, 2005). As Goldberg (2005) has stated, constructions arise because certain collocations of language occur with relatively high frequencies, leading speakers to associate certain linguistic forms with certain meanings. In a usage-based model, processes of communication are assumed to play a critical role in the structuring of linguistic knowledge. Construction Grammar should be seen as part of a broader attempt to understand how humans use language to communicate and interact with each other (Sag, Boas and Kay, 2012). Syntactic categories such as noun, verb, subject and object are abstract semantic construals of the content of their denotations, providing language patterns that can be identified, as Michaelis and Lambrecht (1996), Michaelis and Ruppenhofer (2001), Michaelis (2004) and Steels (2011) have explained in their research. The value of CxG for the study of variation in discourse constructions is that it enables us to find variation patterns with identifiable and definable rules.

Constructions involve a high degree of conventionalisation, since speakers often repeat expressions they have heard before in their own culture, as Hoffman and Trousdale (2011) remarked when referring to the variability of human languages. Also important are culture-specific features such as mental sets, schemata, scripts, speech events, sociocultural norms, linguistic etiquette and pragmatic accent. All these aspects influence writers in their selection of certain constructions or in choosing to use a simpler structure rather than a more complex one.

Thirdly, another important issue taken into account for this study is that language changes depending on different factors. One factor is that some speakers tend to engage in more analytical modes of thinking whereas others tend to think more holistically. This difference has implications for how compatible one's mode of thinking is with speech and it has an impact upon the flow of communication. On the one hand, analytic thinking is characterised by linearity and logic, and can be more readily verbalised while, on the other hand, holistic thinking is characterised by circularity and the assumption of change. In this sense, writers communicate in different ways depending on the characteristics of their mother tongue, whether their manner of thinking is holistic or analytic. Another factor is that assumptions, attitudes and sensitivity issues may also result in the emergence of barriers to communication. Certain aspects of an act of communication have to be filtered or expressed in a certain way because readers are not interested in them or the topic may seem too difficult. Overall, communication is a process that is difficult to carry out correctly, as the sender must find a way to take into account the viewpoint of the receiver in order to relay the message in the most effective way. The multicultural world in which we live affects the way we communicate and the mental construction networks of speakers must be taken into account. One example of this is how language is used in an academic context. Culture

influences whether and how individuals express their thoughts in academic English and whether the speaker or writer is using their mother tongue or a second language is also an important factor to be taken into account when identifying construction patterns. On this issue, Hoffmann and Trousdale (2011: 12) remark that "[…] since L2 speakers normally receive less input of the target language than a native speaker, they will also develop fewer and less deeply entrenched substantive and schematic constructions". Contrasting the production of native speakers and non-native speakers of a language allows differences in language use to be identified.

Given the extent of intercultural variations, it is not difficult to imagine that intercultural encounters can be a challenge for interlocutors, with there being a potential risk of intercultural communication failure. Intercultural communication does not only concern interactions between native and non-native speakers, but any communication between people who, in any particular domain, do not share a common linguistic or cultural background. Communicative competence must include cognitive competence (i.e. choosing the appropriate form) and socio-cognitive competence (i.e. choosing appropriate meaning) if intercultural cognitive problems are to be avoided. Language is both embodied and situated in a specific environment and, thus, it is context dependent. Goldberg (2005) has shown that universalist approaches to language configurations encounter many exceptions that endanger their integrity. It can therefore be said that language is not universal *per se* but is made up of constructions that are specific and unique to each language.

