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Distribution and Appropriateness of Use of Logical Connectors in the Academic Writing of Jordanian English-Major Undergraduates

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Abstract

Logical connectors (LCs), words and phrases (e.g., moreover, therefore, however, consequently) that link clauses or sentences together to achieve text cohesion, are problematic for EFL writers to use appropriately. This study investigated the way LCs are used in the academic expository writing of Jordanian English-major undergraduates through quantitative and qualitative analyses of a sample of 146 essays. The results revealed that students used LCs redundantly, rarely varied the ones they used, and misused them both semantically and syntactically. The study included some examples from students' writings and presented some considerations for eliminating students' problems in using LCs.

Key words: logical connectors, EFL academic writing, Jordanian English-major undergraduates, logical connector frequency, logical connector variety.

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توزيع أدوات الربط ومناسبة استخدامها في الكتابة الأكاديمية لدى الطلبة الأردنيين المتخصصين في اللغة الإنجليزية

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الملخص

هدفت هذه الدراسة تقصي توزيع أدوات الربط ومناسبة استخدامها في الكتابة الأكاديمية لدى الطلبة الأردنيين المتخصصين في اللغة الإنجليزية من خلال تحليل كمي و نوعي لـ ١٤٦ مقالة أكاديمية من كتاباتهم. أظهرت النتائج أن كتابات الطلبة اشتملت على الكثير من الأخطاء التي تعيق فهم النص وأن الطلبة أفرطوا في استخدام بعض أنواع الروابط، و تحديدا التراكمية. كذلك اعتمد الطلبة على فئة محددة من الروابط على حساب التنوع.

الكلمات المفتاحية: أدوات الربط، الكتابة الأكاديمية، الطلبة الأردنيون المتخصصون في اللغة الإنجليزية، تكرار أدوات الربط، تنوع أدوات الربط.

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Introduction

Communicative competence approaches to language learning emphasize that text production requires different types of competences that extend from grammatical to discourse. The latter, which encompassies cohesion and coherence, requires more than the language user's knowledge of English grammar and syntax (McCarthy & Carter, 1994; Mauranen, 1996). Logical connectors (LCs henceforth), words or phrases (e.g., moreover, therefore, however, consequently) used to indicate the direction of the logical relationship between propositions, are quintessential for the production of a cohesive, coherent text (Celce-Murcia & Freeman, 1999).

Scholars' interest in LCs stemmed initially from research on text cohesion, which flourished after Halliday & Hasan's (1976) identification of some links that hold a text together and give it meaning, or the use of explicit linguistic devices that signal relations between sentences and parts of texts (Connor, 1996). Halliday & Hasan (1976) identified two major types of cohesive relations which help in creating a cohesive text (grammatical and lexical). These are then subcategorized into five minor types of cohesive devices: reference, substitution, ellipsis, conjunction, and lexical reiteration and collocation. Reference constitutes items which make reference to something else for their interpretation. Ellipsis involves the omission of elements the speaker/writer assumes to be obvious from the context. Substitution is a replacement of one term by another to avoid

repetition of a lexical item. Lexical cohesion is achieved by the selection of vocabulary. Finally, conjunction or LCs signal the relationship that can be understood through reference to other parts of the text.

Our knowledge about LCs is far from comprehensiveness. This is mainly because most research, especially during the 1980s and 1990s, nested LCs in cohesion research. Clearly, viewed as one type among five types of cohesive relations, LCs were rarely investigated thoroughly. It has been only recently that researchers have become more aware of the distinct features of LCs. As their label suggests, their use is associated not only with language but also with logic (Rahimi & Qannadzadeh, 2010).

In fact, the collective category of LCs comprises four distinct semantic relationships: (a) additive (e.g., moreover, in addition); (b) causative (e.g., therefore, as a result); (c) adversative (e.g., nevertheless, although); and (d) temporal or sequential (e.g., next, then). Goldman & Murray (1992) assert that this four-type categorization scheme of LCs has been used and found to be effective for the purpose of "distinctions among connector types" (p. 517). According to this semantic-based categorization, LCs serve conveying different meanings. Whereas additives are used to signal addition, introduction, or similarity, causatives are used to signal cause/ effect and reason/result relationships. Adversatives, on the other hand, signal such relationships as conflict, contradiction, concession, etc. And sequentials signal a chronological or logical sequence (Celci-Murcia & Freeman, 1983, p. 324).

