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## **Application of Chomsky's X-Bar Theory to Pakistani Languages: A Syntactic Analysis of Urdu and Pashto with Reference to English**

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### **Abstract**

The present study attempts to explore the applicability of Chomsky's *X-Bar theory*, a key component of *Universal Grammar*, to the syntactic structures of two major Pakistani languages, Urdu and Pashto. While X-Bar theory proposes that all human languages share a common phrase structure, the linguistic diversity of non-European languages like Urdu and Pashto raises questions about its universality. Using comparative syntactic analysis as a research method, the current paper identifies the extent to which Urdu and Pashto conform to, or deviate from, the principles of X-Bar theory. The findings reveal that while certain syntactic structures in Urdu and Pashto align with the X-Bar framework, several unique and unusual features such as the use of post-nominal modifiers in Urdu and the use of unusual category of circumpositional phrase (CircumpP) with two Heads in Pashto, challenge its assumptions. The study concludes that the X-Bar model does require adaptation, modification and refinement in order to accommodate the syntactic variability and nuances of syntax such as Pashto's CircumpP generally observed in non-European languages. These findings have broader implications for linguistic theory, multilingual education, and natural language processing systems. The SOV word order of Urdu and Pashto contrasts with the SVO assumptions of X-Bar theory and raises questions about the universality of X-Bar predictions for phrase structure. The analysis of the complex verbal morphology of Pashto verbs entails changes in the X-Bar projections. Urdu and Pashto's tendency to right branching where the Complements are often post-head, i.e. Complements often follow the respective Head is quite unlike X-Bar theory which presupposes left branching (where the Head is followed by the Complement) poses a direct challenge to the X-Bar framework.

Keywords: Universal Grammar, X-Bar theory, Syntactic Analysis of Urdu and Pashto, Pakistani languages, linguistic universals

### **Introduction**

Language universals, in fact, is one of the key and significant fields of linguistic research with Chomsky's Universal Grammar (UG) (1986), being one of the most influential theories in this area as well as the most widely embraced perspective. Linguistic universals refers to the fundamental properties shared by all human



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languages which are assumed to be inherent in all human languages and some of which are often described qualitatively by Chomsky's UG theory. The UG framework is based on one of the central notions known as X-Bar theory according to which all human languages share a common hierarchical syntactic structure.. The X-Bar framework offers a linguistic description of phrases in different languages by providing a formal account of phrase structures across languages. The underlying concept behind X-bar theory is that all human languages are built up out of the same basic syntactic building blocks, represented through hierarchically organized Head-Complement-Specifier relationships. Although such theory has been effectively applied in the analysis of European languages, the possibility of its application in analyzing Non-European languages is still questionable as it remains largely underexplored (Evans & Levinson, 2009). Remarks of the two authors indicate that, although this assumption has been strictly used for European languages such as English, French, and German, little has been done to test its applicability to other non-European languages including South Asian languages and that the Pakistani languages, more particularly Urdu and Pashto is no exception to it. In this context, the present paper tries to assess critically the relevance of X-Bar theory to the syntactic structures of two principal languages of Pakistan Urdu and Pashto. These languages with their distinct syntactic patterns and morphological features, present an ideal test case for assessing the cross-linguistic validity of Chomsky's syntactic framework.

Since Urdu and Pashto, two major languages spoken in Pakistan, offer an ideal test case for X-Bar theory, they are suitable to test X-Bar theory. Urdu, an Indo-Aryan language, and Pashto, an Indo-Iranian language, differ significantly in their syntactic behavior from English, especially in terms of word order, morphological richness, and the use of postpositions instead of prepositions. The SOV (Subject-Object-Verb) order of these languages differs from the SVO (Subject-Verb-Object) order assumed in X-Bar-based models. The study explores the extent to which X-Bar theory can accommodate the syntactic peculiarities of Urdu and Pashto. The present paper aims to further understand how much X-Bar theory can effectively cater the syntax of Urdu and Pashto language.

The study aims to answer the following questions:

1. Do the syntactic structures of Urdu and Pashto conform to the principles of X-Bar theory?
2. What structural variations are observed between these languages and X-Bar theory's assumptions?