2   METHOD

In this study, a corpus of one hundred academic papers was analysed. Fifty of these papers were written by native English speakers (NES), whose nationality was British and American, and fifty were written by non-native English speakers (NNES), whose nationality was Spanish. The papers were selected from online international research journals dedicated to the publication of scientific findings related to the field of engineering. The affiliations and biographical details of the authors were checked in order to identify their mother tongue. Table 1 displays the statistical data of the corpus compiled for this study:

Statistical data	Occurrences NNES (%)	Occurrences NES (%)
Words in the corpus	184,357 (47.11%)	206,907 (52.89%)
Word lists	10,590 (45.43%)	12,716 (54.57%)
Number of sentences	9,017 (50.00%)	9,017 (50.00%)
Average no. of words per sentence	20.44 (46.11%)	22.94 (53.89%)
Number of paragraphs	1,145 (55.51%)	916 (44.49%)
Number of words per paragraph	161.29 (41.58%)	225.88 (58.12%)

Table 1. Statistical data of the corpus

Once the corpus had been compiled, the texts were searched for the modal probability construction which was to be studied. In this case, I chose to focus on the modal verbs that indicate probability, as a modal probability construction, in order to verify the variation in the use of the probability construction formed by *modal verb + infinitive*. The modal verbs to be included in this construction were: *could + infinitive*, *may + infinitive* and *might + infinitive*; that is, those which express that X is probable to a higher or lower degree. The modal verb *can* was not included in the study as the focus of the analysis was on verbs that express mitigation in different degrees, specifically *might, may* and *could*, which are the modal verbs that are difficult to distinguish by NNES.

Then I contrasted the different uses of these modal probability constructions, as my initial hypothesis was that the culture or mother tongue of the speakers might lead to a change in the frequency of the modal probability construction. For example, writers could be said to have different intentions when using the modal probability construction in the following sentences: 'The experiment *could* provide evidence of our theory' versus 'The experiment *may* provide evidence of our theory' versus 'The experiment *might* provide evidence of our theory'. Thus, my aim was to establish whether the use of this construction varies depending on the mother tongue of the speaker and, if so, its effect on contextual meaning.

The examples of the modal probability construction were identified in the corpus using the *WordSmith 5.0* software, specifically the program *WordList.* Once the modal verbs had been identified, the results were verified manually and studied in order to check the meaning of the extracted construction. Finally, some examples were selected to be commented upon and the variation in the frequency of the construction was compared. A statistical analysis of the results was also carried out in order to determine the significance of the results that were extracted. The statistical value was calculated with the formula of relative risk and chi-squared values. This aspect was included in the study to establish whether the results could be extrapolated to similar studies, this calculation shows us if the results extracted in this study are significant or not.

The relative risk is the ratio of the proportions of cases having a positive outcome in two groups and it is calculated with the formula that can be consulted at http://www.medcalc.org/calc/relative_risk.php:

Relative risk = (a / (a+b)) / (c / (c+d))

The chi-squared test was also calculated in order to compare the data recorded with the data we would expect to obtain according to a specific hypothesis. If the result of the calculation is $p < 0.05$, the hypothesis is valid, meaning that the results can be extrapolated to other similar studies. Finally, after displaying and discussing some examples of the construction used by NNES and NES, some conclusions were drawn.

3   RESULTS

The results from the quantitative and statistical analysis of the corpus of this study can be seen in Table 2. The statistical value $p < 0.05$ was used to calculate the extrapolation of the results found in the analysis. The corresponding probability of the statistical calculation is between the 0.10 and 0.05 levels. In the results obtained, the p-value is below 0.05. Since

a *p*-value of 0.03 is less than the conventionally accepted significance level of 0.05 (i.e. *p* <0.05) there is a statistically significant difference in the proportions compared.

Modal probability construction	Occurrences NNES (%)	Occurrences NES (%)	Relative risk (confidence interval)	(c^2) Chi-squared
Could	166 (48.82%)	174 (51.18%)	0.81 (0.66-0.99)	*p* = 0.03
May	181 (39.69%)	275 (60.31%)	0.56 (0.47-0.66)	*p* = 0.00
Might	13 (24.07%)	41 (75.93%)	0.27 (0.14-0.50)	*p* = 0.00

Table 2. Results of the analysis of the corpus

The total raw number of *could + infinitive*, *may + infinitive* and *might + infinitive* constructions was 360 (42.35% of the total number of modals) in the corpus of papers written by NNES and 490 (57.65% of the total) in the corpus of papers written by NES. The percentages shown in Table 2 were calculated taking into account the total occurrences in each modal construction.

