

SENTENTIAL EVIDENTIALS IN ENGLISH AND SPANISH MEDICAL RESEARCH PAPERS

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Abstract: *This paper studies evidentiality in a corpus of medical research papers in English and Spanish. We concentrate on sentential evidentials, i.e. evidentials affecting a complete proposition, in both languages. We will show that these devices are more frequent in English than in Spanish, although the two languages use similar constructions to show authors' source/mode of information. Our study considers evidentials found in the different research sections in order to detect and describe intrageneric differences. This research aims to contribute (1) to the characterisation of the medical research papers in both languages, and (2) to the debate concerning the relationship between evidentiality and epistemic modality. Our view is that they represent two distinct categories. The interpretation of evidentials in terms of authorial commitment is a pragmatic effect perceived by readers/hearers. This approach leads the analyses of the examples to conclude that the two concepts are autonomous, although readers may infer other pragmatic values.*

Key words: *medical register, evidentiality, epistemic modality, research articles, contrastive analysis.*

1. INTRODUCTION

The study of evidentiality, i.e. source of information knowledge, has received a considerable amount of interest recently and the topic has been subject of much redefinition and reworking. For many scholars, the notion of evidentiality is intrinsically linked to the concept of epistemic modality, and so evidential devices are categorised and described as epistemic expressions seeking to attenuate authorial claims while protecting the interactants' public self image, i.e. the concept of face in terms of politeness theory. In this sense, evidentiality is strongly linked to the concepts of *stance* and *epistemic modality*, as has been put forward in Babel (2009), Cliff (2006), and Hsieh (2008). There are, however, opposing views and arguments in the evidential-epistemic debate. While evidentiality may certainly be associated with the concept of *stance* in the area of epistemic space, this aspect is due to contextual premises selected at the time of the communicative exchange, as has been suggested in Alonso-Almeida (2012, forthcoming), where a reader-centered view of evidentiality is offered. We will explain this view in detail in due course since it will underpin our analysis of the samples selected.

Our study offers a characterisation of medical research papers (RAs) in terms of sentential evidentials, i.e. evidentials affecting a complete proposition, in a corpus of Spanish and English texts in journals written by native speakers of each language. This enables us to fulfil two main objectives. The first concerns with the way in which English and Spanish scientists deploy evidential devices in the construction of argumentation in scientific papers. Despite the fact that several studies have been carried out on hedges and other epistemic expressions from different perspectives, including a cross-linguistic approach, we have not found a similar coverage of

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evidential expressions in the literature of modality. The second objective seeks to contribute to our understanding of evidentiality as a theoretical concept by demonstrating that terminological confusion is alleviated when the focus of attention is moved from the author to the recipient in the interpretation of these devices.

The paper is organised as follows. We offer a review of the literature concerning evidentiality and other related concepts in section 2, where we also position our study within a school of thought in the modality tradition. The next section describes our research corpus and the methodology of analysis and interpretation of data. In this section, we also include a description of the rhetorical structure of RAs in English and Spanish, since our study considers and compares data according to each generic section. Section 4 offers the results of our textual enquiries, and these will be firstly classified according to their grammatical status into (a) adverbials, (b) *that*-clauses, and (c) modal verbs. The following sections include the discussion and the conclusions drawn from our analysis of the findings.

2. EVIDENTIALITY AND RELATED NOTIONS

The concept of evidentiality has been looked at from three main perspectives. The first one considers evidentials to be grammatical markers, and, in its narrow sense, the concept is exclusively a grammatical phenomenon (Aikhenvald 2004; Anderson 1986). In an extreme view of evidentiality in this respect, only clitics and morphological devices can show evidential meaning, and that means that languages such as English cannot convey evidential information grammatically. A second view of evidentiality is semantic. This position is followed in Palmer (1986) and Chafe (1986), and most explicitly in Crystal 2001, who defines the concept in the following terms:

evidentiality (*n.*) A term used in SEMANTICS for a type of EPISTEMIC MODALITY where PROPOSITIONS are asserted that are open to challenge by the hearer, and thus require justification. **Evidential** constructions express a speaker's strength of commitment to a proposition in terms of the available evidence (rather than in terms of possibility or necessity). They add such nuances of meaning to a given sentence as 'I saw it happen', 'I heard that it happened', 'I have seen evidence that it happened... (though I wasn't there)', or 'I have obtained information that it happened from someone else'. Tuyuca (Brazil) has a complex system of five evidentials; English, by contrast, has none, relying instead on judgements (propositions which are asserted with doubt, and for which challenge and evidence is irrelevant) (Crystal 2008: 176-77).