### **Literature Review**

The literature on Universal Grammar (UG) is vast, with Chomsky's seminal works—*Syntactic Structures* (1957) and *Lectures on Government and Binding* (1981)—laying the groundwork for later developments. Central to UG is the claim that all human languages share a universal set of grammatical principles. Among these principles is X-Bar theory, which proposes a three-level phrase structure (Head, X', XP) applicable to all phrases in any human language. This model establishes the hierarchical arrangement of Specifiers, Complements, and Adjuncts.



## **Universal Grammar and X-Bar Theory**

Chomsky's theory of Universal Grammar (UG) posits that all human languages share a set of innate grammatical principles that form the basis of language acquisition. The X-Bar theory, one of the sub-components of UG, outlines the structure of syntactic phrases, asserting that every phrase follows a universal three-level hierarchy of Head (X), Intermediate (X'), and Maximal Projection (XP). Each of these units serves a unique function in phrase construction. For example, the Head is the core grammatical category, while the Specifier and Complement elaborate the syntactic relationships between elements (Radford, 2009).

## **Critiques of X-Bar Theory**

The cross-linguistic applicability of X-Bar theory has been questioned and criticised by Croft (2009) as well as Evans & Levinson (2009). In this respect, they posit that languages that exhibit features that are not shared by the mainstream European languages, particularly the non-European languages that exhibit, among other things, a syntactic organization with Subject, Object, Verb (SOV) word order, postpositional phrases, and extensive morphological inflections, do not quite easily and neatly fit into the Head-Complement structure proposed by the classical and traditional model of X-Bar theory. Languages such as Urdu and Pashto that demonstrate the SOV word order and have well developed morphological systems with a robust system of case markings challenge the traditional and monolithic assumption based on the study and analysis of a handful of mainstream European languages that Specifiers and Complements appear in fixed positions. Instead, it necessitates the study of other largely neglected and explored bulk languages, in addition to that of European languages, such as the South Asian, African and other exotic languages to test the validity of a theory largely based on imperial languages.

Criticism also arises from Construction Grammar and Usage-Based Grammar models, which emphasize language as an emergent phenomenon, constructed from language use rather than innately specified templates (Goldberg, 1995). These models challenge the X-Bar assumption that syntactic principles are hardwired into the brain.

## **Application of X-Bar to Pakistani Languages**

Few studies have explored the applicability of X-Bar to Pakistani languages. Rahman (1996) examined Urdu's syntactic structure and noted that its postpositional nature diverges from the prepositional arrangement assumed by X-Bar theory. Similarly, Tegey & Robson (1996) identified complex verb morphology and unique noun phrase structures in Pashto, raising questions about the universality of X-Bar projections in Pashto.

The syntactic analysis of Urdu and Pashto through Chomsky's X-Bar Theory finds relevance in various studies of Pakistani languages and English. For instance, Ali et al. (2020) highlight punctuation challenges in written language, which often reflect underlying syntactic variations. Similarly, systemic functional grammar, as discussed by Ishtiaq et al. (2021), provides a framework for understanding structural representations, such as gender, in language. The



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influence of transliteration on pronunciation and its syntactic implications is evident in the findings of Ishtiaq et al. (2022), emphasizing how phonological features can interact with syntax in multilingual speakers. Furthermore, the pedagogical role of code-switching, explored by Ali et al. (2021), underscores the adaptive nature of syntax in bilingual education.

Parallel structural patterns in English syntax, analyzed by Ishtiaq et al. (2022), align closely with the principles of X-Bar Theory, particularly in identifying universal structures across languages. Nonverbal and paralinguistic features in conversation, as noted by Ali et al. (2019), provide insights into syntactic structures that extend beyond verbal communication. Comparative studies of semantic density in religious texts reveal how syntactic variation can manifest across translations by Ishtiaq et al. (2021), demonstrating the depth of syntax in conveying meaning across different linguistic contexts. Furthermore, the role of idiomatic expressions, as examined by Ali et al. (2019), highlights how figurative language adds complexity to syntactic structures.

