UNRAVELING THE IMPORTANCE OF WH-MOVEMENT IN ENGLISH SYNTAX: THEORETICAL JUSTIFICATIONS AND CONSTRAINTS

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Abstract

The CP Hypothesis posits that interrogative sentences involve the movement of the wh-phrase to a specifier position in the complementizer phrase (CP). In his later work on X-bar theory, in Barriers, Chomsky proposed that complements and specifiers are always maximal projections. Drawing on the theoretical frameworks of the CP Hypothesis, this paper presents an analysis of wh-movement. It aims to elucidate the processes involved in wh-movement and its effects on sentence structure. The study addresses three central questions: the mechanism by which wh-phrase moves to the specifier position of CP, the rationale behind moving a question word into thespecifier of TP, and the constraints that govern this phenomenon. By analyzing empirical data and theoretical arguments, this paper aims to contribute to a deeper understanding of wh-movement in English syntax and its implications for linguistic theory.

Keywords: English Syntax, Wh-words, Wh-movement, Constraints, CP Hypothesis

1. Introduction

The term "wh-movement" was initially introduced within the framework of transformational generative grammar (TGG) theory in the 1950s and 1960s. Noam Chomsky was instrumental in advancing this concept through his endeavors to explain the fundamental framework of languages. Chomsky presented the comprehensive "wh-movement" theory in his 1977 paper "On Wh-Movement". In this theoretical framework, WH movement is construed as a syntactic operation involving the wh-word's displacement from its initial position to a specifier position within a higher phrase.

Trask (1996) defines WH-Movement (WH-Fronting, WH-Preposing, WH-Raising) as "the phenomenon by which a WH-item appears in sentence-initial or clause-initial position, rather than in the 'logical' position typical of non-WH-items of the same category" (Trask, 1996, pp. 303-304). Crystal (2008) describes wh-movement as "a transformational rule that moves a wh-phrase (wh-XP) to the initial position in the sentence."

Over the years, scholars in generative grammar and other linguistic frameworks have suggested refinements and alternative theories regarding the WH movement. These include proposals concerning where wh-words land after movement, restrictions on movement operations (island constraints), and differences in WH movement patterns across languages.

In his attempt to analyze syntactic structure, Chomsky (1964) introduced the term "island" and proposed the A-over-A constraint. According to Trask (1996), an "island" is a constraint encompassing various limitations on syntactic processes and dependencies, where elements within and outside a constituent of a specific type cannot simultaneously participate in a process or relation. Ross (1967) expanded on island constraints under Chomsky's guidance, presenting classical constraints such as 'the Coordinate Structure Constraint', 'Complex NP Constraint', 'Left-Branch Constraint', 'Right Roof Constraint', and 'Sentential Subject Constraint' in his Ph.D. thesis titled "Constraints on Variables in Syntax". Trask (1996) notes that Chomsky and his associates have endeavored to streamline the numerous individual constraints in linguistic theory into a more concise set of overarching principles, ultimately aiming for a unified constraint. Chomsky's research in 1973, 1981, and 1986 marked substantial advancements in this endeavor, particularly in developing the Subjacency Condition within the Government and Binding (GB) framework, effectively incorporating a significant portion of Ross's constraints.

Chomsky (1977) also identified a set of constraints known as wh-islands. Trask (1996) characterized wh-islands as a restriction on dependencies that prohibits movement inside an embedded WH-question. Crystal (2008) also said that wh-islands are "constructions beginning with a wh-phrase, from which it is not possible to move a constituent through a transformational rule, known as the wh-island constraint" (Crystal, 2008: 521).

One of the fundamentals of wh- movement hypothesis is what is known as the CP hypothesis. It, initially proposed by Bresnan (1970) and subsequently supported by Chomsky (1977), posits that in wh-movement, the wh-word in interrogatives undergoes movement to a specific position within the CP layer of the sentence structure. According to this theory, wh-words' ability to function as interrogative or relative pronouns or their licensing by a complementizer are two examples of grammatical constraints on their displacement.

