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A Study of Lexical Cohesion in English Book II

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Abstract

This study investigates the lexical cohesion in the textbook of English at the Intermediate level titled English Book II published by the Punjab Textbook Board Lahore (PTB). A mixed-method approach was used to carry out the study of lexical cohesion in the book. Elements of lexical cohesion were identified through textual analysis method apart from this syntagmatic and paradigmatic relations, lexical density, type-token ratio, number of sentences, and frequencies of lexical cohesion were assessed by using a corpus too- UAM. Halliday and Hassan's (2014) model of lexical cohesion was used as a framework for analysis. The findings of the study suggested that both syntagmatic and paradigmatic relations display different proportions of arrangements in different chapters of the English Book II. The study concluded that textuality is built up through cohesion, and the cohesive knowledge of the text helps greatly in comprehending the text for readers. Furthermore, it was also concluded that the use of syntagmatic relations is more frequent as compared to the paradigmatic relations in the text of English Book II. The current study is significant



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as it can be useful for the material developers and course designers in the particular ELT context in Pakistan as it provides useful information about lexical density or difficulty level of the text. This can also be supportive for the writers and learners in using lexical cohesion appropriately in their writings.

Keywords: Lexical cohesion, Textual analysis, UAM, syntagmatic and paradigmatic relations, lexical density, textuality, cohesive knowledge

1. Introduction

Cohesion endows coherency and logical sequence to a text. It indicates the progression present in different parts of a text. It is a significant property of a text to be more unified and coherent. Lexical cohesion as a cohesive effect is realized by the choice of vocabulary. It helps in creating textuality in a text (Halliday and Hassan,1976; Halliday,1994; De Beaugrande & Dressler,1981) Lexical cohesion as one of the key aspects of textuality is the linguistic technique to assemble different words into a semantically linked idea. Cohesion as such is the correlation of different sentences in a text that facilitates the production of a unified meaning and semantic sense. Cohesion is explained under lexical and grammatical categories. Lexical cohesion consists of the vocabulary and the context of use, while grammatical cohesion is based on grammatical features as well as structural content.

Broughton et al (2003) emphasized that the difficulty level of a text plays a significant role in developing reading competency. A text that contains complex grammatical and lexical features might create obstacles in comprehending the text properly, and can eventually increase the level of frustration among the students. An easy text does not have the potential to enhance the reading or writing competency of a learner. To enhance the reading abilities of the learners, a text should be organized properly. Therefore, a text must be appropriate according to the level of the learners to reduce the reading interpretation problems (Westwood, 2008).

In Pakistan, textbooks of English are used as material to teach English as a second language contain contents in prose form along with texts relating to other literary genres. Lexical cohesion existing in the text of books is significant to be analyzed as it imparts language proficiencies to the students. Based on Khalil (2019), the present research analyzes lexical cohesion present in English Book II published by Punjab Text Board, Pakistan.

1.1 Objectives of the study

The objectives of the present study are as follows:

- To identify lexical cohesion in English Book II published by PTB.
- To evaluate the frequencies of lexical cohesion in English Book II published by PTB.
- To assess the functions of the lexical cohesion

1.2 Research questions

- What kind of lexical cohesion does the texts in English Book II by PTB display?
- What frequencies of lexical cohesion are there in English Book II published by PTB?
- What functions do these cohesive devices perform?

1.3 Significance of the study

The present study can be helpful for the learners, writers, and teachers associated with English language teaching as it raises awareness regarding cohesion present in the text used for language teaching. The study can also guide the material developers to review the material to enhance the reading and writing competency of the language learners. Henceforth, authors and learners alike can obtain assistance from this study for the suitable use of lexical cohesion to make their writings more coherent.

2. Literature Review

According to Halliday and Hasan (1976), text, whether written or spoken, consists of three essential components namely i) texture, ii) cohesive ties, and iii) cohesion. Matthews (1997) states that texture is the factor that makes the whole text consolidated, and is achieved through cohesion and coherence. Cohesive ties are the links that are used to create cohesion. Cohesion is a semantic relation that is built up with the help of different cohesive devices (Halliday and Hasan, 1976).

Cohesion is realized through two sub-categories- grammatical cohesion and lexical cohesion. According to Halliday and Hasan (1976), grammatical cohesion consists of four major elements namely i) reference, ii) substitution, iii) ellipsis, and iv) conjunction. The current study, however, pursues only Halliday and Hassan's (2014) taxonomy of lexical cohesion for the analysis of the text as detailed in figure 2.1. The figure here details the whole range of categories associated with study of such nature. The broad categories involved in lexical cohesion include i) identity, ii) attribution and iii) collocation. The diagram further shows the sub-categories related with the broad ones. Given the range and scope of the present research, we are focusing mainly on the lexis.