LCs are important in text construction as they serve in specifying relationships between sentences as well as between paragraphs, leading to the feeling that the text hangs together or makes sense. According to Olshtain and Cohen (2005), LCs play a crucial role in text as they: (a) indicate the relationship existing among the sentences within a given text and thus lessen the need for complex cognitive processing; (b) facilitate the prediction process while reading; (c) guide the reader to move forward or backward within the text in order to make logical inferences; and (d) help readers develop local and global interpretation. Given this vital role LCs play, they should not be used as slot fillers that have little contribution to text cohesion (Milton & Tsang, 1993), nor should they be memorized or

used in absence of understanding the implications they have on the entire text (Mauranen, 1996).

The three major themes prevalent in previous research on LCs in the writing of NNESs have been frequency, variety, and their context-bound appropriateness of use. Results suggest that it is difficult, if not frustrating, for NNESs to use LCs appropriately (Hinkel, 2001). Even for scholars and educators, it has been challenging to establish a standard that determines how many LCs should be used per text unit. On this, Sloan (1984) describes how students are urged to use LCs wisely "even though we are not sure what wise use is." Sloan continues, "We offer lists and entrust their use to an intuitive sense of aptness. We feel that some students use too many markers while others do not use enough. But who is to say how much is enough?" (p. 158). Awareness of the absence of such a criterion has led writing researchers to compare the frequency of LCs in the texts produced by NNESs to their frequency in NES texts (e.g., Milton & Tsang, 1993; Hinkel, 2001) or to compare their frequency to the total number of words used in a given text.

Findings from studies by many researchers (e.g., Wilcoxon & Hayward, 1991; Field &Yip, 1992; Crewe, 1990; Green et al, 2000, Milton & Tsang, 1993; Hinkel, 2002) suggest that NNES students rely heavily on a small set of LCs to join ideas or textual segments to construct cohesion and neglect others, making the reader's understanding of such texts a painstaking task (Hinkel, 2002). Understanding such texts that are overloaded with misused LC becomes impossible for readers (Crewe, 1990). In fact, the abundance of too many LCs in a text not only hints that poor writers attempt to overcome their writing weakness through overreliance on superficial links but also makes writing appear "dense, opaque, or even incoherent to the reader" (Hartnett, 1986, p.146). Given these considerations, it is necessary to investigate besides the frequency of LCs, the extent to which their use does really contribute to the production of cohesive, coherent quality text (Todd, Khongput, & Darasawang, 2007).

Several studies (e.g., Altenberg & Tapper, 1998; Chen, 2006; Chiu, 2004; Granger & Tyson,1996; Izzo, 1995; Jie, 2008; Kanno, 1989; Martínez, 2002; Meisuo, 2000; Milton & Tsang, 1993; Narita, Sato, & Sugiura, 2004; Qing

& Jiansheng, 2010; Tapper, 2005; Yaochen, 2006; Ying, 2009) have been conducted on NNES writing with findings suggesting that the writing of NNESs displays a higher frequency of LCs compared to the writing of NESs. The majority of these studies addressed LC use by Chinese and Japanese NNES learners.

Qing & Jiansheng (2010) reported that Chinese undergraduates overuse additional statement and progressive relations at the expense of listing, summary and opposite relations. Chinese students' logical-semantic use of and also differed from that of NESs. Jie (2008) conducted a corpus-based study on LC use by non-English-major Chinese students. The results revealed that Chinese students tend to overuse and underuse certain relations in comparison with native speakers related to mother tongue transfer, learners' lack of stylistic awareness and the deficiency in the width and depth of lexical knowledge. Yaochen (2006) analyzed adverbial LC in 200 argumentative essays of sophomore and junior Chinese students compared to those of Canadian NESs as a reference corpus. The results showed Chinese students' overuse of resultative and listing adverbial LCs for linking purposes, which according to the researcher reflected stylistic uncertainty about adverbial LC use.

Meisuo (2000) examined cohesive features in 107 expository essays by Chinese undergraduates. The results showed that Chinese students overuse additives and sequentials and misuse adversatives such as but, however, and on the other hand. The researcher attributed LC overuse in sentence-initial position (e.g., moreover, however, and therefore) to L1 transfer.

