

## Challenges of Syntactic Ambiguity in ESL Learners: A Case Study of QUEST Nawabshah

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### Abstract

*A syntactic ambiguity is confusion between the various meanings of the same linguistic unit on the basis of its structure. This research aimed at analyzing the problems that the syntactic ambiguity introduces to the ESL students as well as plotting out the significant causes of those problems. A qualitative research design was applied to an intermediate group of ESL learners who attended a language school and selected and reformulated 15 syntactically ambiguous sentences. The findings indicated that there were major issues, related to attachment of prepositional phrases, referencing of pronouns, comparative structures, infinitive/gerund ambiguity, coordinated noun groups, and ambiguity of time. The main problems were hyper-dependence on the first language syntax, lack of adequate pedagogic exposure to complicated structures of English, and lack of metalinguistic awareness. Cognitive Load Theory (CLT) explained how ambiguous sentences tax working memory, rendering comprehension arduous. By addressing these problems, teachers can improve students' reading, writing, and communication skills, ultimately allowing them to succeed academically and professionally in English-medium environments.*

**Keywords:** Syntax, Ambiguity, Syntactic Ambiguity, Cognitive Load Theory (CLT)

### 1. Introduction

#### 1.1 Background of the Study

A root cause of syntactic ambiguity is when a sentence or sequence of words can be interpreted using multiple parsing rules based on the structure of the sentence (Dussias, 2003). Another potential issue in English, even in simple sentences such as “I saw the man with the telescope,” is the ambiguity of the telescope owner between the speaker and the man (Ellis, 2008). Comprehending and writing well-formed sentences take good syntactic knowledge, which is a key feature of mastering any language (Jegerski, 2018; Jiang, 2017). For learners of English as a second language (ESL), handling syntactic ambiguity is particularly problematic (Richards & Schmidt, 2010). ESL students tend to have difficulty interpreting multi-meaning sentences correctly, and this can result in misunderstandings not only in academic contexts but also in everyday communication (Lightbown & Spada, 2013). Due to the fact that the rules of syntax may vary a lot among languages, ESL students occasionally resort to native language patterns, thus making them susceptible to mistakes when English sentences are ambiguous (Odlin, 1989). The syntactic ambiguity problem is greatly significant as it not only impacts reading comprehension but also writing clarity and oral

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communication (Pullum & Huddleston, 2002). Most ESL students have a problem parsing sentences appropriately, and this can hinder their general language growth and academic performance (Ellis, 2008). Students also misinterpret sentences due to ambiguities, which leads to serious miscommunication and frustration in real life (Cook 2016).

### **1.2 Statement of the Problem**

Syntactic ambiguity makes most ESL students excruciatingly unable to interpret and produce sentences correctly and it can easily lead to miscommunication and learning difficulties. It is a highly valuable issue but not much research has been conducted regarding the way in which syntactic ambiguity will directly affect the overall understanding and expression of ESL learners. The proposed research will establish the overall challenges that ESL students encounter due to the syntactic ambiguity.

### **1.3 Research Gap**

Most of the researches have been done on the syntactic ambiguity resolution in the native speakers (Tanenhaus et al., 1995) and not much has been done on how the ESL learners process such sentences (White, 2003). *L1 transfer and proficiency level affect ESL learners' resolution of syntactic ambiguity* (Aldosari, 2021). Research that has been conducted has generally looked at lexical rather than syntactic ambiguity (Jegerski, 2018; Roberts & Felser, 2019), and much remains to be learned about structural processing difficulties in second language acquisition.

In addition, much ambiguity resolution research has been carried out in controlled lab environments instead of real-world classroom settings (VanPatten & Williams, 2015). There is scant empirical research concerning which syntactic ambiguity types create the most challenge for learners of varying proficiency levels, or in what way challenges differ among learners from various language backgrounds. The present study hopes to fill such gaps by exploring real-world comprehension challenges encountered by ESL students.

