Cross-Cultural Divergence in the Use of Discourse Markers and Hedges in Public Health Academic Articles

التباعد بين الثقافات في استخدام علامات الخطاب والتحوط
في الأبحاث الأكاديمية للصحة العامة

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Abstract

English is the universal language of science. Consequently, the investigation of scientific discourse by native and non-native English -speaking researchers is the core of this paper. Hedges, linguistic items which denote non/commitment to the truth value of a certain proposition, are considered to be one of the primary features which shape the research article. Discourse Markers are expressions which mark the semantic relationship between two sentences. AntConc is a corpus analysis software. This paper focuses on Wordlist and concordance as tools to investigate discourse markers, based on Fraser's model (2006), and hedges, based on Hyland's model (2005), in Public Health research articles published by the international journal of Public Health and **The Journal of High Institute of Public Health (JHIPH) in Alexandria University.** This corpus linguistic analysis seeks to examine the way non-native and native English speakers use hedges and discourse markers in the field of Public Health articles.

Key Words: AntConc; Corpus Linguistic Analysis; Discourse Markers; Hedges.

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**التباعد بين الثقافات في استخدام علامات الخطاب والتحوط
في الأبحاث الأكاديمية للصحة العامة**

اللغة الانجليزية هي اللغة العالمية للعلم وبالتالي فإن البحث في الخطاب العلمي من قبل الباحثين الناطقين باللغة الإنجليزية كلغتهم الأم والباحثين ذوي اللغة الانجليزية كلغة ثانية هو جوهر هذه الورقة البحثية وتعتبر التحوطات والتي هي بمثابة عناصر لغوية تدل على عدم الالتزام المطلق بالقيمة الحقيقة لمقترح معين واحدة من السمات الأساسية التي تشكل البحث أما علامات الخطاب فهي هي تعبيرات تمثل العلاقة الدلالية بين جملتين ، انتكونك هو برنامج كمبيوتر لتحليل الذخائر وبناء على ذلك تركز هذه الورقة على قائمة الكلمات والتوافق كأدوات لفحص علامات الخطاب بناء على النموذج الذي وضعه فريزر عام ٢٠٠٦ وأيضا فحص التحوط اللغوي بناء على نموذج هايلاند عام ٢٠٠٥ وذلك في الأبحاث الأكاديمية بمجال الصحة العامة التي تم نشرها بواسطة المجلة الدولية للصحة العامة و مجلة المعهد العالي للصحة العامة بجامعة الاسكندرية و يهدف هذا التحليل اللغوي للبيانات الى فحص الكيفية التي يطبقها المتحدثين للغة الانجليزية كلغة أولي و المتحدثين لها كلغة ثانية عند استخدام علامات الخطاب و التحوط اللغوي في أبحاث الصحة العامة.

الكلمات المفتاحية: برنامج انتكونك، تحليل الذخائر اللغوية، علامات الخطاب، التحوط

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1.Statement of the Problem

Science is about reality. Language is "a part of reality, a shaper of reality, and a metaphor for reality" (Halliday, 1993, P. 8). Language is the central medium in which science operates as it has a fundamental part in communicating information and theory-building (Macleod et al as cited in Macleod et al, 2016). It plays a key role in the process of communicating scientific findings, building scientific arguments and providing a context where science develops (Hay as cited in Macleod et al, 2016). According to Weijen (2012), English is the universal language of science and "the lingua franca of the scientific community" as 80% of all journals are published in English. Muller (2005) declares that most articles focus on native speakers of English and their use of discourse tools. These observations have led to the investigation of scientific discourse by native and non-native English -speaking researchers.

To hedge is to weigh evidence and to covey doubt or skepticism, which are fundamental characteristics of science (Salager -Meyer, 1997). To mark discourse is to indicate a sign which organizes its structure, ensure coherence and introduce a theme (Rezanovaa & Kogut, 2015). Based on Fraser's (2006) and Hyland's taxonomies (2005), this paper explores the role of discourse markers and hedges in scientific research articles taken from the discipline of Public Health. These articles are developed by non-native (Arabic) and native English-speaking authors, a thing which may mirror cross-cultural linguistic differences. Public Health is about protecting and improving the lives of individuals and communities, that is why *"public health is vital to all of us all of the time"* (Retrieved from https://www.publichealthcareeredu.org/what-is-public-health/). For its due importance as a field that all people should be cultured in, Public Health research articles are linguistically examined in this paper.

All scientific research has a degree of uncertainty that has to be communicated effectively through scientific discourse (Fischhoff and Davis, 2016). Hedges, linguistic items which denote non/commitment to

the truth value of a certain proposition, are considered to be one of the primary features which shape the research article (Hyland, 1998). They are an important component in scientific discourse which is, according to Mauranen (1997) as cited in Vazquez and Giner (2008), a world of uncertainties and non-finality. Discourse Markers (DMs) are expressions which mark the semantic relationship between two sentences (Fraser, 2015). They affect coherence and cohesion in a piece of writing (Feng, 2010). Moreover, discourse markers guide the text-receivers' interpretation of text according to the text-producers' communicative intentions (Kohlani, as cited in Piurko, 2015).

