

# A Cross-Cultural Comparative Investigation of Linking Adverbials in Linguistics Research Articles Written in English by Native and Arab Scholars

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*Received August 16, 2019; Revised September 20, 2019; Accepted September 27, 2019*

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**Abstract** The study reports a comparative investigation into the way Arabic first language (L1) and English native language scholars construct cohesive English texts in linguistics research articles through the use of linking adverbials (LAs). It was framed by Biber et al.'s (1999) classification of LAs. The corpus comprised 80 published research articles in a linguistics journal written in English by native and Arab scholars (304,144 words). Both qualitative and quantitative analyses have been conducted in order to investigate the semantic uses of LAs and their frequencies and percentages. There were overall similarities between the two datasets and slight differences that can be related to cross-cultural and L1 influence. Some Arab scholars had the tendency to overuse additive adverbials by comparison to other LAs. This tendency might be linked to their L1, such as Arabic which heavily uses additive adverbials. The findings revealed the non-native English speaking scholars' (NNES) slight preference for using formal (e.g. 'in order to') over less formal adverbials (e.g. 'so'). The distribution pattern of the categories was similar in both datasets. The study suggests investigating other genres of RAs written within different disciplines.

**Keywords** Linking Adverbial, Conjunctive Adjunct, Academic Writing, Cross-Cultural Variation, Research Article, L1 Influence

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## 1. Introduction

Various terms have been used to refer to linking devices, such as 'conjuncts,' 'linking adverbials,' 'linking adjuncts,' 'adjuncts,' 'connectives,' and 'logical connectors.' In their English grammar reference book, Biber et al. (1999) used the term linking adverbials (LAs) as one of the three major

types of adverbials. The other two are circumstance adverbials and stance adverbials. Circumstance adverbials add information about an action or state in a clause in terms of place, time, and manner (*John travelled to Paris for a week*). They are, unlike the other two types, integrated into the clause structure. Stance conjuncts express the writer/speaker attitude towards a proposition and, thereby, influence readers' interpretation of the text (*Luckily, he succeeded in accomplishing the task*). LAs reveal the type of connection between two units of discourse (e.g. clause, sentence, paragraph), and their position is not fixed. LAs not only enhance text cohesion and coherence but also contribute to the dialogic and interactive nature of English academic texts. This is natural as these devices are useful for indicating the relation between a piece of information and the writer's point of view or for developing the writer's arguments. Povolná (2016) states that English research articles (RAs) written by native English scholars (NES) are considered "dialogic" and interactive while RAs written in central European languages are described as "monologic" and less interactive. Other languages have also been described as lacking the direct and linear rhetoric of the English text such as Japanese, Chinese, and Arabic (Fakhri, 2009). It is assumed that some non-native English scholars (NNESs) exhibit the influence of their first language (L1) writing styles and conventions when they write in English (Hedgcock, 2005; Povolná, 2016).

The analysis of written academic discourse aims to enhance our understanding of academic communication across languages and cultures (Bennett, 2010; Duszak, 1997; Vogel, 2008). Academic discourse, as manifested primarily in RAs, exhibit similar patterns in style, structure and content that are recognized by the global discourse community making it a genre of its own (Swales, 1990). To increase academic communication worldwide, English language has become the dominant language of the RA genre. Numerous studies on the use of LAs in academic

writing have been conducted over the past decades to compare their use by native and non-native writers or to investigate variations across disciplines or registers. For example, Povolná (2016) compared the use of LAs as means of enhancing communication in English RAs written by NES and those written by Czech and Slovak scholars. The findings revealed that Czech and Slovak scholars' texts were similarly interactive as they seemed "to suppress intentionally any culture-specific aspects when writing scholarly texts in English." (Povolná, 2016, p. 61). It would be interesting to investigate if those tendencies in the academic writing of the Czech and Slovak discourse communities would be found with the proficient Arab scholars' English academic papers. A number of studies (Chen, 2006; Swales, 1990; Tapper, 2005; Vinčela, 2013) have shown that ESL/EFL learners face difficulties in the appropriate use of LAs. One of these is the overuse of LAs or the misuse of LAs in academic texts (Larsen-Walker, 2017; Tapper, 2005; Vinčela, 2013; Yin, 2017). This indicates the need to conduct a cross-cultural comparative analysis to compare the use of LAs in academic RAs written by NES with those written by non-native English speaking scholars (NNES).

Although considerable research has been done on the cross-cultural variation between English and Arabic academic discourse much less is known on English discourse written by Arab scholars (Appel & Szeib, 2018; Modhish, 2012). For example, Modhish (2012) employed Fraser's (1999) discourse markers taxonomy to investigate academic exposition essays written by 50 Yemeni EFL learners. The findings revealed that the writers employed a limited range of cohesive devices, though the frequent ones were elaborative (e.g. 'and', 'also') ones, followed by the inferential (e.g. 'so'), contrastive, causative and topic relating markers; the study, however, did not investigate NS scholars writing in order to conduct a comparison and interpret the results. Similar findings were also reported by Jalilifar (2008) in his study of 598 compositions written by 90 EFL Iranian students. Appel and Szeib (2018) investigated the differences in the use of LAs by Chinese, French, and Arabic undergraduate students. The data were English academic essays collected over two-year period. The results showed that L1 Arabic EFL writers overused additive LAs (e.g., 'in addition', 'also'), L1 Chinese EFL writers overused contrastive LAs (e.g., 'however'), and L1 French EFL writers overused appositional LAs (e.g., 'in fact', 'indeed').

To date, no work has investigated and compared the use of LAs in linguistics RAs written in English by NES and Arab scholars. This is a new area of inquiry that will build upon the knowledge found on the differences between the two languages and reveal cross-cultural variation in academic communication. It was, therefore, pertinent to investigate if there are any cross-cultural variations in the use of LAs in linguistics RAs written by NESs and NNESs in order to reveal 1) the most frequent LAs (listing, summative, appositive, resultive/inferential, and contrastive/concessive) in linguistics English RAs written by NES and NNES, 2) if there were any linguistic cross-cultural variations in the use of any of these LAs in linguistics RAs, and 3) if the LAs contributed to the interaction between the author(s) and reader(s). This investigation was necessary since it may contribute to the fields of learner language analysis and Second Language Acquisition (SLA) research by revealing the underlying causes of any variations, particularly those related to the overuse or misuse of LAs. The study also contributes to our understanding of the nature and the semantic meaning of linguistics' register.