### **1.4 Significance of the Study**

For several reasons it is important to understand how ESL learners process syntactically ambiguous sentences. First, according to VanPatten (2004) ambiguity resolution is fundamental to achieving advanced proficiency in English. Second, misinterpretation of ambiguous structures can lead to communication breakdowns in academic and professional settings. Third, identifying specific problem areas can help educators develop targeted teaching strategies to improve students' parsing skills.

The study is particularly relevant in multilingual educational contexts where English is used as a medium of instruction. As the number of ESL learners continues to grow globally (British Council, 2022), there is an increasing need to understand and address their unique linguistic challenges.

### **1.5 Research Objectives**

- 1 To identify the types of syntactic ambiguity that are most difficult for ESL students to understand and interpret.
- 2 To analyze both the challenges and underlying causes of ESL students' difficulties with syntactic ambiguity.

## 1.6 Research Questions

1. What types of syntactic ambiguity are most difficult for ESL students?
2. What are the key challenges and underlying causes of ESL students' difficulties in understanding and interpreting syntactic ambiguity?

## 2. Literature Review

### 2.1 Theoretical Background on Syntax and Ambiguity

Syntax is the study of how words come together to form phrases and sentences in a language. It helps us understand the structure and meaning of sentences. Carnie (2013), stated that syntax gives us the rules for combining words correctly, and these rules are very important for making clear sentences. However, even if we follow these rules, sometimes a sentence can have more than one meaning. This is called syntactic ambiguity. Chomsky (1965) explained that a single sentence structure can be interpreted in different ways depending on how we group the words or phrases.

Lightbown and Spada (2013) and Roberts and Felser (2019) introduced the “Garden Path” model to explain how people process ambiguous sentences. According to their theory, readers often choose the simplest sentence structure first. If that structure turns out to be incorrect, they must go back and try again, which can cause confusion and slow down understanding. This is especially difficult for people learning English as a second language because they are not always familiar with complex sentence structures or common patterns of usage.

Wasow (2002) highlighted that syntactic ambiguity affects both native and non-native speakers. However, for ESL learners, it creates more serious challenges in understanding and communication because they are still learning how English sentence structures work. This is why studying syntax and how ambiguity happens is so important in second language learning.

### 2.2 Types of Syntactic Ambiguity

Syntactic ambiguity can appear in different forms, and each type can cause confusion for ESL learners. The broadest form is structural ambiguity, which happens when a sentence has more than one possible structure. For example, in the sentence “I saw the man with the telescope,” it is unclear whether the speaker used the telescope or the man had it (Tanaka, 2015). This is a common subtype called attachment ambiguity, where we are unsure which part of the sentence a phrase belongs to. For example, “She hit the man with the umbrella” can mean that she used the umbrella or the man had it (Brown, 2014). Carreiras and Clifton (1993) explain that native speakers use context and experience to resolve these ambiguities, but ESL learners may not have enough exposure to do this easily. Working memory and reading skills affect ambiguity resolution (Dong & Lin, 2020).

A third form is coordination ambiguity, where two or more elements in a sentence are not clearly connected. For instance, “I saw the dog and the cat ran” may mean that both animals were seen or that the dog was seen and the cat ran. Pullum and Huddleston (2002) and Levy (2008) describe that such ambiguity occurs more frequently in spoken language, since there are no commas or punctuation to guide the listener. For ESL learners, understanding this type of ambiguity is especially difficult during fast or casual speech.

### 2.3 Past Research on Ambiguity and ESL Acquisition

There have been studies proving that syntactic ambiguity produces significant issues in ESL learners. Tanaka and Abe (2015) ascertained that numerous learners place attention on meaning in words and sentence structure over whole sentence formation, resulting in misunderstanding ambiguous sentences. Chen (2008), in another experiment, noticed ESL learners guess a sentence's meaning through main keywords, resulting in misunderstanding when it comes to word order being unfamiliar.

Juffs and Harrington (1996) investigated ESL learners' handling of prepositional phrase attachment ambiguity. They discovered that ESL learners committed more errors than native speakers and had greater difficulty knowing which meaning was appropriate. Dussias (2003) also discovered that second language learners take longer to process ambiguous sentences and are more likely to fall back on the sentence patterns of their first language. This type of language transfer can lead to additional confusion and misinterpretation.