As can be observed, the frequencies used to express the modal probability construction were different in the two sub-corpora analysed. The two groups of writers used *could + infinitive* to a quite similar extent, although *may + infinitive* and *might + infinitive* were used less frequently by NNES than by NES. The statistical data of relative risk and Chi-squared show that the data extracted of the constructions *may + infinitive* and *might + infinitive* are more significative than the data of *could + infinitive*, as the relative risk is higher than the other and the value of *p* is 0.03, i.e. it is significative as it is lower than 0.05, which was established as the significative value.

Then, it could be said that the English language has competing syntactic structures in *could + infinitive*, *may + infinitive* and *might + infinitive*, which appear to be describing the same situation, but in Construction Grammar they are viewed as conventionalised linguistic means for representing different interpretations of probability.

Figure 1 below shows the results of the analysis of the NNES corpus with regard to the modal probability construction. *Might + infinitive* was used infrequently to express probability, with NNES preferring to employ *may + infinitive* and *could + infinitive*:
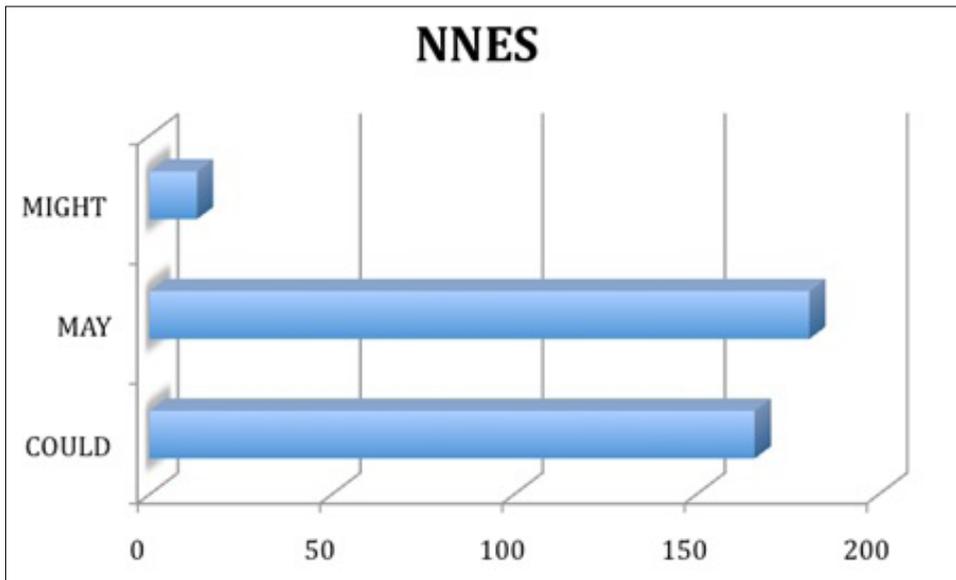
Figure 1. Results of the modal probability construction extracted from the NNES corpus.

This may be due to the writer's intention to describe events in academic English with a higher degree of probability while also expressing the politeness and uncertainty expected in academic English when showing findings. In this sense, Spanish NNES show a preference for *may + infinitive* instead of *could + infinitive* to describe their findings and ideas. These findings could reveal that Spanish NNES find easier to communicate mitigation with modal verbs *may* and *could*, but *might* was less frequently used. These results are in line with a previous study of Carrió-Pastor (2014: 164), in which the author states: "Spanish writers of English as a second language tend to transmit less vagueness when they express themselves in English than their native-speaking English counterparts".