In the same vein, Ying (2009) compared the use of contrastive LCs in expository essays by NESs, Chinese, and Japanese students. Japanese and Chinese students frequently used but as a substitute for however, with frequent use of but and however in clause (or sentence) initial position.

Studies addressing Japanese students' use of LCs reported comparable findings. Kanno (1989), for example, studied LC use in 41 essays by sophomores and graduate Japanese students. The results showed that additives were overused due to the impact of oral discourse, adversatives were underused, causatives were used when they were not required and omitted when necessary due to transfer from the first language.

Following an exploration of Japanese students' use of 25 LCs, Narita, Sato, and Sugiura (2004) reported significant overuse of some connectors used in sentence-initial position such as "for example" and "of course"; some LCs like "then and yet" were underused. Also, in a pilot study limited to subordinating conjunction use by 52 Japanese freshmen, Izzo (1995) reported frequent improper use of "because". This, according to Izzo, derives from students' conversational experiences or popular English language materials.

Studies targeting LC use by other NNES learners (e.g., Taiwanese, Swedish, French) seem not to contradict the above findings. Following an exploration of adverbial LCs in 23 English essays written by 10 Taiwanese TESOL MA students, Chen (2006) reported slight overuse of LCs at the word-based analysis, yet no differences were reported at the sentence-based analysis. The results also indicated misuse of some adverbial LCs (e.g., besides, plus & actually). Also, Chen (2006) and Tapper (2005), following a comparison of LC use in the argumentative writing of advanced Swedish learners and American university students, found that Swedish writers generally overuse adverbial connectives compared to comparable NES writers. And, finally, Martínez (2002) conducted a pilot study on LC use by seven advanced undergraduate Spanish learners of English. The results showed extensive and inappropriate use in both Spanish and English.

A few studies addressed Arab students' use of LCs in their English writing. Hinkel (2001) found that the English writing of Arab learners is characterized by overuse of coordinating conjunctions (and, but, or), which is attributed to L1 discourse structure and rhetorical organization. NNESs' writing had over-reliance on sentence transitions to make their text cohesive, for, as Hinkel's results showed, the median frequency rates of sentence transitions varied in NNESs' writing from double to triple of those in NES writing so as to compensate for the limited syntactic and lexical range they had towards the construction of a unified flow of ideas. In an earlier study, Ostler (1987) reported that Arab students are prone to overuse coordinating conjunctions (and, but, or) to express a sense of parallelism and rhythmic balance. Mohamed-Sayidina (2010) also analyzed fifty academic research papers by Arab ESL students hypothesizing they

would depend predominantly on additive LCs in establishing propositional connectivity, which was found to be true. Asassfeh (2005) carried out a study on the writing of 70 graduate NNES students (Arab, Chinese, Japanese and Korean) and that of graduate NES controls and found that NNES students used logical connectors insignificantly more frequently than did NES students. Comparisons among NNES groups revealed that the highest LC use frequency was found in the writing of Chinese and Arab students.

Al-Shatarat (1990) investigated 100 Jordanian college students' knowledge of cohesive devices using multiple-choice questions. The results indicated that the answers of forty-one students were incorrect and inappropriate due to failure in establishing grammatical and lexical relationships or making logical relationships. Similarly, Abu Hatab (1992) studied 200 essays by English-major students from ten community colleges. The majority of the students misused cohesive devices and found LC use to be the most difficult compared to other cohesive devices.

A review of the extant literature on LC use by NNESs reveals that the recurring themes in the research include: (a) LC use frequency (under/overuse); (b) LC variety, and (c) grammatical correctness or context-bound appropriateness in terms of the LC used in relation to the logical relationship aimed at.