AntConc is a corpus analysis software that includes a concordance, word and keyword frequency generator (Anthony, 2005). This paper focuses on Wordlist and concordance as tools to investigate discourse markers, based on Fraser's model (2006), and hedges, based on Hyland's model (2005), in Public Health research articles published by the international journal of Public Health and **The Journal of High Institute of Public Health (JHIPH) in Alexandria University. Words explored by AntConc are detailed in section (4.3) and section (4.5).**

2. Aim & Significance

This paper aims to compare/contrast the use of discourse markers and hedges, presented in section (4.3) and section (4.5), in the scientific discourse of Public Health research articles written by non-native (Arabic) and native speakers of the English language. This corpus linguistic analysis seeks to examine the way non-native and native English speakers use hedges and discourse markers in the field of Public Health articles. It also aims to analyze the frequency/categories of hedges and discourse markers in the data under investigation.

3. Research Questions

What are similarities/differences among native and non-native English-speaking authors in their uses of discourse markers and hedges?

What are the types of discourse markers and hedges frequently used? For what reasons?

What are the suggestions for further improving scientific discourse in the field of Public Health? This paper is expected to answer the previous questions.

4. Literature Review
4.1. Metadiscourse

Based on Hyland (2015), metadiscourse, the author's manifestation in the text, is the interpersonal resources organizing the writers' stance towards discourse content and the reader; it is "discourse about discourse" (1). Metadiscourse is the linguistic items which frame the writer's stance towards the propositional content expressed. It is a collection of devices that signal the writer's attitude towards the content. Hyland's (2005) model of metadiscourse differentiates between interactive resources, which guide the reader through the text, and interactional resources, which involve the reader in the argument and manifest the writer's persona. The former includes transitions, frame markers, endophoric markers, evidentials, Code glosses. The latter includes hedges, boosters, attitude markers, engagement markers and self-mentions.

This paper is about an aspect of interactive resources, that of discourse markers, and an aspect of interactional resources, that of hedges.

4.2. Discourse Markers (DMs)

Discourse is any instance of language -use (Gee, 1999). For any stretch of language to be cohesive and coherent, discourse markers are of due importance (Feng, 2010). DMs impose a relation between discourse segments of which they are a part and a prior discourse segment (Fraser, 1999). DMs are considered as signaling sequential relationships between utterances and marking discourse coherence. They also initiate discourse, mark a boundary in discourse and facilitate the hearer's task of understanding the speaker's utterance (Muller, 2005).

Discourse markers are devices that provide "contextual coordinates for ongoing talk" (Schiffrin, 1987, P.41). Fraser (1998) considers DMs to be lexical expressions signaling the relations of contrast, implication or elaboration. Litman (1996) explains them as being tools helping in the structuring of information and in the negotiation of meaning. Fraser

(1999) points out that DMs clarify relations between linguistic elements with no effect on un/truthfulness of such elements. For an expression to be a DM, it must meet three conditions. First, a DM is a lexical expression such as "*but*" and "*so*". Second, it must occur as a part of the second discourse segment. Finally, a DM "does not contribute to the semantic meaning of the segment but signals a specific semantic relationship which holds between the interpretation of the two Illocutionary Force segments" (Fraser, 2009, P. 7). Discourse markers relate the previous utterance to the forthcoming one (Fraser, 1996). In this concern, they are called sentence connectors (Brown, 2001).

4.3. Fraser's Taxonomy (2006) of Discourse Markers
4.3.1. Contrastive discourse markers.

Contrastive discourse markers serve as signals of opposition between a discourse element and a proposition. These signs of contradiction are important in discourse because any piece of writing usually involves the use of contrast as a tool to make a certain point more obvious and easily remembered. Contrastive discourse markers that are investigated in this paper include:

but, alternatively, although, contrariwise, contrary to expectations, conversely, despite (this/that), even so, however, in spite of (this/that), in comparison (with this/that), in contrast (to this/that), instead (of this/that), nevertheless, nonetheless, (this/that point), notwithstanding, on the other hand, on the contrary, rather (than this/that), regardless (of this/that), still, though, whereas, yet

4.3.2. Elaborative discourse markers.

This category of discourse markers describes, develops and presents a previous idea in details. To elaborate is to continue a previous discourse element by a forthcoming one. Elaborative discourse markers examined in this paper include:

and, above all, also, alternatively, analogously, besides, by the same token, correspondingly, equally, for example, for instance, further(more), in addition, in other words, in particular, likewise, more accurately, more importantly, more precisely, more to the point, moreover, on that basis, on top of it all, or, otherwise, rather, similarly, that is (to say)