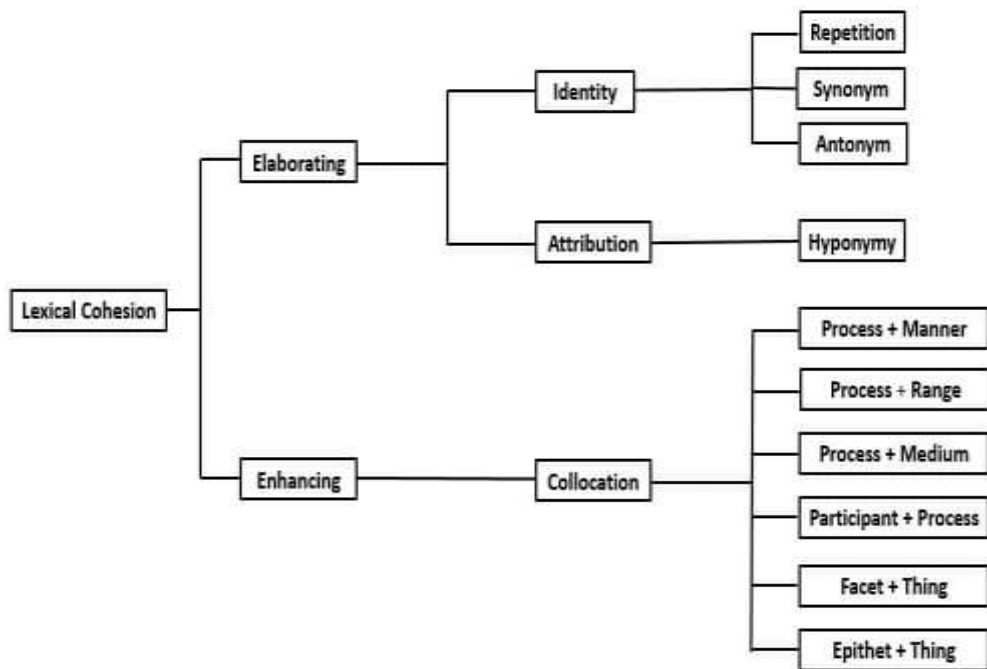


Figure 2.1: *Halliday's Model of Lexical Cohesion (2014)*

Cohesion is a salient feature of good writing and has been a paramount focus of study in textual studies. Mahlberg (2006) explained the role of grammatical and lexical cohesion in language teaching. The study concluded that lexical, as well as grammatical cohesion, help the learners in understanding the text and its structure. The findings also suggested that the corpus rhetorical approach could be useful for the reader to understand the characteristics of a good text. Hameed (2008) analysed cohesion in a text by using the method of discourse analysis in the text of a magazine. The study utilized the approaches of Halliday and Hasan (1976) and Bloor and Bloor (2013). The findings of the study suggested that cohesion could help define semantic relationships present in the text, and reference could be used as a tool for hanging the text together.

Crossley and McNamara (2009) analysed the difficulty level of a text with the help of computational assessment of lexical differences in writings of native English writers and those using English as a second language. The study concluded that the cohesion present in the text is one of the factors that determine the difficulty level of the text. Cheng (2009) analysed spoken discourse to demonstrate the expanded meaning with the help of lexical chains. He used a descriptive model of lexical cohesion propounded

by Sinclair (2004). The model under reference consists of five different categories where three optional groups consist of i) colligation, ii) semantic preferences, and iii) collocation, and two obligatory groups consist namely i) semantic prosody and ii) core. The study showed that it was feasible to explain the semantic prosody about the lexical items. Stubbs (2001), contrarily, argued that semantic prosody was not recognizable. Cerban (2010) analysed the different features of collocation by using Halliday and Hassan's (1976) framework of lexical cohesion. The study concluded that collocation was linked with specific variety and register.

Kafes (2012) investigated the ability of Turkish learners who were also learning the English language. This study presents the Turkish learner's ability to produce cohesive text both in the Turkish and English languages. The findings proved that Turkish learners should improve their English writing ability, and also learn the uses of lexical cohesion in a text consciously because good writing depends entirely upon the lexical and grammatical structure and inadequate knowledge of lexical and grammatical features may lead to the improper structure.