According to the CP Hypothesis, interrogative sentences entail the displacement of the wh-phrase to a specifier position within the complementizer phrase (CP). In this view, this study aims to examine wh-movement within the framework of the CP hypothesis, providing insight into the processes involved and their impact on sentence structure. Specifically, it addresses inquiries regarding the mechanism, specific element, and destination of the wh-movement, as well as the rationale behind moving a question word into the specifier of TP. This research contributes to a deeper understanding of wh-movement and its implications for sentence formation within the CP hypothesis framework by delving into these aspects.

2. Wh-Movement in English

The phenomenon of wh-movement is prominently observed in forming content questions, which elicit informative responses rather than mere affirmations or negations. Although wh-movement also occurs in other linguistic constructions, its most conspicuous role is creating questions that necessitate substantial answers. This differentiation is apparent when comparing yes/no questions, which can be answered with a binary response or uncertainty, with content questions that demand a substantive reply (Carnie, 2021). This contrast is exemplified in sentences (1) and (2).

(1) a) Did you spot the serpent?   Yes/no/ *cat
     b) Have you dined already?   Yes/no/ *apple

(2) a) Who was here last week?   Sami/*no
     b) What do you have there?   Notebook/*yes

As demonstrated in (1) above, questions of the yes-no type can be answered with either affirmative or negative responses, whereas content questions, also known as wh-questions, require a substantive response rather than a simple affirmation or negation. As evidenced by the aforementioned examples in (2), responses to such inquiries with simple affirmations or negations may be perceived as impolite, brusque, or peculiar. This distinction highlights the significance of wh-movement in influencing the syntax and semantics of interrogative sentences, as exemplified in (2).

2.1 Wh-words

Interrogative questions, commonly referred to as wh-questions in English, are so named because they often incorporate interrogative words that commence with the letters wh. These essential components, namely *who*, *what*, *where*, *when,* and *why*, are pivotal in journalistic practice for discerning the necessary information to effectively craft an article.

In English, there exists a variety of interrogative words, such as "who" and "what" along with a complex structure such as "which book" or "whose book" which are used to form wh-questions and typically appear in argument positions within a sentence. These words can be found in the specifier of TP; as the complement of the verb; or as the object of a preposition. Additionally, there are wh-words like "when", "why", and "how" that typically appear in adjunct positions according to the X-bar theory. Furthermore, the wh-word "where" can function as both an adjunct or an argument within a sentence.

Table 1

Wh-words and their functions within a sentence

Wh-words	Functions
Who	
What	
Which X	Usually arguments
Whose X	
Where	Can be either an adjunct or an argument
When	
Why	Usuallyadjuncts
How	

2.2 What is moved in wh-movement?

In wh-movement, the wh-phrase (such as "who," "what," "which," "whos," etc.) moves from its original position to the front of the sentence to form a question or a relative clause. This movement allows for the wh-phrase to be in a prominent position in the sentence.

(3a)