## 2. Methodology

The corpus for the cross-cultural analyses was compiled from two RA datasets published in an academic linguistics journal, *English Language Teaching*, during the period 2016-2018. Each corpus comprised 40 published RAs one written by NESs (304,144 words) and the other written by NNESs (228,927 words). Authors' names, their affiliations, tables, graphs, references, endnotes, footnotes, appendices, and acknowledgements were excluded.

Both qualitative and quantitative analyses have been conducted in order to investigate the semantic uses of LAs and their frequencies and percentages. The study was framed by Biber *et al.*'s (1999) classification of LAs' semantic categories (**Table 1**), which seemed suitable for our purpose due to its clarity and for being common in academic texts: listing (enumerative and additive), summative, appositive, resultive/ inferential, and contrastive/concessive.

Transitional LAs were excluded from the analyses because of the lack of such instances. Biber *et al.* (1999) and Liu (2008) argue that these adverbials rarely occur in academic texts.

**Table 1.** Semantic categories of LAs (Biber, et al., 1999)

No.	LAs		Examples
1.	Listing	Enumerative	First(ly), First of all, In the first place, To begin with, Second(ly), In the second place, Third(ly), Next, Lastly, Finally, For one thing, For another
		Additive	In addition, Additionally, Also, Moreover, Further(more), Similarly, Likewise.
2.	Summative		In sum, To sum up, In short, To summarize, To conclude, In conclusion, All in all, Overall
3.	Appositive		In other words, Namely, Specifically, Which is to say, that is, i.e., For example, e.g., For instance.
4.	Resultive/Inferential		Therefore, As a result, Consequently, In order to, Thus, So (that/as), Then, Hence.
5.	Contrastive/Concessive		In contrast, Instead, On the contrary, By comparison, Whereas, On the other hand, Alternatively, Conversely.
			Though, Although, Anyway, Anyhow, In any case, Besides, However, Yet, Still, Nevertheless, In spite of that, After all Otherwise, Notwithstanding
6.	Transitional		Meanwhile, Now, By the way, Incidentally

Unlike conjunctions, LAs are often marked off by a comma and they provide only semantic ties at the clause, sentence or paragraph levels (e.g. “John slept late. *However*, he got up early” or “John slept late; *however*, he got up early”). Some LAs may blend with other semantic categories. For example, the resultive “thus” may overlap with circumstance adverbials when it means “in this way.” Likewise, the summative “in sum” may also overlap with the style stance adverbial “in brief,” providing a brief analysis of a situation. There are few devices that act both as a conjunction and a LA, especially those used to start a new sentence, such as *so*, *then* (resultive/inferential) and *but*, *though*, *yet* (concessive). Adverbials whose semantic content is retrieved from the context and not the text were excluded from the analyses.

In order to ensure the results’ validity, we calculated the frequency and percentage of the occurrence of each cohesive device type per the total number of words in the RA by dividing the total number of occurrences of each type by the total number of words and multiplying the result by 1000. We used AntConc<sup>1</sup> 3.5.8 software which calculates the frequency of all words in the corpus and presents them in an ordered list. The frequency of each LA was identified using the search only feature. Instances of each LA were then manually checked in the software’s concordance page to eliminate inaccurate annotations. Researchers typically use word-based or sentence-based frequency calculation methods. As sentences can be of varying lengths, we preferred to use Altenberg and Tapper’s (1998) word-based method in order to enable comparability of the results. To ensure reliability in annotating the LAs, the annotation codes were iteratively cross-checked in addition to being revised by a fellow linguist. To make our comparisons (e.g., “more,” “most,” and “equal”) more accurate, we used the Statistical Package for Social Sciences (“SPSS”) software to analyze the quantitative data. The statistical analyses included descriptive statistics (frequencies, means, standard deviation and interquartile range) and the Analysis of

variance ANOVA. We also used the chi-squared test within the log-likelihood calculation (Rayson & Garside, 2000)<sup>2</sup>. The significance threshold was set at  $p < 0.05$  for all the tests. These tests were suitable for the purpose of our analyses as they were used to calculate the significance of the overall differences in the use of the five semantic categories by NESs and NNESSs.

### 3. Results and Discussion

#### 3.1. General Findings

To answer the first research aim on the most frequent LAs in English RAs by native English writers in comparison to non-native L1 Arabic scholars, the frequencies of the five categories were calculated. **Table 2** displays the total frequency use of the five semantic categories of LAs (*listing*, *summative*, *appositive*, *resultive and contrastive*) by the two groups and the significance of the differences following the log-likelihood calculation (Rayson & Garside, 2000). This test showed a clear difference between the two groups as four categories were overused by NESs when compared to NNESSs. The Summative and the resultive LAs ( $p < 0.05$ ) were slightly overused and the appositive and contrastive ( $p < 0.0001$ ) were highly overused. The statistical comparison, however, showed that the fifth category, *listing* adverbials (enumerative and additive), was highly overused by NNESSs as detailed in **Table 2**.

1 <http://www.laurenceanthony.net/software/antconc/>

2 The calculations were conducted using the online Log-likelihood and effect size calculator created by Dr. Paul Rayson, Lancaster University <http://ucrel.lancs.ac.uk/llwizard.html>

**Table 2.** Frequency and rates (per 1000 words) of LAs in the two data groups

LAs	NES		% among LAs	NNES		% among LAs	Log-Likelihood	
	Freq.	%		Freq.	%		LL	Overuse/ Underuse <sup>3</sup>
Listing	1228	4.00	28.9%	1101	4.80	36.8%	<b>17.69****</b>	-
Summative	55	.18	1.2%	23	.10	0.7%	<b>6.00*</b>	+
Appositive	872	2.85	20.5%	526	2.30	17.6%	<b>16.35****</b>	+
Resultive/ Inferential	1108	3.61	26.1%	759	3.31	25.4%	<b>4.02*</b>	+
Contrastive/Concessive	974	3.17	22.9%	579	2.53	19.3%	<b>20.59****</b>	+
Total	4237	13.81		2988	13.04		<b>7.46**</b>	+

\* < 0.05, \*\* < 0.01, \*\*\* < 0.001, \*\*\*\* < 0.0001

Although some differences were found, the data shows that both groups are similar in the preferred category among LAs with *listing* adverbials being the most used compared to all other categories and *resultive/inferential* in second place followed by *contrastive/concessive*, then *appositive* and finally the least used was the *summative* category. The resultive/inferential LA was the lowest frequent LA type in Peacock's (2010) study of LAs in RAs.