Problem of the Study

As an instructor of two compulsory courses (Paragraph Writing and Essay Writing) for English-major undergraduates at a major Jordanian university for six years, the first researcher has noticed that English-major students find it challenging, if not frustrating, to use LCs appropriately. The paragraphs and essays they write seem to incorporate a higher number of LCs compared to what the context requires. They also seem to depend on a limited set of LCs that they keep repeating with little variety, leading to the reader's sense that the writer is linguistically immature. Additionally, their text product seems to be overloaded with LCs that, in addition to high frequency, display links between ideas at the superficial level of the text only. That is, the LC use does not reflect students' consideration of which LC is capable of signaling the target logical relationship. It seems frequent

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for students to use a causative connector, for instance, when there is no cause/effect relationship between the ideas linked together. Much worse, students sometimes misspell a commonly used LC such as "because". In brief, students' writing hardly reflects an adequate level of mastery to these linguistic items. This has negative consequences not only on the reader's ability to follow the flow of ideas in these texts but also on students' achievement in their English courses in general and the writing courses in particular.

This experience together with the researchers' awareness of the little attention LCs received in Arab students' academic writing have prompted this study. It is the researchers' belief that to date LC use in Arab students' EFL writing has not received due attention. This is clear in the absence of any published research on this topic according to the researchers' best knowledge.

Purpose of the Study

This study aims at investigating Jordanian English-major undergraduates' use of LCs. It is the researchers' hope that the findings of this study will be helpful for English academic writing instructors in Jordan and other similar contexts in the Arab world in developing a thorough understanding of students' problems encountered in using LCs as a means for assisting them towards overcoming or reducing the challenges they face in using LCs in academic writing. The results can also be helpful for developing EFL writers' level of awareness associated with LC use in terms of frequency, variety, and appropriateness to the logical-semantic context.

Questions of the Study

The two questions steering this study are the following:

1. How are LCs, viewed by LC type as well as the level of individual LCs, distributed quantitatively in the writing of Jordanian English-major undergraduates?
2. What pattern(s) of inappropriate LC use does the writing of Jordanian English-major undergraduates reveal?

Limitations of the Study

In terms of population, this study was limited to the use of LCs by Jordanian English-major undergraduates only. Generalization of the findings, therefore, is limited to student samples studying English under similar circumstances. Regarding methodology and instrumentation, the study was based on quantitative and qualitative analyses of those students' expository academic writing. Other research methods (e.g., while-writing observation and interviews) were not used in this study.

Subjects, Instrumentation, Data Collection and Analysis

Purposive sampling was used in this study based on a voluntary basis; no compensation was offered for the study participants. The initial sample comprised 200 students. However, after exclusion of essays that had less than 180 words, only 146 essays filtered into analysis. These were written by 146 (104 female and 42 male) Jordanian English-major undergraduates (an essay by each participant) representing the four academic years (freshman, 34; sophomore, 41; junior, 40; and senior, 31), all enrolled at a public Jordanian university during the time of data collection, during the Fall 2010.

The main instrument used for data collection in this study was writing prompt. In order to elicit essays of reasonable length, the topic of the writing prompt was intended to be familiar to students and required no domain-specific knowledge. Moreover, with the intention of avoiding the interference of genre or topic variety on LC distribution in students' essays (Hinkel, 2002), the required topic was the same for all participants.

To ensure the appropriateness of the prompt for the participants and the study purpose, three prompts were developed and presented to a panel of three professors with expertise in relevant domains. The prompt, the panel agreed on asked students to "write about three problems they faced in their daily life."

The writing prompt was administered in the presence of regular classroom instructors during classroom session time. Participants were asked to sign the informed consent form and instructed to write 200-250 words during one class session (40-50 minutes). Their essays were collected directly after they finished their writing.

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Students' essays were word processed and presented in the format of an MS Word document to two coders experienced in teaching writing. Each coder was provided a copy of Celci-Murcia & Freeman's (1983) categorization scheme of LCs (See the Grammar Book, pp. 324-329) to ensure that all LCs are categorized under their respective logical relation types. This scheme was adopted in previous research (e.g., Milton & Tsang, 1993) and found to be effective for the purpose of distinction among LCs by the logical relation type. It was agreed with the coders that a LC would be counted regardless of its grammatical correctness or context-bound semantic appropriateness. Each coder was requested to read each essay carefully, identify LC instances, categorize each by the respective logical relation type, and write the results on a separate sheet. The data coming from these sheets was analyzed using SPSS software.