Odlin (1989) described that the students tend to use the native language rules to read or hear English, particularly when the sentence is complex or ambiguous. Sometimes, this cross-over from the first language helps, but syntactic ambiguity, more often than not, generates errors.

### 2.4 Instruction and Exposure to Ambiguity

We know that instruction and practice can improve ESL students' understanding and management of syntactic ambiguity. VanPatten (2004) proposed the concept of "processing instruction," which guides learners to pay attention to how sentences are structured and how to accurately interpret them. His studies indicated that such instruction as instructing learners to search for sentence structure and ambiguity improved their reading and listening skills.

Ellis (2006) also found that explicit teaching of grammar and sentence patterns can improve learners' ability to deal with ambiguity. He suggested that teachers should use real examples of ambiguous sentences in the classroom to help students practice resolving them. Long (1996) supported this idea and explains that exposure to real-world English—such as movies, books, and conversations—helps learners develop better understanding of sentence structure and meaning.

Chen (2013) **highlighted** that while many studies focus on lexical ambiguity (word meaning), not enough attention has been given to syntactic ambiguity. This is a serious gap because sentence structure plays a big role in comprehension. Lightbown and Spada (2013) agreed that teaching grammar alone is not enough—students must also be trained to recognize and understand ambiguous sentence structures.

Last but not least, Cook (2016) observed that syntactic ambiguity triggered by miscommunication can undermine learners' confidence and result in frustration. When learners are unclear about what the other person said or wrote, they might become embarrassed or discouraged, particularly in scholarly or working environments. This indicates that assisting students with handling ambiguity is not only a matter of grammar, but also comes under the rubric of supporting their general language progress.

## 2.5 Theoretical Framework: Cognitive Load Theory

The present research embraces Cognitive Load Theory (CLT), first mooted by John Sweller (1988), as a theoretical framework to comprehend the challenges faced by ESL (English as a Second Language) learners in the processing of syntactically ambiguous sentences. CLT, as refined by Sweller et al. (2019), emphasizes that human working memory is highly limited in terms of capacity and duration. CLT continues to guide instructional design for complex input (Chen, Kalyuga, & Sweller, 2020). Learners who are exposed to information that is complex, new, or ill-structured are likely to have their cognitive resources overloaded, leading to decreased comprehension and learning effectiveness. Digital feedback reduces cognitive load in ESL writing (Bai & Hu, 2022). CLT differentiates three categories of cognitive load as under:

**2.5.1 Intrinsic cognitive load** refers to the inherent difficulty of the material to be learned. Syntactic ambiguity in this study is an inherent challenge since learners must parse sentence structures permitting more than one interpretation.

**2.5.2 Extraneous cognitive load** is due to the manner in which information is presented. Ambiguous sentence structures—such as indefinite affixing of prepositional phrases or ambiguous pronoun reference—can increase this load by requiring learners to strive more to arrive at meaning that could have been made more clear.

**2.5.3 Germane cognitive load** pertains to the cognitive effort that goes into constructing and automating schema, or organized pools of knowledge. For ESL learners, it involves establishing cognitive representations of advanced sentence structures and applying them proficiently in language use.

Second language syntactic ambiguity puts a twofold cognitive load on the learner: not only do they need to learn new words and sentence patterns, but they also have to deal with structurally complex input that can yield more than one potential meaning. For example, when reading or hearing the sentence "The coach told the player that he was injured," the learner needs to ascertain whether "he" refers to the coach or the player. It requires working memory capacity to sustain and entertain the possibility of different meanings while at the same time trying to grasp the general meaning.

Also, syntactic ambiguity can hinder not just comprehension, but also production. When forced to generate explicit English sentences, learners in states of cognitive stress may simply not use complex structure at all, over-simplify their output, or produce sentences that are accidentally ambiguous. This shows how unfinished syntactic issues can influence receptive as well as productive language.