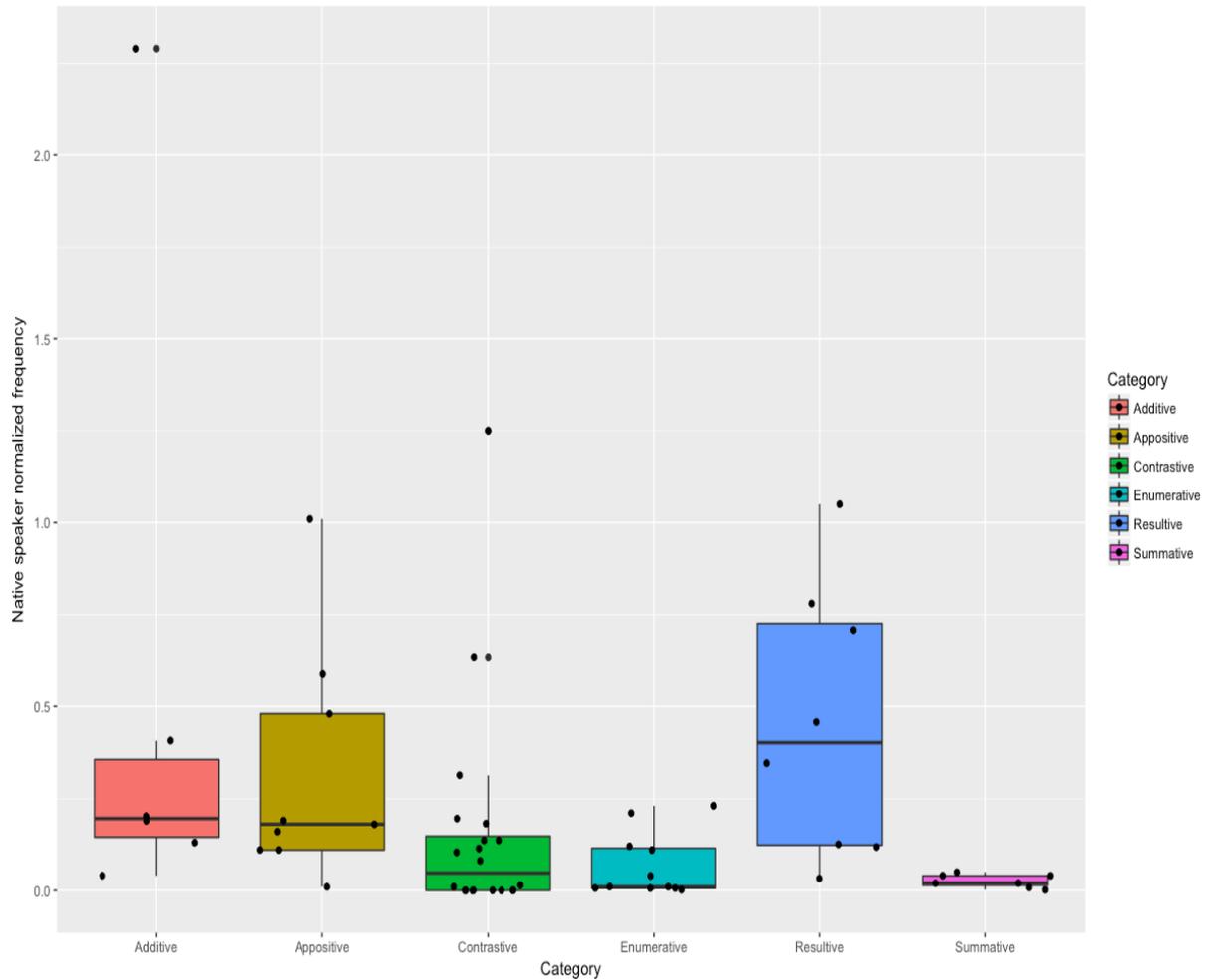
Recently, more researchers suggest incorporating different ways of interpreting and calculating corpus data through mean scores and SDs (Gablasova, Brezina, & McEnery, 2017; Lijffijt et al., 2016). **Table 3** shows means, standard deviation and inter-quartile range (75 percentile– 25 percentile) by corpus and by category for NESs and NNESs.

**Table 3.** Descriptive statistics of adverbial categories in the two datasets

	NES		NNES	
	Mean (SD)	Interquartile range	Mean (SD)	Interquartile range
Listing (Enumerative)	0.068 (0.086)	0.109	0.055 (0.086)	0.067
Listing (Additive)	0.543 (0.864)	0.211	0.692 (0.864)	0.36
Summative	0.026 (0.018)	0.026	0.014 (0.018)	0.0085
Appositive	0.316 (0.320)	0.37	0.256 (0.320)	0.293
Resultive/ Inferential	0.452 (0.366)	0.60275	0.415 (0.366)	0.44725
Contrastive/Concessive	0.158 (0.299)	0.1475	0.126 (0.299)	0.1495