Majid et al. (2019) demonstrates the richness of syntax in literary texts through the stylistic analysis of poetic structures, and examine educational materials to explore syntactic frameworks in English textbooks. Ali et al. (2019) further delve into syntactic principles through conversational analysis of Muhammad (PBUH), complementing earlier work on narrative characterization in Arabic and English by Ali et al. (2018). Finally, disagreement strategies in intercultural communication, analyzed by Ishtiaq et al. (2022), and the perceptions of British and American English varieties discussed by Ali et al. (2020), both highlight the role of syntax in shaping linguistic interactions across different contexts. Additionally, the comparative syntactic analysis by Arshad et al. (2024) offers critical insights into English and Urdu structures, particularly through the application of X-Bar Theory and the Theta Criterion. These studies collectively enrich the syntactic analysis of Urdu and Pashto in the light of English.

### **Theoretical Framework**

Chomsky's X-Bar theory, a subcomponent of Universal Grammar, proposes a three-level hierarchical phrase structure ( $X$ ,  $X'$ , and  $XP$ ) shared by all human languages. The theory assumes that all phrases have a "Head" (the core category, such as noun (N), verb (V), or preposition (P) that projects into larger syntactic units, with "Complements" and "Specifiers" filling specific roles. This abstract model has been applied successfully to English and several European languages, but its applicability to typologically diverse languages like Urdu and Pashto is contested.

Croft (2009) and Evans & Levinson (2009) have equally criticized X-Bar theory for possibly presenting linguistic biases, due to the fact that the theory has largely relied on data from European languages. It is thus asserted that languages of the non-European zone, including the Pakistani languages such as Urdu and Pashto, may embody elements that challenge the universality of X-Bar schema. As this study examines to what extent X-Bar theory aligns with syntactic realities of Urdu and Pashto, it helps to advance a general discourse on the subject of Universal Grammar.

### **Methodology**



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The work uses a comparative syntactic analysis of Urdu, Pashto, and English language sentences. In the present paper, the researcher adopts a qualitative design underpinned by theory-driven approach in order to explore the syntactic configuration of *Determiner Phrases (DPs)*, *Verb Phrases (VPs)*, and *Noun Phrases (NPs)* within the X-Bar theoretic framework. Urdu and Pashto data was obtained from standard language resources: literary works, grammars, and speech corpora. To make a comparison of the syntactic structures of Urdu and Pashto with English, the areas of similarity and dissimilarity were analyzed.

The methodology involves three key steps:

1. **Data Collection:** Sample sentence structures from Urdu, Pashto, and English were chosen, analyzed, categorized and classified
2. **Syntactic Tree Construction:** Syntactic trees were drawn to show the structural arrangement of Heads, Complements, and Specifiers. X-Bar framework was employed in the analysis of each syntactic construction, with a particular focus on phrase structure, Specifier positions, and postpositional elements.
3. **Comparative Analysis:** The syntactic structures of Urdu and Pashto were then compared with English to highlight areas of similarity and dissimilarities with regards to the X-Bar model which was reviewed critically.

### Analysis and Results

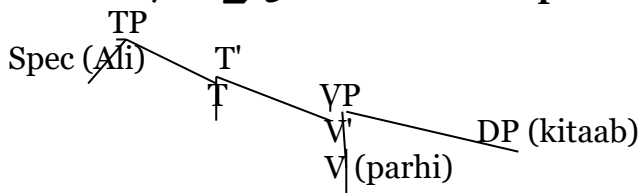
The analysis reveals a complex relationship between the syntactic structures of Urdu and Pashto and the X-Bar model. The analyses were informed by a theoretical framework that is consistent with Chomsky's Universal Grammar and X-Bar theory.

#### Urdu

In the analyses, certain peculiarities of Urdu syntax have been identified based on its comparison with English using the X-Bar theory, which cast doubt on the theory as it seems to challenge the basic assumptions of the said framework. Urdu as a language belongs to the SOV type, which is different from SVO type which is taken as base model for the X-Bar theory. This difference has a far-reaching effect on the respective roles and positions of Specifiers, Heads and Complements in syntactic trees. For example, in an Urdu sentence say 'Ali ne kitaab parhi' (Ali read the book) where Ali is the doer/action initiator i.e., the subject, kitaab i.e., the book) is the receiver of the action that is being done i.e., the object and parhi i.e., read is the description of the action i.e., the verb. In this construction, the object occupies the middle position, while in English, the verb is in the middle of a sentence. This word order inversion presents problems to the classical X-Bar model which presupposes a fixed linear order of Specifier-Head-Complement.