In the ELT context of Pakistan, there are scarcely any studies that have been conducted to analyze cohesion in the material used for teaching the English language. This study will provide insightful implications for the language teachers, learners, and material developers as it analyses the use of cohesion in the material used for the teaching of L2. Therefore, it can assess the effectiveness of material used for English language teaching.

3. Research Methodology

3.1 Overall methodological approach

The current study is mixed-method in nature as it uses the paradigms of both quantitative and qualitative research. It is based on a quantitative paradigm as it elaborates the frequency and distribution of lexical cohesion across the text. However, the functions of lexical cohesion in English Book II published by PTB were explained qualitatively.

3.2 Data for analysis

The data for the analysis comprised the text of English Book II published by Punjab Text Board. The text was converted to the machine-readable format as the data was processed through the UAM corpus tool for the analysis of lexical cohesion present in the text.

3.3. Process of data analysis

3.3.1 Model for analysis

Halliday and Hassan's (2014) model for lexical cohesion was used to investigate the lexical cohesion present in the text of English Book II published by PTB. In addition, the corpus approach was adopted to identify the frequencies and types of lexical cohesion present in the text. The textual analysis helped in explicating the extensive description and functions of the lexical cohesion. UAM corpus tool was used for the statistical analysis of lexical cohesion in the selected textbook to calculate the occurrences of different cohesive features in the text.

3.3.2 UAM corpus tool

UAM corpus tool was used for the annotation of the text. The corpus facilitated annotating the text. The description of the text file is associated with the linguistic layers defined by the researchers. UAM corpus tool is based on the different features as listed below:

- a) Project window
- b) layers
- c) Annotation window
- d) Auto coding
- e) Corpus search
- f) Statistics window

The project window consists of the corpus text file and different linguistic layers according to which these files are annotated. The main step of UAM software is to describe the project. The second window of UAM software comprises various layers. The layer is made according to the project. In this layer, there is an option of editing scheme, and by using this option scheme of the project and it can be edited at any time. The third feature is called the annotation feature. Different segments can be created according to the scheme of the project. The tool allows to overlap the various segments. The present research was carried out with the help of the scheme given in the figure below.

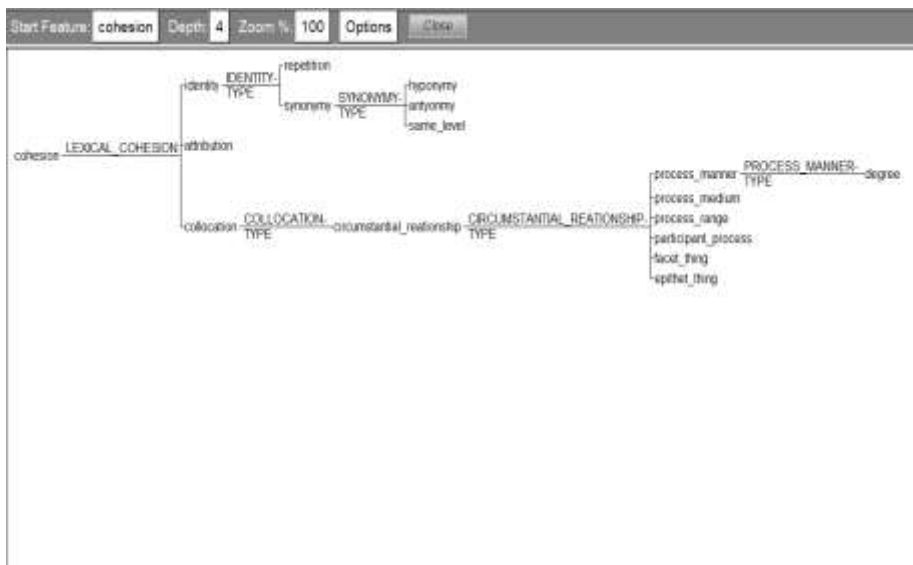


Figure 3.1: scheme of lexical cohesion

UAM software annotates all the data for the statistical analysis. It provides accurate frequencies of the features present in the text. The result of all the files can be checked, individually. It also presents the whole datasheet. Files are tagged manually. The linguistic layers are followed for tagging the data.

4. Analysis and Discussion

The analysis of the text of English Book-II was carried out employing two approaches. Firstly, the textual analysis of the chapters included in the book was carried out to locate lexical cohesion and to elaborate on the function served by cohesive ties. Secondly, the statistical analysis was carried out to find out the syntagmatic and paradigmatic relations, lexical density, type-token ratio, number of sentences, and frequencies of lexical cohesion present in the text.