Figure 2 below shows the data obtained in the corpus of texts written by NES and the results are similar in the sense that *might + infinitive* is not frequently used, with *may + infinitive* and *could + infinitive* being preferred. As it was remarked in the comments on Figure 1 above, linguistic constructions provide a structure for concepts, as Ellis and Cadierno (2009) have stated.
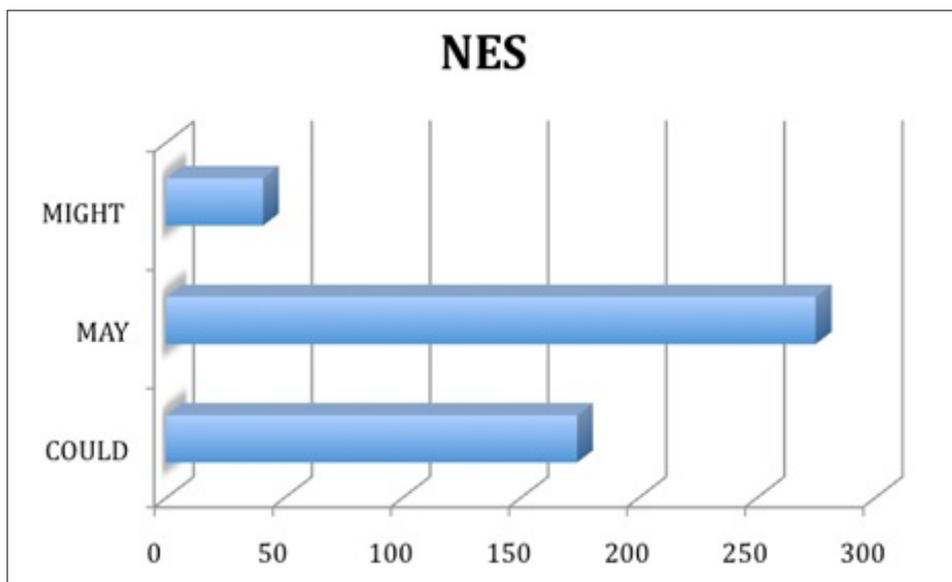
Figure 2. Results of the modal probability construction extracted from the NES corpus.

Thus, NES preferred the use of *may + infinitive* to express probability, thus signalling to the reader which elements should be considered more or less probable in the construction. Native English writers transmit their perception of academic language conventions to the reader, thus hiding their face and mitigating the way they express the results of their experiments. NES used *may* (60.31%) more frequently than the other modals to describe their research as humble, avoiding assertion.

Figure 3 below provides a visual representation of the results explained in detail in Table 2 and it contrasts the use of *might + infinitive*, *could + infinitive* and *may + infinitive* by NNES and NES. The figure clearly shows the variation in the use of the modal probability construction, particularly in the case of *may + infinitive*, with this being used more frequently by NES than by Spanish NNES, and with little variation in the use of *could + infinitive* or *might + infinitive* by NNES and NES being observed. The variation in the use of *may + infinitive* may be due to the less frequent use of the modal probability construction by NNES, who choose to use the modal probability construction less frequently when seeking to make allowances for academic English conventions.
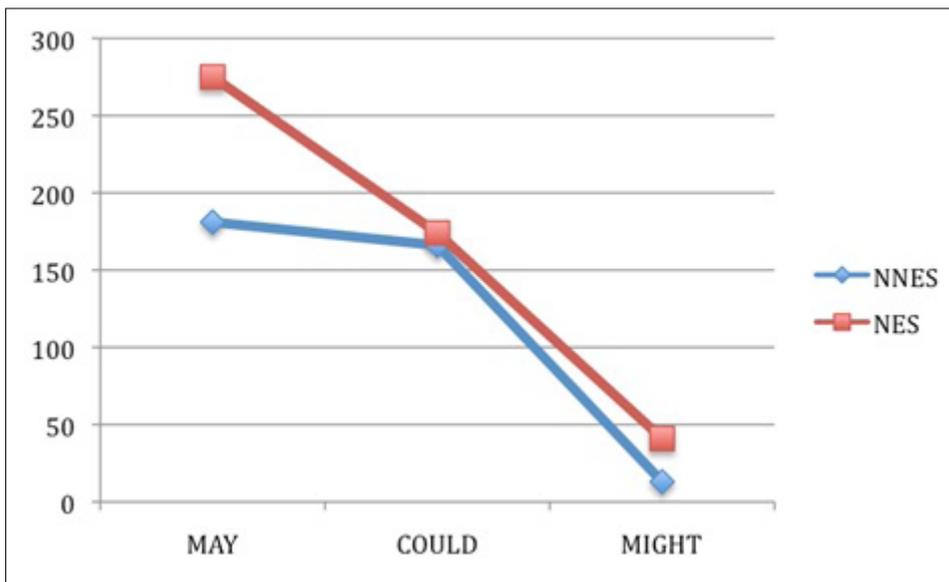
Figure 3. Comparison of the results for the modal probability construction.

