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# Working with Percolation Conventions: A Generative Analysis of the Urdu Nominal Complex Derivatives

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**ABSTRACT**

*This study presents the analysis of tetramorphemic Urdu nominal complex derivatives with structural and percolational perspectives. Complex morphological trees demonstrate the general formal properties as syntactic structures, present factorization of the constituency, and hierarchical structures of the complex derivatives. In the present work, the constituents of the complex nominals are decomposed into morphemes and the geometry of building blocks of the complex derivatives are presented through binary branching trees. The research is conceived within the framework of Generativism. Data are collected from Feroz-ul-Lughat Jame New Edition. Following purposive sampling technique, twelve tetramorphemic complex nominals are selected. The complex nominals are presented with percept to elaborate percolation conventions proposed by Lieber (1980), Selkirk (1982), Di Sciullo (1986), and Spencer (1994).The present work finds the percolation conventions a handy guide to draw morphological trees. It highlights the co-occurrence of the same category markers as one of the derivational phenomena. It also highlights some constraints on complex morphological trees. It reveals that mismatching between modifier and modified nodes and violating locality condition lead to ambiguity and crash of derivation.*

**Keywords:** Urdu complex words, derivatives, morphological trees, percolation conventions

## 1. INTRODUCTION

This study strives to investigate the structure and distribution of Urdu complex derivatives. Complex derivatives contain the root and multiple affixes, which play pivotal role for projecting syntactic, morphological, and semantic features. The researcher has taken resort to complex morphological trees for magnifying the features of morphological nodes and their percolation to the higher ones. A tree diagram is a convenient means of displaying the internal hierarchical structure of sentences and words as generated by a set of rules (Crystal, 2008). The study attempts to project morphemes onto binary branches following the traditional cults of syntactic

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I express my deepest gratitude to my mother *Shehnaz Akhtar*for infusing into me the philosophy of life.

trees. Feature percolation conventions proposed by some morphologists are used to present morphological trees systematically. These conventions help trace features moving from the root to the maximal projection. This study also explores the constraints on the trees. If they are not handled properly, they cause ambiguity and ungrammaticality.

## 2. SIGNIFICANCE OF THE STUDY

The complex nominalization is analyzed with various perspectives, including form, meaning, and use. Lees (1960) and Chomsky (1970) scrutinize nominalization with generative perspective. Halliday (1994) and Eggins (2004) use functional lens to analyze nominalization. Langacker (1991) applies the framework of cognitive grammar on nominalization. Quirk et al. (1985) study nominalization with respect to traditional grammar. Mangrio (2016) investigates Persian, Arabic, and English strands of nominalization with inflectional and derivational perspectives. In the present study, the Urdu complex nominalization is scrutinized within the framework of Generativism. English complex words and their internal structures have much been discussed in the annals of research but the Urdu complex derivatives have never been studied with generative perspectives with particular reference to percolation conventions. The present work intends to fill up this research gap. The complex nominals are decomposed and their constituents are projected on the binary branching trees to trace the embedded features. In line with phrase structure grammar, phrase structure morphology is applied on the complex derivatives to highlight their underlying derivational mechanism.

## 3. RESEARCH OBJECTIVES

The present study organizes an objective to highlight syntactic perspectives of the complex nominals. The following research objective determines the focus of the study:

i. To demonstrate the tetramorphemic Urdu nominal complex derivatives with structural and percolational perspectives.

The set objective is generative in nature. The first step is to trace the underlying structure of the complex derivatives to present them on the hierarchical structure with binary branching. The second step is to probe the morphosyntactic features of the complex nominals and apply feature percolation conventions on their tree diagrams. The set objective is interwoven in morphology-syntax nexus.

## 4. LITERATURE REVIEW

Words are classified on the base of their morphological structures. They are either simple, complex or compound constructions. Simple words are monomorphemic and they are void of morphemic segmentation of internal structure e.g., *ʃʊkr* ‘gratitude’ (N) is not divided into morphemes. On the other hand, complex words are further

divided into multimorphemic complex and compound derivatives. Compounding is not the focus of the study. Contrary to monomorphemic word, a complex word contains more than one morpheme. Plag (2003) elaborates multiple affixations with diagrammed examples. Urdu is rich in complex derivatives, which are seen in both literary and spoken usages. In the structure of complex derivatives, the root is attached with multiple affixes. A number of prefixes, suffixes, and circumfixes perform vital role for generating the complex derivatives. The present study intends to unpack morphemes of the Urdu complex nominals by using tree diagrams to analyze their internal structures.