Crystal's definition also introduces the concept of *justification* as the driving force for the use of evidentials. This justification seeks to show the commitment of the author(s) towards the proposition hedged by the evidentials. We will show in due course that concepts such as commitment and reliability are not inherent values of evidentiality. A third tenet considers evidentiality within the realm of pragmatics. This view is included in Ifantidou (2001) and Faller (2002). Ifantidou (2001: 1) points out the fact that studies on evidentials have relied heavily on pragmatic interpretations of the phenomenon.

Having established this framework, numerous definitions concerning evidentiality have been given. The most basic one reads as follows: "Evidentiality is the speakers source of information" (Nishiguchi 2006: 10). This means exactly what it says; the author, however, shows that alternative readings of a particular device can co-exist. In other words, one item can be both evidential and bouletic, as is the case of the Japanese word *mo* 'also/too' (Nishiguchi 2006: 14). Plungian (2001: 353) is more specific in that "evidential values indicate the source of information the speaker has for P where P represents a described situation". Diewald, Kresic and Smirnova, in the line of Chafe (1986) and Anderson (1986), give a more complex definition, which includes the concept of reliability: "Evidentiality is concerned with indicating the information source the

speaker is relying on to make a claim. This places this category next to epistemic modality without, however, merging them into one” (2009: 190). These authors emphasise the apparent association held between evidentiality and epistemic modality, which we shall discuss below. A different definition of evidentiality is the following:

In about a quarter of the world’s languages, every statement must specify the type of source on which it is based—for example, whether the speaker saw it, or heard it, or inferred it from indirect evidence, or learnt it from someone else. This grammatical category, whose primary meaning is information source, is called ‘evidentiality’ (Aikhenvald 2004: 1).

Aikhenvald’s definition is more restrictive in that evidentiality is purely a grammatical phenomenon. Thus we can see that scholars have not agreed as to the very definition of evidentiality. Cornillie (2009) stresses the ontological status of evidentiality in relation to the proposition, and he defines evidentiality as “the functional category that refers to the perceptual and/or epistemological basis for making a speech act” (2009:45). He excludes satellite notions such as commitment, justification, and reliability as defining values of evidentials. Aikhenvald (2004: 5) also says that the declaration of source of knowledge is not connected to the truth of the statement, although she later claims that evidentials may optionally present secondary meanings. In this vein, she concedes a quasi-intersective approach, since she also states that secondary meanings do not make an evidential a modal: “Evidentials may acquire secondary meanings—of reliability, probability, and possibility (known as epistemic extensions), but they do not have to. A hypothetical modality may overlap with a non-firsthand evidential: both could be used for something one has not observed and thus has reservations about” (Aikhenvald 2004: 6).

As already mentioned, the relationship between epistemic modality and evidentiality has given way to a debate on the independent status of the two concepts. Nuyts (2001: 21) defines epistemic modality as “the evaluation of chances that a certain hypothetical state of affairs under consideration (or some aspect of it) will occur, is occurring or has occurred in a possible world”. The relation of evidentiality and epistemic modality shows a threefold distinction: (a) inclusive, (b) intersective and (c) disjunctive.

The inclusive type considers evidentiality as a subdomain of epistemic modality, and rather than assigning to evidentiality the clear function of indicating the source of knowledge, scholars include an evaluative meaning concerning the truth of the proposition hedged (Chafe 1986; Kranich 2009; Ortega-Barrera and Torres-Ramírez 2010; Palmer 1986). This inclusive approach is seen in Hyland, as shown in the following: “These epistemic lexical verbs are also the most frequent forms writers use to express their degree of commitment in science research articles... and their frequency indicates the importance that academic writers attach to overtly signalling both the degree of conjecture involved in a claim and the evidential reliability of its source” (Hyland 2004: 90-91).