(3b)
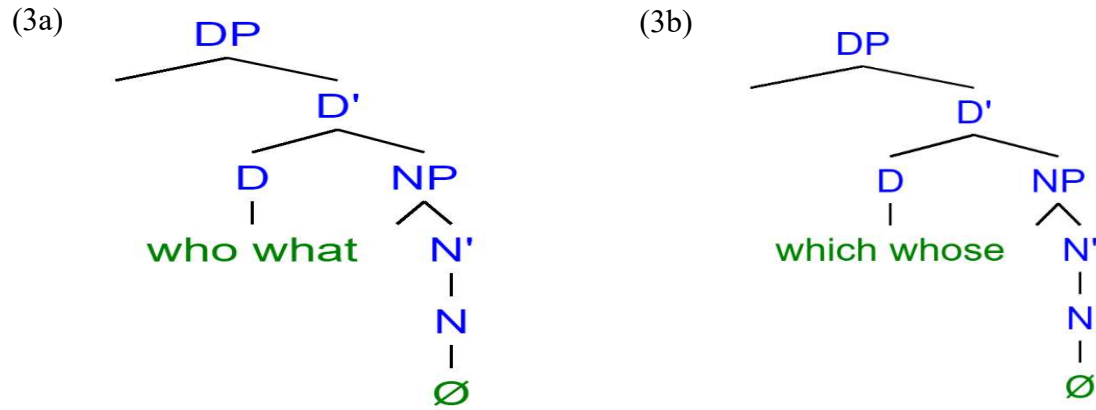
In the tree diagram in (3a), the determiners "who" and "what" function as determiners themselves and take an empty noun phrase due to the lack of specific content. Therefore, it is the entire determiner phrase (DP) that undergoes movement during wh-movement. This argument is supported by the existence of complex DPs in the tree diagram seen in (3b) such as "whose book" or "which book," where "whose" and "which" clearly function as determiners and take a noun phrase complement with specific content. When wh-movement occurs, it is the entire DP that is moved, rather than just the question word. In certain contexts, such as in the phrase "what book," "what" can function similarly to "which" and "whose." Thus, during movement, it is the entire phrase that is moved, not just the headword.
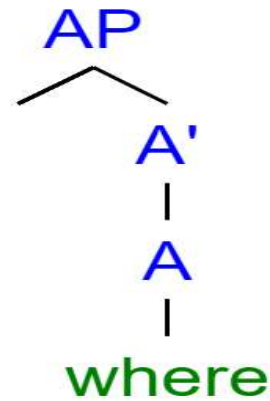
The use of the wh-word "where" can be complex and tricky as it can function as a determiner when used as an argument, as in (4a) and (5a), and as an adverbial phrase in sentences such as (4b) and (5b).

(4)   a) Where did Ameen go to? (cf. Ameen went to school)
        b) Where did Khan go? (cf. Khan went home)

(5a)

DP
├── D'
│   ├── D
│   │   └── where
│   └── NP
│   └── N'
│   └── N
│   └── Ø

(5b)

AP
└── A'
     └── A
          └── where
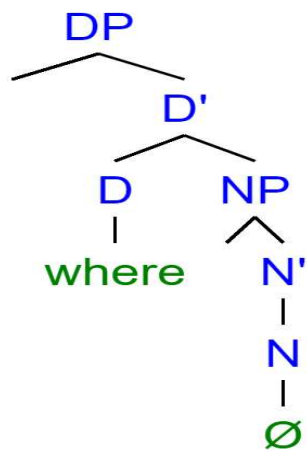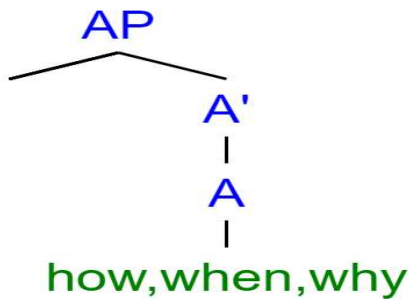
The wh-words "how," "when," and "why" usually function as adverbs to elucidate the manner, timing, and rationale behind a given phenomenon or event. They are positioned as the sister to the bar and the daughter of the bar, as depicted in the diagram in (6).

(6)

AP
└── A'
     └── A
          └── how,when,why

However, it is important to consider moving the entire phrase rather than just the headword, as phrases are often moved in other contexts.

(7) a) I bought a book
     b) What did you buy _____?

In (7), there is a discernible alternation in position, a phenomenon that should be recognizable from both the head movement and DP movement.

2.3 The Movement of Wh-Phrases: From Where?

In English, wh-phrases can be moved from their original position (case or thematic position to the beginning of a sentence to form a question or to emphasize the information contained in the wh-phrase. The example in (8) shows that the case position and the thematic positions are different from one another.

a) What did you say [_____ was played _____]

Role

cf. the game was played   cf. Aliplayedthe game

As demonstrated in (8), in the sentence "Ali played the game", the theme is assigned to the second position. In this passive construction, the theme does not receive its case as it is subject to a case-by-case filter for DPs. Any element that does not receive a case in this position will instead obtain a case in the specifier of the TP.