Tyler (2012: 107) indicates that the modal verbs included in the modal probability construction can be interpreted in terms of their own meaning (semantic meaning) and the meaning that they have for the receiver of the message (pragmatic meaning). She goes on to explain how the physical/social meaning of *may* is that "[…] external authority allows action, takes away possible barrier to action" or "external force removes barriers", which is metaphorically extended to "nothing bars me from concluding X (but nothing forces or compels me to conclude this either" (Tyler, 2012: 112). For the purposes of this study, these comments enable us to say that *may + infinitive* implies that there is a reasonable possibility of a particular conclusion being true, with there being no barriers to the drawing of this conclusion.

Following Tyler (2012: 114), the physical/social meaning of *could* is a "[…] weakened ability to undertake action, implies possibility", with the metaphorical extension being: "The data provide weakened support to possibly conclude X, but I see potential barriers". For this study, *could + infinitive* means weakened probability to draw a particular conclusion. Tyler (2012: 113) explains that the physical/social meaning of *might* is "[…] weakened forms, mitigated" and the metaphorical extension is "Probably nothing to bar me from concluding X, but nothing seems to compel me to conclude this either".

Other authors (for example, White, 1975; Palmer 1979; Allan, 2001; Nuyts, 2006, Simon-Vandenbergen and Aijmer, 2007) discuss in their research the nature of *might* and *could* as modal verbs of epistemic possibility, defined by Nuyts (2006: 6) as "[Epistemic modality] concerns an indication of the estimation, typically, but not necessarily, by the speaker, of the chances that the state of affairs expressed in the clause applies in the world".

In the functional analysis of language, there are two main differences to interpret modal verbs; Lyons (1977) wrote a seminal work on this topic, defining the two different types of modality: epistemic and deontic. Lyons (1977: 797) defines epistemic modality as "[the speaker's] commitment to the truth of the proposition expressed by the sentence is utters" and deontic modality as "concerned with the necessity or possibility of acts performed by morally responsible agents" (1977: 823).

But in this research I prefer to consider Tyler's (2012) point of view as this author focuses on the meaning of the modal verbs rather than on their function. In this research, *might + infinitive* is the weakened form of the modal probability construction and it is used to mitigate the statements made by the writer. I believe that this is not very frequent in the corpus analysed because writers prefer not to highly mitigate their findings in academic English. NES and NNES used more frequently the constructions *could + infinitive* and *may + infinitive* to mitigate the findings of their research but the authors decided not to use *might + infinitive* very frequently; this may be caused by the nature of the corpus, which is composed of research papers that support their findings on data.

To illustrate the results and discussion of this section, some examples from the corpus are now given. The examples of modal verbs from the NNES and the NES writers are similar. I specifically focused on the frequency of the construction in order to identify the patterns preferred by writers with different mother tongues, as I noticed that the modal probability construction was used to convey similar meanings but there was variation in the frequency of its use. Examples [1], [2], [3], [4], [5] and [6] illustrate the use of the modal probability construction in the corpus.

In [1] and [2], it can be seen that that the modal probability construction *could + infinitive* communicates a weakened probability meaning (compared with the same sentence using *can*) that the writers desire to transmit to the reader:

[1] NES: "This simple test was required to verify that the designed pMA system *could move* the pole and a load (combined mass 70 kg) through a work volume measuring 3 m × 3 m at the pole tip. The tests revealed that this *could* easily *be* achieved by satisfying the power and motion range requirements."

[2] Spanish NNES: "The atmosphere *could be measured* with an adequate method."

The probability construction *could + infinitive* was used with similar frequency by native (174 occurrences) and non-native (166 occurrences) speakers of English. Both groups of researchers are aware that they should use this construction in academic English in order not to be assertive when describing their findings.