The intersective approach is included in Carretero (2004). The author defines the relationship in terms of a continuum, and so devices are categorised “depending on the commitment to the truth of the utterance in which they encode or implicate” (Carretero 2004: 27-28). Finally, Cornillie (2009) proposes a disjunctive model, in which epistemic modality and evidentiality are seen as distinct categories. De Haan (1999) also considers the two concepts to be distinct, as does Marin-Arrese (2004). Cornillie argues that confusion concerning the overlapping of these domains is due to the frequent association of the mode of knowing and the degree of the speaker’s commitment concerning P. In his view, modes of knowing do not really imply any degree of authorial certainty, evaluation, commitment or likelihood of P to be true. Modes of knowing can be direct or indirect, depending on how the speaker has obtained the information, which could be: visually, non-visually, through their own inferences or from other people’s inferencing processes. His definition of evidentiality reflects this trend of thought, and thus evidentiality

“refers to the reasoning processes that lead to a proposition” (2009: 47), whereas epistemic modality “evaluates the likelihood that this proposition is true” (2009: 47). All in all, he rejects the inclusive and overlapping combinations describing the relationship between epistemic modality and evidentiality.

In this paper, we follow an exclusive approach following Cornillie (2009). We claim that additional values are pragmatic interpretations of the hearer rather than the function of evidentials (Alonso-Almeida 2012, forthcoming).

3. DATA AND METHOD

The corpus of study is monogeneric in that it only includes research articles. The contents are varied, but all the articles belong to the medical register. The medical research paper has been defined as “a highly technical form with a standard format for the presentation of information” (Ngozi-Nwogu 1997: 119). Following Swales’ traditional (1990) description of genres into moves and steps, Nwogu (1997) has outlined the medical research paper into four sections, none of which corresponds to the abstract. These four sections, or stages following Martin (1984) and Hasan (2002), are the Introduction, the Methods, the Results, and the Discussion (IMRD). Sometimes, a conclusion section is given but it is optional, and generally the discussion and the conclusion sections tend to be presented together without any external evidence of internal division. In all the papers included here the identification of section boundaries was straightforward, since the sections are conveniently signalled by the authors themselves.

The RAs have been taken from databases of scientific journals on medicine in both languages. Native speakers of the language wrote the texts between 1998 and 2008. The periodicals the texts were taken from are classified as high impact journals. For the present study, we have concentrated on a corpus of eleven articles per language. Data have been normalised to 10,000 words for contrastive purposes. Results have been gathered according to genre sections. The texts have been analysed manually in order to tag evidential cases but computational analyses have been also performed in order to verify and contrast initial findings. To this end, we have used the *Onicom*¹ corpus tool, which has been created by the Emerging Technology applied to Language and Literature research group at the University of Las Palmas de Gran Canaria. This software permits textual interrogation based on selected linguistic, textual and social variables.

4. EVIDENTIAL STRATEGIES IN MEDICAL RAS

Our analysis of findings reveals that English authors make use of evidential devices more often than Spanish ones:

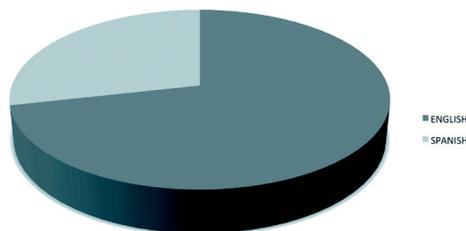


Illustration 1. Frequency of sentential evidential devices, N/10,000 (percentage).

As we can see in the graph above, evidentials in the English subcorpus (70.94%) occur more than twice as often as in the Spanish subcorpus (29.06%). The distribution of forms in each subcorpus is given in the following graph:

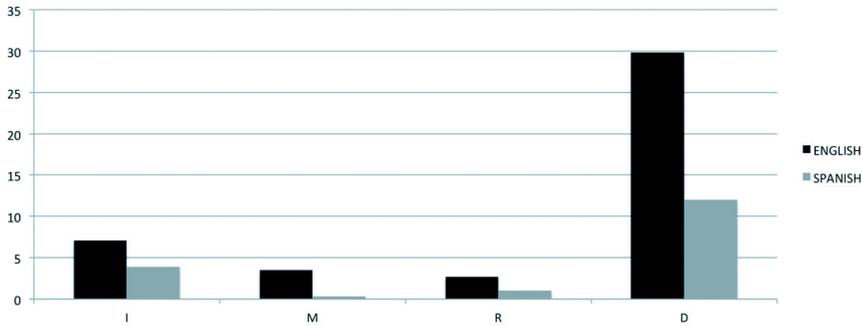


Illustration 2. Distribution of percentages of sentential evidential devices, N/10,000.