4.2 Textual analysis

4.2.1 Synonyms

A word or phrase that means exactly or nearly the same as some other word of that language is known as a synonym. In English Textbook-II published by PTB, numerous synonyms have been used to express the similarity of the meaning.

Example 1

I remember going to the British Museum one day to read up the treatment for some slight ailment of which I had a touch - hay fever, I fancy it was., I idly turned the leaves, and began to indolently study diseases, generally. I forget which was the first distemper I plunged into some fearful, devastating scourge, I know and before I had glanced half down the list of “premonitory symptoms,” I plodded conscientiously through the twenty-six letters, and the only malady I could conclude.

These lines have been taken from chapter six ‘*The Man Who was a Hospital*’ of English Textbook II. The words like ‘*Ailment*’, ‘*Disease*’, ‘*Distemper*’ and ‘*Malady*’ all are synonyms and have been used to avoid repetition. They deliver the same meaning in the text.

Example 2

Of the boys who do not reach their natural academic boundary during their college career, but who fail to get through, there are two main classes: those who try, and those who do not try. As a general thing, the boy wins out in such controversies. He supposes that he can float through college with as little effort as he did through school.

The above-mentioned lines are part of Lesson 3 of English TextBook-II “*Why Boys Fail in College*”. ‘*Get Through*’, ‘*Wins ou’t* and ‘*Float through*’ are synonymous expressions. The function of avoiding the repetitions in the text is being served by the synonyms.

4.2.2 Repetition

Repetition is related to the occurrence of the same words in different parts of the text. Some of the repetitions might have different morphological forms. The use of this feature is also present in English Book-II.

Example 1

This lesson should help you understand how the use of the scientific method has improved living conditions and changed people. It should also help you understand how you can make better use of the scientific method in your everyday living

Repetition is considered to be a purely direct form of lexical cohesion. The basic purpose of repetition is to give insistence towards some work and also reflect the

importance of one thing as compared to others. In this example, the writer used ‘*help*’, ‘*understand*’ and ‘*use*’ to show the insistence of the message.

Example 2

In Asia and the Far East, the death rate has been reduced rapidly by *modern medicine* and epidemic control. In Ceylon, For example, the death rate was reduced by one-third in two years by greatly reducing mortality from malaria. This was *due to the* discovery of DDT which killed off the mosquitoes which carry malaria. The only long-term answer for these countries is to reduce their birth rate.

In example 2, underlined words, ‘*reduced*’, ‘*reduce*’, and ‘*reducing*’ are repeated, and occur in different morphological forms.

4.2.3 Antonym

According to Halliday (2014), the antonym is also considered as a type of synonym. An antonym is a special form of synonym which shows its opposite words. Antonym has no mandatory reference regarding identity.

Example

So far I do not know how long I strayed up and down, increasingly fearful of being watched, summoning up my courage to take the plunge and quailing from it at the last moment. Good God: you worm, better men than you have gone to the gallows.” With the courage of despair, I took a heave. The sack dropped sheer. A vast splash. Then silence fell again. No one came. I turned home; and as I walked I thought a little sadly of all those books falling into the cold torrent, settling slowly down through the pitchy dark, and subsiding at last on the ooze of the bottom, there to lie forlorn and forgotten whilst the unconscious world of men went on.

In the given example, the writer used the words (*up ... down*) to show the opposite meaning. The use of *splash* and *silence* also shows opposite meanings as one word is about the noise which is the opposite of silence. The use of antonyms also keeps the text cohesive as it creates a semantic relationship between the words.

4.2.4 Hyponymy

Hyponymy is known as the classification of words from specific to general. It is also considered an umbrella term that covers all its sub-categories. The use of hyponymy is also evident in the book.

Example 1

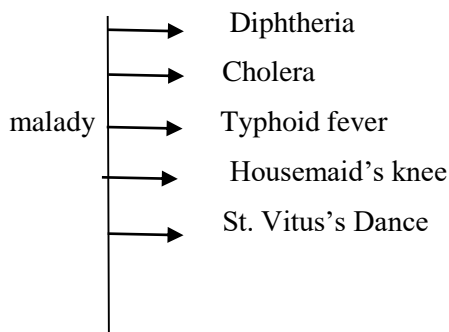
I expect that at some time you have all come home after an energetic game of football or netball or after a few hours when you have been too busy to eat, and said, "I'm starving!" But this hunger did not last long. If your meal was not ready for you, after a few slices of bread and butter you forgot all about those hunger pangs.

