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The Variations in the Use of Sentence Connectors in Timed and Untimed Student Writing: A Comparative Corpus Study of British Students

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Abstract. This study investigates the use of sentence connectors in British students' timed and untimed writings, utilizing data from the British component of the International Corpus of English (ICE-GB). By comparing the frequency and patterns of 54 selected connectors between these two writing conditions, the research reveals that students tend to overuse certain basic connectors like *and* and *or*, particularly in timed examinations. The analysis also highlights the impact of time pressure on linguistic choices, showing a preference for simpler connectors in timed settings. The findings contribute to understanding native English speakers' connector usage and suggest implications for academic writing and teaching strategies.

Keywords: sentence connectors, timed writing, untimed writing, British students, ICE-GB, corpus analysis

1. Introduction

Connector usage can vary significantly based on disciplinary culture and the specific genre or subgenre involved [1]. Acknowledging this variability, this study examines how British students use connectors in timed and untimed writing from the British component of the International Corpus of English (ICE-GB). Understanding how connectors are used is crucial as they play a significant role in structuring arguments and ensuring coherence in academic texts [2]. However, few studies have explored the use of connectors by native speakers under different writing conditions, and some overused connectors have not been further explained. Thus, this study aims to address these gaps by employing a list of 54 connectors used in Bolton et al.'s [3] research, which allows for a comparison with his findings on academic writing.

2. Literature Review

2.1. The Definitions and Classifications of Connectors

Researchers have used different terms to refer to connectors in the study of cohesive devices in discourse, contributing to different classifications of these linguistic elements. Scholars have labelled connectors using various terms such as 'conjuncts' [4], 'connectives' [5, 6] and 'conjunctive adverbials' [7]. In addition, the term 'sentence adverbials' has been used to describe 'conjuncts', especially when they refer to the coherence of a sentence or relate one sentence to another [4]. Despite the diversity of terminology, the term 'connector' will be used consistently throughout this study.

Linking sentences by conjunctions or connectors is essential for achieving cohesion in discourse, serving as a linking mechanism between sentences [8]. Halliday and Hasan [9] elaborated on the function of conjunctions, describing them as cohesive elements that indirectly facilitate coherence through their specific meanings. Halliday and Hasan [9] introduced four categories of conjunctive relations: additive, adversative, causal and temporal . Additive conjunctions signal addition or similarity, adversative conjunctions indicate contrast, causal conjunctions suggest cause-effect relationships and temporal conjunctions establish temporal sequence. Quirk et al. [4] then presented a comprehensive classification of connectors called 'conjuncts', which includes seven categories: listing, summative, appositive, resultive, inferential, contrastive and transitional. Quirk et al. [4] also distinguished sub-categories within some of these main categories, such as listing connectors . Enumerative and additive are subdivisions within the listing category.

In contrast to Halliday and Hasan's [9] grammar-based approach to classification, Martin and Rose [10] adopted a discourse-oriented perspective in their treatment of connectors, referring to them as 'conjunctions'. They categorised conjunctions into two dimensions: external and internal. External conjunctions organise ideation and construct experience activities, while internal conjunctions organise information waves in periodicity and present discourse. Despite this difference, both types of conjunctions encompass four general logical relations: addition, comparison, time, and consequence. Each logical relation further comprises two or more subtypes.

Despite variations in terminology and classification, the effectiveness of connectors as cohesive devices in discourse has been well-documented in academic research. However, understanding connectors seems to be complex due to the diverse range of terms and classifications. Traditional classifications and definitions of connectors often oversimply and introduce ambiguity. For example, the connector *thus* exemplifies this complexity as it can fulfil summative, appositive, or resultive roles depending on the discourse context, making it difficult to classify a single semantic role [4]. Such ambiguity poses challenges in precisely categorising connectors within predefined categories. Moreover, the multifunctionality of connectors is evident in words like *because*, denoting both causal and temporal relationships simultaneously, thus complicating existing categories [3]. This multifunctionality and the overlap of semantic roles challenge the categorisation of connectors and show the limitations of traditional classification systems. Furthermore, Wießner [11] highlights the difficulty of classifying words that can function as both conjunctions and prepositions, such as *after*, *as*, and *before*, leading to confusion in classification. This overlap shows the inherent complexity in identifying the specific functions of connectors within sentences.

In summary, previous classifications of connectors may be limited by their inability to account for the multifunctionality and dynamic nature of language use and the overlap between connective expressions and other syntactic categories.