Both subcorpora present more devices in the discussion section of the academic medical articles in sharp contrast with the method and the results sections, which display the fewest frequencies. Neither do the introduction sections of both subcorpora offer many cases of evidentials. We have grouped the sentential evidentials according to their syntactic form into (a) adverbial, (b) *that*-clauses, (c) infinitive clauses, and (e) modal verbs, the distribution of which shown in Illustration 3, below. We will discuss each category in turn.

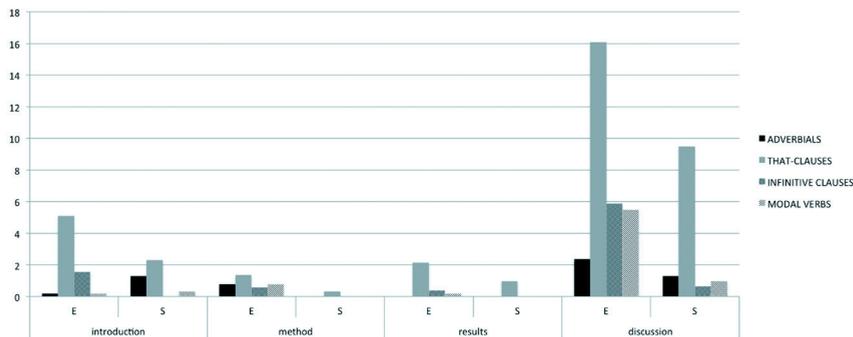


Illustration 3. Distribution of devices per RA section per language, N/10,000 (E, English; S, Spanish).

4.1. Adverbials

Adverbials appear in both corpora in almost every section, except the results sections of both subcorpora, in which no one single instance of an evidential adverbial has been identified. Of those found, the highest frequencies are in the English and Spanish discussion sections, followed by the Spanish introduction and English method sections. Conrad and Biber (2000) characterise adverbials according to three parameters. These are (a) semantic class, (b) grammatical realization, and (c) position in the clause. According to the semantic class, adverbials may be further categorised as epistemic stance, attitudinal stance and style stance. The grammatical realization deals with the form, so an adverbial can be a single verb, a noun phrase, a prepositional phrase, a finite subordinate clause, or a non-finite subordinate clause. According to this last criterion, i.e. position in the clause, adverbials can be categorised as initial, pre-verbal, post-verbal, and final.

With very few exceptions, the majority of adverbials are placed at the beginning of the clause. Formally, adverbs belong to one of three types: single adverbs, prepositional phrases, and finite subordinate clauses, as shown in the examples, below:

1. In our experience, carotid bulb calcifications rarely limit stenosis evaluation on the axial source images (Barlett, 2006).
2. In a more recent study of perioperative pediatric cardiac arrests during noncardiac operations, 19.2% (5 of 26) of arrests were associated with hyperkalemia during RBC transfusion (Smith, 2008).
3. Indeed, systolic blood pressure has also shown itself to be valuable when incorporated within multivariate risk formulas for estimating the conditional probability of cardiovascular events (Goldberg, 2001).
4. Preterm birth obviously has an effect at the PGHS level, as both PGHS-1 and -2 mRNA levels are elevated in human preterm birth (Cook, 1999).
5. Apparently, this was a case-control study that is “probably the lowest evidence of clinical studies...” not blinded or controlled (Bolton, 2005).
6. Según los resultados de dicho estudio, el SM aumenta 4 veces el riesgo de nuevas complicaciones cardiovasculares o muerte sólo en las mujeres que tienen lesiones coronarias ‘ According to the results of said study, the [metabolic syndrome] increases the risk of new cardiovascular complications or death by four only in women with coronary lesions’ (Cordero, 2006).
7. De hecho, diversos estudios han demostrado que la persistencia bacteriana de la vía aérea inferior después de una agudización de la BC no es inhabitual, incluso cuando se ha seguido un tratamiento antibiótico al que el microorganismo repetidamente aislado es sensible, siendo esta persistencia asintomática en la mayoría de las ocasiones⁴⁻⁶ ‘In fact, several studies have shown that bacterial persistence in the lower airway after the [chronic bronchitis] becomes more acute is not unusual, even when a treatment of antibiotics to which the microorganism that has repeatedly been isolated is sensitive has been followed; this persistence is symptomless in most cases⁴⁻⁶’ (Monso, 1998).