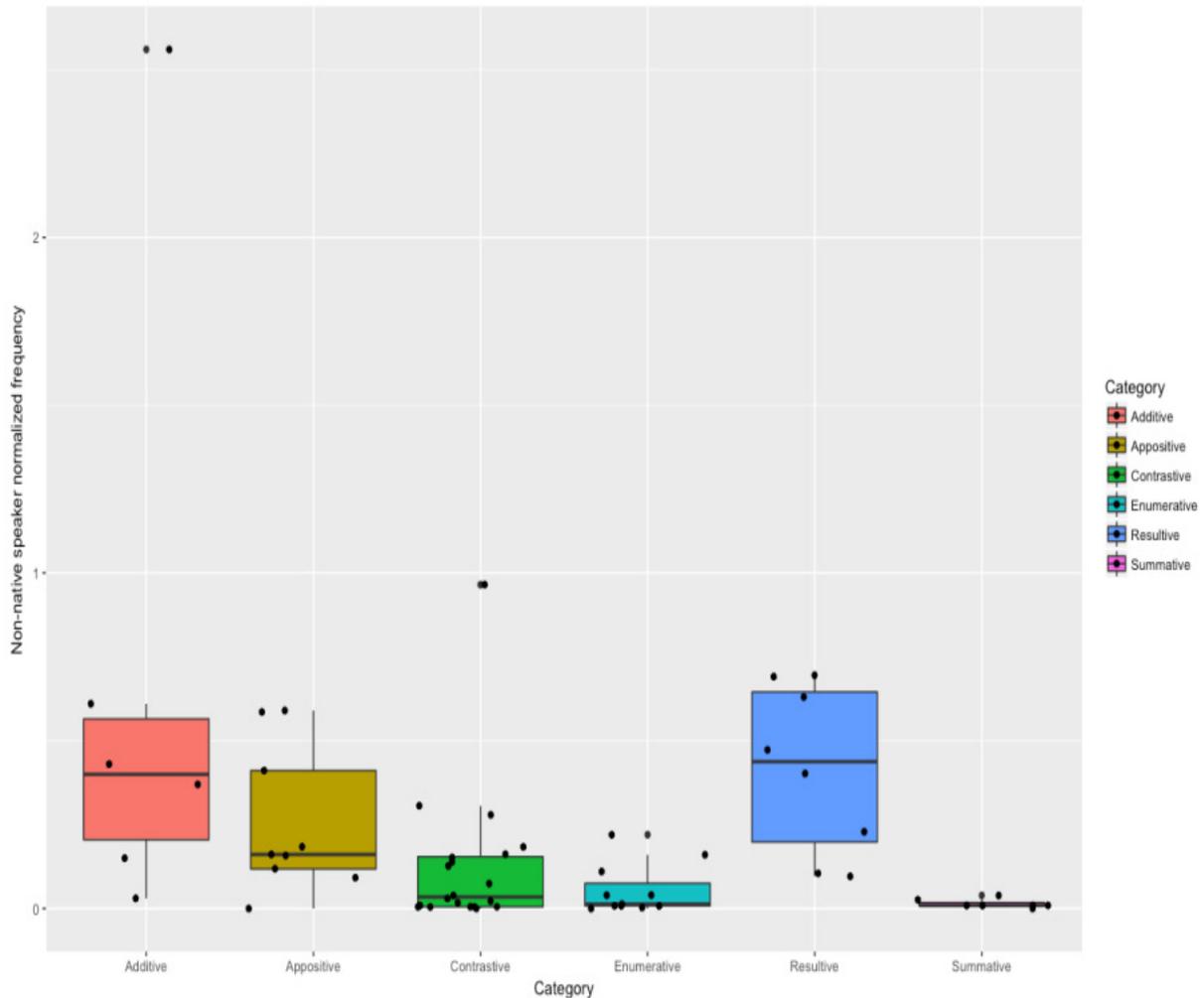
In contrast to the previous log-likelihood results, mean scores and standard deviations show very similar numbers between the two groups. Also, boxplots of the distribution of the use of LAs by the two groups (**Figure 1** & **Figure 2**) show a similar pattern of use and some individual variation within each corpus.

3 The overuse/underuse calculation is referring to corpus 1 (NES) in relation to corpus 2 (NNES)



**Figure 1.** Distribution of adverbial use in NESs' corpus

To confirm if these numbers and plots are indeed similar with no significant difference an ANOVA test was conducted and the results of the ANOVA test for the difference between the two datasets were found to be not statistically significant. However, the ANOVA revealed a significant difference at the  $p < .05$  level [ $F(5) = 4.29, p = 0.001$ ] in the use of adverbial categories among NNESSs only.



**Figure 2.** Distribution of adverbial use in NNESS' corpus

The detailed ANOVA showed that the major cross-cultural difference is found in the NNESSs use of the listing *additive* adverbials ( $M=0.69$ ,  $SD= 0.86$ ) in a significantly higher rate when compared to three adverbial categories: listing *enumerative* ( $M= 0.05$ ,  $SD= 0.08$ ,  $p = 0.006$ ) *contrastive* ( $M= 0.12$ ,  $SD= .29$ ,  $p =0.008$ ), and *summative* ( $M=0.014$ ,  $SD= 0.018$ ,  $p = 0.008$ ). The result indicating the overuse of *additive* adverbials by NNESSs is the reason the *listing* category was found to be overused by NNESSs when compared to NESs (**Table 2**). It is also consistent with other cross-cultural studies reporting the tendency of Asian writers of academic English to overuse these LAs (Ha, 2016; Ishikawa, 2010; Mudhhi & Hussein, 2014; Xu & Liu, 2012). This overuse of additive LAs by L1 Arabic scholars could be traced to the influence of classical Arabic (Mohamed-Sayidina, 2010; Mohamed & Omer, 2000; Ostler, 1987). For example, Mohamed and Omar (2000, p. 53) argue that while “Arabic cohesion is described as context-based, generalized,

repetition-oriented, and additive, English cohesion is characterized as text-based, specified, change-oriented, and non-additive.” Kaplan (1966) states that Semitic languages (Arabic and Hebrew) excessively use repetition in the development of propositions due to their use of parallel constructions, which are both positive and negative. Kaplan (1987) concedes later on by stating that he may have overstated. A number of scholars (Abuhamdia, 1972; Al-Rufai, 1976; Mohan & Lo, 1985), however, refute Kaplan’s earlier claim by arguing that rhetorical style differences between the two languages may be caused by the influence of the students’ colloquial Arabic and their insufficient writing skills. The latter cause may be more plausible as students in primary education receive minimal instruction in the use of English LAs.

To investigate the cross-cultural variation in the frequency use of LAs, the top 10 most frequently occurring LAs in each corpus were identified as shown in **Table 4**.

**Table 4.** Top 10 most frequently used LAs in the two data groups

NESs RAs				NNEs RAs			
LA	Freq.	%	% among LAs	LA	Freq.	%	% among LAs
Also	700	2.28	16.6%	Also	587	2.56	19.6%
However	384	1.25	9.1%	However	221	.965	7.3%
Thus	322	1.05	7.6%	Therefore	159	.695	5.3%
e.g.	311	1.01	7.3%	Thus	158	.691	5.2%
Then	239	.780	5.6%	<b>In order to</b>	144	.630	4.8%
<b>So (that/as)</b>	217	.708	5.1%	<b>In addition</b>	140	.610	4.6%
<b>Although</b>	195	.635	4.6%	For example	135	.590	4.5%
For example	183	.590	4.3%	i.e.	134	.586	4.4%
i.e.	148	.480	3.5%	Then	108	.473	3.6%
Therefore	140	.457	3.3%	<b>Moreover</b>	99	.430	3.3%
			67%				<u>62.6%</u>

The top ten most frequently used LAs account for a large percent of all LAs used in both NESs' (67 %) and NNEs' (62.6%) texts. This result is similar to Lei's (2012) finding on the academic English of Chinese writers signaling that writers from different cultures rely heavily on a small set of LAs. The two scholar groups in the present study also share the use of seven LAs in their top 10 most frequent list (*also, however, therefore, thus, for example, i.e. & then*). The LAs *also, however* and *thus* are among the top three most frequently used LAs for both groups which is also similar to the results of previous studies (e.g. Appel & Szeib, 2018; Lei, 2012). The difference found is that the NNEs' list of the top ten LAs include two additives not found in the NESs' list which are (*in addition, & moreover*). This also supports the previous results of the log-likelihood and the ANOVA on listing and additive LAs marking the major cross-cultural difference between the two groups in our study. Another cross-cultural difference is the tendency of the NNEs to use the formal form of the English resultive *in order to* while the NESs prefer the informal resultive *so* (Table 4).

