

# Investigating Sentence Complexity in Scientific Abstracts of Kurdish Researchers:

## A Gender-Based Analysis

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### ABSTRACT

Syntactic complexity in academic writing is crucial, but research on Kurdish researchers' practices and gender's influence on scholarly abstracts is limited. The objective of this study is to identify the predominant sentence structure type used in the abstracts and to examine any differences in their utilization between male and female researchers. A mixed-methods approach (qualitative and quantitative) is employed to study 50 abstracts in total, with an equal number written by males and females. Using UAM Corpus Tool 3, the abstracts are annotated and classified into types of sentence structure based on Brinton's (2000) classification of sentence structure. For the statistical analysis, SPSS is employed, while tree diagram is used to examine the syntactic structures of sentences. It is found that, regardless of gender, the dominant sentence structure type is complex sentences, and the least used type is compound sentences. The study also reveals that both genders rank complex sentences first in sentence structure usage, followed by simple, compound-complex, and compound sentences. The statistical analysis shows significant differences for compound and complex sentences; i.e., female authors use compound sentences more than males, while male authors utilize complex sentences more than females. Therefore, it is concluded that Kurdish researchers are aware that the complex sentence is the most significant and effective kind of sentence for expressing detailed ideas, and that gender influences how often each sentence type is used.

KEY WORDS: Sentence Structure, Clause, Abstracts, Gender Differences, Writing

### 1. INTRODUCTION<sup>1</sup>

Language and gender are becoming increasingly essential in sociolinguistic field. Gender has a big impact on language, resulting in distinct language use by men and women. Coates (2015) argues that gender influences anthropology, dialectology, language, and social roles. Kamari et al. (2012) declare that gender is one of the sociocultural variables that people need for language acquisition, including writing. It is clear that men and women use language differently, and these differences are apparent in the verbal and written forms of communication. In the same vein, Fattah (2025) indicates that gender strongly shapes online communication, influencing linguistic strategies, word choice, and interaction styles so that female interlocutors rely more on hedges, empty adjectives, apologies, euphemisms,

intensifiers, and emoticons, whereas males tend to favor humor and sarcasm. An alternative interpretation may involve cultural context, as it is essential to recognize that gender-related linguistic practices can differ considerably among various societies. In certain cultures, expectations may exist for women to adopt softer speech and employ more intensifiers, whereas in others, these linguistic tendencies may be less evident (Sabir, 2025). Similarly, Lakoff (1973), Eckert (1989), Tannen (1990), and Cameron (2005) believe that males and females utilise language in different ways. Haliliday (2014), as stated in Argamon et al. (2003), points out that, in contrast to females, males are interpreted as more informative than females due to their tendency to give more details regarding topics mentioned in the text. However, some scholars believe that gender has little to do with the way language is used, suggesting that "other variables, such as social status or age of the

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speaker/writer and/or of the listener/reader, may have a greater impact on language use" (Brouwer, 1982, Berryman-Fink and Wilcox, 1983, Ishikawa, 2011).

Writing scientific papers is a fundamental requirement in Kurdistan educational system that must be fulfilled to receive a scientific degree. The purpose of scientific papers, which are expository texts, is to convey new information or discoveries in various domains, including biology, engineering, chemistry, and other scientific fields. The most fundamental section of any scientific paper, and one that should be composed in a way that captivates the reader's interest, is the abstract. According to Tovar-Viera (2019), an abstract is the most important part, as it should summarize the essential content of a particular knowledge record and serve as a true surrogate of the document. When a researcher writes a scientific paper, the abstract should contain the most essential information about the study, including the aim, methodology, and results (Vega Garrido, 2018). So, a well-written abstract is one that is written objectively and in detail.

The study aims to identify the most commonly used type of sentence structure in scientific papers authored by Kurdish researchers, to compare the use of sentence structures between male and female Kurdish researchers, to investigate the impact of gender on the choice of sentence structures in scientific abstracts, and to further understand sentence complexity and gender-based writing styles in scientific discourse. Therefore, the study tries to answer the following questions:

1. What is the predominant sentence structure type utilized by Kurdish researchers in their scientific abstracts?
2. How do male and female researchers share the same ranking in sentence structure usage?
3. Are there any significant differences between male and female Kurdish researchers in their use of sentence structures in scientific abstracts?

## 2. LITERATURE REVIEW

One of the significant components of a text's structure is the length and the genre because this is how the message of a text is conveyed to the reader clearly and effectively. For example, in an argumentative text, using simple sentences would not be effective in delivering the message because an argument needs a more detailed explanation of facts and concepts. So, in this case, authors can make use of complex sentence structure when trying to give more detailed information about facts and concepts (Hidayah et al., 2024, Burhanuddin, 2020). To make any piece of writing even more effective and engaging, authors can utilize a variety of sentence types, rather than relying on just one type of sentence (Hidayah et al., 2024).