2.2. The Measurement of Overuse and Underuse of Connectors Using Quantitative Approaches

The use of connectors in learner writing has received attention, while some studies have had different approaches to measuring the use of connectors.

To begin with, Milton and Tsang [12] quantitatively analysed logical connectors in EFL (English as a Foreign Language) students' writing. They compiled a Learners' Corpus comprising 4,084,000 words from assignments by Cantonese learners of English. Additionally, they compared this corpus with three native-speaker corpora: the American Brown Corpus, the British LOB Corpus, and the HKUST Corpus. Their frequencies were quantitatively analysed. Differences in connector usage between NES and NNES corpora were assessed for potential underuse or overuse. They calculated the 'ratio of occurrence' by dividing the number of logical connectors by the total number of words in the corpus. This method revealed differences in connector usage between the HKUST Learners' Corpus and native-speaker corpora, facilitating direct comparison of their usage patterns. Results showed that learners tend to overuse basic connectors like *moreover* and *besides* and underuse terms like *previously*, highlighting their overall avoidance of referring back to earlier points.

Unlike Milton and Tsang's [12] measurement, Granger and Tyson [13] selected connectors based on Quirk et al.'s [4] framework and aimed to discover learners' general overuse of connectors and use the ICLE corpus of learner English to test selected connectors. Individual connector frequencies were examined and calculated as the number of logical connectors per 100,000 words. The extent of overuse of each connector can be determined by comparing the frequency of each connector from the native English speakers (NES) and non-native English speakers (NNES) corpora. Results showed that learners often overuse connectors like *moreover* and underuse connectors like *however* and *therefore*.

Although Carrió-Pastor [14] used the same theoretical framework to classify the connectors with Granger and Tyson's [13] study, they measured the ratio of every connector. The study involved compiling and analysing two corpora of scientific papers, one by NES and the other by NNES, focusing on connectors. Connectors were classified using two frameworks from Halliday and Hasan [9] and Quirk et al. [4]. Only connectors used as sequence markers were selected, and their frequencies were quantitatively analysed. This was achieved by dividing the total occurrences of a specific connector by the total occurrences of all connectors combined. Differences in connector usage between the NES and NNES corpora were examined to determine potential underuse or overuse. Results indicated that NNES showed less variety and potential overuse of specific connectors than NES, likely influenced by the discoursal style and nature of scientific English.

While the above studies adopted various approaches, they however are word-based measurements and do not consider sentence levels, which are the basic units for connectors. These approaches may have certain limitations when assessing the real impact of connectors within texts. One issue lies in the choice between word-based and sentence-based calculations. While a word-based calculation may seem straightforward, it overlooks the primary function of connectors in relating linguistic units at the sentential level and beyond [13]. This approach may not accurately capture the usage of connectors in discourse, as it fails to consider variations in sentence length and complexity. For example, a longer text with more sentences would naturally offer more opportunities for connector usage compared to a shorter text with fewer sentences. Moreover, the calculation method can impact the interpretation of findings. A word-based calculation may amplify the frequency of connectors in longer texts, leading to potential misinterpretation of overuse or underuse. In contrast, since it accounts for variations in text length and structure, a sentence-based calculation provides a more comprehensive understanding of connector usage.

2.3. Methodological Approach by Bolton et al.

2.3.1. The Approach of Identifying Connectors

Most previous studies on connectors identified these connectors by using the established classifications. However, such lists of connectors are controversial. This led to question methodologies solely based on pre-existing categorisations.

The adoption of Bolton et al.'s [3] methodology in this study stems from the complexities of classifying connectors. These linguistic elements exhibit diverse classifications and numerous subcategories and sometimes serve multiple functions. Consequently, accurate classification becomes problematic during research endeavours. Therefore, by refraining from relying on pre-existing classifications, as advocated by Bolton et al., and instead of opting to select connectors from the corpus for analysis directly, this study aims to mitigate classification inaccuracies and ensure a more precise examination of connector usage.

Bolton et al. [3] highlighted that, instead of relying on established categorisations proposed by scholars such as Halliday and Hasan [9] or Quirk et al. [4], they adopted a different approach. They developed their list of connectors through a detailed analysis of academic writing samples extracted from the ICE-GB corpus. This methodology enabled them to customise their selection of connectors to the specific features and subtleties observed within academic discourse, ensuring a more accurate and contextually appropriate framework for their study.