### 3.2. Linking Adverbials

Detailed results of the use of LAs in each semantic category calculated by the log-likelihood test will be presented next to capture any differences or patterns of use among the two groups. Along with examples from the corpus, this will provide us with more insights on cross-cultural differences and the role of LAs in enhancing the interaction between writers and their readers (research aims two and three).

#### 3.2.1. Listing Adverbials: Enumeration and Addition

The semantic category of listing adverbials was found to account for 28.9% of all LAs of NESs and 36.8% of all LAs of NNEs (Table 2). The category is subdivided into enumerative (Table 5) and additive adverbials (Table 6). The data shows that the high percentage in the use of this category is related to additive adverbials not enumerative. As stated earlier, both groups used additive adverbials extensively in comparison to all other LAs and for NNEs with a significantly higher rate. No difference is found in the total use of enumerative adverbials between the groups and the only adverbial that shows overuse by NESs is *next* ( $p < 0.01$ ). The enumeration LA *for one thing* was rarely used by the NESs only. This long expression (overture) LA aims to signal a new direction in discourse (Biber, et al., 1999).

The major cross-cultural difference which was found is that the NNEs tended to overuse the category of additive adverbials in comparison to NESs (Table 6) with a highly significant difference ( $p < 0.0001$ ). In particular, they overused the three additive adverbials: *in addition/additionally* ( $p < 0.0001$ ), *moreover* ( $p < 0.0001$ ), and *furthermore* ( $p < 0.001$ ). This supports the results of earlier studies (An & Xu, 2018; Appel & Szeib, 2018; Povolná, 2016; Xu & Liu, 2012) regarding the overuse of additive adverbials by non-native English writers. For example, Xu and Liu's (2012) study showed that Chinese learners, unlike native English speakers, have a preference to use listing and contrasting LAs. Costa (2015) argues that this could be attributed to the fact that while Brazilian NNEs explicitly add messages to their arguments, NESs not only add information but also emphasize their point of view through the use of stance adverbials, such as *importantly* and *interestingly*.

**Table 5.** Frequency and rates (per 1000 words) of enumerative LAs in the two data groups

LAs	NES		NNES		Log-Likelihood	
	Freq.	%	Freq.	%	LL	Overuse/ underuse
First(ly)	60	.210	38	.160	0.70	
First of all	4	.010	2	.008	0.23	
In the first place	4	.010	2	.008	0.23	
To begin with	2	.006	1	.003	0.12	
For one thing	2	.006	0	0.00	2.24	
Second(ly)	40	.120	25	.110	0.54	
Third(ly)	13	.040	9	.040	0.04	
Fourth	1	.002	3	.013	1.70	
Last(ly)	2	.006	2	.008	0.08	
Finally	67	.230	50	.220	0.00	
Next	34	.110	9	.040	<b>9.25**</b>	+
Total	<b>229</b>	<b>.750</b>	<b>141</b>	<b>.610</b>	<b>3.57</b>	

\*<0.05, \*\*<0.01, \*\*\*<0.001, \*\*\*\*<0.0001

**Table 6.** Frequency and rates (per 1000 words) of additive LAs in the two data groups

LAs	NES		NNES		Log-Likelihood	
	Freq.	%	Freq.	%	LL	Overuse/ underuse
In addition/ Additionally	125	.407	152	.663	<b>15.88****</b>	-
Also	703	2.29	587	2.56	3.43	
Moreover	40	.130	99	.432	<b>45.41****</b>	-
Further(more)	58	.189	80	.349	<b>12.55***</b>	-
Similarly	62	.202	35	.152	1.90	
Likewise	11	.040	7	.030	0.12	
Total	<b>999</b>	<b>3.25</b>	<b>960</b>	<b>4.19</b>	<b>29.09****</b>	-

\*<0.05, \*\*<0.01, \*\*\*<0.001, \*\*\*\*<0.0001

In some cases, the NNESs used those additive LAs in line with their cohesive function in English to “mark the next unit of discourse as being added to the previous one” and “show explicitly that the second item is similar to the first” (Biber, et al., 1999, p. 876) as shown in example (1):

- (1) It is suggested to conduct experimental studies that examine the effectiveness of using D2L in improving students’ English language skills. Moreover, [Listing Additive] other survey studies may explore the factors that motivate students and teachers to use the D2L system. Studies that consider gender differences could also [Listing Additive] compare male and female perceptions and attitudes towards using the D2L system in EFL learning and teaching processes. Furthermore, [Listing Additive] correlational studies may study students’ D2L perception and their EFL achievements. (English Language Teaching, 11/9, 2018)

Examples 2-7, on the other hand, show that some NNESs have overused the English listing additive LAs without serving the function of giving a clear semantic

connection to the immediately preceding item. Note in examples 2-7 that the additive *moreover* is supposed to extend two parallel propositions in a text and *furthermore* is supposed to conjoin more than two unrelated messages but they were not used by L1 Arabic writers to serve these semantic functions. This may explain the significantly high use of this category found by the ANOVA test:

- (2) Also, [Listing Additive] the tasks must be motivating and stimulating so that [Resultive/ Inferential] young learners could feel satisfied with what they have done. Furthermore, [Listing Additive] Slattery (2001) highlighted some characteristics young learners have. (English Language Teaching, 9/7, 2016)
- (3) Their perceptions were analyzed according to the four constructs of the TAM model. Moreover, [Listing Additive] it attempted to explore the problems that would hinder their use of the D2L system ... (English Language Teaching, 11/9, 2018)

- (4) In some point, this result is consistent with the results of (Lindsey, 2015) study, which found that inserting and instilling technology was useful and positive in the college. **In addition to [Listing Additive]** the consolidation of extra experience on the topic of digital citizenship, which was outside the scope of previous experience of trainers and teachers, as there is determination for teachers to model digital citizenship in the classroom. (English Language Teaching, 11/1, 2017)
- (5) Thorough analysis will begin in the following sections by first focusing on pronouns, nouns and adjectives analyzing the frequency, collocates and the common lexical patterns. Then, **[Resultive/ Inferential]** verbs and grammatical patterns will be analyzed **similarly [Listing Additive]**. (English Language Teaching, 9/7, 2016)
- (6) According to Partington (1980), language researchers and teachers started to compile mini corpora for specific purposes. **Furthermore, [Listing Additive]** Partington (1980) argued that these specially designed corpora are extremely relevant to language research. (p. 4). (English Language Teaching, 9/7, 2016)
- (7) The standard deviation of how TQA models were always helpful was between .772 and .905. **Furthermore [Listing Additive]**, answering the second research question of the current study related to the procedures for applying the linguistic functional approaches in assessing the quality of translation, the following is a descriptive analytical report about the research findings: (International Journal of English Linguistics, 6/6, 2016)

The overuse of listing LAs is documented in a number of studies (Appel & Szeib, 2018; Park, 2013; Xu & Liu, 2012). They found that rather than paying attention to both form and content, some non-native English learners concentrate only on connection, structure and language (Xu & Liu, 2012).