In the above sentence, "the game was played," the game receives a theta role and is assigned its case before ultimately undergoing movement to the initial position of the sentence, as in (9).

What did you say [_____ was played _____]

ιp here

In summary, movement occurs from a case position when the element being moved is a determiner phrase (DP). This requirement does not apply to adverb phrases, as they do not necessitate a specific case. However, when moving a DP wh-phrase, it is essential to move from the case position to satisfy the case filter. Additionally, all movements originate in the thematic position where the element receives its theta role.

The strict order of operations in sentence structure begins with a thematic position, followed by a case position if necessary, and finally the movement of all wh-elements. This

sequence is essential for satisfying the theta criterion, the case filter, and the constraints that drive wh-movement.

2.4 The Movement of Wh-Phrases: Where Do They Go?

The phenomenon of wh-movement typically results in subject-auxiliary inversion, wherein the auxiliary precedes the subjectas illustrated in (10) and depicted in the tree diagram in (11).

(10)   **What have you seen _____?**
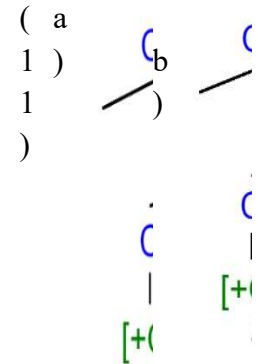
As seen in (11b), the movement of the tense node T into the $+Q$Complementizer is necessary to achieve the subject auxiliary order in English. The placement of "you" in this position is due to its case position. As for "what," one possible claim is that it moves to the specifier of the TP, which is the position in front of the inverted auxiliary as in (12).

(12)
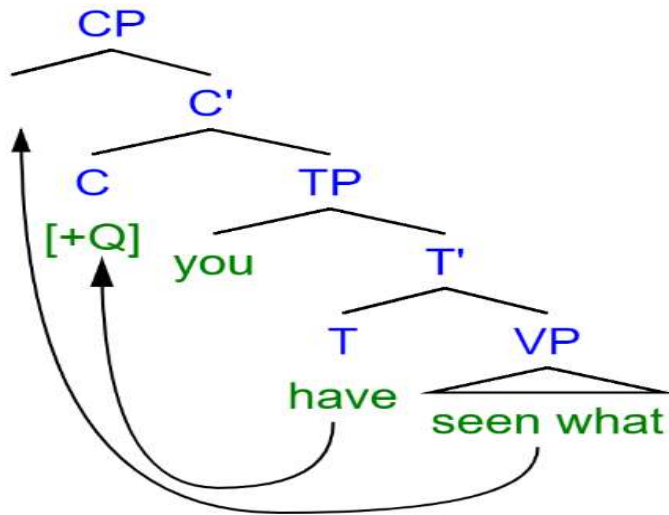
The tree diagram in (12) illustrates that subject-auxiliary inversion occurs when the auxiliary is located in the C position and the wh-word "what" moves into the specifier positions preceding the specifier of CP.

2.5 Theoretical Justification for the Movement of Wh-Phrases

The displacement of the question word to the specifier of the TP is believed to be driven by a linguistic necessity, namely the activation of a [+WH] feature in C. This feature dictates that the wh-word must be positioned in proximity to it, leading to the movement of the question word into the specifier position. This proposal suggests that complementizers also possess a similar feature, which mandates the proximity of the wh-word to it as in (13).

(13)
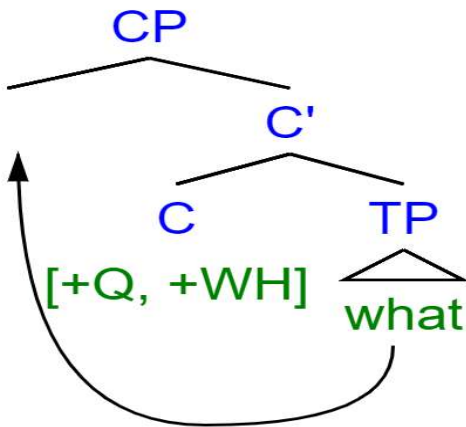
As depicted in (13), the complementizer [+Q] serves as a motivator for T to C movement, while also indicating its feature [+WH], signifying its function as a wh-element requiring a wh-phrase in its specifier. The presence of the [+WH] feature on the complementizer is significant in determining the type of clause it introduces. Specifically, complementizers serve to categorize clauses as statements [-Q], yes-no questions [+Q], or wh-questions. In this context, the presence of the [+WH] feature on the complementizer signifies its role in motivating wh-movement. It is