With CLT applied to this research, it emphasizes the fact that difficulties in syntactic ambiguity among ESL learners are not only a consequence of insufficient knowledge of grammar rules but also greatly influenced by processing limitations in the mind. On this basis, teaching syntactic ambiguity in ESL instruction involves, in addition to teaching rules of grammar, offloading unnecessary processing load, presenting structured input, and providing experience for repeated encounters and guided reinterpretation of uncertain structures. Finally, Cognitive Load Theory puts the emphasis on the control of mental effort during second language learning, especially in the context of dealing with intricate and unclear linguistic input.

### **3. Research Methodology**

#### **3.1 Research Design**

The study has used a qualitative research design, a textual analysis. The overall goal was to define and categorize the syntactic ambiguities detected in the written answers of ESL students and to reveal the misunderstanding issues and underline cause-and-effect factors which lead to the issue of misinterpretation. The method gave a detailed investigation of naturally occurring written data to identify the trends and problems that might otherwise be buried in spoken language tasks.

#### **3.2 Participants**

These were 15 ESL undergraduate programs at Quaid-e-Awam University of Engineering, Science and Technology (QUEST), Nawabshah, Sindh, Pakistan. Each of them had already studied the English language in at least two semesters at the Department of English. They belonged to different linguistic backgrounds and these included Urdu, Sindhi, Punjabi, and Pashto heritage and this gave them good insight of how the first language affects the processing of syntactic structures in the English language. The sample size was not very high (only 15 students) but this fact has to be taken as a limitation, of course, it permitted to get very specific qualitative information in terms of the research.

#### **3.3 Sampling**

Purposive sampling method was used to fulfill the criteria by selecting the students who had shown competence in English at an intermediate level as identified by placement tests or may be by the university designation. This is because it made sure that the learners would have enough exposure to the English language to interact effectively with the more complex sentential structures. The selection of the site where the data collection process will take place was decided as QUEST Nawabshah since the student population is quite diversified to reflect a diversity of regional languages and therefore the student population could serve as an ideal location to study the relationship between the gloves of first language and syntactic ambiguity in English.

#### **3.4 Data Collection Procedure**

Written Diagnostic Test: The participants were given a list of 15 syntactically confusing sentences and they were to: Comprehend every sentence, rewrite off in their own words, Mark out what parts they could not understand.

#### **3.5 Data Analysis**

Thematic and structural analysis approaches were applied: Thematic Analysis methodology of grounding the behavior and drawing patterns and reasons of misinterpretation were provided, i.e. the use of native language syntax or the low level of awareness towards the ambiguity of attachment, and references towards ambiguity of coordination.

### **4. Collected data**

#### **1. "The chicken is ready to eat."**

##### **Student 1:**

- **Interpretation:** The chicken is going to eat something.

- **Rewritten:** The cooked chicken is ready to be served.
- **Confusing Part:** Is the chicken eating or being eaten?

2. "She watched the man with the binoculars."

**Student 2:**

- **Interpretation:** She used binoculars to watch the man.
- **Rewritten:** Using binoculars, she watched the man.
- **Confusing Part:** Who has the binoculars—she or the man?

3. "The coach told the player that he was injured."

**Student 3:**

- **Interpretation:** The coach said that the player was injured.
- **Rewritten:** The coach told the player, "You are injured."
- **Confusing Part:** Who is injured—the coach or the player?

4. "The old men and women were seated."

**Student 4:**

- **Interpretation:** Old men and women sat down.
- **Rewritten:** The old men and the women were seated.
- **Confusing Part:** Is "old" describing both men and women or only the men?

5. "He saw the boy with the toy."

**Student 5:**

- **Interpretation:** The boy had the toy.
- **Rewritten:** He saw the boy who was holding a toy.
- **Confusing Part:** Who had the toy—he or the boy?

6. "Flying planes can be dangerous."

**Student 6:**

- **Interpretation:** Piloting planes is risky.
- **Rewritten:** It is dangerous to fly planes.
- **Confusing Part:** Are the planes flying, or is someone flying them?