In examples [3] and [4], native and non-native speakers of English use *might + infinitive* to mitigate the action undertaken and transmit insecurity to the reader about the statement. We observed that both native and non-native speakers used this construction with a similar function of mitigating an assertion:

[3] NES: "These results show that there is promise for developing an integrated process that *might produce* syngas, methanol, and power from a methane source."

[4] Spanish NNES: "The results obtained have been confirmed against experimental measurements, indicating that the proposed diagnostic technique *might be* a useful tool for failure detection."

The frequencies obtained in the two corpora showed that native speakers (41 occurrences) used the construction *might + infinitive* more frequently than the non-native speakers (13 occurrences) of English. It seems that native speakers prefer to show their results in a humble way, only suggesting the conclusions of their experiments.

In examples [5] and [6], the writers prefer the use of *may + infinitive* to indicate that there is a reasonable possibility of a particular conclusion being true, with there being no barriers to asserting the sense of the infinitive:

[5] NES: "Nevertheless, this solution *may carry* several shortcomings."

[6] Spanish NNES: "Efforts to develop design methods and to provide an understanding of the dynamic properties *may contribute* to a wider implementation of integrated columns."

The construction *may + infinitive* was used by native speakers (275 occurrences) more frequently than by non-native speakers (181 occurrences). Native speakers of English are more aware of the importance of using modal probability constructions, as shown in Table 2.

As pointed out above, the modal probability construction is used to express the same function by NES and NNES, but the frequency of the occurrences found demonstrates that there is variation in the use of this construction. It seems native speakers of English are more aware of the usefulness of mitigation in research papers and so they used this construction more frequently to communicate appropriately in academic English.

4   CONCLUSIONS

Grammar must be an integral and necessary part of any linguistic research and, although Construction Grammar has focused mostly on stable constructions, some studies (Fried and Östman 2005, Fried 2009, Hoffmann and Trousdale 2011) on CxG variation have argued that changes within the grammatical code should also be studied. I believe a combination of the usage-based model, Radical Construction Grammar and Cognitive Construction Grammar should be used to integrate the insights of semantics with grammatical theory, blending the specifics of any linguistic encoding and pairing form with meaning in the interpretation of language. Furthermore, conventional discourse settings may be seen as large-scale constructions and should be studied in this way, as the mapping of the constructions will allow us to understand the configuration of language. Frequency patterns should also be incorporated into CxG in order to identify language constructions and discover the variation in the use of these constructions.

In this study, the objective has been to analyse whether the use of language constructions varies, as I believe there is no universal manner of communication or conveying meaning, and the results obtained show that language is not so universal or fixed as might initially be thought, and this should be taken into account when making cross-linguistic generalisations. NNES employed the modal probability construction less than their NES counterparts and variation was observed in the use of the *may + infinitive* construct. In common with other

academic languages, English uses modal verbs to represent the speaker's attitude regarding probability within academic contexts. The importance of these constructions in English needs to be underlined, as they cause difficulties for NNES when they seek to communicate and express the meaning they wish to convey. Some constructions are used inappropriately, while others are underused or overused. Almost all modal verbs have two senses: the root sense and the epistemic sense. In this study, my purpose was not to describe the nature of the meaning of these constructions, but to show that constructions are not used in the same way by speakers with different cultural and linguistic backgrounds. Even in the same context, writers preferred to use the modal probability construction in different ways, which means that while mapping language is important, other factors such as variability should also be taken into account.

The results of this study support the statement made by Croft and Cruse (2004: 258) in which they indicate that meaning in CxG stands for "[…] all the conventionalised aspects of a construction's function, which may include not only properties of the situation described by the utterance, but also properties of the discourse in which the utterance is found […] and of the pragmatic situation of the interlocutors". Further studies should be undertaken to identify other constructions demonstrating variation when used by speakers with different mother tongues, in order to offer a precise representation of the semantics of modal constructions.

5   REFERENCES

ALLAN, K. 2001. *Natural Language Semantics*. Oxford: Blackwell.