Learning sentence structures is one of key elements that enables the writer to convey ideas in a meaningful manner. There are many definitions of sentence. Scholars like Saragih and Hutajulu (2020), describe sentence as "a group of words that conveys one or more ideas, with a clause expressing each of these ideas." Sari et al. (2019) point out that "a sentence is a grammatical unit having a grammatically complete statement". They believe that a sentence is not just a group of words connected randomly, but they are connected through grammatical rules. This network is referred to as structure.

Additionally, Umriyah (2018) states that a group of words is connected to create a sentence, and writing any text requires some sentences to form a paragraph. To form any paragraph, it is essential to employ different sentence types that are correctly punctuated.

A sentence is a group of words that is connected through grammatical rules and conveys a complete thought and meaning. Each sentence type has its own distinct structure, which is important for grammar. So, understanding the basic types of sentences in English, as mentioned by Oshima (2006), can enhance one's writing style. It means that a text is considered effective and well-written when all types of sentences are used because writings that rely on only a single type of sentence may not convey the intended message.

### 2.1. Types of Sentence Structure:

The building blocks of English communication are sentence structures. They provide a framework that arranges ideas and thoughts, and conveys meaning in a clear and comprehensible manner. Sentences are put into two different groups: sentence types according to function and sentence types according to structure, as reported by Frank (1972). Based on function, sentences are classified into four types: declarative, interrogative, exclamatory, and imperative sentences. Each one of them has their own function, like to inform, inquire, command, or express feelings. However, when it comes to the structure of sentences, which is the focus of this study, sentences are categorized as *simple*, *compound*, *complex*, and *compound-complex sentences*. Depending on the clause type and number, sentences can be classified into their structure (Dharmawati and Mulyadi, 2021). When there is only one independent clause, it is referred to as a simple sentence. And that independent clause is the clause that can stand alone without depending on another clause to make the sentence a complete thought. It is also defined as a group of words that express a complete thought and include a subject and verb (Graves and Graves, 2011). The subject and the predicate of a simple sentence can be either simple or compound (Fasano, 2015). A second type, which is a compound sentence, is composed of two independent clauses that are connected by coordinating conjunctions, such as FANBOYS: *and*, *but*, *or*, *for*, *yet*, *so*.

Thirdly, a sentence that has one independent clause and a subordinating clause is called a complex sentence. The primary characteristic of complex sentences is the presence of two or more main verbs. These verbs allow the writer or speaker to deliver more than one idea in a single sentence (Paul, 1981). To form this type of sentence, it is essential to use subordinating conjunctions like *because, although, if, though, unless, while, when,....etc.* The last one is a compound-complex sentence, which, according to Indriyani and Said (2022), is a sentence composed of at least two main clauses and one subordinating clause. In other words, a compound-complex sentence is a sentence that has the features of a compound sentence and a complex sentence through the use of coordinating and subordinating conjunctions.

## 2.2. Finite and Non-Finite Clauses:

A clause is described by Zulyanputri and Mahdi (2020) and Helmie et al. (2022) as a group of words that contains a subject and a predicate. Helmie et al. state that if the syntactic units are ranked from the highest to the lowest, a sentence would rank first since it is the highest syntactic unit, followed by a clause, then a phrase, which is the lowest. An important point to mention is that a clause can also be referred to as a sentence when it conveys a complete thought, but when it is a dependent clause, then it is considered to be a lower syntactic unit than a sentence. An example (1) of an independent clause, like *"She runs quickly."* can also be called a sentence since it has a complete thought consisting of a subject *"she"*, verb *"runs"*, and adverb of manner *"quickly"*. However, a clause that cannot function on its own is referred to as a dependent clause. For example (2), *"unless the rain stops by noon."* (Zulyanputri and Mahdi, 2020). This clause is not a sentence because it doesn't make sense; i.e., it requires another clause (independent clause) to complete it. For example (3): *"We won't be able to play unless the rain stops by noon"*

In the same regard, Brinton (2000) states that a clause can be classified as finite or non-finite. A finite clause can be either dependent or independent. It has a subject and a verb. The verb of a finite clause should show tense and agree with the subject of the clause in terms of number and tense. For example (4), *"The sun is shining."* is a finite clause that can function on its own. While (5) *"He typed a letter while at the same time making very few typos."* Consists of an independent and a dependent finite clause. Unlike the finite clause, a non-finite clause doesn't express a complete thought, and it is always dependent. Besides, the verb of a non-finite clause doesn't contain a visible subject or a verb that shows tense, number, or person, and it doesn't have a visible subject (Ibid).