**7. "The man chased the thief with a stick."**

**Student 7:**

- **Interpretation:** The man used a stick to chase the thief.
- **Rewritten:** The man, holding a stick, chased the thief.
- **Confusing Part:** Who has the stick—the man or the thief?

**8. "The spy saw the cop with the revolver."**

**Student 8:**

- **Interpretation:** The cop had the revolver.
- **Rewritten:** The spy saw that the cop was carrying a revolver.
- **Confusing Part:** Who has the revolver—the spy or the cop?

**9. "They are hunting dogs."**

**Student 9:**

- **Interpretation:** They are dogs used for hunting.
- **Rewritten:** Those dogs are trained for hunting.
- **Confusing Part:** Are the people hunting dogs or are the dogs for hunting?

**10. "I know more successful students than John."**

**Student 10:**

- **Interpretation:** I know more successful students than John does.
- **Rewritten:** I am familiar with more successful students than the number John knows.
- **Confusing Part:** Is it comparing the number of students or their success compared to John?

**11. "The girl hit the man with the umbrella."**

**Student 11:**

- **Interpretation:** The girl used the umbrella to hit the man.
- **Rewritten:** The girl struck the man using an umbrella.
- **Confusing Part:** Who has the umbrella—the girl or the man?

**12. "He told her that brother is annoying."**



**Student 12:**

- **Interpretation:** He said that her brother is annoying.
- **Rewritten:** He told her, "Your brother is annoying."
- **Confusing Part:** Is "her brother" the subject of the statement or the object being told?

**13. "The dog bit the man on the hill."**

**Student 13:**

- **Interpretation:** The dog bit the man who was standing on the hill.
- **Rewritten:** The dog bit the man who was on the hill.
- **Confusing Part:** Is the dog or the man on the hill?

**14. "He likes playing chess more than his brother."**

**Student 14:**

- **Interpretation:** He enjoys chess more than his brother does.
- **Rewritten:** He enjoys playing chess more than his brother enjoys it.
- **Confusing Part:** Is it about the person who plays more or who enjoys it more?

**15. "Mary said she would call her mother yesterday."**

**Student 15:**

- **Interpretation:** Mary said it yesterday, or the call was supposed to happen yesterday.
- **Rewritten:** Mary said (yesterday) that she would call her mother.
- **Confusing Part:** Does "yesterday" modify "said" or "would call"?

**5. Findings and Discussions**

**5.1 Thematic Analysis of Syntactic Ambiguity in ESL Student Responses**

***Theme 1: Prepositional Phrase Ambiguity***

**Sentences Involved:**

2. *She watched the man with the binoculars*
5. *He saw the boy with the toy*
7. *The man chased the thief with a stick*
8. *The spy saw the cop with the revolver*
11. *The girl hit the man with the umbrella*
13. *The dog bit the man on the hill*

**Observation:**

Many students were confused by prepositional phrases and their attachment—whether the phrase modifies the subject or the object. This ambiguity often arises due to the unclear position of modifiers in English syntax.

**Sub-theme:**

- Tool vs. possession: “with the umbrella/stick/revolver” may imply *who has it* or *what was used*.
- Locative ambiguity: “on the hill” leaves unclear whether the subject or object is located there.

**Theme 2: Pronoun Reference Ambiguity**

**Sentences Involved:**

3. *The coach told the player that he was injured*

12. *He told her that brother is annoying*

**Observation:**

Students struggled to resolve pronoun references ("he", "her") especially when two potential antecedents were present. This indicates a lack of context and difficulty with co-reference in sentence parsing.

**Sub-theme:**

- Ambiguity in pronoun antecedents when multiple nouns are present.
- Unclear reporting structure in embedded clauses.

**Theme 3: Comparative Ambiguity**

**Sentences Involved:**

10. *I know more successful students than John*

14. *He likes playing chess more than his brother*

**Observation:**

Comparative structures led to confusion about whether the comparison is about quantity (how many) or degree (how much/more skilled). The comparison's direction (subject or object) was also ambiguous.