The function of hyponymy is to facilitate the reader about the semantic categories and semantic sub-categories of words. In example 1, 'Game' is considered as a specific noun or a hypernym. 'Football' and 'Netball' are considered as co-hyponyms of games.

Example 2

I sat for a while frozen with horror; and then, in the listlessness of despair, I again turned over the pages. I came to typhoid fever - read the symptoms - discovered that I had typhoid fever, must have had it for months without knowing it. I wondered what else had got turned up St. Vitus's Dance - found, as I expected, that I had that too, - began to get interested in my case and determined to sift it to the bottom, and so started alphabetically - read up again and learnt that I was sickening for it and that the acute stage would commence in about another fortnight. Bright's disease, I was relieved to find, I had only in a modified form and so far as that was concerned, I might live for years. Cholera I had severe complications, and diphtheria I seemed to have been born with. I plodded conscientiously through the twenty-six letters, and the only malady I could conclude. I had not got, was housemaid's knee.

In example 2, 'malady' represents the general term and various diseases are its co-hyponyms and are also called as super-ordinate of the malady. 'cholera, diphtheria, housemaids' knee' and 'typhoid fever, Bright's disease, and St. Vitus's Dance' are the



4.2.5 Collocation

According to Halliday (2014), collocation has six different categories of relationship enhancement. Collocation is found in a fixed pattern of phrases and thus renders a meaningful interpretation of a text. English Book-II also contains collocations.

4.2.5.1 Process+manner

The first circumstantial relationship is *process+ manner* where the process performs the function of a verb, and manner performs the function of an adverb.

Example

These millions of stars are wandering about in space. A few form groups which journey in company, but most of them travel alone. And they travel through a universe so immense that it is very, very rare event indeed for one star to come anywhere near to another.

In the given example, the writer used two collocations in different parts of the text. Two relationship enhancements are ‘*wandering about*’ and ‘*travel alone*’. Here ‘*wandering*’ and ‘*travel*’ performs the function of a verb. The second part of the enhancement relationship ‘*about and alone*’ performs the function of adverbs. The writer consciously used these words to make the clear circumstantial relationship of process+ manner.

4.2.5.2 Participant+process

The second circumstantial relationship is of *participant + process*. It shows the relationship between the noun and the verb. Actor, goal, say, behaver, carrier, senser, and existent also perform the function of a participant.

Example 1

As always, under any dynasty, sovereignty in the Muslim world, West or east, was unstable. In Spain the Umayyad dynasty kept the nominal rule from the time Abd-al-Rahman I imposed it; but by the time of the ascension of the next outstanding figure in the dynasty, Abd-al-Rahman III, in the year 912, civil disturbances and tribal revolts had reduced the Muslim state of Spain to the city of Cordova and its neighbourhood.

Example 2

A few lazy bluffers drift into college and usually drift out again. Most of them have not found any serious interest in life, and some of them never will. It is usually wise to let them retire to the cold world for a reason and find out by experience how much demand there is for a lazy bluffer

Example 3

Famine has been a problem since the beginning of time. The early hunter buffered grave shortages during the winter months and quite often these were serious enough to mean starvation for him and his family.

Example 4

When I go into a bank I get rattled. The clerks rattle me; the wickets rattle me; the sight of the money rattles me; everything rattles me.

The findings have been presented in table 4.1

Table 4.1: Example of Participant + Process

Participant + process	
Noun	Verb
Umayyad dynasty	Kept
Lazy bluffers	Drift
Early hunter	Buffered
Clerks	Rattle
Wickets	Rattle
Money	Rattles

4.2.5.3 Process+ Medium

Process (verb) + medium (noun) is also the form of circumstantial relationship and is used most often in the construction of a text. The text of English Book-II also contains this feature.

Example

In North Africa he barely escaped assassination at the hands of the governor of the province. Wandering from tribe to tribe, always pursued by the spies of the new' dynasty, he finally reached Ceuta, five years later. He was a grandson of the tenth

caliph of Damascus, and his maternal uncles were Berbers from the district of North Africa.

In the given example, the first part of extensive relationships ‘*escaped*’ and ‘*reached*’ performs the function of the process. The second part of the extensive relationship ‘*assassination*’ and ‘*ceuta*’ perform the function of the medium.

4.2.5.4 Process + Range

Process + range is the most used and important collocational feature. The occurrence of verb + assertion with a preposition is considered as a process + range. This feature was also found in the book.