As can be seen from the instances above, the types of adverbials in both languages are similar: prepositional phrases and factual adverbs. The English subcorpus also presents other types of adverbials, which are generally labelled as stance adverbs. These are, for instance, the forms *obviously* and *apparently*. Ernst (2004) defines evidential adverbs in the following terms:

On their clausal reading, evidential adverbs describe the ease of perceiving the truth of their object proposition, which must be true and thus a fact. In this way, they are like evaluatives, but they differ in that they act more like main predicates: rather than taking facts to form facts, they take facts to form (stative) events. As such they are more like their adjective forms than other speaker-oriented adverbs (2004: 103-04).

His definition mixes up different concepts such as truth, factuality and evaluation. Although these concepts are frequently combined in some descriptions of evidentiality in the European languages, the relationship between them is not so obvious and should not be taken for granted, as we shall see in our description of the examples. As a matter of fact, Ernst’s concept of evidentiality is conditioned by his classification of evidentiality as a subcategory of epistemic

modality (2004: 44). As we have already said, evidentiality and epistemic modality are two distinct concepts.

In English, prepositional phrases present *in* + NP, this NP frequently referring to earlier studies, papers, researches, and less tangible nouns, such as *experience*, *view* and *opinion*. These last types of nouns more specifically relates to authorial stance. A reader-oriented interpretation of (1) and (2) would be connected with the idea of reliability concerning the source of information. Thus, experience in (1) is an entity that readers can trust without needing to contrast the information as is the case of (2), which refers to verifiable proof. In this sense, the string *in our experience* falls into the realm of faith. Our view however is that authors mean no less than their source of information, and whether other authorial values come into play here is difficult to ascertain. In Spanish, the prepositional phrase is often introduced by *según* followed by words related either to previous research or owned evidence, as in (6).

Factual adverbs in the two subcorpora are *indeed*, *in fact*, and *de hecho*. For Hyland (2005), *in fact* and *indeed* are code glosses, and these “supply additional information by rephrasing, explaining or elaborating what has been said, to ensure the reader is able to recover the writer’s intended meaning” (Hyland 2005: 52). Biber *et al.* (1999: 562, 858, 972-73) classifies *indeed* as a stance adverb while *in fact* is an actuality adverb with a clear connective force. Here, Biber *et al.* coincides with Hyland in the cohesive nature of *in fact*. In this sense, Freddi (2005: 137-38) argues that *indeed* shows concession or argumentative prolepsis, i.e. “the inclusion by the author of an Objection in order to immediately refute it”. For Hasselgard (2010), *indeed* is a contingency adjunct, and *in fact* is a manner adjunct. In (3), *indeed* helps to connect with the previous discourse. In our view, this form is an evidential that strengthens the evidential value of the following structure *X has shown itself to* + infinitive. Admittedly, *indeed* also portrays authorial stance in the sense that this adverb normally implies such an intonation force that readers may understand this as full commitment of the author towards the truth of the proposition.

The adverbs *obviously* and *apparently* in instances in (4) and (5) can safely be classified as evidentials since they show the way in which information is gained. The pragmatic effect of these two adverbs for readers is, as also stated in the definition by Ernst given above, a statement concerning the truth of the proposition as well as an evaluation of the status of the information. Semantically speaking, that something is obvious does not necessarily mean that something is true. As pointed out in Alonso-Almeida (forthcoming),

The concept of obviousness relates to what is clear and easily perceived through the senses, i.e. evident, but the very notion of what is evident very much depends on individuals and their selection of contextual premises... A proposition hedged by obviously is intended to be accepted and shared... obviously functions exactly like *clearly*, and so obviously is allocated to the field of clarity, which does not attest to truthfulness of the proposition.

4.2. That-clauses and infinitive clauses

That-clauses and infinitive clauses signal the way in which the information has been gained. These structures contain verbs, some of which have been labelled as epistemic lexical verbs (Hyland 1998). However, they function as evidential lexical verbs, as they primarily show source or mode of information either perceptually or cognitively, rather than degrees of certainty or commitment. Instances of these verbs are *demostrar*, *confirmar*, *considerar*, *concluir*, and *sugerir*, in Spanish; and *show*, *note*, *suggest*, *appear*, *demonstrate*, *know*, and *think*, in English. In Illustration 4, we divide these verbs into the semantic groups given below following Dixon’s classification (2005) and give with their distribution in each subcorpus:

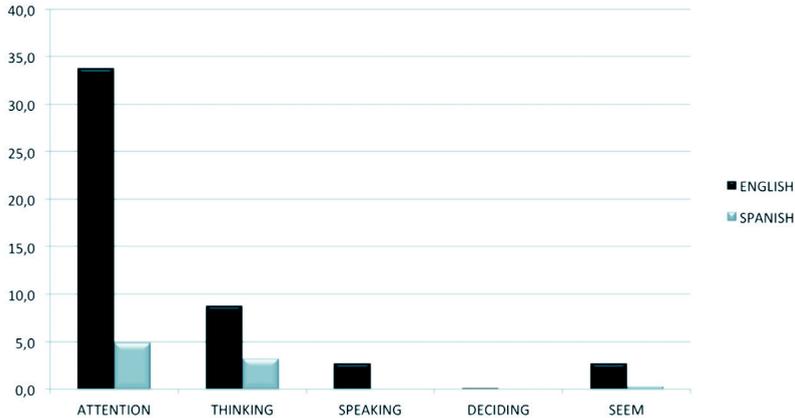


Illustration 3. Semantic classification of verbs in that-clauses and to-clauses.

As seen in the graph above, the most common semantic verbal categories in our corpus are ATTENTION, THINKING and SEEM showing the highest frequencies in the English subcorpus than in the Spanish one. This subcorpus also shows verbs of the SPEAKING type, and very few cases of the DECIDING type. The verbal subtypes and the distribution in the two subcorpora are the following:

Table 1. Semantic types and distribution of subtypes in our corpus, N/10,000.

English			Spanish		
Type	subtypes		Type	subtypes	
ATTENTION	SHOW	14,5	ATTENTION	SHOW	4,25
	DISCOVER	1,6		DISCOVER	0,33
	SEE	0,4		SEE	0,33
	RECOGNISE	0,2			
	LOOK	0,2			
THINKING	CONCLUDE	3,9	THINKING	PONDER	1,96
	THINK	2,0		THINK	0,33
	KNOW	1,8		CONCLUDE	0,98
	PONDER	1,2			
DECIDING	RESOLVE	0,2			
SPEAKING	REPORT	1,6			
	INFORM	1,2			
SEEM		2,7	SEEM		0,33

In the instances of *that*-clauses below, there is a combination of active and passive sentences. Passive sentences include the verbs *show*, *know* and *demonstrate*. These structures are also given in impersonal forms with *it* in the case of *demonstrate* and *know*. In the case of *show*, the subject is an inanimate object. Active sentences are mainly in the present tense and in one case in the past. The present tense cases present the verb forms *suggest*, *confirm* and *hypothesize*. The sentence containing this last form shows the use of the pronominal form

we, as also occurs in instance (12). For many, the use of the passive voice and the impersonal structures are indicative of the author's detachment with respect to the propositional content, and, conversely, the use of the pronoun *we* conveys authorial involvement and so commitment to the propositions. In Spanish, the reflexive passive in (15) may also have this same detachment effect on readers, and similarly the use of the first person plural pronouns in (16) and (17) may also convey more authorial involvement, making the proposition appear more reliable. In the case of (17), the verb *observar* implies that the authors have obtained information first-hand, and so the idea of reliability is reinforced. This is, however, the readers' assumption in the light of the contextual premises available to them.