Findings and Discussion

Frequency and Variety of Logical Connectors

The first question in this study addressed the quantitative distribution of LCs in students' essays at a collective level as well as at the level of each of the four logical relation types (additive, causative, adversative, and sequential) as well as the variety of the LCs used. Students' 146 essays had a total of 43,915 words. Among this total, there was a total of 2,585 LC tokens. By dividing the former number on the latter (43,915/2,585), the result obtained is 16.99 (almost 17). This means that one LC was used almost every 17 words. In order to make judgments about whether this ratio reflects underuse, overuse, or moderate use, it should be compared with the findings of other previous studies.

In a previous study that compared LC use by graduate NES and NNES graduate students from four linguistic backgrounds (Chinese, Arabs, Korean, and Japanese), Asassfeh (2005) found that the graduate students wrote a total of 25,238 words among which there were 1,149 LCs. Division of the total number of words by the number of LC tokens (25,238/1,149) yields 21.97 (almost 22). This means that graduate students used one LC every 22 words. Comparing these findings, it becomes clear that the undergraduates in this study used a higher ratio of LCs; NNES graduates in that study used

a LC almost every 22 words while the participants in the current study used a LC every 17 words.

However, this finding is less astonishing compared to LC frequency in the writing of some other NNES undergraduates. For example, Rahimi and Qannadzadeh (2010) found that the ratio of LC occurrences to the total number of words was 5.86 when in the current study it was 5.89 (calculated by dividing the number of LCs by the total number of words in students' essays).

A look at the results of LCs by type in the current study indicates that the most frequently used type of LCs was additives, with a total of 1086 tokens (Table 1). In other words, the mean occurrence of additives was almost eight (1086/146) in every essay. This result goes in line with the findings of other studies (e.g., Kanno, 1989) which revealed that EFL students' overreliance on additives.

In terms of variety, which refers to the number of different LCs used under each of the four types (additive, causative, adversative, and sequential), previous research findings suggest that NNESs rely heavily on a limited set of LCs (e.g., and, so, because, but) and neglect others. A look at the distribution of individual LCs within the additive category indicates that there was an extreme over-reliance on and (872 tokens). Alone, this LC constituted a ratio of 80% of the additives and no less than 34% of the entire set of LCs used in students' essays. This over-reliance on "and" becomes clearer when compared to the frequency of the second ranking LC within additives, "also", that had only 54 occurrences. There is also a clear discrepancy between the frequency of "for example" and "for instance". It is noticeable that "in other words" that is used to introduce a restatement of an idea occurred only once in students' writing, which reflects that they assumed their ideas were clear.

Table (1)
Frequency of Additive LCs

LC	Frequency	LC	Frequency
And	872	Moreover	8
Also	54	Not only, but also	7

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Table (1) Continued

LC	Frequency	LC	Frequency
For example	47	Furthermore	7
Or	29	For	6
In addition	22	For instance	4
That is	15	Besides	3
And also	11	In other words	1
Total		1086	

Causative LCs (Table 2) ranked second with a total number of 609 LCs and a mean occurrence of almost four causatives per essay. The most frequently used causatives were "because" and so (329 and 234 occurrences respectively). These two had a ratio as high as 93% of the entire causatives.

Table (2)
Frequency of Causative LCs

LC	Frequency	LC	Frequency
Because	329	Otherwise	4
So	234	When	4
Therefore	15	Consequently	3
As a result	7	For	3
To (initially)	5	Because of	1
Thus	4	-	-
Total		609	

Sequentials (Table 3) were used less frequently with a total number of 477 and a mean of 3.27 per essay. Within this category, the writers depended heavily on "first(ly)" to introduce an initial point and "second(ly)" to mark an intermediate point. These two connectors had a ratio of almost 50% of the entire set of sequential LCs used. However, the writers varied their use of the LCs that serve as concluding signals (e.g., finally, in conclusion, last, in brief, all in all, to conclude, in summary, in short). One possible reason behind overdependence on first, second, and third is that students are instructed to use these in essays that adopt an organizational pattern of logical division of ideas. The variety of concluding signals is most likely

attributed to the explicit instruction students receive in writing instructions emphasizing the importance of marking their end of paragraph or essay.