2.3.2. Bolton et al.'s Measurement

Bolton et al. [3] highlighted adopting a comprehensive approach to measure the overuse and underuse of connectors. Initially, a list of connectors was compiled through analysis of academic writing samples from the ICE-GB corpus. This process involved analysing 40 samples covering a range of academic disciplines, published between 1990 and 1993, totalling 85,628 words across 4,507 sentences. This non-arbitrary list served as a benchmark for subsequent analysis. The frequency of each connector per sentence was calculated and multiplied by 1,000 to eliminate low figures. The resulting frequencies were then compared between writing samples from Hong Kong students (ICE-HK) and British students (ICE-GB), facilitating an assessment of overuse and underuse across different contexts. Results showed that both native and non-native students often overuse connectors like *also*, *moreover*, and *therefore*, with no significant evidence of underuse.

Bolton et al.'s [3] approach has several advantages for analysing connector usage by calculating connector occurrence, which involves dividing the frequency by the total number of sentences in the corpus and multiplying it by 10,000. First, their method standardises data across different corpus sizes and structures, enhancing comparability and accuracy in identifying the overuse of connectors. Second, this method effectively accounts for the inherent characteristics of connectors in facilitating the coherence and cohesion between sentences. It normalises connector frequencies based on the number of sentences rather than words, better reflecting connectors' functional role in linking sentences. Consequently, it provides a more accurate reflection of how connectors contribute to the discourse's overall flow and coherence.

3. The Present Study

Previous studies have shown that there is a gap in understanding how connectors function differently under different writing conditions, particularly when comparing essays in timed and untimed settings. There is also a need to explore how these findings relate to native English speakers, as most existing research focuses on ESL (English as a Second Language) and EFL learners. The study aims to examine variations in the use of sentence connectors between timed examination and untimed essays. Thus, the research questions formulated are as follows:

RQ1. To what extent does the frequency of connectors used differ between untimed essays and timed examinations among British students?

RQ2. What pattens emerge in the use connectors between untimed essays and timed examinations among British students?

To address the research questions, the study applied Bolton et al.'s [3] approach to identifying connectors and measuring their overuse and underuse. Due to the inconsistent classification of connectors in previous studies and the multifunctional nature of some connectors making them difficult to categorise, this study analysed the 54 connectors selected in Bolton et al.'s research. This approach facilitates direct comparison with his academic data. The measurement of overuse and underuse involves three aspects: the total word count of the corpus, the total number of connectors and the total number of sentences within the corpus. Among them, sentence number mainly relates to the number of sentences with connectors and the total number of sentences in the corpus, which relatively suits the properties of connectors.

3.1. Selection of Corpus

This study used the ICE-GB corpus to compare the patterns of connector usage in timed examinations and untimed essays. Untimed essays allow for more thoughtful and detailed compositions and are represented here by ten essays comprising 21,304 words and 862 sentences, with 853 connectors used. In contrast, timed examinations, often completed under time-limited

conditions which may influence linguistic choices, also consist of ten essays with a slightly lower total word count of 21,225 and fewer sentences at 888, though they include a similar number of connectors, totalling 947. The data for both writing types were collected from 1990 to 1991, involving most script contributors aged 18-25.

Table 1. Overview of the corpus

	Timed examinations	Untimed essays
The number of texts	10	10
Total sizes (word count)	21,225 words	21,304 words
The number of sentences	888	862
The number of connectors	853	947
The script contributors' age	18-25 years old	18-25 years old
The timeframe of the scripts collected	1990 to 1991	1990 to 1991

3.2. Analytical Methods

3.2.1. Measuring Overuse and Underuse

Comparisons were drawn between the timed examinations and untimed essays to determine whether variation could be detected by using sentence connectors. Quantitatively, the statistical comparison of the frequencies for each representative sentence connector in each category was used to check the differences in the use between timed and untimed English academic writing. The 'ratio of occurrence' was calculated by dividing the number of sentences containing connectors by the total number of sentences in the corpus. For example, if the connector *however* appears in 34 sentences out of a total of 862 sentences in the corpus, the ratio of occurrence would be (34/862)*1000 = 39.44.