In contrast, a similarity between the two groups is found in the use of the LA *also* with no significance indicated by the log-likelihood test. Peacock (2010) suggests that *also* is a very commonly used adverbial that serves to make claims and not just to show addition or similarity as defined by Biber et al. (1999). Indeed the use of *also* to make claims was used by both native English and L1 Arabic writers as shown in the following excerpts 8 and 9 from both NNEs and NESs respectively.

- (8) The present study was limited to addressing the issue of the role of social media in promoting the digital citizenship among the female students at Imam Mohammed bin Saud Islamic University in Riyadh, **therefore, [Resultive/ Inferential]** it is important to carry a further similar research in other universities of KSA with comparison to this study. This study **also [Listing Additive]** opens the gates for other researches to conduct a similar study on public education. (English Language Teaching, 11/1, 2017)
- (9) **In short [Summative]**, whilst the current paper argues in favor of UG, it **also [Listing, Additive]** argues Generative Linguistics needs to be integrated into Cognitive Psychology more broadly. (Open Linguistics, 2/1, 2016)

### 3.2.2. Summative Adverbials

In comparison to all the other categories, summative LAs are the least frequently used by both NESs and NNEs showing no cross-cultural variation (Table 2). This is expected since such LA is typically used in the conclusion section of the RA. Biber et al. (1999) describe summative LAs as markers of the conclusion of discourse since they summarize the propositions in the preceding text. NES slightly overused this category ( $p < 0.05$ ) and the only significant difference is found in the overuse of *to summarize* as this adverbial was not used at all by the NNEs (Table 7).

Table 7. Frequency and rates (per 1000 words) of summative LAs in the two data groups

LAs	NES		NNEs		Log-Likelihood	
	Freq.	%	Freq.	%	LL	Overuse/ underuse
In short	10	.040	2	.009	3.79	
In summary	10	.040	2	.009	3.79	
In sum	6	.020	2	.009	1.12	
To summarize	7	.020	0	.000	<b>7.86**</b>	+
Overall	17	.050	9	.039	0.75	
To conclude	3	.002	6	.026	2.05	
In conclusion	2	.008	2	.009	0.08	
<b>Total</b>	<b>55</b>	<b>.180</b>	<b>23</b>	<b>.100</b>	<b>6.00**</b>	+

\* $<0.05$ , \*\* $<0.01$ , \*\*\* $<0.001$ , \*\*\*\* $<0.0001$

Examples (10) and (11) from NESs' and NNESs' writings show also that this LA was not only employed to conclude and link the information to the preceding discourse but also to provide a variety of the other semantic categories, such as resultive/inferential, contrastive, and listing. This means that the infrequent use of summative LAs in both datasets did not affect the semantic function of summation nor the cohesion and coherence of the text.

(10) NES:

Overall, [Summative] I found that conducting this experiment was a challenge because [Resultive/Inferential] students were unfamiliar not only with how to provide peer feedback but [Contrastive/Concessive] also [Listing Additive] with how to use online blogging as a means of doing so. Nevertheless, [Contrastive/Concessive] students viewed the peer collaboration that resulted from blogging positively (Note 7). (English Language Teaching, 9/7, 2016)

(11) NNES:

To conclude, [Summative] it is important to note that conducting follow-up interviews with the participants would have helped increasing the reliability of teachers' responses and solving the contradiction between their perceptions of the use of L1 and L2. However, [Contrastive/Concessive] due to the fact that this study has been conducted over a short period of time, the participants could not be interviewed. Therefore, [Resultive/Inferential] further studies can use a questionnaire supported by follow-up interviews and classroom observations. (English Language Teaching, 10/6, 2017)

### 3.2.3. Appositive Adverbials

Appositive LAs may function to exemplify through presenting the second text as "information that is in some sense included in, rather than exactly equivalent to, the previous text" (Biber, et al., 1999, p. 877). The use of appositive LAs marks a clear cross-cultural variation in the writing of native English and L1 Arabic scholars. Its total

use is found to be greater by NES ( $p < 0.0001$ ). The adverbials that are found to be significantly overused by them when compared to the NNES are: *specifically* ( $p < 0.05$ ) and *e.g.* ( $p < 0.0001$ ). The adverbials *for example* and *e.g.* which are counted by Biber *et al.* (1999) as one of four most frequent LAs in English academic prose are used in this data more frequently by NESs (1.60) than by NNESs (1.00) (Table 8). It is found that native English writers are more explicit in making their exemplifications when compared to L1 Arabic writers. This finding is in line with Costa's (2015) study, who found that the same cross-cultural variation as native English writers employed these LAs 153% more times than did the non-native writers.

An appositive adverbial also functions to restate and reformulate the information in a different way or more explicitly (Biber, et al., 1999). The adverbial *namely* is found to be overused by the NNESs when compared to the NESs ( $p < 0.05$ ).