According to Brinton (2020), there are four types of non-finite clauses:

1. Use bare infinitives, such as (6) *"the teacher made me do*

*it."*

2. The to-infinitive form of the verb is formed by adding the base form. For example (7), *"I'd like to offer you a present."*

3. Gerund refers to the present participle (-ing form) of the verb. For example (8), *"he ceased working there for a year."*

4. Use the past participle (*ed, en, etc.*) form of the verb. For example (9), *"the book provided to him was really useful."*

## 2.3. Related Researches

There are many studies on sentence type, sentence structures, or sentence complexity. Each study is conducted on different groups, in various contexts, and with different texts. These studies offer important insights into the utilization of sentence types and complexity, as well as the effects of genre, gender, and proficiency on linguistic choices. For example, in 2018 a study conducted by Putrayasa et al. (2018) "The Types of Sentences in the Essays of Grade VI Elementary School Students in Bali Province: A Syntactic Study". Their aim is to describe the types of sentences used in essays written by students of VI grade. The participants in their study are non-native speakers of English language, aged 11-12. Their analysis reveals that 1035 sentences used by the students and all these sentences are declarative sentences. Based on the number of clauses, 510 of these sentences are simple sentences, 520 of them are compound sentences, and five sentences not including both; 876 included verbal sentences, 159 nominal sentences; 798 were classified as active, and 237 passive sentences. According to this result, it is suggested to the students to pay attention always to the type of sentence in writing essay for the effectiveness of the ideas conveyed.

The other research that has been carried out in the same year is a comparative study "Syntactic Complexity in EFL and Native Learners Undergraduate Thesis Abstracts" by Murniati (2018), the aim is to find the syntactic complexity used by undergraduate students in their abstracts. It is a comparative study between university learners in Indonesia and native English speakers at the university. She finds that the Indonesian learners tend to write more complex sentences. In comparison, the native speakers tend to write longer sentences with longer T-Units and clauses. They also tend to write complex nominal in the abstracts. The number of coordination used is similar between those written down by Indonesian learners and native speakers of English. It means that compared to native speakers, Indonesian students write longer abstracts with more sentences. It is also evident from the abstracts of the Indonesian students that they employ more dependent clauses.

Two researchers that have conducted a gender-based study in 2020 are Saragih and Hutajulu. Their article is "Types of Sentences Used by Male and Female Writers in

Journal Article Abstracts". They examine 20 abstracts to find if gender has an effect on the use of sentence structure types. They discovered that the most regularly used type of sentence is simple sentences, followed by the complex sentence, and compound and compound-complex sentences are the least commonly used varieties. The rankings of sentence structure usage by both groups differ; i.e., they do not show the same rankings in using sentence types. They also concluded that there are no significant differences between the groups in their use of these sentences.

Additionally, the study by Suhendra et al. (2022) titled "The Syntactic Analysis of Sentence Structure in the Hobbit: An Expected Journey", attempt to examine the sentence structure types in each stage of the plot in "The Hobbit: An Unexpected Journey." Through a mixed-methods approach, the authors identify 1298 sentences in the movies, revealing that all types of sentence structure are employed, with simple sentences being the dominant type and compound-complex sentences the least used. Their study concludes that the movie uses a variety of sentences in each stage of plot, and that is to make it more interesting and easier to understand for the viewers of the movie.

In the same vein, Mubshirah et al. (2023) analyzes the types of sentence complexity in the thesis abstracts of UIN Ar-Raniry Banda Aceh students and the level of sentence complexity used in scientific papers by students of UIN Ar-Raniry Banda Aceh. The study concludes that all types of sentence structure are used with complex sentences being the most dominant and compound-complex sentences the least used type; i.e., it shows the students' capability in using a variety of sentence structures.

Another research article that studies student's writing skills is entitled "Analysis of Sentence Types in Affecting College Students' Writing Skill" and is conducted by Hidayah et al. (2024). They examine writing skills of seventh-semester in using sentence structure types. Their aim is to identify the most common sentence structure type, determine the sentence forms, and analyze the factors that affect their writing. They find that students mostly use simple sentences because they are easier to construct, it is also found that the students have difficulty in using other sentence structure types. The reasons for these results are: (1) students' lack of motivation to learn, (2) their lack of confidence, and (3) the classroom environment.

Although the studies above examined sentence structures in students' essays, novels, and abstracts from different linguistic backgrounds, this study focuses on analyzing scientific abstracts written in English by Kurds. This population hasn't been extensively studied before. The focal point of this research is the comparison between the two genders in using sentence structures in their scientific writing, rather than in students' writing or

general literature.