3.2.2. Discourse Analysis

Qualitatively, after measuring each connector, this study conducted discourse analysis based on the text to explore the reasons for their overuse or underuse. The texts containing the most frequent use of sentence connectors were further read and analysed to find out the causes of the most frequent variations and the position of the connectors across the different writing conditions of the academic papers written by native English students. Additionally, the semantic and syntactic functions of high-frequency and nonused connectors were analysed to understand their linguistic roles within the text. Following Halliday and Hasan's [9] perspective that the text's context and logical flow dictate the appropriate use of connectors, this analysis helped examine how connectors integrate with the surrounding discourse. Comparing students' use of connectors with academic writers also highlighted potential learning challenges, enhancing the understanding of connector usage in educational settings.

4. Findings and Discussion

4.1. Overview of Frequency across the Corpora

Appendix A displays the frequencies of 54 connectors across the corpora, comparing the non-professional writing of the ICE-GB corpus to Bolton's academic writing results. Overall, British students demonstrated a higher usage of connectors in untimed essays and timed examinations of ICE-GB compared to academic writers in Bolton et al.'s [3] study. This excessive usage is consistent across both untimed and timed writing, with students employing these connectors more than twice as much as academic writers. For example, the most overused connectors in British students' writing are *and* and *or*, exceeding the academic norm by more than +400 and +70 occurrences, respectively. In the case of other overused connectors, the differences from the academic norm are comparatively high for timed students' writing and comparatively low for untimed students' writing. In addition, in the present corpus only 17 connectors (e.g. *yet, as a result, indeed*, etc.) are more frequently used in untimed essays compared to timed examinations. The remaining 37 connectors are used more in timed examinations than in untimed essays. This finding from ICE-GB aligns with Bolton's, wherein connectors with simple spelling are used relatively more, while connectors with complex words or phrases are used less. Most connectors vary within a reasonable range, but the results of a few words show significant differences, such as *and* and *or*. Notable differences of these two connectors may be ascribed to the genre of the essay and writing time constraints (detailed in Section 4.2). Finally, neither the timed examinations nor the untimed essays in the ICE-GB included the eleven connectors (e.g., *first of all, at any rate, in the event,* etc.).

4.2. Variations in the Use of Connectors across the Corpora

This section will present and discuss the four patterns observed: (1) Overuse in both untimed essays and timed examinations (2) Overuse in untimed essays versus nonuse (underuse) in timed examinations (3) Nonuse (underuse) in untimed essays versus overused in timed examinations and (4) Nonuse of connectors in both untimed essays and timed examinations.

4.2.1. Overuse in Both Untimed Essays and Timed Examinations

Table 2 shows the top three most overused connectors in untimed essays and timed examinations, highlighting the differences from Bolton et al.'s [3] standard academic writing. *And* is the most overused connector in both types of essays, with 457 occurrences in untimed essays and 446 in timed examinations. Following *and*, the connectors *or* and *but* also show significant overuse but to a lesser extent. *Or* is used notably more in untimed essays, suggesting that students may lean on this connector to explore alternatives or introduce options when not under the pressure of time. Conversely, *but* appears slightly more in timed examinations, indicating its use for contrasting ideas during more pressured writing scenarios. These findings suggest that British students rely on these connectors, especially in their untimed writings.

Table 2. The top 3 most overused connectors, with their differences from the academic writing

Rank	Connectors	Untimed essays	Timed examinations
1	and	457 (+526.2)	446 (+498.3)
2	or	74 (+85.7)	63 (+70.8)
3	but	60 (+60.9)	64 (+63.4)

Due to space limitations, the coursework only presents the discourse analysis results of *and*, listed as the most overused connector, to identify the usage patterns within these essays from ICE-GB. Four cases of using *and* are identified, with interpretations provided alongside relevant excerpts. It seems that the overuse of *and* is ascribed to the misuse by the British student writers and direction quotations.

Pattern 1. Potential misusing *and* in listing

It is possible to identify instances of misuse of *and* for listing functions in examination settings, but such misuse is not commonly found in untimed essays. Below are examples of how *and* has been misused in these contexts.

Excerpt 1: ICE-GB-W1A-016: Timed examination script

<#47:2> The feedback **and** knowledge of results is received through input systems ***and**, muscle receptors **and** kinesmatic receptors **and** is related to the comparison centre.

Excerpt 2: ICE-GB-W1A-019: Timed examination script

<#9:1> He used [...] squeezing the paint directly from the tube, ***and** pouring directly from cans of paint **and** basting syringes.