(12) Moreover, [Listing Additive] the GAT measure yielded a counter-intuitive result; namely [Appositive] that less-successful learners had higher GAT scores than the successful ones, though [Contrastive/Concessive] the difference wasn't statistically significant. (English Language Teaching, 9/7, 2016)

The adverbials of this category are also used by authors to make claims (Peacock, 2010) resulting in enhancing the understanding of the reader and clarifying conveyed arguments. Example 13 from the NNESs' data illustrates how the adverbial *namely* is used to elaborate and explain concepts in a clear interaction with the reader:

(13) Moreover, [Listing Additive] the GAT measure yielded a counter-intuitive result; namely [Appositive] that less-successful learners had higher GAT scores than the successful ones, though [Contrastive/Concessive] the difference wasn't statistically significant. (English Language Teaching, 9/7, 2016)

**Table 8.** Frequency and rates (per 1000 words) of appositive LAs in the two data groups

LAs	NES		NNES		Log-Likelihood	
	Freq.	%	Freq.	%	LL	Overuse/ underuse
In other words	34	.110	37	.161	2.41	
Specifically	49	.160	21	.092	<b>4.97*</b>	+
Which is to say	3	.010	0	.000	3.37	
For example	183	.590	135	.590	0.03	
e.g.	311	1.01	94	.411	<b>69.09****</b>	+
i.e.	148	.480	134	.586	2.39	
For instance	58	.190	36	.158	0.84	
Namely	33	.110	42	.184	<b>5.15*</b>	-
That is	53	.180	27	.118	2.83	
<b>Total</b>	<b>872</b>	<b>2.84</b>	<b>526</b>	<b>2.30</b>	<b>16.35****</b>	+

\* $<0.05$ , \*\* $<0.01$ , \*\*\* $<0.001$ , \*\*\*\* $<0.0001$

**Table 9.** Frequency and rates (per 1000 words) of resultive/inferential LAs in the two data groups

LAs	NES		NNEs		Log-Likelihood	
	Freq.	%	Freq.	%	LL	Overuse/ Underuse
Therefore	140	.456	159	.694	12.62***	-
As a result	38	.124	24	.104	0.46	
Consequently	10	.032	22	.096	8.66**	-
In order to	106	.345	144	.629	21.62****	-
Thus	322	1.05	158	.690	20.24****	+
So (that/as)	217	.707	92	.401	22.75****	+
Then	239	.779	108	.470	20.46****	+
Hence	36	.117	52	.226	9.24**	-
Total	1108	3.61	759	3.31	4.02*	+

\*<0.05, \*\*<0.01, \*\*\*<0.001, \*\*\*\*<0.0001

### 3.2.4. Resultive /Inferential Adverbials

The fourth category of resultive/inferential LAs was the second most highly used LA type (Table 2) by both NESs (26.1%) and NNEs (25.4%) with little cross-cultural variation. This category serves the function of tying the second unit of discourse to the previous one in a result/consequence relation. The data shows slight significant overuse in the total result of this category by NESs ( $p < 0.05$ ). However, many differences are found in the choice of adverbials by the two groups as shown in Table 9.

Biber *et al.* (1999) state that *thus* and *therefore* are among the four most frequent LAs in English academic prose. The results show that while NESs overused *thus* ( $p < 0.0001$ ), NNEs overused *therefore* ( $p < 0.001$ ). These numbers signal that the cross-cultural variation is not found in the use but rather in the choice of LAs. These two resultive LAs were the top most frequently occurring LAs in Phoocharoenil's (2017) study of written academic English in the Corpus of Contemporary American English. However, a closer examination of the use of *therefore* by L1 Arabic writers (Examples 14 & 15) might indeed reveal a cross-cultural variation similar to the finding in Gao's (2016) study of Chinese writers who used this 'cohesive device' without the logical relationship of cause-and-effect, i.e. the use of *therefore* did not logically connect the sentence in a cause-and-effect manner. In these examples, the use of a conjunction would have served the cohesive function with no need for a resultive adverbial.

(14) The problem is that the verb in the first conjunct has been used twice: the verb requires a subject and an object; both are available in the first conjunct; but [contrastive/concessive] the same verb governs other arguments in the second conjunct. **Therefore [resultive/inferential]**, this paper claims that the f-structure is not coherent in this analysis. (International Journal of English Linguistics, 7/6, 2017)

(15) Clark and Paivio (1991) identified three types of processing: representational, which is the direct activation of verbal or non-verbal representations; referential, which refers to the activation of the verbal system by the nonverbal system or vice-versa; and associative processing, referring to the activation of representations within the same verbal or nonverbal system. **Therefore [resultive/inferential]**, the decoding of language symbols is an important skill in reading comprehension. (International Journal of English Linguistics, 6/4, 2016)

Note in Table 9 the high frequency of using *then* (.77) and *so (that)* (.7) ( $p < 0.0001$ ) in NNEs' data which is a variation expected with native English speakers, as corpus studies find those two LAs more common in conversations (Biber, et al., 1999). This cross-cultural variation with L1 Arab writers is similar to the results of L1 Czech and Slovak writers in comparison to native English writers (Povolná, 2016). However, examples (16) and (17) from the NNEs' data show that the use of the adverbials *so (that)* (.4) and *then* (.47) although significantly lower still shows an informal expression of ideas as found with NNEs' writing which, in turn, increases the dialogue between the writer and reader.

(16) It has become necessary to make advantages of such technological and digital advances in the field of education **so that [Resultive/ Inferential]** the new generation can easily adapt and cope with this new technological and digital world. (English Language Teaching, 11/1, 2017)

(17) **Then, [Resultive/ Inferential]** their answers were translated into English **in order to [Resultive/ Inferential]** analyze the data. (English Language Teaching, 11/1, 2017)

Another observation about resultive/inferential LAs is the cross-cultural variation in using more formal versions of LAs by non-native English writers as the data shows significant overuse of the formal *in order to* (.62) ( $p < 0.0001$ ), *consequently* (.09) ( $p < 0.01$ ) and *hence* (.22) ( $p <$

0.01) among the NNEs. This supports Biber *et al.*'s (1999) finding that English scholars rarely use *hence* and prefer *thus* and *therefore*. However, it is noted that this difference does not affect the negotiation of meaning as L1 Arab writers use *hence* in addition to other LAs even the less formal *so* to connect with the reader as shown in Example 18.

(18) Therefore. [**Resultive/ Inferential**] they would intend to use D2L in their future classes. For instance. [**Appositive**] one of the teachers said, "I had found the question library and quizzes tools significant that I would like to use them again in all my classes." Hence. [**Resultive/ Inferential**] most of the teachers' responses showed positive attitudes and willingness towards using D2L. Findings of the study ascertained that teachers would intend to use D2L in their all English language classes. They would also recommend D2L to their colleagues to motivate students to log into D2L to check all its options. So. [**Resultive/ Inferential**] teachers' positive attitude affected their intention to use D2L. (English Language Teaching, 11(9), 2018)

#### 4.2.5. Contrastive/ Concessive Adverbials

Adverbial of this category mark differences and

alternatives between discourse units "which often lead to main points that academic authors want to make" (Biber, et al., 1999, p. 881). They, therefore, "contribute to the interactive nature of academic discourse" and "enable voices other than the author's to enter the text" (Povolná, 2016, p. 57). Previous studies have found cross-cultural variations showing that non-native English writers underuse contrastive LAs (Altenberg & Tapper, 1998; Granger & Tyson, 1996; Ha, 2016; Lei, 2012). Lei (2012) ascribes this to the complex semantic relationship between discourse units as they "mark incompatibility between information in different discourse units, or signal concessive relationships" (Biber, et al., 1999, p. 878).