4.3.3. Inferential discourse markers.

This category is used when a coming discourse element is inferred, deduced or concluded by a precedent one. Inferential discourse markers studied in this paper include:

so, after all, all things considered, as a conclusion, as a consequence (of this/that), as a result (of this/that), because (of this/that), consequently, for this/that reason, hence, it follows that, accordingly, in this/that/any case, on this/that condition, on these/those grounds, then, therefore, thus

4.3.4. Temporal discourse markers.

Temporal discourse markers relate discourse elements to time. The temporal discourse markers investigated in this paper include:

then, after, as soon as, before, eventually, finally, first, immediately, afterwards, meantime, meanwhile, originally, second, subsequently, when

4.4. Hedges

Scientific article authors seek to present accurate discourse, evaluate their results to gain acceptance for their propositions and their reliability in the scientific community. In this context, hedges are appropriate as they are used in order to "indicate either a) lack of commitment to the truth value of an accompanying proposition or b) a desire not to express that commitment categorically" (Hyland, 1998, p. 1). Hyland (2006, P.1-4) considers hedges to be expressions of "tentativeness and possibility" which allow writers to express propositions with greater precision, avoid the negative consequences of being proved to be wrong and develop writer-reader relation by considering the reader's role in accrediting information.

Lakoff (1972) defines hedging as being linguistic items which "make things fuzzier or less fuzzy" (195). Hedges are linguistic devices which help academic researchers to build a moderate level of certainty and a relationship with their readers (Salager-Meyer, 2011).

4.5. Hyland's Taxonomy of Hedges

Being cautious, hedging, when presenting scientific material is a feature that makes hedging devices receive due attention in discourse

studies. Hyland's taxonomy of hedging items (2005) is adopted in this study. It is as follows:

About, almost, apparent, apparently, appear, appeared, appears, approximately, argue, argued, argues, around, assume, assumed, broadly, certain amount, certain extent, certain level, claim, claimed, claims, could, couldn't, doubt, doubtful, essentially, estimate, estimated, fairly, feels, felt, frequently, from my perspective, from our perspective, from this perspective, generally, guess, indicate, indicated, indicates, in general, in most cases, in most instances, in my opinion, in my view in this view, in our view, largely, likely, mainly, may, maybe, might, mostly, often, on the whole, ought, perhaps, plausibly, possible, possibly, postulate, postulated, postulates, presumably, probable, probably, quite, rather x, relatively, roughly, seems, should, sometimes, somewhat, suggest, suggested, suggests, suppose, supposed, supposes, suspect, suspects, tend to, tended to, tends to, to my knowledge, typical, typically, uncertain, uncertainly, unclear, unclearly, unlikely, usually, would, wouldn't.

It is thought that to categorize previous hedges may be better for analyzing the frequent occurrences of each category in articles under investigation. For this reason, the following categories, based on the above taxonomy, are prepared:

4.5.1. Modal(epistemic) adjectives and adverbs.

This category refers to an adjective or an adverb that serve to make careful proposals. Instead of presenting absolute fact, a thing to recommended in scientific writing, authors tend to offer cautious claims.

Examples of this category that are applied in this paper include: About, almost, apparent, apparently, broadly, certain amount, certain extent, certain level, approximately, around, doubtful, essentially, fairly, , frequently, from my perspective, from our perspective, from this perspective, generally, in general, in most cases, in most instances, in my opinion, in my view in this view, in our view, largely, likely, mainly, mostly, often, on the whole, perhaps, plausibly, possible, possibly, presumably, probable, probably, quite, rather x, relatively, roughly,

sometimes, somewhat, , to my knowledge, typical, typically, uncertain, uncertainly, unclear, unclearly, unlikely, usually.

4.5.2. Modal verbs.

The category of modal verbs is used to make soft and less direct whatever is written or presented. Examples investigated in this paper include: could, couldn't, may, maybe, might, ought, should, would, wouldn't.

4.5.3. Epistemic lexical verbs (introductory verbs).

To avoid direct adherence to an answer, an opinion, a decision or a proposition is achieved via some verbs with certain lexical meanings. These meanings have to do with vagueness rather than precision.

Examples applied in this research include: appeared, appears, argue, argues, assume, claim, claims, claimed, assumed, argued, felt, doubt, estimate, estimated, feels, guess, indicate, indicates, indicated, postulate, postulates, postulated, seems, suggest, suggests, suppose, suggested, supposed supposes, suspect, suspects, tend to, tends to, tended to.

Salager-Meyer, (1994) examines "Hedges and textual communicative function in medical English written discourse.", Rabab'ah (2013) investigates "Hedging in nursing and education academic articles", Takimoto (2015) studies hedges and boosters in English academic articles, Haufiku (2016) studies hedging and boosting devices in academic discourse cases in Namibia. Fischhoff and Davis (2015) study types of discourse markers in scientific texts in the German and Russian languages, Babanoğlu (2013) examines pragmatic markers in EFL learners' argumentative essays, Liu (2013) explains the effect of first language on the use of discourse markers by L1 Chinese speakers of English, and Buysee (2017) focus on "you know" as a marker.