**Sub-theme:**

- Students debated whether the speaker is more knowledgeable or if the comparison is between individuals' abilities or preferences.

**"Distinguishing Gerund/Infinitive vs. Lexical-Structural Ambiguity"**

While both Sentences 6 ("Flying planes can be dangerous") and 9 ("They are hunting dogs") involve *-ing* forms, they represent distinct ambiguity types. Sentence 6 exemplifies **purely structural (gerund/infinitive) ambiguity** (Theme 4): the ambiguity arises solely from whether "flying" functions as a *gerund* (the act of piloting) or a *modifier* (planes that are flying). No lexical shift occurs—"flying" retains its core

meaning. In contrast, Sentence 9 demonstrates **lexical-structural ambiguity** (Theme 5), where the word "hunting" carries *lexical duality*: it can be interpreted as a *verb* ("they are pursuing dogs") or an *adjective* ("they are dogs for hunting"). This lexical flexibility interacts with syntactic grouping, creating ambiguity that is both semantic (meaning of "hunting") and structural (grammatical role). Thus, Sentence 9 aligns with the hybrid "Lexical/Structural Ambiguity" classification noted in Theme 5.

#### ***Theme 4: Infinitive/Gerund Ambiguity***

##### **Sentences Involved:**

1. *The chicken is ready to eat*
6. *Flying planes can be dangerous*

##### **Observation:**

Students struggled with whether the noun phrase (e.g., "the chicken") is the *agent* (eater/pilot) or the *patient* (being eaten/flown). This reflects confusion over verb forms functioning as nouns and subjects.

##### **Sub-theme:**

- Passive vs. active interpretation of infinitive/gerund phrases.
- Agent-patient confusion due to verb nominalization.

#### ***Theme 5: Scope and Structural Ambiguity***

##### **Sentences Involved:**

4. *The old men and women were seated*
9. *They are hunting dogs*

##### **Observation:**

Students were unsure about how adjectives and nouns group together. In Sentence 4, "old" could apply to men only or both men and women. In Sentence 9, "hunting" could describe the action or be an adjective.

##### **Sub-theme:**

- Unclear grouping in coordinated noun phrases.
- Lexical ambiguity with participial adjectives vs. verbs.

#### ***Theme 6: Temporal Ambiguity***

##### **Sentence Involved:**

15. *Mary said she would call her mother yesterday*

##### **Observation:**

The confusion here was whether "yesterday" refers to the time of saying or the time of calling. This reveals difficulty in parsing adverbial modifiers with auxiliary verb phrases.

**Sub-theme:**

- Time reference ambiguity in indirect speech.
- Placement of temporal adverbs affects meaning.

**5.2 Summary of most difficult Syntactic Ambiguity Types****Table 1:** Types of Syntactic Ambiguity Challenging for ESL Learners

No.	Sentence	Type of Ambiguity	Explanation
1	The chicken is ready to eat.	Structural (Infinitival)	Ambiguity Is the chicken going to eat or is it ready to be eaten?
2	She watched the man with the binoculars.	Prepositional Attachment	Phrase Did she use binoculars or did the man have them?
3	The coach told the player that he was injured.	Pronoun Ambiguity	Reference Does "he" refer to the coach or the player?
4	The old men and women were seated.	Coordinating Ambiguity	Structure Are both men and women old, or only the men?
5	He saw the boy with the toy.	Prepositional Attachment	Phrase Did he have the toy or did the boy?
6	Flying planes can be dangerous.	Subject/Gerund Ambiguity	Is the act of flying dangerous or are flying planes dangerous?
7	The man chased the thief with a stick.	Prepositional Attachment	Phrase Did the man use a stick or did the thief have it?
8	The spy saw the cop with the revolver.	Prepositional Attachment	Phrase Who had the revolver — the spy or the cop?
9	They are hunting dogs.	Lexical/Structural Ambiguity	Are they dogs that hunt, or people hunting dogs?
10	I know more successful students than John.	Comparative Ambiguity	Do I know more than John knows, or more than John is successful?
11	The girl hit the man with the umbrella.	Prepositional Attachment	Phrase Did she use the umbrella or did the man have it?
12	He told her that brother is annoying.	Structural/Embedded Clause Ambiguity	Did he say "her brother is annoying" or inform her that someone is annoying?
13	The dog bit the man on the hill.	Prepositional Attachment	Phrase Was the dog on the hill or the man?
14	He likes playing chess more than his brother.	Comparative Ambiguity	Does he like playing chess more than his brother does, or more than his brother?
15	Mary said she would call her mother yesterday.	Temporal Ambiguity	Did she say it yesterday, or was the call supposed to happen yesterday?