### 3. RESEARCH METHODOLOGY:

This section describes the detailed information about the participants of the study, the data, the procedures used to collect and analyses the data, and the model of analysis:

#### 3.1. Participants

To obtain the data of this study, the researcher employed a Mixed-methods approach, combining qualitative and quantitative methods. It aims to determine the frequencies of sentence structure types used in the selected scientific abstracts in the field of physics, biology, chemistry, engineering...etc. It also investigates whether there are significant differences between males and females in their use of sentence structure types in their abstracts. Kurdish researchers who publish their research articles in English are the subject of the investigation. Therefore, the researchers of this study employ a purposive sampling technique to ensure equal gender representation; out of the 50 scientific abstracts, 25 are written by females, and the remaining 25 are written by males. It is also worth noting that all the studies are peer-reviewed scientific abstracts and are accessible via academic databases.

The researchers identify and classify sentences according to the theory of Laurel J. Brinton (2000), utilizing the UAM Corpus Tool 3 (Universidad Autonoma de Madrid), a specialized software for linguistic annotation and analysis. This tool facilitated the identification and classification of sentence structures in the abstracts. Sentences were manually annotated and categorized into four types—simple, compound, complex, and compound-complex—based on Laurel J. Brinton's theory of sentence structure.

#### 3.2. Procedures

The researchers in this study follow specific steps to analyse the abstracts. First, they prepare the abstracts for analysis using the UAM Corpus Tool 3 to identify and mark the sentences within each abstract. Based on Brinton's theoretical framework, each abstract is classified into simple, compound, complex, and compound-complex sentences. After that, the frequencies of sentence types are calculated for the overall corpus, male researcher sub-corpus, and female researcher sub-corpus. To answer the second question regarding the differences between male and female researchers in sentence structure use, the data are analysed using a two-way analysis of variance (two-way ANOVA) with SPSS, version 9.3.1. The results are expressed as means  $\pm$  SD, and values are considered statistically significant at  $P \leq 0.5$ . The Dunkin test is used to compare different groups. Specifically, means that share at least one common letter



are not considered significant, whereas means that differ in letters are deemed significantly different.

More importantly, the study relies on publicly accessible scientific abstracts. Full acknowledgment of the authors' work is ensured to maintain academic integrity. No personal information of the authors is used or disclosed.

### 3.3. Model of Analysis

This study uses tree diagram to analyze the syntactic structure of the sentences, following the rules of Generative Grammar, particularly as outlined by Chomsky (1995), where syntactic representation is key to explaining language users' competence. Tree diagram is widely employed in several linguistic studies. They are useful in such studies as they visually represent the hierarchical relationships among sentence constituents, making it possible to analyze the structure at the phrase and clause levels (Radford, 2004). It breaks down a sentence into its syntactic components, like noun phrases (NP), verb phrases (VP), and complementizer phrases (CP), which clarify the grammatical functions of each constituent. Carnie (2013) reports that tree diagrams provide a framework based on phrase structure rules, which determine how a group of words are combined to form larger units (sentence). By applying these rules, the study shows sentences in a hierarchical branching structure exhibiting both dominance and constituency relationships. This kind of analysis not only demonstrates how words are put together in a sentence, but it further reveals patterns of modification, subordination, and coordination.

## 4. DATA ANALYSIS AND RESULTS:

As previously stated, this study focuses on identifying the most frequently used sentence structure type in scientific abstracts authored by Kurdish researchers and examining whether there are any significant differences in the use of sentence structure types between male and female researchers. After collecting 50 scientific abstracts, 25 of which were written by males and 25 by females, the researcher found 425 sentences, with 210 written by females and 215 by males.

After annotating and classifying the abstracts using the UAM Corpus Tool 3 and SPSS, the researcher answers the research questions as shown in the table 1. Firstly, Table 1 provides the answer to the study's first question regarding the most dominant sentence structure used in the abstracts by Kurdish researchers, regardless of gender. Secondly, it shows that all types of sentence structure are used, but with different frequencies; i.e., the most dominant one is complex sentences, which account for 54.59%, while compound sentences account for only 5.18%, which is the least used type.

**Table 1**

The Ranking and Distribution of Sentence Structure Types Used in Scientific Abstracts by Both Genders.