Examining academic papers written by non/native English-speaking authors in the field of Public Health in an attempt to compare/contrast uses of DMs and hedging devices appears worthy of interest and investigation for this paper.

5. Research Methodology

This article is a corpus-based study as it tries to evaluate the implementation of hedges and discourse markers in Public Health Research articles written by non-native (Arabic) and native English-speaking authors. A corpus of twenty-six articles written by native-English speakers are taken from the international journal of Public Health (available at www.elsevier.com/puhe). Authors' biographies are checked so as to make sure that the selected articles are written by native-English speakers. Another corpus of articles by non-native English speakers is selected from Alexandria University Journal of High Institute of Public Health (http://jhiphalexu.journals.ekb.eg/).Consequently, a corpus of fifty-two corresponded articles-two corpora each containing twenty-six articles- is processed via AntConc as a software to generate word list and concordance. Articles selected are chosen because they are published recently between (2015-2019)-see appendix (A) & appendix (B) for corpus identification.

AntConc is a corpus analysis toolkit that includes a concordance, word and a key word frequency generator (Anthony 2005). The two corpora are uploaded separately. One file contains twenty-six research articles written by Arabic writers (AWRAs). The other file contains twenty-six research articles written by native English speakers (NESRAs). All files are transformed from PDF to TXT. AntConc is employed to count words of each file. This step shows the number of occurrences of words in each corpus. Word list counts all words in each corpus and presents them in an ordered list. This function is useful in detecting the most frequently used words in each corpus. The AWRAs corpus contains 112909 words, the NESRAs corpus contains 152887 words. The two corpora contain 265796 running words.

All frequent uses of discourse markers and hedges are detected according to Fraser 's taxonomy of discourse markers (2006) and Hyland's classification of hedges (2005)- see section 4.3. and section 4.5. These two taxonomies of discourse markers and hedges are selected because they are considered to be more elaborative of the items needed for scientific article examination.

6. Analysis

Fraser's taxonomy of DMs (2006) and Hyland's taxonomy of hedges (2005) are used as references for DMs and hedges and their categories (see section 4.3. and section 4.5.). AntConc software is employed to count the number of all instances of hedges and DMs from the two corpora of articles, those written by native and non-native speakers of English, based the number of occurrences. Each instance of hedges and discourse markers is typed in the search box. After that, AntConc is processed to generate all examples of the search term with their frequency of occurrence. The concordance tool is applied to present search results in contexts of each word. When reference words, instances of hedges and DMs, are entered in the searching box lists of all sentences containing the search words appear on the screen. All search words occurring within quotations are excluded. This step aims to show the different numbers in the uses of DMs and hedges. The frequency of DMs and hedges in each corpus is normalized in frequency per 1000 words.

After determining the number of DMs and hedges and their categories in both corpora, an analysis of the frequency of the number and type of DMs and hedges used by non/native English authors is carried out. Analysis explained the differences/similarities in terms of the authors' use of DMs and hedges, a thing that goes back to cultural/background differences.

7. Discussion

7.1. The Frequency of DMs and Hedges in English Research Articles Written by Arabic Writers

The corpus contains twenty-six recently-published articles by Arabic researchers. For further information on Corpus identification, see appendix (A).

As clear from table (1), the numbers of DMs and hedges used in AWRAs are identified. The number of DMs is 4980 words within 112909 running words, 44.11 per 1000 words. The number of hedges is 939 words ,8.32 per 1000 words.

	DMs	Hedges
COUNT	4980	939
%	4.41%	0.83%
Per 1000 Words	44.11	8.32

Table (1)

7.2. The Frequency of DMs and Hedges in Research Articles Written by Native Speakers of English

The corpus contains twenty-six recently-published articles by native English-speaking researchers. For further information on Corpus identification, see appendix (B).

As presented in table (2), the numbers of DMs and hedges in NESRAs are clarified. The number of DMs is 7997 words within 152887 running words, 52.31 per 1000 words. The number of hedges is 1601 words, 10.47 per 1000 words.

	DMs	Hedges
COUNT	7997	1601
%	5.23%	1.05%
Per 1000 Words	52.31	10.47

Table (2)

As a result, the numbers of occurrence of DMs and hedges in the two corpora show that native English-speaking writers generally employ more DMs (with an obvious deviation of 5.8 per 1000 words) and more hedges (with a deviation of 1.52 per 1000 words) than non-native English-speaking writers.

7.3. Categories of DMs and Hedges in English Research Articles Written by Arabic Writers

Table (3) presents categories of DMs with their frequency of occurrence. Discourse markers refer to any word/phrase joining what is written together and serving a smoother transition of ideas presented.