8. We also showed that as the physicians became more assertive in the sicker patient population, the patients were more likely to agree to transport to the hospital (Burstain,1998).
9. Recent information from the baboon decidua also suggests that PGHS does not increase in late pregnancy (Cook,1999).
10. However, it was recently demonstrated that low concentrations of ATP (0.01-1.0 $\mu\text{mol/L}$) can significantly enhance collagen-, thromboxane A₂- and thrombin- induced platelet aggregation (Birk, 2002).
11. The rapid dissolution of the tablets confirms that the formulations are uncomplicated (almost 100% dissolved in less than 30 minutes) (Bolton, 2005).
12. We hypothesize that direct millimeter measurements of carotid bulb stenosis and derived percent ratios are related in a linear fashion (Barlett, 2006).
13. IL-8 has also been shown to be a transcriptional target of NF- κ B (29) and is known to be up- regulated by NF- κ B in gastric cells exposed to *Helicobacter pylori* (33) (Jenkins, 2004).
14. It is known that these products differ somewhat from tablet to tablet and batch to batch (Bolton, 2005).
15. Se consideró que tenía barreras arquitectónicas referidas a la accesibilidad al domicilio si vivía en un primer piso o más alto, sin ascensor 'It was considered that there were architectonic barriers in terms of access to the home if the person lived on or above the first floor, and the building did not have a lift' (Escudero, 1999).
16. En resumen, consideramos que la DE debe constituir la primera opción terapéutica en el vólvulo de sigma con mucosa viable dado su alto porcentaje inicial de éxito y el bajo índice de complicaciones en manos expertas, permitiendo diferir la cirugía en los casos recidivantes 'In short, we consider that [endoscopic volvulus] has to constitute the first therapeutic option in the sigmoid volvulus with viable mucous given its high initial success percentage and low rate of complication in expert hands, which has enabled surgery to be differed in recurring cases' (López, 2000).
17. Igual que otros autores¹⁶, hemos observado los linfocitos se encuentran más frecuentemente en las UG que en las UNG; teniendo en cuenta que la UG tiene un período de incubación más corto y unas manifestaciones clínicas más intensas, desconocemos el significado de esa mayor presencia de linfocitos, que se relacionaría mejor con la presentación clínica menos llamativa de la UNG 'Like other authors¹⁶, we have observed

lymphocytes more frequently in [gonococcal urethritis] than in NGU; bearing in mind that GU has a shorter incubation period and more intense clínica manifestations, we do now know the meaning of this increased presence of lymphocytes, which would fit better with the less noteworthy clinical presentation of NGU' (Mazuecos, 2001).

18. Globalmente, han demostrado que se consigue un control virológico en un 10-30% de los pacientes y la mayoría de ellos están realizados en pacientes que se encontraban en óptimas condiciones inmunológicas y virológicas, y que no presentaban resistencias a los fármacos utilizados¹⁶⁻¹⁸ 'Globally, it has been demonstrated that virological control is obtained in 10-30% of patients most of which are carried out on patients in optimum immunological and virological conditions, and who did not present resistance to the drugs used¹⁶⁻¹⁸' (Amador, 2005).

The structure of an evidential verb followed by an infinitive clause is also deployed in the two subcorpora, as seen in the instances below:

19. The main roles of PGE in parturition have reported to be preparatory, including cervical ripening, membrane rupture, and enhanced receptor-coupling events (Cook, 1999).
20. Algunos autores parecen obtener mejores resultados ulteriores con la colocación de una sonda rectal después de la DE⁹ 'Some authors appear to obtain better ulterior results when a rectal catheter is placed after the [endoscopic volvulus]⁹' (Lopez, 2000).

In these instances, although from a purely evidential standpoint, we can only describe how the information has been gained in each case, i.e. hearsay/third party attribution, showing either the author's background knowledge or their reading-around of the topics. However, from a purely pragmatic standpoint, readers may infer differing degrees of authorial commitment and reliability. The combination of *algunos autores* 'some authors' and the verb *parecer* 'to seem' supports this idea. In this line, Cornillie (2009: 52) argues that "note that the verb *parecer* only conveys an evidential and no epistemic dimension: there is no evaluation of the chance that a hypothetical state of affairs is or will be occurring in a possible world". Cornillie adds that the interpretation of *parecer* plus infinitive as an evidential relies on its subjective nature and on the concept of reliability, but this reliability "cannot be presented in terms of an assessment of likelihood" (Cornillie, 2009: 59).

4.3. Modal verbs

Modal verbs are an interesting class to focus on, since, in our view, they represent the most obvious grammatical evidential in the English language, and possibly also in Spanish. The distribution of modals in the two subcorpora are shown in Illustration 4, below.

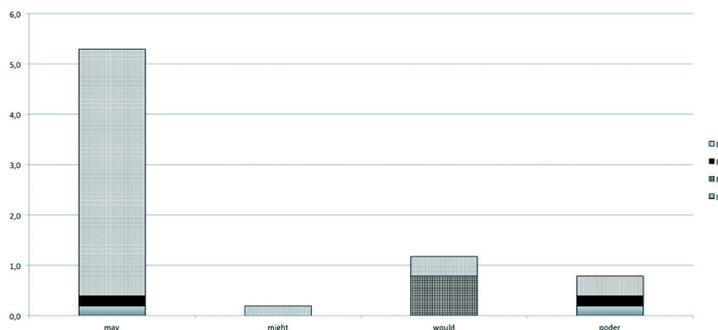


Illustration 4. Distribution of modals per RA sections, N/10,000.