### 5.3 Challenges, Underlying Causes, and Comparative Context

The syntactic ambiguity challenges identified among ESL students at QUEST Nawabshah not only mirror global trends in second language acquisition research but also highlight site-specific nuances rooted in the students' diverse linguistic backgrounds. One prominent area of difficulty was *Prepositional Phrase (PP) Attachment Ambiguity*. Uncertainty in modifier attachment, as illustrated by sentences like "*the man with the binoculars,*" persisted in 6 out of 15 responses. This aligns with Dussias (2003), who noted PP attachment as a universal source of syntactic confusion, yet the structural mismatch between English and students' native languages further complicated processing. The main aspect of this phenomenon is rooted in the difference between the word order of English and the participants' first language or L1. The first language or L1 of the participants of this research for instance Urdu and Sindhi respectively is Subject-Object-Verb (SOV) language each as compared to English being Subject-Verb-Object (SVO) language. Urdu and Sindhi being SOV languages often place modifiers pre-nominally and the participants of this research had to adapt to English's flexible post-nominal Prepositional Phrase (PP) structures, which likely increased their cognitive load (Sweller, 2019). Moreover, there is evidence of similar L1 transfer effects which were observed in Arabic ESL learners by Aldosari (2021). This study, however, extends those insights to South Asian contexts that remain underrepresented in the research pertaining to Syntactic ambiguity.

Pronoun Reference Ambiguity emerged as another persistent challenge, where confusion over antecedents created garden-path effects consistent with findings by Juffs and Harrington (1996). Participants of this study i.e. undergraduate students of QUEST Nawabshah often defaulted to the subject as the antecedent, reflecting a universal "first-mention" bias, a pattern also noted among Japanese ESL learners by Tanaka and Abe (2015). The concept of first person bias is also explained using alternative terms for instance primacy bias or order of mention bias. This actually stands for a trend or tendency that is reflected in interpretation of pronoun as referring the first mentioned entity in a preceding sentence. This trend is also connected to LI due to the fact that grammatical elements of first language or L1 are likely to affect the ways an individual undergoes processing and interpreting sentences in his second language or target language. In this connection, pro-drop nature of Urdu and Punjabi, which allows subjects to be omitted when understood contextually, may further weaken students' reliance on overt pronouns for clarity (White, 2003). This overlap of universal processing preferences and L1-specific structural tendencies underscores the complex interplay of cross-linguistic factors in syntactic ambiguity.

Comparative Ambiguity was another recurring issue, particularly in sentences involving quantifiers and degree structures such as "*more successful than John.*" Students often struggled with elliptical parsing, echoing Chen's (2008) findings on Chinese ESL learners who face similar difficulties due to L1 comparatives lacking auxiliary structures. Punjabi and Urdu comparatives, which typically use postpositions like "*John se zyada*", appear to delay mastery of the English "than" construction, suggesting that typological features directly shape how learners interpret comparative forms.

Infinitive and Gerund Ambiguity was also notable, as students frequently misinterpreted agent-patient roles in phrases like "*flying planes.*" This supports VanPatten's (2004) claim that second language learners prioritize lexical items over

grammatical structure during processing, leading to structural oversights. Ellis (2008) goes further to stress that in such constructions there are minimal morphological clues that increase processing demands. This could especially be the case with Sindhi and Pashto language speakers whose first language does not provide non-finite forms of the verb at all creating a greater probability of being misinterpreted in English.