Table (3)
Frequency of Sequential LCs

LC	Frequency	LC	Frequency
First	118	Anyway	5
Second	117	At the end	5
Third	77	To sum up	4
Finally	53	In brief	4
In conclusion	31	All in all	3
Last	26	To conclude	2
Next	13	At the beginning	2
Then	9	In summary	1
Finally	6	In short	1
Total			

The least frequently used were adversatives with a total of only 413 occurrences and a mean of 2.83 LCs per essay. This means almost only three adversatives were used per essay. There is an extreme reliance on "but that, alone", accounted for a ratio of around 71% of the entire set of adversatives used.

Table (4)
Frequency of Adversative LCs

LC	Frequency	LC	Frequency
But	292	Though	3
Although	32	Despite this	3
Actually	20	In spite of	3
However	18	Yet	3
On the other hand	17	Instead	2
While	7	Even though	1
In fact	7	Nevertheless	1
At the same time	4	-	-
Total		417	

It should be noted that writing research on LCs has rarely addressed LCs

by type. Thus, it is beneficial to resort to findings from reading research in interpreting variability in students' use frequency of LCs by type.

Goldman & Murray (1992) asked students to fill out empty slots with the appropriate LC and found that students committed the highest number of mistakes with empty slots that called for sequential LCs, followed by adversatives, causatives, and the least difficult were additives. Moreover, using a multiple-choice test, Ozono & Ito (2003) introduced six short reading passages with a blank space in each passage that required a LC to a group of undergraduate Japanese students. The LCs used were additive for example, causative therefore, and adversative however. Results showed that the most difficult was "however", followed by "therefore", and the easiest was "for example". The findings of these two studies and others (e.g., Louwerse, 2001; Sanders & Noordman, 2000) suggest that distinction among LCs by type has a cognitive plausibility. Their hypothesis suggests that a logical relationship that is cognitively demanding to construct on the writer's mind is likely to be cognitively demanding on the reader's behalf. This research line may justify why additives, which mark the weakest logical and the least cognitively demanding relationship, were the most frequently used. Adversatives, Goldman and Murray (1992) suggest, signal not only an implied causative logical relationship but also one in which the result contradicts the normal cause-effect relationship. Thus these are more demanding on the language user's behalf. This may justify why the adversative category was the least frequently used.

The results also show clearly that notwithstanding the fact that English offers writers no less than eighty LCs, students' overdependence on only six connectors (and, because, so, but, first, and second) accounted for a ratio of 76% of the entire LCs they used. The most frequently used LCs in students' essays are noticeably the ones deemed prototypical of the different logical relations.

In considering the reasons behind students' overdependence on a particular set of LCs but not others in textualizing their ideas, the two LCs "although and even though" are a case in point. Despite that both convey a comparable semantic function and require the same structural pattern, the first occurred

32 times while the latter appeared only once in students' entire writing. What this discrepancy suggests is related to the level of consciousness exercised when dealing with LCs. Indeed, if writing instructors heighten students' sensitivity to variety when using LCs, students will alter the LCs they use consciously, of course provided that they know the options they have at their disposal.

Additionally, the results, particularly with relevance to adversatives, shed light on Fraser's inter-substitutability hypothesis. According to Fraser (1998), the adversative "but" can replace "however", "but" not vice versa since but expresses a general contrast compared to "however". According to Fraser (1998, p. 314), "although and however" are more restrictive than "but". This can be seen wherever "however" occurs; it can be replaced by "but", but not vice versa. Looking at LCs in a hierarchy according to their specificity based on inter-substitutability yields that "but" is the most general, followed by "however" followed by "nevertheless", since there are contexts in which "however" is, acceptable while "nevertheless" is not (Fraser, 1998). Bringing this perspective to the results of this study indicates that "but", the least restrictive, occurred as frequently as 292 times whereas "although" (which is more restrictive) occurred only 32 times. Additionally, the more restrictive "however" occurred 18 times whereas the most restrictive adversatives nevertheless had only a single occurrence and "nonetheless" did not appear in students' writing at all. It should be stated that the implications of Fraser's principle have, to the best of the researchers' knowledge, never been brought under investigation in the writing context. Particularly with reference to adversative LCs, the findings of this study support the hypothesis that the more restrictive a LC is the less frequently it is used.