#### Tree Diagram for Urdu and English Equivalent TPs Respectively

**Urdu:** علی نے کتاب پڑھی 'Ali ne kitaab parhi'





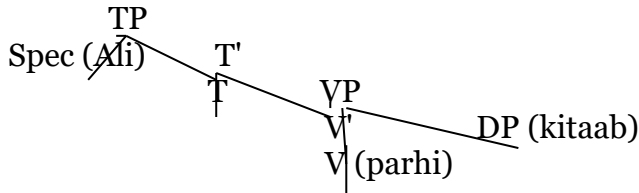


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**Additional Note**

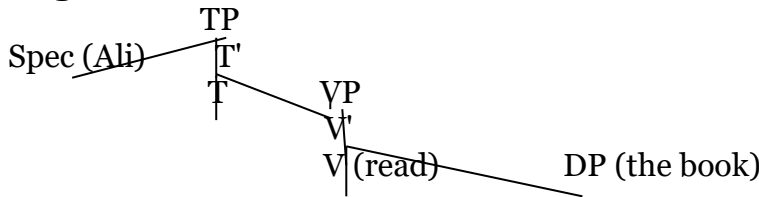
“ne” is a case marker in Urdu that is part of the syntactic structure but is typically not shown in this simplified tree representation because it does not function as a core element like the verb or noun phrase. It marks the subject for ergative case when the verb is transitive in Urdu.

**Pashto:** علي کتاب ولوستل (Ali kitaab wulustal)



The Pashto counterpart of the sentence علي نه کتاب پږی (Ali ne kitaab parhi) (Ali read the book) is علي کتاب ولوستل (Ali kitaab wulustal) and is structurally identical to the Urdu TP except for “ne” which is an ergative case marker as well as transitivity marker at the same time in Urdu syntax.

**English:** Ali read the book

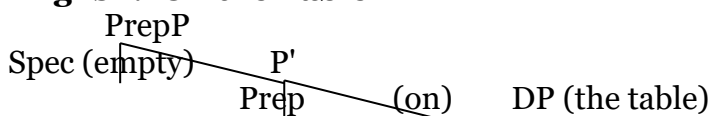


To summarize, the above tree diagrams for Urdu and English TPs respectively follows the standard X-bar theory, with heads like V (Verb) and T (Tense) having their respective complements or adjuncts. The Specifier (Ali) is the subject, and the Verb Phrase (VP) contains the verb and its direct object (kitaab).

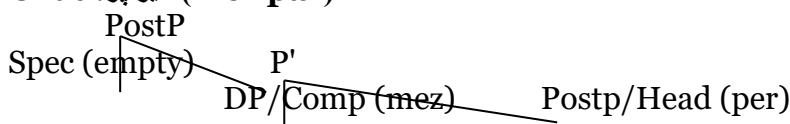
Urdu postpositions add to the differences between the postpositional language and those that use prepositions such as English. In the X-Bar model, PPs are treated as [XP [P] [YP]] where the preposition takes place before the YP phrase. However, in Urdu; postpositions occur after the N.P, we take the example ‘mez par’, meaning ‘on the table’ ‘par’ (On) comes after ‘mez’ (table). This structure leads to a reconsideration of the syntactic projections within the X-Bar framework since the Head-Complement relation is inverted. This change dramatically affects the syntactic tree structure of the English PP in Urdu, and particularly the way it deals with the Urdu PostP ( Postpositional Phrase) as a subcategory of the X-Bar framework.

**Tree Diagram for English, Urdu & Pashto Equivalent AdPPs (PrepP in English, PostP in Urdu & CircumpP in Pashto)**

**English:** ‘On the Table’



**Urdu:** ميز پر (mez par)





## Pashto: په میز باندے (pa maiz bande)

CircumpP

Spec (empty)

P'

PreP/Head (په)

DP/Comp (میز)

Postp/Head (باندے)

Urdu, like other morphologically rich languages, also has a morphologically complex system that affects and plays a role in construction of Verb Phrase (VP). Tense, aspect and mood affect Verb conjugation in that they are added to the verb in the form of suffixes or as separate and independent auxiliary verb forms. For example, the verb 'parhna' (base form) means 'to read' can be transformed to other forms such as 'parha' (past tense form) which means 'read', or 'parh raha hai' (present progressive form of the same verb) which means 'is reading'. This morphological complexity adds further layers to the structure of the VP, and requires that the simplistic X-Bar model of Head-Complement-Specifier must be revised. As suggested by previous research in the Minimalist Program, more than one functional projection may be necessary for tense, aspect, and mood, unlike a straightforward linear configuration.