The Noun Phrase Ambiguity having the coordinated type, as in case with the phrase old men and women, corresponded to the scope ambiguity that Pullum and Huddleston (2002) earlier discussed. It is possible that this difference is due to the high degree of misinterpretation exhibited by Urdu speakers at QUEST compared to the learners whose background was with the Romance languages.

Lastly, the problem of Temporal Ambiguity connected with the placement of adverbs, such as in the case of structures like, call yesterday, still remained even after specific training was given on indirect speech. Dong and Lin (2020) attributed such temporal confusion to the factor of working memory limitations that complies with the discussion of extraneous cognitive load presented by Sweller et al. (2019). Compared to the flexibility of adverb placement in English, Pashto and Urdu with the strict arrangement of adverbs and verbs are still much more rigid, probably creating more resistance to the accurate processing of adverbial input in English complex sentences by students.

Combining the examples with corresponding literature on the phenomena, the discussion does not only place the findings of QUEST Nawabshah on a wider theoretical spectrum but also demonstrates the interplay of characteristics of using the native language, cognitive load, and structural mismatches to exacerbate the problem of syntactic ambiguity. This comparative view shows that although types of some kinds of ambiguity show universal processing challenges, others are distinctively defined along regional and typological lines. In this way, the present work can be seen as an addition to the existing discussion since it brings the struggle of the underserved South Asian ESL learners in resolving structural issues to the fore and presents an insight that enhances existing ideas about ambiguity resolution in the multilingual context.

## **1. Conclusion**

From the perspective of second language acquisition, there is a significant interconnection between the overreliance on L1 syntax as well as grammar and ignorance of target language (L2) syntax and grammar. This is crucially important while dealing with syntactic ambiguity because various issues for instance L1 interference and negative transfer alongside ignorance or unawareness of L2 Grammar system cause several problems ranging from grammatical functions to sentence word order. Hence studies pertaining to syntactic ambiguity cannot undermine or ignore the L1 related issues of Grammar structure and L1 interference and transfer. From the perspective of Cognitive Load Theory, this L1-L2 mismatch puts extra burden on working memory during comprehension resulting in incorrect analysis and sluggish or slow processing of certain language structure especially complex sentences.

This paper explored how syntactic ambiguity presents a challenge to ESL learners at QUEST Nawabshah. The results were broken into six problematic types of ambiguity: prepositional phrase attachment (such as ambiguity in the statement, She watched the man with binoculars, about who held the binoculars), pronoun reference ambiguity (such as confusion over the antecedent he in the statement, The coach told the player he was injured), comparative ambiguity (such as ambiguity in the statement I know

more successful students than John about both the student and John who are being compared), infinitive/gerund ambiguity (such ambiguity in the statement Flying planes can be dangerous about the roles

These challenges were founded on three inter-related causes. To start with, Cognitive Load Theory (CLT) was the theory used to explain that ambiguous sentences overload the working memory, endangering the learners to use simultaneous interpretations. Second, there was the interference of native language (in the Urdu, Sindhi, Punjabi, or Pashto language), where learners used grammar rules they were used to despite them not fitting the English grammar. Third, students did not have enough metalinguistic awareness so that they could consciously analyze sentence structures.

To resolve these problems, three options of ESL teaching should be introduced: 1) formatted parsing exercises on real life ambiguous sentences to train disambiguation; 2) contrastive grammar exercises pointing out the differences between English and the native languages the student is acquainted with; 3) managed cognitive-load activities like breaking a complex sentence making it into smaller units. Ambiguity resolution could be studied in the future in terms of proficiency levels or certain patterns of L1 interference.

Finally, a structured instruction of the syntactic ambiguity resolution process will allow learners to cope with academic and work life in English with increased accuracy and assurance and limit structural English-related misunderstandings to a minimum at QUEST Nawabshah (and other settings with multilingual users).

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