important to note that while [+Q] motivates head-to-head movement, [+WH] motivates wh-movement.

2.5.1 Head Movement

The movement of heads in syntax is motivated by specific features and nodes within the syntactic structure. For instance, the movement of the verb (V) to the tense node (T) is motivated by tense features. This movement allows for the checking of verb tense features against the T node. Additionally, the movement of T to C is motivated by the presence of a [+Q] complementizer, indicating a question.

2.5.2 NP movement

NP movement in both Raising and Passive constructions is driven by the necessity to satisfy the Case filter. This motivation arises from the need to assign appropriate case roles to the constituents involved in these constructions.

2.5.3 Wh-movement

The process of Wh movement involves the relocation of a wh-phrase to the specifier of CP to verify the presence of the [+wh] feature in C. This movement is essential for checking off the wh feature in the complementizer.

3. Constraints on Wh-Movement

Ross (1967) proposed a family of constraints on wh-movement in English. He argued that wh-movement is not unbounded. According to him, these constraints restrict the movement of wh-words out of certain syntactic structures, known as wh-islands. The term 'island' refers to a grammatical construction that, when an element is extracted from it, results in a sentence that is either ungrammatical or marginally acceptable. For instance, the sentence in (14) exemplifies such a construction:

(14)   a. *What did you wonder whether Lisa invented __? (Goodall, 2021).

These phrases are commonly known as extraction islands or simply islands, as they prohibit the movement of wh-elements (Riemsdijk& Williams, 1986; Roberts, 1997). Ross (1967) categorized four types of island constraints on reordering transformations, namely the ComplexNoun Phrase Constraint, Coordinate Structure Constraint, The Pied Piping Convention, and Sentential Subject Constraint (Graffi, 2001). Configurations characterized by conspicuous limitations on the extraction process have been alternatively labeled as adjunct islands, wh-islands, and complex noun phrases in the literature (Sprouse et al., 2021). This section aims to elucidate the phenomenon of islands, with particular emphasis on wh-islands and Adjunct islands.

3.1 Adjunct islands

Adjunct islands are linguistic structures that restrict the movement of wh-words (such as who, what, where, etc.) within a sentence. These islands prevent the wh-words from being moved to certain positions in the sentence, even if they would normally be able to move freely. According to Dal Farra, (2020, p. 27), "adjuncts belong to the class of strong islands, which

means that both arguments and adjuncts extractions are prohibited." For example, the sentence in (15) is a type of relative clause adjunct island:

15)

    a)   I know the person who you met yesterday.

    b)   *Who I know the person you met yesterday?

As seen in (15a), the relative clause "who you met yesterday" acts as an adjunct providing additional information about "the person." Wh-movement is not possible from this adjunct island because it would disrupt the structure and meaning of the sentence as in (15b). If we try to move "who" to the beginning of the sentence, we get "*Who I know the person," which is ungrammatical.

Another example of an adjunct island is a prepositional phrase as in (16).

16)

    a)   I'm not sure about what you're talking about.

    b)   *What I'm not sure about?

The sentence in (16a) contains a prepositional phrase "about what you're talking" which functions as an adjunct modifying "sure." Wh-movement out of this adjunct island is not possible because it would result in ungrammatical sentences like (16b).

In both (15b) and (16b), attempting to move the wh-word out of its adjunct island leads to ungrammatical sentences. This restriction on movement occurs because these adjunct islands have specific structural and semantic requirements that must be maintained for grammaticality.