The total results show that some variation is indeed found with this dataset as the native English writers overused contrastive LAs when compared to the L1 Arabic writers ( $p < 0.0001$ ) (Table 10). However, the detailed results of each adverbial indicate that both NESs and NNEs show comparable overuse and underuse of the LAs of this category which indicates similar to resultive/ inferential adverbials, a difference in choice not use. While the NNEs overused the contrastive adverbials *whereas*, *on the other hand*, *besides* and *still*, the NESs overused *though*, *although*, *however*, and *otherwise*.

**Table 10.** Frequency and rates (per 1000 words) of contrastive/concessive LAs in the two data groups

LAs	NES		NNEs		Log-Likelihood	
	Freq.	%	Freq.	%	LL	Overuse/ underuse
In contrast	42	.136	29	.127	0.13	
Instead	60	.195	32	.139	2.55	
On the contrary	4	.014	5	.022	0.58	
By comparison	0	0.00	1	.005	1.69	
Whereas	56	.182	70	.306	8.07**	-
On the other hand	35	.114	42	.184	4.17*	-
Alternatively	0	0.00	1	.005	1.69	
Conversely	0	0.00	2	.009	3.38	
Anyway	0	0.00	1	.005	1.69	
In any case	0	0.00	1	.005	1.69	
Besides	0	0.00	9	.039	15.21****	-
Though	96	.313	37	.162	13.02***	+
Although	195	.635	64	.279	37.41****	+
However	384	1.25	221	.965	10.32**	+
Yet	42	.136	35	.152	0.20	
Still	0	0.00	4	.017	6.76**	-
Nevertheless	25	.081	17	.074	0.11	
After all	0	0.00	1	.005	1.69	
Otherwise	32	.104	7	.030	11.04***	+
Notwithstanding	3	.010	0	.000	3.37	
Total	974	3.17	579	2.53	20.59****	+

\* $<0.05$ , \*\* $<0.01$ , \*\*\* $<0.001$ , \*\*\*\* $<0.0001$

The concessive adverbial *though* is considered by Biber et al. (1999) as one of four most frequent adverbials in conversation rather than academic prose, yet we found overuse in the NESs' data (.31) compared with the NNESS (.16) ( $p < 0.001$ ). This supports the recurring cross-cultural variation showing that native English writers resort to informal dialogic styles in their academic writing while non-native writers generally avoid using less formal styles. Biber et al. (1999) list *however* as one of the four most frequent LAs in academic discourse, and described as "uniformly preferred" (p.889) to mark contrast by authors of this type of discourse. A clear cross-cultural variation is not found with this adverbial because although significantly underused by NNESSs when compared to NESs, the use of *however* (.96), as shown **Table 3**, is the most frequently used adverbial in the NNESSs' data. This marks a difference from studies on Chinese writers having a tendency to underuse the contrastive adverbial *however* (Chen, 2006; Gao, 2016; Lei, 2012). This finding is congruent with Leedham and Cai's (2013) study of Chinese undergraduates students' use of LAs, who used this LA more often, though not as much as did the L1 English students. The cross-cultural variation found in this study is that native English writers used this LA in varied positions and not only in initial position as did most L1 Arabic writers, as shown in the excerpts in 19.

(19) NES:

However, [**Contrastive/Concessive**] both Carlos and Juan noted that their teachers do not provide enough time for them to process the course materials and do not repeat parts of the instruction when asked to do so. (English Language Teaching, 11/1, 2018) Ironically however, [**Contrastive/Concessive**] while most schools and many researchers struggle to find ways to improve student outcomes, only a few have gone and ask the students about their learning experience. (English Language Teaching, 11/1, 2018) This approach to integration of content-based approaches (use of cases) should be lauded; however, [**Contrastive/Concessive**] a greater focus on principles of task-based approaches should also be considered. (English Language Teaching, 11/8, 2018)

This finding is in line with other studies showing cross-cultural variation in the use of *however* such as Leedham and Cai's (2013) study of Chinese undergraduate students who used *however* in a sentence-initial position. Similarly, Korean English learners in Yoon and Yoo's (2011) study preferred to use coordinators in initial position even when not correct.

#### 4. Conclusions and Implications

The present study revealed the way Arabic L1 and English native language scholars construct cohesive English texts in 80 RAs (304,144 words) published in a linguistics journal through the use of LAs. Biber *et al.*'s

(1999) theoretical framework was employed for the linguistic analyses of LA. The results indicated that there were overall similarities between the two datasets and slight differences that can be related to cross-cultural and L1 influence. The overuse of additive LAs by Arab scholars in the present study is in line with a number of studies on L1 Arabic writers (Appel & Szeib, 2018) and other writers from different cultural backgrounds (An & Xu, 2018;; Povolná, 2016; Xu & Liu, 2012) . On the other hand, the overuse of appositive LAs by native English writers compared to L1 Arabic writers is in line with the findings of previous cross-cultural studies (e.g. Costa, 2015).

The distribution pattern of the semantic categories was similar in both datasets with listing LAs being the most frequently used category followed by resultive/inferential, then contrastive/ concessive, appositive, and finally the summative category. NESs and NNESSs shared the preference of seven LAs out of the ten most used, and the top three LAs in both datasets were: *also*, *however*, and *thus*. This finding has an implication for EAP tutors and course designers who can focus on the top most frequently used LAs. The study found variation in the two groups' use of two categories: resultive/inferential and contrastive/concessive. Yet this variation was not found in the use but rather in the preferred choice from these two categories.

Finally, there are limitations to the present study that need to be addressed in future research. While the corpus size compares well to similar research in the field, larger corpus would provide more insights on some slight L1 tendencies that were found. Also, to have a complete picture about the use of LAs by NNESSs, additional types of RAs written within different fields from sciences and humanities can be investigated and compared. In addition, the examination of different types of discourse such as abstracts, conference papers, and theses would give a more comprehensive evaluation of the use of LAs in NNESS' academic writing.

#### Acknowledgements

The authors are indebted to the two anonymous reviewers for their insightful and helpful comments. The authors express their appreciation to both the Deanship of Scientific Research and the Research Centre at the Faculty of Arts for funding the current article. Also the authors thank RSSU at King Saud University for their technical support.

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