ALONSO ALMEIDA, F. AND CARRIÓ PASTOR, M. L. 2015. "Sobre la categorización de 'seem' en inglés y su traducción en español. Análisis de un corpus paralelo". *Revista Signos. Estudios de Lingüística*. 48: 154-173.

ANTONOPOULOU, E. AND NIKIFORIDOU, K. 2011. "Construction grammar and conventional discourse: A construction-based approach to discourse incongruity". *Journal of Pragmatics.* 43: 2594-2609.

BOAS, H. C. 2013. "Cognitive Construction Grammar". In T. Hoffmann and G. Trousdale (eds.), *The Oxford Handbook of Construction Grammar*. Oxford: Oxford University Press. Pp. 233-254.

CANDEL MORA, M. A. AND CARRIÓ-PASTOR, M. L. 2012. "Corpus analysis: a pragmatic perspective on term variation". *RESLA, Special edition on 'Converging ways of applying corpus linguistics'.* 25/1: 33-50.

CARRIÓ PASTOR, M. L. 2014. "Cross-cultural Variation in the Use of Modal Verbs in Academic English". *SKY Journal of Linguistics*. 27: 153-166.

CARRIÓ PASTOR, M. L. 2016a. "A contrastive study of the hedges used by English, Spanish and Chinese researchers in academic papers". In F. Alonso et al (Eds.). *Input a word, analyze the world: Selected approaches to Corpus Linguistics*. Cambridge: Cambridge Scholars. Pp. 477-492.

Carrió Pastor, M. L. 2016b. "A contrastive study of interactive metadiscourse in academic papers written in English and in Spanish". In F. Alonso et al (Eds.) *Corpus-based studies on language varieties*. Bern: Peter Lang. Pp. 89-114.

Carrió Pastor, M. L. 2016c. "Mitigation of claims in medical research papers: A comparative study of English and Spanish writers." *Communication & Medicine.* 13: 1-25.

Carrió Pastor, M. L. 2019a. "Different ways to express personal attitudes in Spanish and English engineering papers: An analysis of metadiscourse devices, affective evaluation and sentiment analysis". *Lodz Papers in Pragmatics*. 15-1: 45-67.

Carrió Pastor, M. L. 2019b. "Do writers express the same attitude in historical genres?" In I. Moskowich et al (eds.) *Writing history in Late Modern English. Explorations of the Coruña Corpu*s. 12, pp. 237 - 259. Amsterdam: John Benjamins.

Carrió Pastor, M. L. and Muñiz, R. 2015. "Identification and causes of lexical variation in Chinese Business English". *English Today*. 31: 10-15.

Carrió-Pastor, M. L. 2009. "Contrasting specific English corpora: Language variation". Special issue of *International Journal of English Studies.* 9-2: 221-233.

Carrió-Pastor, M. L. and Candel Mora, M. A. 2013. "Variation in the translation patterns of English complex noun phrases into Spanish in a specific domain". *Languages in Contrast.* 13-1: 28-45.

Carrió-Pastor, M. L. and Muñiz, R. 2012. "Lexical variations in business e-mails written by non-native speakers of English". *LSP Professional Communication, Knowledge Management and Cognition.* 3-1: 4-13.

Croft, W. A. 2001. *Radical Construction Grammar: Syntactic Theory in Typological Perspective.* Oxford: Oxford University Press.

Croft, W. A. and Cruse, D. A. 2004. *Cognitive Linguistics*. Cambridge: Cambridge University Press.

Dufter, A., Fleischer, J. and Seiler, G. (Eds). 2009. *Describing and Modeling Variation in Grammar*. Berlin: De Gruyter.

Ellis, N. C. and Cadierno, T. 2009. "Constructing a second language: Introduction to the special section". *Annual Review of Cognitive Linguistics.* 7: 111-139.

Fillmore, C., Kay, P. and O'connor, C. 1988. "Regularity and Idiomaticity in Grammatical Constructions: The Case of let alone". *Language.* 64: 501–38.

Fried, M. 2009. "Construction grammar as a tool for diachronic analysis". *Constructions and Frames.* 1-2: 262-291.