Sentence Structure Types	No.	%
Simple	129	30.35
Compound	22	5.18
Complex	232	54.59
compound-complex	42	9.88
Total	425	100%

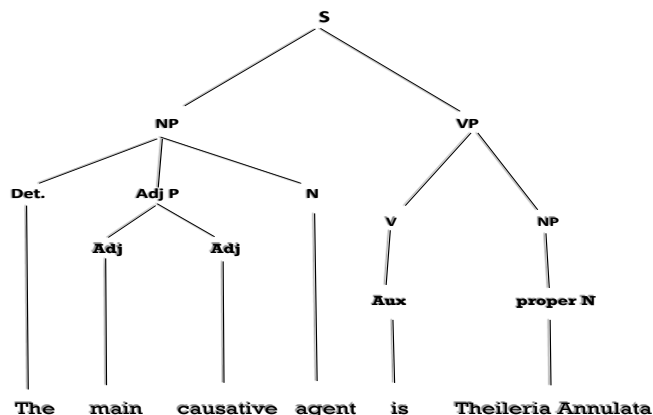
To provide a deeper understanding of how sentence structure types are constructed, the researcher employs Noam Chomsky's "Transformational Generative Grammar" theory to analyse examples of sentence structures extracted from scientific abstracts written by Kurdish researchers. Purnomoadjie and Mulyadi (2019) define transformational generative grammar as a grammatical theory that describes how languages are formed. It is set of grammar rules that are utilized to create new sentences from the existing one. A tree diagram displays the relationship between these sentences elements that are structured hierarchically. These rules are the basis of transformational-generative grammar and have been widely used in modern syntactic analysis (Radford, 2004; Carnie, 2013). The primary rules can be formulated as follows:

1.  $S \rightarrow NP (Aux) VP$
2.  $NP \rightarrow \{Det (Adj) N, Pro, N (PP)\}$
3.  $VP \rightarrow V (NP) (PP)$
4.  $PP \rightarrow P (NP)$
5.  $AP \rightarrow A (PP)$

The analysis is as follows:

### 1. Simple Sentence

Figure 1 presents the tree diagram of a simple sentence which shows how the simple sentence is structured:



**Fig.1. Tree Diagram of a Simple Sentence**

On the tree diagram in Figure 1, the subject of the sentence is "the main causative agent", "is" is a predicate, and "Theileria Annulata" is a subject complement. "the" is a

determiner, "main causative" is an adjective phrase which consists of two adjectives: the premodifier adjective "main" with the head adjective "Causative" and "Agent" is a noun that is combined into a noun phrase. "Is" is a verb which is a part of the verb phrase. "Theileria Annulata" is a proper noun and part of the noun phrase. This sentence is considered simple because it only has one independent clause.

## 2. Compound Sentence

As it is presented in Figure 2, the sentence analyzed through tree diagram is a compound sentence.

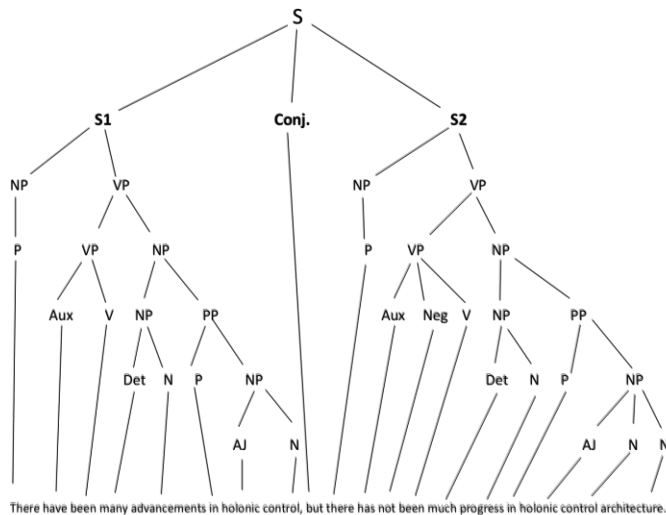


Fig.2. Tree diagram of Compound Sentence

It contains many elements. "there" is a subject, "have been" is a predicate, "many advancements in holonic control" is a subject complement, "But" as a conjunction, "there" is a subject, "has not been" is a predicate, "much progress in holonic control architecture" is a complement. "there" is a dummy pronoun and part of a noun phrase. "have" is a perfect auxiliary, "been" is a verb combined into a verb phrase. "many" is a determiner, and "advancements" is a noun combined into a noun phrase. "in" is a preposition, "holonic" is an adjective and "control" is a noun combined into a prepositional phrase. "But" is a coordinating conjunction. "there" is a demonstrative pronoun and part of a noun phrase. "has" is an auxiliary, "not" is negation and "been" is a verb combined into a verb phrase. "much" is a "quantifier" determiner, and "progress" is a noun combined into a noun phrase. "in" is a preposition, "holonic" is an adjective and "control architecture" is a noun that is combined into the prepositional phrase. Since this sentence has two subordinating clauses connected via "but", it is said to be a compound sentence.

## 3. Complex Sentence

Figure 3 illustrates the tree diagram of a complex sentence. It presents the way the complex sentence is structured.