3.2 Wh-islands

Wh-islands are a linguistic phenomenon characterized by the presence of an embedded sentence introduced by a wh-word, thereby creating a dependent clause. These constructions serve to restrict the movement of wh-words within a sentence. Wh-islands are considered to be weaker than adjunct islands, and any violation of them typically results in a sentence that is perceived as ungrammatical by native speakers as shown in (17) and (18).

(17)   a)   Sohaib asked why Ali was waiting for **Sawsan**.
         b)   ***Whom** did Sohaib ask why Ali was waiting for __?

(18)   a)   Sami wonders <u>where Mohammed went to buy **a laptop**</u>.
         b)   ***What** doesSami wonder where Mohammed went to buy __?

In the sentence (17a), a wh-island is observed, specifically in the form of "why Ali was waiting for Sawsan." When attempting to extract from this wh-island, as shown in (17b), the sentence becomes ungrammatical. Similarly, the sentence in (18b) is considered to be strongly marginal or unacceptable due to its violation of the principle of wh-island constraints. The ungrammaticality in these sentences arises from the attempt to extract a constituent from a wh-island, specifically a determiner phrase (DP) containing multiple wh-words. This results in interference between the wh-words, making it impossible to successfully relocate the lower wh-

word to the top of the structure. To achieve grammatical correctness, proper wh-movement must occur, following a cyclic process that does not allow for bypassing the higher DP occupying the Spec-C position.

19)

    a)   Did you ask whether he bought **a gift**?

    b)   * What did you ask [CP whether he bought ____]?

The example provided in (19b) is considered ungrammatical due to the presence of the wh-word "what" within a subordinate clause (CP), specifically "whether he bought." This wh-word is unable to be extracted or moved to the main clause, which is "what did you ask." Although "what" belongs to the main clause, it refers to the content of the embedded CP. Consequently, this situation creates a barrier or island that hinders the extraction of the wh-word from the subordinate clause to the main clause. In other words, it is not possible to rephrase "What did you ask" as "You asked what."

3.3 Pied-piping convention

Pied-piping refers to a syntactic constraint that is observed in numerous cases of wh-fronting. This linguistic phenomenon involves the displacement of a word, typically a preposition or an interrogative pronoun, which results in the repositioning of an entire accompanying phrase to the initial position within the clause (Ross,1967). This occurs when a wh-word is inside a noun phrase and when a noun phrase is a part of a larger construction, such as a relative clause or a prepositional phrase, as in (20):

20)

    a. John is watching Mary's movie.

    b. Whose movie is John watching?

    c. *Whose is John watching movie?

In (20b) we notice that the noun phrase "Mary's movie" is pied-piped along with "whose" to form the question "Whose movie is John watching?" In (20c), however, the sentence appears ungrammatical because it incorrectly places the possessive pronoun "whose" before the verb "is." without fronting the entire noun phrase along with it.

3.4 The sentential subject constraint

According to Ross (1967), the principle of the sentential subject constraint in linguistics posits that no constituent governed by a sentence (S) can be extracted from that sentence if the S is governed by a noun phrase (NP) which itself is immediately governed by an S. This principle aims to capture the restriction on moving categories out of a sentential subject. In essence, it asserts that the subject of a sentence must be either a noun phrase as in (20a), or a clause as in (21b) and (21c), rather than a mere single word or phrase. Consequently, a complete noun phrase such as (21a) must be employed as the subject. Additionally, the subject can also take the form of a clause, such as (21b) or (21c).

(21)   a. [For John to beat Ahmed] is difficult.

          b. [that John beat Ahmed] annoyed them.

          c. [whether she will come] remains unknown.

As seen in (21a) and (21c), the Sentential Subject Constraint predicts that the wh-movement of "Ahmed" out of the sentential subject leads to ungrammaticality, as in (22):

(22)   a. *Who is [For John to beat t] is difficult?

          b. *Who did [that John beat Ahmed] annoyed them?