The misuse of *and* in the given excerpts from student writing in a timed examination context shows a common issue where students struggle with the proper syntactic structure of lists. The misuse can lead to confusion, disrupt the reading, and sometimes obscure the meaning of a sentence. The misuse of *and* in timed examinations is often due to time pressure, lack of revision opportunities, and poor planning, leading to rushed and disorganised writing. In contrast, untimed essays allow for more careful construction and editing, resulting in a cleaner, more coherent text.

Pattern 2. A number of *ands* from direct quotation

The use of *and* is sometimes not entirely writtenby the student themselves, as *and* can appear in the quotation of essays. This might be due to the style or content of the article, requiring the students to frequently quote sentences containing *and*. The ICE-GB corpus contains many excerpts in the students' essays.

Excerpt 3: ICE-GB-W1A-018: Timed examination script

<#88:2> ***and*** *the shallow flood might have been taught to flow in a deep channel* ***and*** *a clear stream.*

Excerpt 4: ICE-GB-W1A-001: Untimed essay script

<#18:1> *The Britons took up arms* ***and*** *fighting for themselves [...] expelling the roman officials* ***and*** *setting up their own administration as well as they could.*

In excerpt 1, *and* appears 65 times, with 28 occurrences found within quotations. In excerpt 2, *and* appears 89 times, with 17 occurrences within quotations. This is a relatively high proportion, suggesting that much of the use of and comes from cited sources rather than the student's writing.

This high frequency within quoted material indicates that a significant portion of the use of and stems from the sources the student has cited. This pattern suggests that the essay relies on external texts that feature complex and detailed information, which often requires the conjunction and to link ideas and elements cohesively. Such a pattern may reflect the analytical nature of the essay, where extensive referencing and integration of various thoughts and sources are necessary.

Pattern 3. Using *and* for listing

This pattern involves using *and* for listing purposes, which is a basic function of *and* in academic writing. It is used to connect items in a list, whether nouns, adjectives, adverbs, or verbs. For example, in the excerpt from a student's timed examination script:

Excerpt 5: ICE-GB-W1A-011: Timed examination script

<#69:2> A gift is from its 'hau' **and** thus in giving **and** receiving a cycle of exchange is set up whilst simultaneously establishing personal, economic, **and** political relations.

Excerpt 6: ICE-GB-W1A-001: Untimed essay script

<#64:1> In Britain archaeological findings indicate a serious fall in the number **and** condition of the villas **and** estates.

In these sentences, *and* is used to link verb phrases: *giving and receiving.* Here, *and* connects two related actions that define a exchange process. It can be also used to link noun phrases: *personal, economic, and political relations. And* is used to list different types of relationships that are established through the act described.

This use of *and* helps to structure the sentence clearly and logically, showing how different concepts and actions are interrelated. It lists and builds a complex understanding of how various elements interact within a broader social or cultural context. Moreover, using *and* in such contexts illustrates its role in creating cohesive and comprehensive arguments or descriptions in academic writing. This conjunction aids in elaborating on ideas, linking them seamlessly to enhance the reader's understanding of the subject matter being discussed.

Pattern 4. Using *and* for extending the ideas from the earlier sentences

The last pattern involves using *and* to expand upon ideas from previous sentences, which is a common strategy to construct a more complex sentence structure. It is employed to link two or more independent clauses. For instance, consider this example from a student's writing script:

Excerpt 7: ICE-GB-W1A-008: Untimed essay script

<#4:1> **And** everywhere I have seen that as the Feminine is realised in art **and** religious metaphysics so it is projected on to the actual bodies of women in society who are then both adored **and** abhorred in the process.

Excerpt 8: ICE-GB-W1A-011: Timed examination script

<#85:2> **And** third is that 'hau' acts as a route for witchcraft.

The connector *and* is commonly used to link ideas, arguments, and pieces of evidence, which are essential components in critique and discussion-oriented writings. Thus, the nature of the essay topics and the analytical approach required could contribute to the high frequency of and in student academic writing.

The *And* at the beginning of the sentence suggests that this sentence is an extension of an idea previously introduced. It indicates that the sentence is adding to, elaborating on, or expanding upon a point already made.

The use of *and* to link independent clauses is a valuable tool in writing, especially in academic contexts where complex ideas need to be conveyed clearly and effectively. It allows writers to construct detailed sentences communicating more information and analysis cohesively.