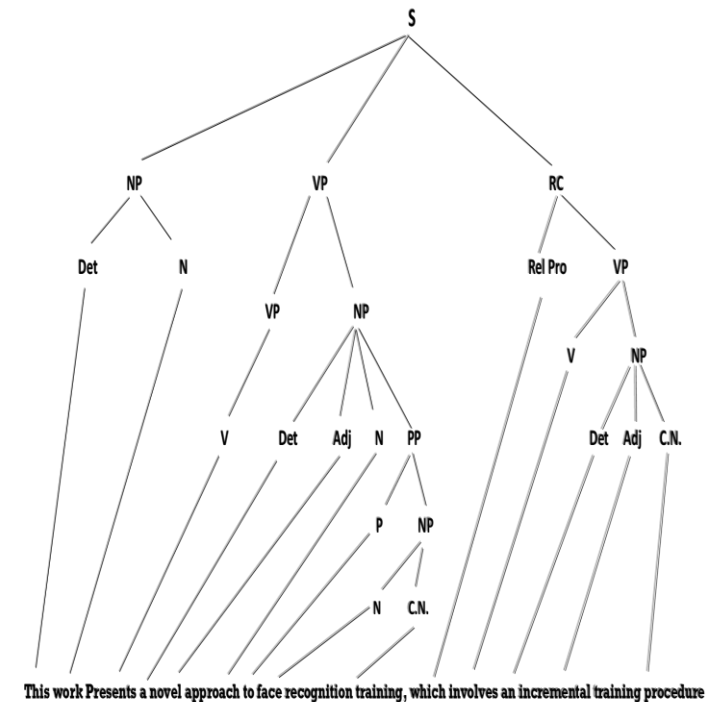


Fig.3. Tree Diagram of a Complex Sentence

As it is shown in figure 3, "This work presents a novel approach to face recognition training" is an independent clause in the tree diagram. "which involves an incremental training procedure" is a dependent clause. The first clause, "This work" is a subject, "presents" is a predicate, and "a novel approach to face recognition training" is an object. The second clause, "which," is a conjunction, "involves" is a predicate, and "an incremental training procedure" is an object. "This" is a determiner, "work" is a noun combined into a noun phrase. "presents" is a verb and part of a verb phrase. "A" is an article, "novel" is an adjective, and "approach" is a noun combined into a noun phrase. "to" is a preposition, "face" is a noun, "recognition training" is a compound noun combined into the prepositional phrase. "which" is a subordinating conjunction. "involves" is a verb and part of a verb phrase. "an" is an "article", "incremental" is an adjective, and "training procedure" is a compound noun combined into a noun phrase.

#### 4. Compound-Complex Sentence

As it can be seen in Figure 4 shows the tree diagram for a compound-complex sentence.