Example

We believe, however, that some two thousand million years ago this rare event took place, and that another star, wandering blindly through space, happened to come to near the sun. Just as the sun and moon raise tides on the earth, so this second star must have raised tides on the surface of the sun. But they would be very different from the little tides which the small mass of the moon raises in our oceans; an immense tidal wave must have travelled over the surface of the sun, at last forming a mountain so high that we can hardly imagine it..... And before the second star began to move away again, its tidal pull had become so powerful that this mountain was torn into pieces and threw off small parts of itself into space. These small pieces have been going round the sun ever since. They are the planets, great and small, of which our earth is one.

In the given lines, ‘*Happened, raises, and torn*’ examples of process and ‘*to come near the sun, in our ocean and into pieces*’ are the examples of range.

4.2.5.5 Epithet+ Thing

An epithet is considered as an adjective and the thing is considered as a noun. Epithet (adjective) shows the characteristics of a noun, an object, or a place. It is used to add more prominence to the noun. This feature was also present in the book.

Example

This agricultural development was one of the glories of Muslim Spain and one of the Arabs lasting gifts to the land, for Spanish gardens have preserved to this day a Moorish” character. One of the best-known gardens is the Generalife - a word which comes from the Arabic, Jannat al’-arif, “the inspector’s paradise.” This garden,

“proverbial for its extensive shades, falling waters, and soft breeze,” was in the form of an amphitheatre and irrigated by streams which, after forming numerous cascades, lost themselves among the flowers, shrubs and trees represented today by a few gigantic cypresses and myrtles.

In the given example, agriculture performs the function of epithet, and development performs the function of a thing. Simply Spanish, best-known, extensive, falling, soft, numerous, and gigantic are the adjectives and perform the function of epithet. The nouns with these adjectives are the thing.

4.2.5.3 Facet + Thing

Facet + thing is also a circumstantial relationship. This extensive relationship performs the function of the nominal group. Facet (noun) + thing (noun) is also categorized as a collocational feature. This feature is also present in the book.

Example

I went up to a wicket marked “Accountant.” The accountant was a tall, cool devil. The very sight of him rattled me. My voice was sepulchral. He had gathered from my mysterious manner that I was a detective. I knew what he was thinking, and it made me worse. “No, not from Pinkerton’s,” I said, seeming to imply that I came from a rival agency.

In the given example, ‘wicket marked’ and ‘rival agency’. Wicket and rival are considered as facet (noun). The second part of co-text marked and agency performed the function of thing (noun).

4.3 Statistical analysis

4.3.1 Paradigmatic relation

Paradigmatic relation expresses the lexical relation of repetition, synonymy, hyponymy, and antonymy. Table 4.2 provides a detailed description of paradigmatic relation in English Book II.

Table 4.2: Paradigmatic relation in English book II published by PTB

Corpus Documents	Repetition	Synonym	Antonym	Hyponym
Chapter 1	44	55	11	7
chapter 2	26	36	9	8
Chapter 3	14	25	5	0

Chapter 4	9	27	4	1
Chapter5	37	52	17	7
Chapter 6	23	28	1	8
Chapter 7	17	4	1	0
Chapter 8	26	61	8	17
Chapter 9	16	64	20	13
Chapter 10	27	85	9	13
Total	239	437	85	74

Table 4.2 shows the findings of paradigmatic relations among words in English book II published by PTB. All the chapters have different frequencies of paradigmatic relationships. Chapter 1 *The Dying Sun* shows more repetition, 44 times, as compared to the other text. In chapter No. 4, *End of the Term*, the writer used fewer repeated words. Only 9 repeated words are found in this text. In chapter 10, *Jewel of the World*, the writer used more synonyms as the feature has been used 85 times. Chapter 7 *My Financial Career* shows fewer synonyms in the text due to the less complicated and simple sentence structure. Less number of sentences is also one of the main reasons for less use of vocabulary. Antonym is considered a category of synonyms. In chapter 9, *Hunger and Population Explosion*, the writer used more lexical relation of antonyms. In chapters 6 and 7, the number of antonyms used is less as compared to other chapters. In chapter 8 *China's Way to Progress*, there is more use of hyponyms. In chapter 7, there is 0 frequency of lexical relation of hyponyms.

4.3.2 Syntagmatic relation

Syntagmatic relations express all the collocational relationships in the text. Table 4.3 gives a detailed description of the syntagmatic relationship present in the text of English book II published by PTB.