Fried, M. and Östman, J. O. 2005. "Construction Grammar and spoken language: The case of pragmatic particles". *Journal of Pragmatics.* 37: 1752-1778.

Goldberg, A. 1995. *Constructions: A Construction Grammar Approach to Argument Structure.* Chicago: University of Chicago Press.

GOLDBERG, A. 2003. "Constructions: a new theoretical approach to language". *TRENDS in Cognitive Sciences*. 7-5: 219-224.

GOLDBERG, A. 2005. "Constructions, Lexical Semantics and the Correspondence Principle: Accounting for Generalizations and Subregularities in the Realization of Arguments". In N. Erteschik-Shir and T. Rapoport, eds. *The Syntax of Aspect*. Oxford: Oxford University Press.

GOLDBERG, A. 2006. *Constructions at Work: The Nature of Generalization in Language.* Oxford: Oxford University Press.

GOLDBERG, A. AND CASENHISER, D. 2007. "English Constructions". In B. Aarts and A. McMahon, eds. *The Blackwell Handbook of English Linguistics*. London: Blackwell.

HOFFMANN, T. AND TROUSDALE, G. 2011. "Variation, change and constructions in English". *Cognitive Linguistics*. 22-1: 1-23.

HOLME, R. 2010. "Construction grammars: Towards a pedagogical model". *AILA Review.* 23: 115-133.

KAY, P. AND FILLMORE, C. 1999. "Grammatical constructions and linguistic generalizations: the what's X doing Y? construction". *Language.* 75: 1-33.

LAKOFF, G. 1987. *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind*. Chicago: CSLI.

LANGACKER, R. 1987. *Foundations of Cognitive Grammar.* Stanford: Stanford University Press.

LYONS, J. 1977. *Semantics*. Cambridge: Cambridge University Press.

MICHAELIS, L. A. 2004. "Type Shifting in Construction Grammar: An Integrated Approach to Aspectual Coercion". *Cognitive Linguistics* 15: 1–67.

MICHAELIS, L. A. AND LAMBRECHT, K. 1996. "Toward a Construction-Based Model of Language Function: The Case of Nominal Extraposition". *Language.* 72: 215–247.

MICHAELIS, L. A. AND RUPPENHOFER, J. 2001. *Beyond Alternations: A Construction-Based Account of the Applicative Construction in German*. Stanford: CSLI Publications.

NUYTS, J. 2006. Modality: Overview and linguistic issues. In: W. Frawley (ed.). *The expression of modality*. Berlin: Mouton de Gruyter, 1–27.

PALMER, F. R. 1979. Modality and the English Modals. London: Longman.

SAG, I., BOAS, H. AND KAY, H. 2012. "Introducing Sign Based Construction Grammar". In H. Boas, I. Sag and H. Kay (eds.), *Sign Based Construction Grammar.* Stanford: Center for the study of language and information.

SANDRA, D., ÖSTMAN, J. O. AND VERSCHUEREN, J. (EDS). 2009. *Cognition and Pragmatics.* Amsterdam: John Benjamins.

SCHLEEF, E. 2009. "A cross-cultural investigation of German and American academic style". *Journal of Pragmatics*. 41: 1104-1124.

Simon-Vandenbergen, A. M. and Aijmer, K. 2007. *The Semantic Field of Modal Certainty. A Corpus-Based Study of English Adverbs*. Berlin: Mouton de Gruyter.

Steels, L. (Ed.). 2011. *Design Patterns in Fluid Construction Grammar*. Amsterdam: John Benjamins.

Tyler, A. 2012. *Cognitive Linguistics and Second Language Learning*. New York: Routledge.

Wee, L. And Ying, T. Y. 2008. "That's so last year! Constructions in a socio-cultural context". *Journal of Pragmatics*. 40: 2100-2113.

White, A. R. 1975. *Modal Thinking*. Oxford: Blackwell.

Yli-Jokipii, H. and Jorgensen, P. E. F. 2004. "Academic journalese for the Internet: A study of native English-speaking editors' changes to texts written by Danish and Finish professionals". *Journal of English for Academic Purposes*. 3: 341-359.