The raw number of DMs in the articles written by Arabic writers is categorized as follows: contrastive DMs contain 215 examples, elaborative DMs contain 4023 examples, Inferential DMs contain 169 examples and temporal DMs contain 573 examples. As for hedges, Table

(3b), modal epistemic adjectives and adverbs as hedges include 497 examples, modal verbs as hedges include 301 examples and epistemic lexical verbs contain 141 examples.

WORD COUNT	Contrastive DMs	Elaborative DMs	Inferential DMs	Temporal DMs	TOTAL DMs
112909	215	4023	169	573	4980
%	0.19%	3.56%	0.15%	0.51%	4.41%
Per 1000 Words	1.90	35.63	1.50	5.07	44.11

Table (3)
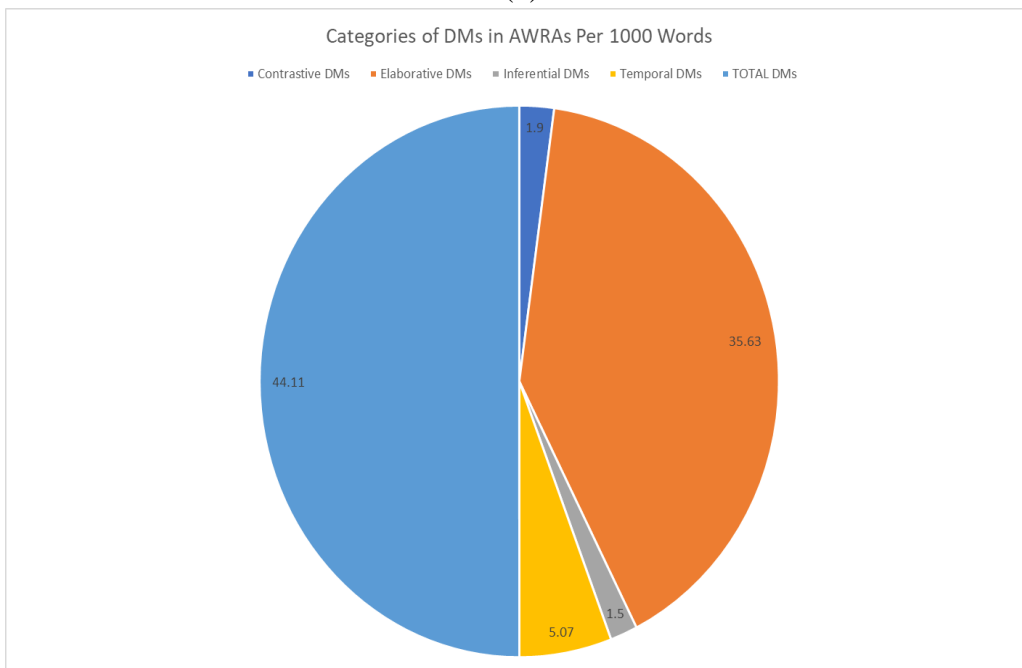
Figure (1) Illustrating Table (3)

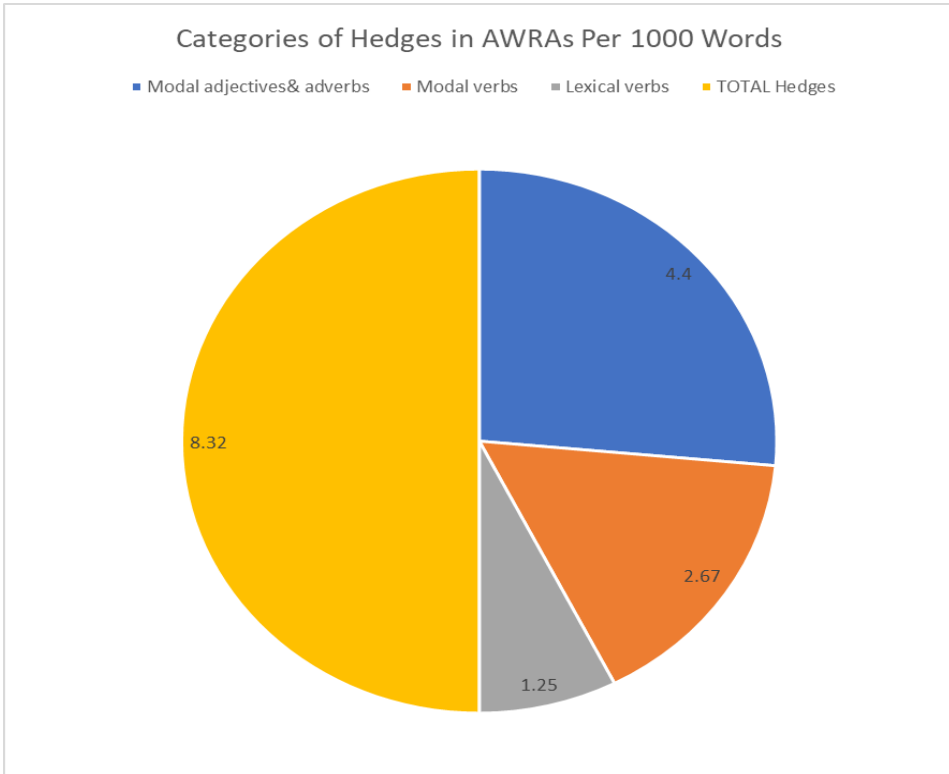| WORD COUNT	Modal adjectives& adverbs	Modal verbs	Lexical verbs	TOTAL Hedges
112909	497	301	141	939
%	0.44%	0.27%	0.12%	0.83%
Per 1000 Words	4.40	2.67	1.25	8.32