Table 4.3: Syntagmatic relation in English Book II published by PTB

Corpus Document	Process + manner	Process +range	Process + medium	Participant + process	Epithet + thing	Facet +thing
Chapter 1	24	43	18	16	21	47
Chapter 2	14	22	17	3	41	18
Chapter 3	8	21	1	7	59	23
Chapter 4	14	7	1	3	47	28
Chapter 5	19	18	11	8	43	20

Chapter 6	10	11	3	5	27	15
Chapter 7	5	7	0	4	15	6
Chapter 8	11	12	17	24	132	47
Chapter 9	12	16	27	25	96	51
Chapter 10	14	31	50	39	122	61
Total	131	188	145	134	603	316

Table 4.3 shows that ten different chapters use a different range of collocation. The collocational feature of process + manner (verb+ adverb) has been used 24 times used in chapter 1, *The Dying Sun*. This feature is less frequently used in chapter 7, *My Financial Career*. The second category of collocational feature is process + range. The collocational feature of process + range is used more in chapter 1, *The Dying Sun*. This feature is less frequently used in chapter 4, *End of Term*, and chapter 7, *My financial Career*. The third category of circumstantial relationship is process + medium (verb + noun). The highest frequency of process + medium, 50 times, is present in the 10th chapter, *Jewel of the World*. The feature is absent in the chapter, *My Financial Career*. The fourth category of circumstantial relationship is the participant + process which consists of the collocational features of noun + verb. The highest frequency of this feature namely 39 is found in the 10th chapter *Jewel of the world*. The feature is less frequent in chapters 2 and 4. The frequency of the feature in these chapters is 3. Epithet + thing is the more used in chapter 8, and less used in chapter 7. The sixth and last category of circumstantial relationship is facet + thing. This has been used 61 times in the 10th chapter and is less frequent in chapter 7, *my financial career*.

4.3.3 Lexical density

Lexical density is used to check out the information that is present in the chapter. A text with a higher density level is more difficult to understand. A lower density level in a text means less information and fewer lexical features are used in the text. A reader can easily understand a text having a lower density level. English book II published by PTB has ten different modern prose works written by different Native writers. Each chapter has a different level of density level.

Table 4.4: Lexical Density in English Book II published by PTB

Corpus Documents	Lexical Density
Chapter 1	36.38
Chapter 2	39.62
Chapter 3	34.22
Chapter 4	46.62

Chapter 5	44.93
Chapter 6	36.13
Chapter 7	37.91
Chapter 8	41.36
Chapter 9	37.25
Chapter 10	39.52

Table 4.4 shows that chapter 4, *End of Term*, possesses 46.62 lexical density. More information is contained in chapter 4, *End of Term*, as this chapter contains a higher level of lexical density as compared to the other chapters. Chapter 3, *Why Boys Fail in College*, has the lowest density level of 34.22. A reader can easily understand this chapter due to less use of vocabulary and less information. Lexical density can be checked by the formula given in the figure below.

$$\text{Lexical density} = \frac{\text{Total number of lexical features}}{\text{Total number of words}} * 100$$

Figure 4.1: *Formula of Lexical density*

4.3.4 Type-Token ratio

The term “token” attributes to the series of distinct characters. “Type” attributes to the statistics of the various tokens present in the text. For example, “the food is in the fridge” contains five types. Six tokens are present in the given example “the” occurred two times in the text, so, it is considered as one token. Lexical variation in a text can easily be determined with the help of a type-token ratio.

Table 4.5: Type-Token Ratio of English Book

Chapter	Word type	Word token	Type-token ratio (TTR)
1	376	1036	36.29%
2	507	1281	39.57%
3	572	1680	34.04%
4	421	916	45.96%
5	539	1028	52.43%
6	420	1199	35.02%

7	345	991	34.81%
8	911	2278	39.99%
9	572	1572	36.38%
10	877	2265	38.71%

The length of the sentence affects the type-token ratio. The higher sentence length means the writer used a different range of words to express the ideas. The type-token ratio also reflects the variation of the vocabulary in the text that can be easily determined with the help of lexical density and TTR. A higher number of TTR shows greater use of vocabulary, and the lower number shows a lesser use of vocabulary. Table 4.5 shows that Chapter 5, *On Destroying Books*, showing the higher number of TTR. It means that the writer used different words to explain the story. In *End of Term* and *My Financial Career*, the writers used less variety of words. Type token ratio can be assessed by the formula given in figure 4.2.

$$\text{Type-Token ratio} = \frac{\text{Number of Types}}{\text{Number of Tokens}} * 100$$

Figure 4.2: Formula of Type-Token Ratio

4.3.5 Number of Sentences

The average sentence number was counted to check the number of sentences in different texts. Many cohesive ties are directly linked to the number of sentences. The greater the number of sentences in a text, the greater is the use of the cohesive ties in the text. The table contains the number of sentences present in various chapters of the selected book.