Similar to Urdu, Pashto follows an SOV word order. However, Pashto exhibits an even more rigid syntactic structure, especially in the arrangement of its Noun Phrases (NPs) and Verb Phrases (VPs). The sentence structure 'Zama Khwagey da' (I like it) illustrates the SOV arrangement. Here, 'Zama' (I) is the subject, 'Khwagey' (sweetness) is the object, and 'da' (is) serves as the verb. Unlike English, where the verb typically follows the subject, Pashto's syntax places the verb at the end, causing a restructuring of the Specifier-Head-Complement positions.

The case marking system in Pashto adds another layer of complexity. Pashto employs an ergative-absolutive alignment, unlike the nominative-accusative alignment seen in English. For example, in past transitive constructions, the subject takes an ergative case marker, while the object takes the absolutive form. This system affects syntactic structure, as the role of the subject changes depending on tense. Such structural differences present a challenge to X-Bar theory, which assumes a more uniform arrangement of Heads and Complements. Pashto also exhibits an intricate verbal morphology that influences phrase structure. Verbs in Pashto are conjugated to reflect tense, aspect, mood, and evidentiality. For instance, the simple verb 'kawal' (to do) can appear as 'kawi' (he does), 'kawo' (I do), or 'kare' (he did). This morphological variety affects VP projections, as tense and aspect markers are often analyzed as separate functional categories in Minimalist Program analyses. The implications for X-Bar theory are significant, as these inflectional elements must be accounted for in the syntactic tree structure. The notion of a unified Specifier-Head-Complement arrangement becomes insufficient to capture this complexity.

Pashto also provides an example of a rich morphological language type specifically in its verbal system that influences phrase structure as it determines the position of words in the phrase. Pashto verbs are described according to their tense, aspect, mood and evidentiality. For example the basic uninflected verb form 'kawal' (base form) which means 'to do' can be pronounced as 'kawi' (third-person singular present-tense form), e.g. 's/he does', or as 'kawo' (first-person



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plural present-tense form), e.g. ‘they do’, and as ‘kare’ (past tense form) e.g. ‘s/he did’. This morphological variability impacts on VP projections because tense and aspect are regarded as separate functional categories in the analyses as in the frame of the Minimalist Program. The consequences for X-Bar theory are also important, because these inflectional morphemes must be accounted for and resultantly incorporated into the syntactic tree structures. The idea of the simple and unified structure comprising the Specifier-Head-Complement combination, as assumed in the traditional/classical model of X-bar schema is simply insufficient and is no longer adequate to capture and describe the multiplex issues that emerge on account of Syntactic nuances displayed by syntax of the languages across the world.

### **Comparative Analysis of Urdu and Pashto**

Although Urdu and Pashto have common features such as SOV configuration, postpositional phrase structure and morphologically complex systems, they also bear some differences that not only affect their conformity with X-Bar theory but also destabilize their fair compliance with X-Bar theory characteristics. In both languages, the X-Bar projections have to be reconsidered since its Head-Complement structures do not fit to the general Specifier-Head-Complement configuration. Nevertheless, due to ergativity, Pashto has the syntactic difference that is not found in Urdu as Pashto’s use of ergativity introduces a distinction that affect the syntactic arrangement of subject, object, and verb. that is, the difference between the subject, the object and the verb. Pashto’s ergative alignment system requires a reassessment and reevaluation of subject roles, which are traditionally fixed in the nominative-accusative model/system employed in languages like English.

### **Findings**

#### Urdu

**Word Order:** Urdu like many other languages has SOV order, while English has SVO order. This has consequences for the position of Complements and Specifiers in Urdu and English tense phrase (TP) respectively.

**Verb Phrase (VP) Structure:** The verb phrase in Urdu is also in the form of Subject-Object-Verb order, here the verb is the last word. This is contrary to the SVO languages’ predictions in the X-Bar model.