4.2.2. Overused in Untimed Essays Versus Nonuse (Underuse) in Timed Examinations

Table 3 shows differences between the use of *consequently* and *nevertheless* in timed examinations and untimed essays. Notably, *consequently* is absent in timed examinations, whereas its synonyms *Therefore* (+25.3) and *Hence* (+3.5) are used more frequently. This suggests that during exams, students prefer simpler connectors. Carrió-Pastor [14] observed a similar trend where *consequently* is more common in academic writing by native English speakers, while *hence* is less used. Similarly, Bolton et al. [3] stated that *consequently* is more frequently used than *hence* in academic contexts. This indicates that *consequently* is common in academic writing, but most examinees opt not to use this complex, more advanced vocabulary under exam conditions.

Table 3. Overused in untimed essays versus nonuse in timed examinations, with their differences from the academic writing

Connectors	Untimed essays	Timed essays
consequently	5 (+3.6)	0 (-2.2)
nevertheless	3 (+2.2)	0 (-1.3)

Excerpt 9: ICE-GB-W1A-011: Untimed essay script

<#89:1> Both Wales and the North had never progressed beyond being military zones, so that there was no structure of government to be destroyed **and consequently** they were much harder to subdue.

Excerpt 10: ICE-GB-W1A-020: Timed examination script

<#86:3> A non-conformity is not necessarily angular **and therefore** is detected singly by [...] clasts.

Excerpt 11: ICE-GB-W1A-020: Timed examination script

<#74:3> The features of unconformities vary **and hence** environments or the changing conditions [...] structures.

In the untimed essays, the combination of *and* and *consequently* within the same sentence effectively links the historical context of Wales and the North with their outcomes. In contrast, the timed examinations prefer simpler connectors like *and*

therefore (4 times) and *and hence* (3 times), used to fast establish logical links under exam conditions. For example, *therefore* and *hence* are used to directly connect preceding ideas to conclusions, reflecting the need for clarity and efficiency in timed settings. These differences illustrate how writing conditions influence the choice of connectors, with untimed essays allowing for more complex constructions and timed examinations need straightforward, quick connections.

Excerpt 12: ICE-GB-W1A-011: Untimed essay script

<#78:1> **Nevertheless**, it is from the data about amnesia to the proposed theories of amnesia that the discussion now turns.

Additionally, nevertheless is used three times in untimed essays but not in timed examinations. Instead, its synonym *however* (+56.2) is used excessively during exams, likely because it is a simpler connector. Carrió-Pastor [14] found that *nevertheless* is frequently used in academic papers by native English speakers. Similarly, Bolton et al. [3] observed considerable use of *nevertheless* in academic writing. This preference for *nevertheless* in academic settings may be due to its formality and complexity, which is suitable for the edited and longer writing-up periods typical of academic papers. Field and Yip [8] noted that connectors like *moreover* and *nevertheless* are more formal and rarely found in student essays, which might confuse native English speakers.

4.2.3. Nonuse (Underuse) in Untimed Essays Versus Overused in Timed Examinations

The connectors *lastly* as representative examples from a group of seven connectors that are not used in untimed essays but are overused in timed examinations. It had 0 occurrences in untimed essays, with a -0.2 difference from academic writing, and was used four times in timed exams, showing a +4.3 difference from academic writing.

The overuse of *lastly* in student writing indicates the sequence and is commonly used in the examination to show logic. Instead, *finally* was used as a substitute for listing. Carrió-Pastor's [14] research shows that in a corpus of academic papers by native English speakers, *finally* was used 20 times more frequently than *lastly*. Similarly, in Ma's [15] academic writing research, *finally* was used seven times more than *lastly*. This indicates a strong preference for *finally* over *lastly* in native English academic articles. Since academic papers have a long creation process and undergo thorough editing, more sophisticated and formal connectors like *finally* are preferred.

4.2.4. Nonuse of Connectors in Untimed Essays and Timed Examinations

In both student datasets, 11 connectors used in academic writing have zero occurrence (see Appendix A). In the 11 nonused connectors, most are consistent with findings from Bolton et al. [3]. This discussion will focus on one connector, *second*, which shows a variation from previous nonuse results. Two scenarios have been identified from analysing sentences in the corpus that use *first* or *firstly* but not *second*. The first scenario involves replacing *second* with *furthermore*. For example:

Excerpt 13: ICE-GB-W1A-019: Timed examination script

<#13:1> **Firstly** the physiological experience is part of the emotional experience.

<#16:1> **Furthermore** there is evidence that supports [...] as being essential to an emotional state.