Table (4)

Figure (2) Illustrating Table (4)

It is apparent that elaborative DMs have the priority in writing, while modal epistemic adjectives and adverbs as hedges outnumber other hedging categories.

7.4 Categories of DMs and Hedges in Research Articles Written by Native Speakers of English

Table (5) shows categories of DMs regarding the number of their frequency: Contrastive DMs (DM1) contain 531 examples, elaborative DMs (DM2) contain 6652 examples, Inferential DMs (DM3) contain 309 examples and temporal DMs (DM4) contain 505 examples. As for hedges, as present in Table (6), modal epistemic adjectives and adverbs as hedges include 764 examples, modal verbs as hedges include 572 examples and epistemic lexical verbs contain 265 examples. Elaborative DMs far exceed other categories. Modal epistemic adjectives and adverbs as hedges are used more.

WORD COUNT	Contrastive DMs	Elaborative DMs	Inferential DMs	Temporal DMs	TOTAL DMs
152887	531	6652	309	505	7997
%	0.35%	4.35%	0.20%	0.33%	5.23%
Per 1000 Words	3.47	43.51	2.02	3.30	52.31

Table (5)
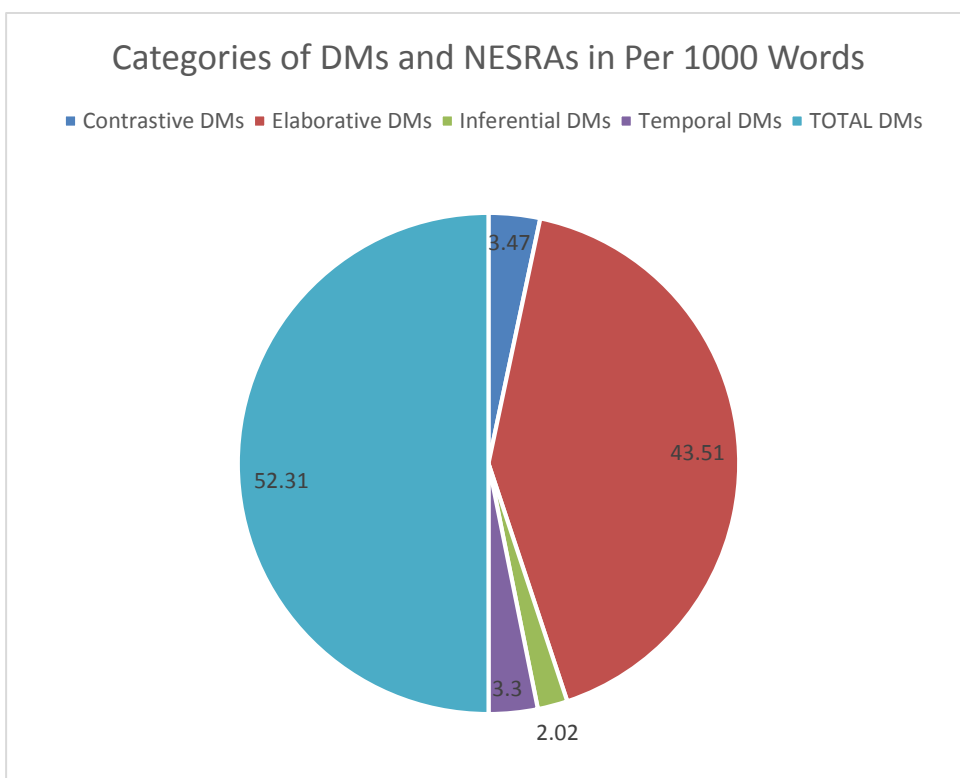
Figure (3) Illustrating Table (5)