Across the four LC types, some LCs did not find their way into students' writing. These include the additive "additionally, in the same way, likewise, particularly, namely, and indeed", causative "due to, whether, aside from this, with regard to, for this purpose, inasmuch as, and provided that", the adversative "rather, anyhow, on the contrary, at any rate, by contrast, in any case, and whereas", and sequential "afterwards, on the whole, in sum, initially, in a word, hitherto". One possibility behind the absence of these

connectors in students' essays is the writing topic. Different topics may trigger different patterns of essay development (e.g., chronological, logical division of ideas, comparison/contrast, etc.), which influence the number of corresponding LCs. Another possibility amounts to whether EFL learners, in relation to NESs, have comparable cognitive access to the wide set of LCs, "on the one hand", as well as to particular LCs. A judgmental approach to EFL students' use of LCs, especially when compared to the norms of NES use, is less beneficial to EFL writing instruction pedagogy than an analytic approach that transcends mere description leading to an analysis of the potential factors behind such LC distribution. That is, whereas a comparison between LC use by NES and NNES writers is necessary to bring under light the differences as a requisite for determining the deviations, mere description of the differences is less beneficial unless researchers trace these differences and link them to the reasons behind their existence.

In this regard, Asassfeh (2005) found that NES and NNES graduate students differ significantly in oral background exposure to LCs, remembering ability of them, and confidence in knowledge of their appropriate use in favor of NESs. Accordingly, it seems that the EFL learners in this study rarely hear LCs, thus they find difficulty in recalling them from memory when needed, leading to a lack of confidence in using them. However, since EFL students are convinced they need to use LCs, they do so despite their low confidence in the ability to use them appropriately. This will certainly lead these students to overuse and misuse LCs despite the poor reservoir of LCs they have.

Pattern(s) of Inappropriate Use of Logical Connectors

A qualitative look at students' use of LCs in this study is no less revealing than a quantitative one, especially since extant literature makes a strong association between NNESs' overuse and misuse of LCs. Careful reading of students' writing indicates the abundance of tens of examples illustrating deviations from the NES prescribed norm of LC use. For the sake of brevity, only some indicative examples are presented and discussed in this piece of research.

The introductory statement (topic sentence) in one of students' essays

reads, "Because of you ask me to write about three problems I face daily So I will start with the first one it's coming early to university" (essay 19). This example illustrates more than one point. The first, which has been documented in EFL writing research in particular, amounts to whether writing instructors should be teaching writing or logic. The fact is that writing and logic are inseparable; if the writer fails to realize the "logical" relationship based on his/her world background knowledge, appropriate LC use can hardly filter into composition. Clearly, the sentence quoted above from the student's writing lacks the basic logic that would give it the legitimacy to stand as a sentence even outside the language boundaries. In fact, a writer "will [not] start with the first one" because s/he is asked to "write about three problems." Additionally, the writer uses the two LCs "because of" and "so" when the context calls for neither of them. This misuse accompanied by overuse opens the door wide for possible explanations. It is fair to say that the writer does not distinguish between oral and written communication, for the expression of the idea this way might be applicable to oral speech in such statements as "Since I'm required to explain three problems, let me start with the first one." Another possibility is that the sentence may reflect either lack of awareness of paragraph structure (since this is the topic sentence) or absence of adequate planning, interpretations that are strongly interrelated. One more possibility is that the writer wants to impose cohesion at the surface level on two unrelated propositions, regardless of whether they are semantically or logically related.

The writer's use of "because of" in an independent clause indicates clearly that s/he does not differentiate between the structural constraints of using "because and because of"; whereas "because" introduces an independent clause, "because of" introduces a noun phrase/clause. Interestingly enough, "because of" was used only once in the participants' entire composition, and that use was syntactically inappropriate. More interestingly, "due to", which invites the same structure of "because of", did not appear in students' writing at all. This may hint to students' intentional avoidance of certain LCs when they feel such use can be troublesome on syntactic grounds. This justification becomes clearly sound when considering the exaggerated frequency of "because" (329 occurrences) despite the fact

that "because of and because" are semantically equivalent. Intentional avoidance, accordingly, may partially explain why certain LCs with certain characteristics may filter into students' writing when others do not.

It is not the researchers' purpose to list examples on inappropriate LC use as much as to show the severity of the problems in search for optimal solutions. This stated, the following self-explanatory example in which five "and", one "but", one "so", one "because", and an "or" are used to impose connectivity speaks eloquently of how written discourse is not distinguished from oral communication in students' writing. The repetition of "really" and the use of "gonna are" supportive to this line of thought.