After using *firstly* in a text, authors may not need to follow a strict numerical order. *Furthermore*, provides a natural transition that expands on the discussion after *firstly* without directly moving to *secondly*. This style is common in academic writing because it emphasises the connection and logical flow between points. Later points might be better introduced with words like *additionally*, *moreover*, or *furthermore*. These words provide logical connections without being restricted to ordinal numbers. Alternatively, after using *firstly*, moving directly to other non-numerical transitional words or connectors can prevent the writing from sounding too mechanical or overly formulaic. In summary, although *firstly* and *secondly* naturally pair together, in actual academic writing, authors might choose expressions that better suit the needs of the article and their style, enhancing the logical flow and readability of the paper.

The second scenario is that the students use *second* as a determiner within the sentence, where it acts as the subject rather than starting the sentence with it.

Excerpt 14: ICE-GB-W1A-007: Untimed essay script

<#65:1> **Firstly**, he suggests that the diagnostic process [...] are assessed subjectively.

<#71:1> The **second** criticism concerning diagnosis, is based on the assumption that physical illness [...] is culture-bound.

In the excerpt provided, *second* is used as a determiner within the sentence to enhance both emphasis and contextual clarity. By embedding *second* directly, the student ensures a seamless logical progression from the first criticism, maintaining a smooth flow of the argument. This approach not only keeps the text grammatically cohesive and easy to read but also avoids the repetitiveness with a new sentence starting with *second*. Consequently, it connects *the criticism* directly to its subject, making the sequence of points clear.

5. Conclusion

This study has compared the use of connectors in British students writing from ICE-GB. It presents the results of an analysis of connectors in the timed and untimed writing of students in British. Using Bolton et al.'s [3] results as a baseline, this study

measured the overuse and underuse of connectors. It indicates a noticeable overuse of connectors in timed examinations and untimed essays, with this issue more pronounced in timed examinations. Both types of essays employ a smaller variety of connectors than academic writing, leading to an overreliance on these connectors, especially in timed examinations, particularly in *and*, *or*, *so*, *but*, and *however*. The findings suggest a preference for simpler connectors like *and* and *finally* over more complex ones like *consequently* and *nevertheless*, likely due to the pressure and constraints of timed settings.

This study contributes to the academic discourse by addressing a gap in existing research, as few studies have explored differences in connector usage between timed and untimed writing styles among native speakers. Few studies have focused on native speakers' use of connectors, with most research targeting second language writers. Additionally, this study contributes to the existing literature by focusing on the connector *and*. Bolton et al.'s [3] study and Field and Yip's [8] research both found that *and* is the most overused connector, yet they do not discuss the reasons for this . Moreover, while most academic papers focus on contrastive connectors, only a few examine listing connectors and *and*. This work emphasises the role and overuse of *and* among listing connectors, providing a deeper understanding of its application in academic writing.

Moreover, this study highlights important implications for academic writing, showing a key area for further research and application in writing strategies. Connectors present challenges in various types of academic writing, not just for non-native English speakers but also for native speakers from different linguistic backgrounds. Research focusing on the use of connectors in both untimed and timed writing reveals that understanding connectors is more than just knowing their semantic meanings. It also involves appreciating their pragmatic and stylistic uses in real contexts. This study suggests that the application of connectors in academic writing requires more attention to their actual use in writing scenarios. It is crucial to understand that connectors and discourse patterns can differ significantly across different academic fields or types of writing [16]. This variability highlights the need for understanding how these elements enhance coherence across diverse writing tasks.

Limitations of the study are mainly twofold. This study mainly relies on data from the ICE-GB corpus, which may limit the generalisability of the results. Since the corpus is based on a single source with limited diversity in writing topics, it does not fully reflect the use of connectors by the broader university student population. This could affect the breadth and depth of the findings. Another limitation could be the research methods. Although the study employed a sentence-based calculation method to analyse the use of connectors, which effectively reflects their functions and purposes, it is limited by the smaller corpus size in terms of word count and number of sentences compared to Bolton et al. [3]. Future research can address these limitations by expanding the sample range, diversifying data sources, and adopting different analytical methods, thereby providing a more comprehensive understanding.