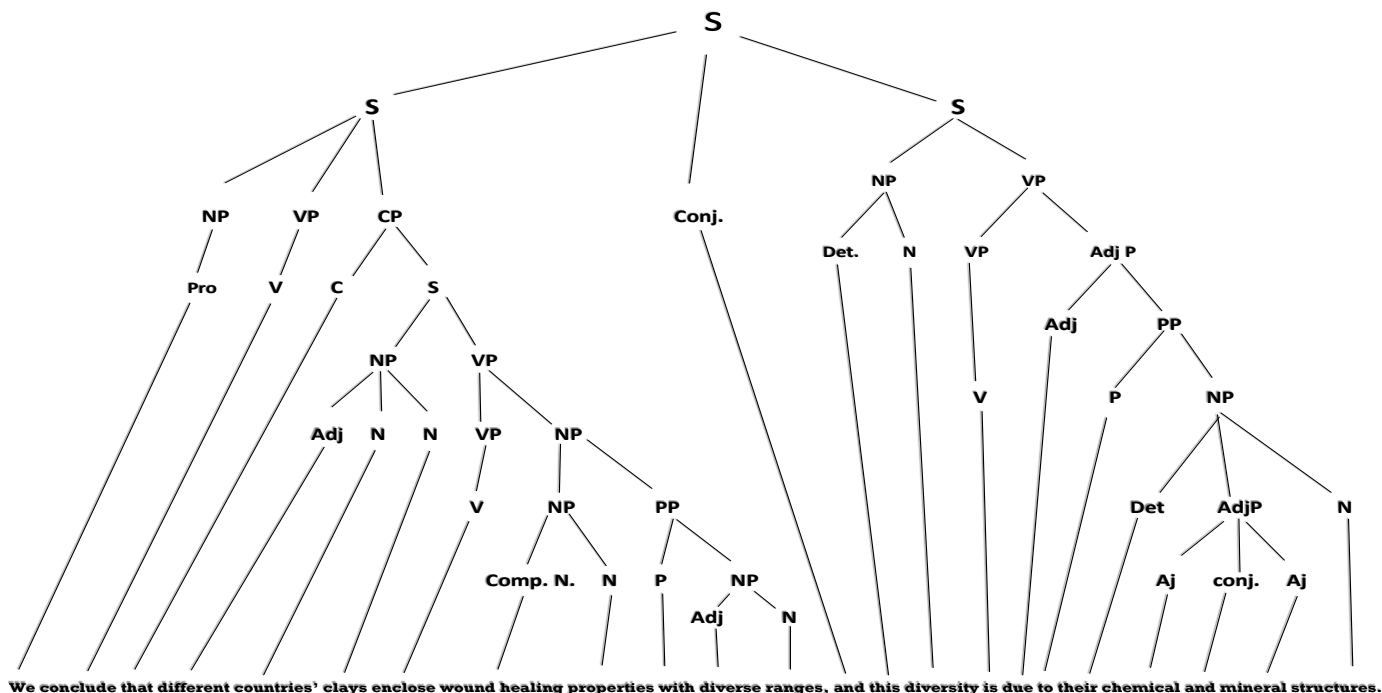


Fig.4. Tree diagram of a Compound-Complex Sentence

The sentence has three clauses, one dependent and two independent clauses combined by coordinating conjunction "and" and subordinating conjunction "that". "we conclude" is an independent clause. "that different countries' clays enclose wound healing properties with diverse ranges" is a dependent clause. "this diversity is due to their chemical and mineral structures" is an independent clause. The first clause, "we" is the subject, and "conclude" is the predicate. "We" is a pronoun and part of a noun phrase. "conclude" is a verb and part of a verb phrase. The second clause, "that " is a conjunction. "Different countries' clays" is a subject, "enclose" is a predicate, and "would healing properties with diverse ranges" is an object. "that" is a subordinating conjunction. "different" is an adjective, "countries's" is a noun, and "clays" is a noun combined into a noun phrase. "enclose" is a verb and part of a verb phrase. "wound healing" is a compound noun, and "properties" is a noun combined into a noun phrase. "With" is a preposition, "diverse" is an adjective, and "ranges" is a noun that is combined into a prepositional phrase. The third clause, "and " is a conjunction, "this diversity" is a subject, "Is" is a predicate, and " due to their chemical and mineral structures " is a complement. "This" is a determiner, "diversity" is a noun that is combined into a noun phrase. "Is" is a verb and part of a verb phrase. "due" is an adjective and part of an adjective phrase. "to" is a preposition, "their" is a possessive determiner, "chemical and mineral" is a

compound noun, and "structures" is a noun which is combined into the prepositional phrase.

Table 2

The Distribution of Sentence Structure Types by Male and Female in Their Scientific Abstracts

Sentence Structure Types	Male/ No.	%	Female/ No.	%
Simple	62	28.8	67	31.90
Compound	5	2.3	17	8.10
Complex	130	60.5	102	48.57
Compound-complex	18	8.4	24	11.43
Total	215	100%	210	100%

Table 2 shows the answer to the second research question. As presented, the results for female authors parallel those for male authors, which show the same order of sentence structure type use. The two groups use almost the same number of sentences: 215 for men and 210 for women with complex sentences ranking first, followed by simple sentences, then compound-complex sentences, and finally, compound sentences. The dominance of complex sentences in both males (130 sentences, 60.5%) and females (102 sentences, 48.57%) suggests that both groups rely heavily on complex sentences to express their ideas. Then, simple sentences, which rank second in frequency, appear 62 times (28.8%) in males and 67 times (31.90%) in females. However, compound (2.3% by males and 8.10%

by females) and compound-complex (8.4% by males, and 11.43%) sentences are the least frequent types of structure in both groups.

To answer the third question of the study, the researchers use SPSS to examine the differences between the writers of the abstracts, specifically males and females, in their use of sentence structure types. The statistical analysis confirms the earlier finding that both genders employ the same ranking patterns in their abstracts. As Table 3 illustrates, there are statistically significant differences in the frequency of certain types of sentence structures.

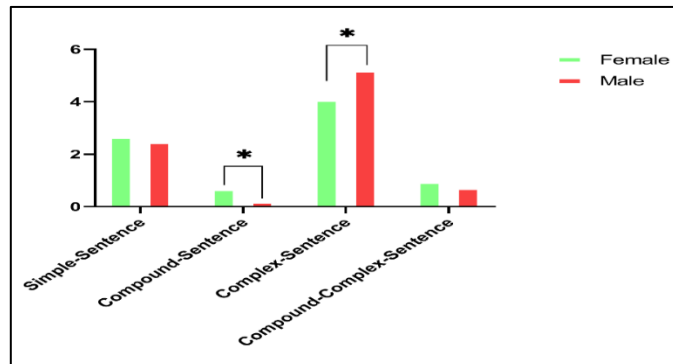


Fig. 5: Sentence Structure Usage Comparison between Male and Female Researchers in scientific Research Abstracts

Figure 5 visually provides the comparison of sentence structure utilization between female and male authors in scientific abstracts. It clearly shows the differences between male and females in using complex and compound sentence. And table 3 provides the detailed statistical values like mean scores and the letters that show if there are differences between the groups or not.