**Determiner Phrase (DP) Structure:** Since X-Bar theory involves a DP headed by a Determiner (D), there is a lot of variation from the English DP model in Urdu, such as the use of post-nominal modifiers in Urdu.

**Morphological Complexity:** Inflectional morphology of Urdu has bearing on syntactic organization. For example tense, aspect markers are located on the verb and they affect the projection of the VP within the X-Bar framework.

#### 4.5 Pashto

**Word Order:** Pashto like Urdu is an SOV language but has a stricter word order and more rigid adherence to this pattern.

**Verbal Morphology:** The verbs in Pashto, therefore, very highly inflect for tense, aspects and moods which have implications for the syntactico-morphological structure of Pashto.

**Adpositional Phrases (APs):** Pashto uses the unusual/marked category of





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circumpositions, unlike the usual and familiar categories such as preposition and postposition used by English and Urdu respectively. And this further challenges X-Bar assumptions, which are typically designed for prepositional phrase (PP) structures.

**Noun Phrase (NP) Structure:** It was found that noun phrases in Pashto behave differently from those of other languages in so far as case and agreement is concerned, and hence the X-Bar framework has to be adapted to the syntax of the Pashto language.

### **Discussion**

The findings highlight several critical points regarding the applicability of X-Bar theory to Urdu and Pashto.

The following are some of the significant points that the study brings into focus in connection with the nature of applicability of X-Bar theory to Urdu and Pashto.

**Cross-Linguistic Variability:** The SOV word order of Urdu and Pashto contrasts with the SVO assumptions of X-Bar theory. This raises questions about the universality of X-Bar predictions for phrase structure and leads to some doubts concerning X-Bar predictions with reference to the structure of the phrases.

**Morphological Interactions:** While the morphological complexity of English is not highly developed, the analysis of the complex verbal morphology of Pashto verbs entails changes in the X-Bar projections. Tense, aspect, and agreement features have to be placed in the syntactic tree, thus, necessitating the expansion of the X-Bar theory.

**Head Directionality:** Unlike X-Bar theory which presupposes left branching (where the Head is followed by the Complement), Urdu and Pashto display right branching where the Complements are often post-head, i.e. Complements often follow the respective Head. This poses a direct challenge to the X-Bar framework.

**Code-Switching:** Usually Urdu exhibits code-switching with English randomly. This free mixing of words in languages illustrates the fact that sociolinguistic factors influence syntactic structure, an area that X-Bar theory seems to ignore.

Consequently, the results of the present research pose significant questions in regards to the universality and generality of X-Bar theory. The structural differences shown in Urdu and Pashto indicate that the assumptions made in the X-Bar framework are impractical to some extent as far as their universal applicability is concerned. The first implication is related to the necessity to extend X-Bar theory to the type of languages in which the word order is SOV and display Head-final structure unlike English which is Head-initial. The positioning of postpositions after the noun phrase as observed in Urdu and Pashto indicates that the traditional account of PPs as a single projection under X-Bar theory is inadequate. Hence, a variant of the X-Bar schema which includes configurations for SOV and Head final projections is required to effectively capture these phenomena. Such differences indicate that, although X-Bar theory gives a valuable framework, this framework needs to be altered when applied to a range of linguistic systems. The study indicates that in order to apply X-Bar theory, more parameters should be included to account for right-headed languages, postpositional languages, and languages with rich verbal morphology.



## Conclusion

The present study critically examined the validity of Chomsky's X-Bar theory in analyzing Urdu and Pashto, two major Pakistani languages and revealed that while Chomsky's X-Bar theory is applicable in certain respects, its assumptions require re-evaluation when applied to non-European languages like Urdu and Pashto. The comparative analysis reveals that while some aspects of the X-Bar framework apply, significant deviations exist due to differences in word order, morphological complexity, and head directionality. These findings suggest that X-Bar theory requires adaptation to account for the syntactic diversity observed in non-European languages. Differences in word order, morphology, and the use of postpositions highlight the need for a more inclusive, cross-linguistic approach. Future research should expand the analysis to other non-European languages, enabling a more robust theory of linguistic universals.

It is recommended that future work on X-Bar theory include a wider array of language families to capture the syntactic diversity observed in world languages. Incorporating insights from construction grammar and typological linguistics may provide alternative explanations for the variation in linguistic patterns seen in Urdu, Pashto, and other non-European languages.

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