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Appendix A

Connectors in students' timed and untimed writing, compared with academic writing (The +/– columns show the difference between the relevant value and the value in academic writing; a positive value denotes overuse, and a negative value denotes underuse. Rf = Ratio of frequency/per 1000 sentences)

	Untimed essays			**Timed examinations**			**Academic (Bolton's et al, 2003)**	
Connectors	Freq.	Rf per 1000 sentences	(+/−)	Freq.	Rf per 1000 sentences	(+/−)	Freq.	Rf per 1000 sentences
and	457	530.2	+526.2	446	502.3	+498.3	18	4
or	74	85.8	+85.7	63	70.9	+70.8	1	0.2
but	60	69.6	+60.9	64	72.1	+63.4	39	8.7
so	35	40.6	+36.6	46	51.8	+47.8	18	4
however	34	39.4	+19	68	76.6	+56.2	92	20.4
then	23	26.7	+18	30	33.8	+25.1	39	8.7
first	21	24.4	+22.2	34	38.3	+36.1	10	2.2
rather	19	22	+20	13	14.6	+12.6	9	2
thus	17	19.7	+11.9	27	30.4	+22.6	35	7.8
therefore	15	17.4	+6.7	32	36	+25.3	48	10.7
still	11	12.8	+12.6	17	19.1	+18.9	1	0.2
yet	11	12.8	+12.6	9	10.1	+9.9	1	0.2
as a result	10	11.6	+10.7	4	4.5	+3.6	4	0.9
though	7	8.1	+7.2	12	13.5	+12.6	4	0.9
indeed	7	8.1	+2.6	7	7.9	+2.4	25	5.5
again	6	7	+5.9	10	11.3	+10.2	5	1.1
furthermore	5	5.8	+5.4	10	11.3	+10.9	2	0.4
also	3	3.48	+3.28	5	5.63	+5.43	1	0.2
consequently	5	5.8	+3.6	0	0	-2.2	10	2.2
in fact	4	4.6	+1	5	5.6	+2	16	3.6
hence	4	4.6	+1.3	6	6.8	+3.5	15	3.3
firstly	4	4.6	+3.9	10	11.3	+10.6	3	0.7
instead	3	3.5	+1.9	3	3.4	+1.8	7	1.6
nevertheless	3	3.5	+2.2	0	0	-1.3	6	1.3
at the same time	2	2.3	+1.6	2	2.3	+1.6	3	0.7
finally	2	2.3	+2.1	2	2.3	+2.1	1	0.2
in turn	2	2.3	+2.1	2	2.3	+2.1	1	0.2
in the first place	1	1.2	+1	1	1.1	+0.9	1	0.2
in total	1	1.2	+1	0	0	-0.2	1	0.2
overall	1	1.2	+1	1	1.1	+0.9	1	0.2
in effect	1	1.2	+1	0	0	-0.2	1	0.2
by comparison	1	1.2	+1	0	0	-0.2	1	0.2
in contrast	1	1.2	+0.8	2	2.3	+1.9	2	0.4
above all	1	1.2	+1	0	0	-0.2	1	0.2
in other words	1	1.2	+0.1	1	1.1	+0.03	5	1.1
secondly	1	1.2	+0.1	3	3.4	+2.3	5	1.1
lastly	0	0	-0.2	4	4.5	+4.3	1	0.2
in short	0	0	-0.2	0	0	-0.2	1	0.2
in sum	0	0	-0.2	0	0	-0.2	1	0.2
in the event	0	0	-0.2	0	0	-0.2	1	0.2
moreover	0	0	-2.4	1	1.1	-1.3	11	2.4
on the other hand	0	0	-2.2	0	0	-2.2	10	2.2
nonetheless	0	0	-1.1	1	1.1	+0.03	5	1.1
second	0	0	-1.1	0	0	-1.1	5	1.1
on the whole	0	0	-0.9	0	0	-0.9	4	0.9
on the contrary	0	0	-0.7	0	0	-0.7	3	0.7
on the one hand	0	0	-0.7	0	0	-0.7	3	0.7
alternatively	0	0	-0.4	1	1.1	+0.7	2	0.4

	Untimed essays			Timed examinations			Academic (Bolton's et al, 2003)	
conversely	0	0	-0.4	1	1.1	+0.7	2	0.4
accordingly	0	0	-0.2	3	3.4	+3.2	1	0.2
at any rate	0	0	-0.2	0	0	-0.2	1	0.2
by contrast	0	0	-0.2	0	0	-0.2	1	0.2
first of all	0	0	-0.2	0	0	-0.2	1	0.2
in any case	0	0	-0.2	1	1.1	+0.9	1	0.2
Total	853	989.6	16.3	947	1066.4	16	486	107.8