Table 4.6: Average sentence number in English Book II

Corpus Document	Sentence Number
Chapter 1	45
Chapter 2	66
Chapter 3	67
Chapter 4	26
Chapter 5	63
Chapter 6	67
Chapter 7	94

Chapter 8	109
Chapter 9	85
Chapter 10	101

Table 4.6 shows that chapter 8, *China’s Way to Progress*, contains 109 sentences which is higher than the rest of the chapters. This shows that the chapter contains more cohesive devices. Chapter 4, *End of Term*, contains fewer sentences. The fewer sentences imply that cohesive devices are not frequent in the chapter.

4.3.6 Frequencies of lexical cohesion in English Book II

The frequencies of lexical cohesion, along with the feature of relation, type of expansion, and kinds of lexical relation present in the selected textbook of English have been presented in the following table.

Table 4.7: Frequencies of lexical cohesion in English Book II

Features of Relation	Type of expansion	Type of lexical links	Frequency	Percentage
Paradigmatic relation	Identity	Repetition	239	10.16
Paradigmatic relation	Identity	Synonym	437	18.57
Paradigmatic relation	Identity	Antonymy	85	3.61
Paradigmatic relation	Attribute	Hyponymy	74	3.14
Syntagmatic (collocation)	Enhancing	Participant + process	134	5.69
Syntagmatic (collocation)	Enhancing	Process + manner	131	5.56
Syntagmatic (collocation)	Enhancing	Process + range	188	7.9
Syntagmatic (collocation)	Enhancing	Process + medium	145	6.16
Syntagmatic (collocation)	Enhancing	Epithet + thing	603	25.63
Syntagmatic (collocation)	Enhancing	Facet + thing	316	13.43

Three different types of expansion have been used in the selected textbook of English published by PTB. Repetition, synonym, and antonym are considered as elaborating expansions and come under identity type. Table 4.7 shows that percentage of occurrences of repetition, synonyms, and antonyms are respectively 10.16%, 18.5 %, and 3.6 %. Therefore, in identity expansion, synonyms contain the most percentage as

compared to other identity elements. The second type of paradigmatic relation is an attribute. In the selected book, only 3.14% of hyponyms are used in the text. The second category of lexical relation is syntagmatic that pertains to the enhancing relationship of the text. This enhancement is further divided into six different categories of collocational features (Halliday & Hassan, 2014). The presence of collocational features in the text of the book is 64.5 percent.

5. Conclusion

The familiarity of an ESP reader with the notion of lexical cohesion facilitates greatly decoding a text satisfactorily. Cohesive ties make the text more comprehensive and create textuality in it. The study aimed to investigate the text of English Book II to find out lexical cohesion. The findings of the study show that lexical cohesion in terms of both syntagmatic and paradigmatic relations is found in the selected book. The use of cohesive ties in the form of synonyms, antonyms, repetitions, hyponyms, and collocations was more evident in the text of the book. The frequency distribution of the various elements of cohesion, however, was different in the text. The feature of repetition was used 239 times in the corpus document. Synonyms were used 437 times and antonyms were used 85 times. The use of hyponyms was less frequent in the text of the book. In syntagmatic relation, the collocation 'Process + manner' was used 131 times in the selected works. Writer used Process + manner 188 times, process + medium 145 times, participant + process 134 times, epithet + thing 603 times and Facet + thing 316 times. The most used syntagmatic relation is epithet + thing and the less used syntagmatic relation is process + manner. The study also concludes that lexical cohesion contributes well to building up textuality because it creates continuity of ideas. The findings of the study suggest that different elements of lexical cohesion serve different purposes. The feature of the repetition helps in emphasizing certain things in the text. Repetition may also occur in different morphological shapes like give, gave, given. Synonyms are used to avoid repetition which can make the text look dull. The semantic relations of antonyms and hyponyms are also used to endow clarity and unity to the text. The feature of collocation builds linkages that vary according to the sub-categories of collocations. Therefore, the study concludes that lexical cohesions are present in different proportions in different chapters of the book. Apart from this, the chapters having high frequencies of lexical cohesion contain more lexical density thus it affirms that various elements of lexical cohesion serve certain purposes to make the text comprehensive.

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