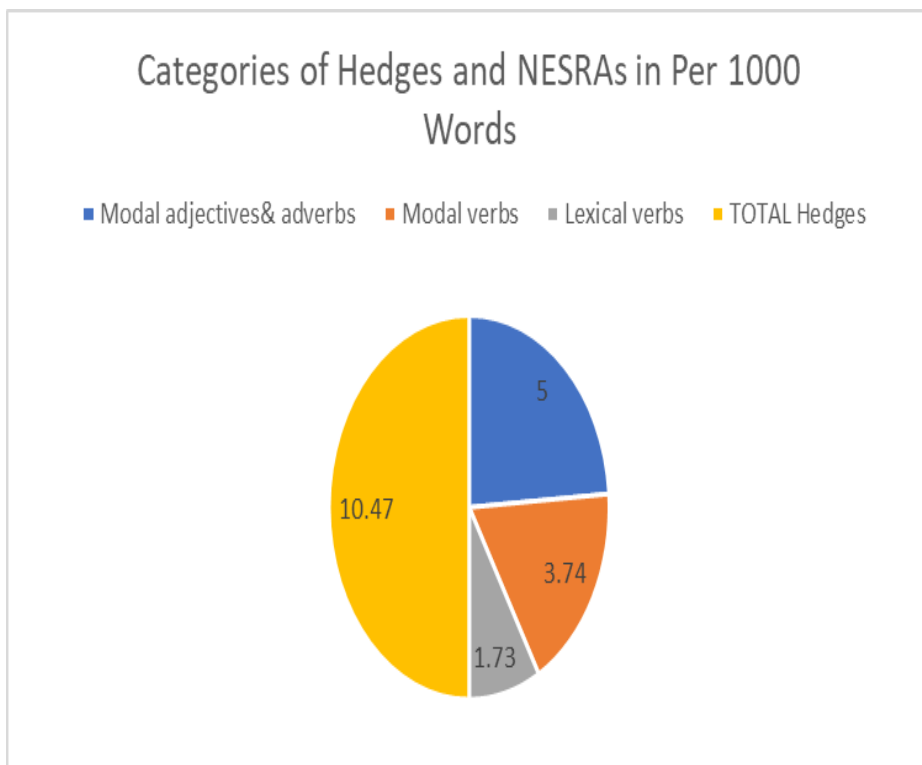| WORD COUNT	Modal adjectives& adverbs	Modal verbs	Lexical verbs	TOTAL Hedges
152887	764	572	265	1601
%	0.50%	0.37%	0.17%	1.05%
Per 1000 Words	5.00	3.74	1.73	10.47

Table (6)

Figure (4) Illustrating Table (6)

Figure (5) clarifies the frequency of DMs and hedges in both corpora as follows:
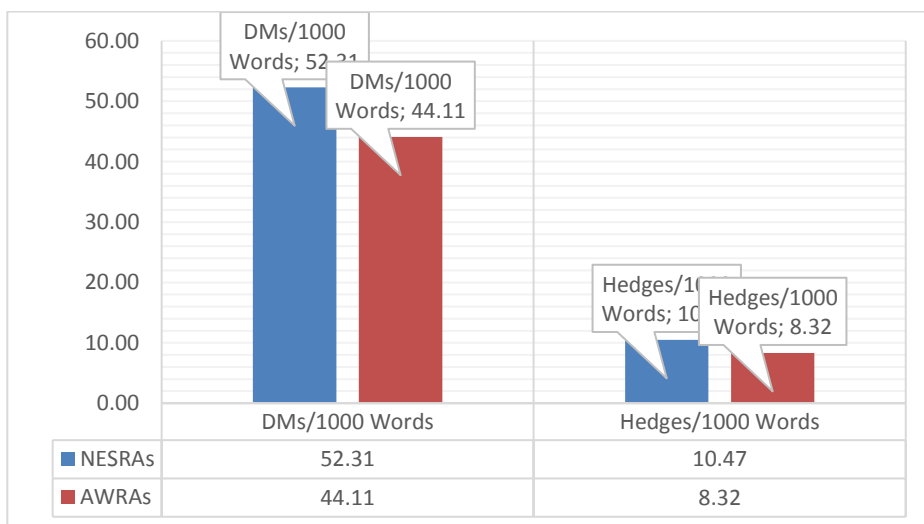

Figure (5): the frequency of DMs and hedges in both corpora.

Previous explanation proves Hyland's opinion that communication is much more than the mere exchange of information, as it reflects assumptions, beliefs and the culture of communicators (2005).

7.5. AWRAs & NESRAs: Comparison& Contrast

Generally, native speakers of English pay more attention to the uses of discourse markers and hedges than non-native speakers. Concerning discourse markers, native -English authors are more careful to use linguistic ties/cues that hold segments of an extract together. These discourse cues mark and facilitate transition between sentences and ideas and direct the reader throughout the whole article. Arabic researchers pay less attention to discourse markers as they seem to focus more on the content with less attention paid to the way it is organized/presented. This endeavor makes the impact of articles written by native-English speakers more strongly than that of articles written by non-native speakers of English.

Though scientific researches are far more concerned with data, logical ideas and reasonable evidences, data organization via discourse markers is an element required for an effective article. The more an author employs discourse markers, the better his data are presented, comprehended and retrieved. For this reason, native-speakers of English are more potent in presenting scientific data.

As for hedges, native speakers of English-again-exceed non-native speakers. To hedge is to be more accurate because there is nothing called an absolute truth/fact. Progression and changeability of scientific data are the only fact because everyday scientists become able to achieve what was previously assumed to be impossible. Showing this tendency towards hedging devices is in favor of native English- speaking authors. They take care of every word and try to leave a door open for more discoveries. This makes their writings more convincing.