"Well , my study is really hard for me and I study all the time but with no solution or let me say without any result for my effort and that really really annoys me so much , and I am going to get married soon and that gives me so much pressure , because I want to finish school then to get marry but I don't think that it's ganna happend because my future husband wants to get marry as soon as possible and I want to finish school so that is what I mean when I said that my study is a problem for me". (essay 31)

The following excerpt from another essay testifies that LC overuse and misuse can be inherited from linguistic and rhetorical problems.

"Well, I asked many people to give me some solutions to this problem that I have, well, some told me to sleep, but that is not a good solution because I heard ones that when you are sleep when you are mad that make a rise to get heart problems, others told me to eat, but that is not a good solution either, because it is gonna make me fatter. then I found the best solution ever which is to get a stress ball and squeeze it to make the stress go away". (essay 76)

There are two lessons we can learn from this excerpt. First, the writer lacks knowledge of English sentence structure, evident in having the entire paragraph as one sentence. Had the writer been aware of the different sentence types (simple, compound, complex, and compound complex), the necessary divisions would have been clearer leading to a lower number of LCs. Also, the writer does not seem to be aware of the basic components of a paragraph; a topic sentence, supporting sentences, and a concluding sentence. This necessitates that writing instructors realize that LC use

neither does nor should constitute a starting point; it should come only after securing a minimum level of grammatical, syntactic, and semantic linguistic maturity.

The results of this study support the idea that some NNESs, even English majors, treat LCs as accessories or decorative features of text. If future research is to be beneficial, it has to address LCs within a wider writing instruction framework.

Conclusion

Mememorizing LCs in absence of understanding their semantic function is a factor widely claimed as standing behind NNESs' misuse of LCs. Task-based instruction (cf. Ellis, 2003) can be a good suggestion for effective LC instruction. For example, the teacher may start by asking students to describe a group of pictures prepared to elicit a given type of logical relationship (additive, causative, etc.). This is likely to help students understand better the correspondence between a LC and its semantic function.

Since the results of the current study showed that students use LCs inappropriately, EFL writing instructors should stress that LCs are capable of linking two propositions only when such propositions are logically related. Such awareness will minimize the number of LCs that filter into students' writing inappropriately to impose logicality on propositions that are unrelated logically.

The results showing inappropriate LC use suggest that, especially in EFL contexts where language is learned rather than acquired, EFL instructors provide explicit instruction about LCs which stresses that appropriate LC use involves recognition of semantic and syntactic constraints (e.g., the difference between because and because of). Furthermore, students should be informed that overdependence on simple, prototypical LCs (e.g., and, so, but) representative of the major logical relation types leads to the production of weak ties and causes boredom on the reader's behalf. Altering these with other LCs that are capable of expressing the same logical relations more tightly will make a text more cohesive. Additionally, students should be made aware that sentences that include LCs are worth a special second look due to the cognitive demand this inappropriate use causes for the

reader in text processing. Students should also be instructed that implicit cohesion that does not require using LCs at the surface level of text when the semantic logical relationship between consecutive ideas is clear has no less contribution to text coherence (Philip, Mukundan, & Nimehchisalem, 2012).

Given the relative variability in the cognitive load posed on the writer's mind, adversative LCs should receive more emphasis in terms of their context of use compared to other categories.

Writing instructors are also invited to shed light on the difference between oral and written communication in terms of LC prevalence. Reading NES texts constitutes a good source for appropriate use of linguistic expressions, LCs included. Examples of misspelling a commonly used LC like "because, for instance", support the idea that some EFL writers have not yet developed a positive attitude towards reading.

Writing textbooks can contribute to solving students' LC misuse through avoiding tables that introduce LC lists as if any two within a given category can be used interchangeably. When it comes to the semantic function (exemplification, for instance), it should be presented that "for example" has a function that is not synonymous to that of "for instance".

Further research may be conducted on LC use using other research methods. For example, it would be interesting to see how students go about using LCs as they write i.e. during the writing phases with the purpose of investigating students' level of consciousness when using LCs and the decisions they make as they shape their text cohesion using LCs.

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