The ungrammatical nature of the construction in (22) demonstrates that the Sentential Subject Constraint can be understood as a reflection of the Subject condition outlined in Huang's (1982) Condition on Extraction Domain.

3.5 The coordinate structure constraint

Ross (1967) proposed the Coordinate Structure Constraint, which dictates that no conjunct within a coordinate structure may undergo movement, and no element contained within a conjunct may be moved out of that conjunct. This constraint requires coordinated elements to be of the same grammatical category and have similar syntactic structures. Specifically, nouns should be coordinated with other nouns as in (23a), verbs with other verbs, and so on. Furthermore, the coordinated elements should have similar subcategorization frames and semantic roles. Violating the Coordinate Structure Constraint can lead to ungrammatical sentences or sentences with ambiguous meanings as in (23c) and (23d).

(23)   a.   You shared the pizza with [Aisha and Fatima].

          b.   You [$_{VP}$ [$_{VP}$ borrowed the pen from Ahmed] and [$_{VP}$

d the pencil to Omar]].

          c.   *Which friend did you share the pizza with [Aisha and t]

          d.   *Which pen did you [$_{VP}$ [$_{VP}$ borrow t from Ahmed] and

rn the pencil to Omar]].

As seen in (23c) and (23d), these examples violate the first and the second clauses of the CSC, respectively.

3.6 Complex Noun Phrase Constraint

Ross (1967) examines the challenges associated with extracting elements from within a noun phrase, particularly due to the presence of the complex NP constraint. This constraint includes two restrictions: one against extracting from a sentential complement of a noun, as seen in (24), and another against extracting from a relative clause that modifies a noun, as illustrated in (25).

(24)   a) He knows the rumor that his coworker is leaving the company.
         b) * What does he know the rumor that his coworker is leaving_____?

(25)   a) They recruited a candidate who speaks Iraqi Dialect.
         b) *What Iraqi dialect did they recruit a candidate who speaks____?

4. Conclusion

Studying English syntax is essential for comprehending the intricate movement of wh-phrases within sentences. Wh-movement, a phenomenon involving the displacement of wh-phrases from their original positions to the initial position of a sentence, holds significant importance in syntactic analysis (Chomsky, 1981). This paper delves into the mechanics of wh-movement, which entails the relocation of a wh phrase, such as a Determiner Phrase or an Adverb Phrase, under the influence of an element typically beginning with 'wh' in English but potentially varying in other linguistic contexts. The ultimate goal of this movement is to reach the specifier position within the Complementizer Phrase.

Wh-movement is predominantly observed in content questions, eliciting detailed responses rather than simple yes or no answers. Wh-words involved in wh-movement fulfill diverse syntactic roles within a sentence, serving either as arguments or adjuncts (Radford, 2009). The wh-words "who," "what," "which X," and "Whose X" commonly function as arguments. The adverb "where," can be either an adjunct or an argument, while the adverbs like "when," "why," and "how" are typically utilized as adjuncts.

The theoretical justification for the movement of wh-phrases lies in the motivations behind various syntactic movements, such as V to T and T to C (Kayne, 1994). Additionally, noun phrase movement is motivated by the necessity to satisfy the Case filter (Chomsky, 1981). These theoretical underpinnings provide insight into why wh-phrases undergo movement within a sentence.

However, there are constraints on wh-movement that must be considered. Hence, this paper highlights the constraints on wh-movement, specifically the (wh-) island constraints in English as proposed by Ross within the framework of the CP hypothesis. Five types of constraints are discussed, detailing their mechanisms and impact on wh-movement. Ross (1967) identified four island constraints that impede wh-movement: ComplexNoun Phrase Constraint, Coordinate Structure Constraint, The Pied Piping Convention, and Sentential Subject Constraint. Additionally, there is an additional restriction on wh-movement known as adjunct islands (Sprouse et al., 2021). The analysis of these constraints elucidates the syntactic environments that restrict movement and offers insights into the rationale behind such limitations. Violating these constraints would lead to ungrammaticality or unacceptability as they disrupt both the structure and meaning of the text, rendering movement impossible.

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