As shown in the graph above, *may* is the most frequent evidential modal verb in English, especially in the discussion section of the RA. The extremely common presence of this modal in the discussion section reinforces the idea of *may* as an evidential. This section is devoted to the interpretation of the results obtained in the analysis, and so new information is gained in the course of the argumentation. The form *would* is also used as an evidential device in English in the method and discussion sections only. In Spanish, *poder* is used with the same function as *may* in English, and it also presents a similar distribution in our corpus. The following are examples of *may* and *poder* taken from the two subcorpora:

21. Hence in humans only the fetal organs and membranes express an increase in PGHS-2 mRNA in late gestation whereas both sheep and mice display gestational-dependent increases in maternal uterine tissues. This **may** suggest that a central signal from the fetus, such as a glucocorticoid or androgen signal from the adrenal gland, **may** stimulate an increase in PGHS-2 expression. Conversely, each fetal organ and membrane **may** have an independent mechanism for stimulating gene expression (Cook, 1999).
22. Algunos autores aconsejan la preparación para resección electiva en todos los enfermos, basándose en el alto grado de recurrencia post-DE, pero otros trabajos más recientes^{2,5} ponen de manifiesto que **puede** existir un 60-70% que no presenten recidiva tras la DE, lo que **puede** justificar la actitud conservadora en estos enfermos con alto riesgo quirúrgico, reservando la cirugía electiva para aquellos que tengan alguna recidiva o que, por las características del colon (dolicocolon) u otros factores predisponentes asociados, se pueda prever una recidiva a corto plazo^{2,5,22} ‘Some authors advise preparation for elective resection for all patients, based on the high level of a post-DE recurrence, but other more recent studies^{2,5} show that there **may** be 60-70% that do not present recurrence after the DE, which **may** justify the conservative attitude of these patients that present high surgical risk, reserving elective surgery for those that have had a relapse or for whom, given the characteristics of the colon (dolichocolon) or other associated predisposing factors, a short-term relapse may be predicted^{2,5,22} (Lopez, 2000).

In (21), the three occurrences of *may* indicate inferential reasoning concerning the propositions hedged. In all cases, *may* can be safely substituted for a deductive or even a cognitive verb such as *deduce*, *infer*, *suppose*, and *think*, for instance. In all these cases, there is no relation between the modal and degrees of probability/possibility of the event taking place in the future. However, we admit that there are dynamic nuances in the use of *may* in the fragment “that a central signal from the fetus, such as a glucocorticoid or androgen signal from the adrenal gland, may stimulate an...”, and so *may* refers to the potential of the signal from the fetus to stimulate an increase in said expression. This dynamic view is also possible for the last example of *may* in (21). The same applies for *puede* in (22) in the second instance of this form in the excerpt. Thus, *puede* in “lo que puede justificar la actitud conservadora en estos enfermos con alto riesgo quirúrgico” is certainly inferential, and this form is contextually equivalent to a cognitive verb of the THINK subtype, for instance, and so *puede* can be replaced by *creemos* ‘we think’, for example, without changing the meaning of the utterance.

5. CONCLUSION

This paper has described evidentials affecting the meaning of a complete proposition in a corpus of Spanish and English medical research articles. Our analyses have classified data according to grammatical categories and to the generic sections in which they appear. Adverbials are found in all the sections of the RAs in both subcorpora. Their forms are single adverbs and

prepositional phrases, frequently introduced by *in*. Single adverbs include actuality adverbs and others related to the field of clarity and obviousness in the case of the English subcorpus. *That*-clauses are far more frequent in the English subcorpus than in the Spanish texts. The semantic verbs most commonly used in these expressions include ATTENTION, THINKING, DECIDING and SPEAKING types in the case of English, and ATTENTION and THINKING types in the case of Spanish. The SEEM type is also used in both subcorpora, and evidential qualification of this form is found in more often in the English subcorpus. In the case of modals, the English subcorpus presents more forms, e.g. *may* and *might*, than the Spanish one, in which only evidential *poder* has been identified. Besides this characterisation of RAs in terms of evidentials, we have also contributed our view to the relationship between evidentiality and epistemic modality. We think that they constitute independent categories and that other values rather than ‘source/mode of knowledge’ are the result of the listener’s interpretation given certain contextual premises.

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