Both native and non-native speakers of English share the preference of elaborative discourse markers which are used with a relatively higher frequency in both corpora. This inclination to explain via elaborative markers is a purely scientific trend because a scientific article aims to explain a certain problem and suggest creative solutions. Explaining is the

essence of scientific writing. As a result, it is normal that elaborative discourse markers are mostly prominent in both corpora.

Inferential discourse markers appear with the least frequency in both corpora. Authors are more interested in explaining and elaborating.

As for hedging devices, modal adjectives and adverbs outnumber other categories in both corpora. They are preferred as using adjectives and adverbs is a common strategy which authors are familiar with.

Epistemic lexical verbs is the least category of hedges used in both corpora. Authors, English or Arabic, prefer adjectives and adverbs to verbs. This may go back to a popular strategy of adjective/adverb preference among authors.

Both corpora share the feature of preferring elaborative discourse markers and using modal adjectives and adverbs as hedging devices. Both corpora share the resemblance of dis-preferring temporal discourse markers and epistemic lexical verbs as hedging devices. Both corpora show a wide difference as to the use of discourse markers and hedges: native speakers of English are more concerned with using discourse markers and hedges than non-native speakers of English. This is a signal that articles written by native speakers of English are better organized and are more accurate.

8. Conclusion

Culture is about historically transmitted patterns that shape people's communication of knowledge (Hyland 2005). Cultural-divergence, in consequence, results in differing styles, differing manners of expressing a content. This paper examines the scientific content as expressed by two differing culturally-based corpora: that of native speakers of English and that of non-native speakers of the same language.

Findings show clearly that native-English speaking authors employ more DMs than non-native English-speaking authors; both corpora focus on elaborative DMs. This means that native English-speaking authors tend to carefully organize scientific information especially when it comes to the elaboration of coming information. That is why elaborative DMs are used with noticeable increasing numbers. Concerning hedges, native English-speaking authors employ more hedging devices than non-native English-speaking authors. This refers to the fact that native English authors are more accurate in expressing their commitment as to scientific information. They are more cautious to show that scientific information is the field where absolute certainty is not a possibility. The frequency of modal epistemic adjectives and adverbs as hedges is higher in both corpora.

This study shows that though native English-speaking authors are similar to non-native English-speaking authors in their preference of elaborative DMs and modal epistemic adjectives and adverbs as hedges, native speakers of English differ clearly in their larger rate of using DMs and hedges. This linguistic difference may be traced to cultural differences. This study suggests that Arab writers should be advised to use more hedging devices when they express an academic content. This helps their writing appear more accurate and more convincing. It is also suggested that Arab writers should pay more attention to the process of organizing their scientific material via the careful use of DMs.

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Appendix (A)

Corpus identification: English research articles written by Arabic authors are retrieved from (http://jhiphalexu.journals.ekb.eg/) and   author identification for each separate article is as follows:

Elshehy, Agamy& Ismail (2018), Abd El-Latef, Zaki &Issa (2018), Zaki et al. (2018), Alazmi (2018), Abou Faddan & Ismail (2018), Deghedi et al. (2018), Diab et al. (2018), Abdelsalam & Said (2018), Emara et al. (2018), Bassiouny et al. (2018), Moustafa & Muhammad (2018), Ibrahim et al. (2018), Elsharkawy et al. (2018), Alazmi & Almutairi (2018), Salama, Elweshahi & Abd El Raheem (2017), El-Sebeay, Ibrahim & Yousif (2017), Abdel Aaty et al. (2017), Shuaib & Frass (2017), Salem & Abdelsalam (2017), Abdel-Salam & Abdel-Khalek (2016), Awad Allah , Salem & Said (2016), Mohamed et al. (2016), Abuzaid & Abdalla (2016), Shata, El-Kady & Ibrahim (2016), El-Kady (2015) and Goweda (2015).

Appendix (B)

Corpus identification: English research articles written by native speakers of English are retrieved from (www.elsevier.com/puhe). Author identification is as follows:

Reeves et al. (2019), Kelly & Barker (2016), Garnir-Purkis et al. (2019), Craig & Robinson (2019), Sabey, Bray &Gray (2019), Motz & Currie (2018), Leston et al. (2018), Wou et al. (2018), Hardcastle et al. (2018), Seok et al. (2018), Bouvill et al. (2018), Vojt et al. (2018), Gruer et al. (2018), Curtis, Thompson & Fairbrother (2017), Vanasse, Courteau &Ethier (2018), Garay & Chiriboga (2017), McCartney t al. (2017), Froster et al. (2017), Mclaren et al. (2017), Johnson et al. (2017), Editorial (2017), Li et al. (2017), Gruer, Hart & Watt (2017), Brewster et al. (2017), Moffat et al. (2016), and Graham and White (2016).