Table 3

Statistical Analysis of Sentence Structure usage in Research Abstracts by Male and Female researchers

Sentence Structure Types	Female	Male
Simple	2.68± 1.43a	2.48± 1.63a
Compound	0.68± 0.48b	0.20±0.17c
Complex	4.08± 1.84d	5.2±1.91fe
Compound-Complex	0.96± 0.97a	0.72± 1.13a

Values are means± SD of Types of Sentences for each group. Comparisons are between the columns of the same row, and there are no comparison relationships between the rows of the table. The similar letter indicates non-significance, and the different letter indicates significance.

Starting with the first type of sentence structure, because the mean score of females ( $2.68 \pm 1.43$ ) and males ( $2.48 \pm 1.63$ ) have the same significance letter (a) for simple sentence usage, it suggests both groups use simple sentences equally, since it doesn't reveal any significant differences. The same is true for compound-complex sentences, as indicated by the means for males ( $0.72 \pm 1.13$ ) and females ( $0.96 \pm 0.97$ ), which share the same significance letter (a). So, it can be said that both groups,

male and female authors, use simple sentences and compound-complex sentences at similar rates.

Nonetheless, significant differences are evident between compound and complex sentences. For compound sentences, female authors have a higher mean ( $0.68 \pm 0.48$ ) than male authors ( $0.20 \pm 0.17$ ), with different significance letters (b vs. c). On the contrary, for complex sentences, male authors have a significantly higher mean score ( $5.20 \pm 1.91$ ) compared to females ( $4.08 \pm 1.84$ ).

The results shown above demonstrate that, although both genders share the same overall ranking in using sentence structure types, there are significant gender-based differences in their preferences for compound and complex sentences.

## 5. DISCUSSION OF THE RESULTS

This study aims to address three research questions. Firstly, it seeks to answer the following question: What is the predominant sentence structure employed by Kurdish researchers in their scientific abstracts? The results show that all types of sentence structure are used, but with different frequencies; i.e., the most dominant type is complex sentences, which account for 54.59%, while compound sentences account for only 5.18%, which is the least used type. This result differs from that of Suhendra et al. (2022); Putrayasa et al. (2018); and Saragih and Hutajulu (2020) in that they all found simple sentences to be the predominant kind of sentence structure, while complex or compound-complex sentences are the least.

Secondly, regarding to the question: How do male and female researchers share the same ranking in sentence structure usage?

The results show that both males and females demonstrate the same ranking in sentence structure usage; i.e., in both groups, complex sentences rank first in frequency, followed by simple sentences, then compound-complex sentences, and finally, compound sentences. Again, this result contrasts with Saragih and Hutajulu (2020), who determined that males and females do not demonstrate identical rankings in sentence structure usage.

The frequent use of complex sentence utilization in both groups confirms that they rely extensively on complex sentences to deliver their ideas and thoughts effectively. This might be due to the limitations of abstracts in terms of word count, the effectiveness of complex sentences in conveying detailed information concisely, and the requirement of employing an effective writing style. Therefore, instead of using too many short sentences or simple sentences, which can make any piece of writing weak and overly simple, it is preferable to use a variety of sentence structures.



Lastly, the third question is: are there any significant differences between male and female Kurdish researchers in their use of sentence structures in scientific abstracts? The analysis confirmed a statistically significant association between author gender and the use of specific sentence structures. Female authors employed compound sentences, which utilize coordination to link ideas of equal importance at a significantly higher frequency than their male counterparts. Conversely, male authors demonstrated a greater propensity for complex sentences, using subordination to elaborate ideas, which consequently introduced greater syntactic depth into their abstracts.

## 6. CONCLUSIONS

This study underscores the significance of syntactic complexity in English-Language scientific writing of Kurdish researchers, putting emphasis on the predominant role of complex sentence structure in formal scientific discourses. The analysis clearly reveals how gender has an impact on syntactic choice in subtle yet meaningful ways, indicating varying style preferences within a shared academic context. Overall, the constant use of complex sentence structure shows that the researchers make deliberate efforts to communicate complicated ideas concisely and coherently. Although the study provides insightful information about linguistic patterns in English scientific Writing written by Kurdish researchers, its scope is limited by the sample size. It is therefore recommended that future studies employ a larger, more varied corpus to achieve a deeper linguistic interpretation and broader generalization.

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