In various disciplines, the use of tree diagrams has been common for presenting visual images and representations of a large component in small segments. In the study of Syntax, tree diagrams are frequently referred to highlight the syntactic structures. To make prominent the syntactic features and hierarchical organizations, a set of established symbols are used to capture the syntactic properties.

Baker (1998) defines that tree diagrams are used extensively in scholarly works and textbooks. Their major validation is to provide quick and efficient representations of some important organizational properties of individual sentences. With the advent of Distributed Morphology: a theoretical framework introduced by Morris Halle and Alec Marantz in 1993, the application and tradition of trees have been witnessed in the study of Morphology. It advocates the interface between the construction of words and sentences. In the study of linguistic Morphology, it is called complex morphological trees as it deals with the internal structure of complex words. It explores the occurrences of affixation around the base form and captures morphological changes, which appear with the attachments of affixes. The geometry of complex trees also reveals how to decompose the attached morphemes.

Minimalist Morphology (MM)highlights the places and combinations of stems and affixes. It generally assumes that stems and affixes may be combined freely. On principles of affixation Wunderlich (1996:97) asserts that the permissible combination is only restricted by potential input specifications of affixes and the following principles:

a. MONOTONICITY: The output of affixation must be more informative than the input.
b. ADJACENCY: The input requirement of affixes must be met locally.
c. AFFIX ORDER: The order of affixes must conform to the hierarchy of functional categories, i.e., affixes that express lower-ranked categories must be attached first.

These principles help draw the morphological trees to avoid ambiguity and wrong attachments. Irrelevant attachments bring disastrous change in meaning and structure.

In the study of Syntax, tree diagrams are drawn to magnify the syntactic features of phrases. Carnie (2001) states the golden rule of tree and asserts that modifiers are

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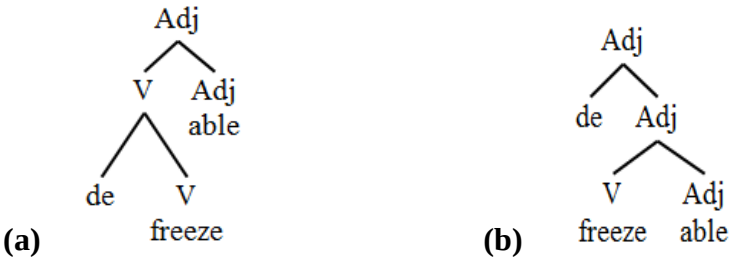
always attached within the phrase they modify. Application of the same golden rule on morphological trees appears to be beneficial as it avoids ambiguity, which gives two-tailed meaning. Since morphological trees have certain constraints, the attachments of morphemes should not be irrelevant. Plag (2003) gives an analysis of the word *'**un**regret**ful**'*. There are three possible combinations for the analysis of the given word in morphological tree. They include:(a)***un***-+*regret*+***-ful***, (b) ***un****regret*+ ***-ful***, and (c)***un***-+*regret****ful***. At first glance, it appears to be difficult to decide which distribution is correct. The internal distribution gets clear if the meaning of the word *'**un**regret**ful**'* is understood. The suffix ***–ful*** adjectivizes the construction by attaching to '*regret'*, and is further prefixed with the negator ***un-***. If the first attachment is made with ***un-*** and ***-ful*** is attached later on, which should be something like 'full of **un**regret'. It is still not clear what '***un****regret****ful***' really means. The given point can further be elaborated with the morphological trees of the word *'**de**freeze**able**'* in two different contexts whether it is ***de***-+*freeze****able*** or ***de****freeze*+***-able***.

4.1




Both structures give different approaches and forces to meaning. In Diagram *a*, verb *'**de**freeze*' is modified with *'**-able**'*, and together means 'there is something which can be made liquid. In Diagram *b*, the prefix ***de-*** gives meaning of negation, which contains some other force of meaning. The same illocutionary force exists in ***un-*** +*lock****able*** vs. ***un****lock*+***-able*** and ***un***-+*do****able*** vs. ***un****do*+***-able***. The whole discussion reveals that there are certain constraints which occur, while drawing the morphological tree diagrams. Meaning can be interpreted differently by extracting branches from different nodes.

Aronoff and Fudeman (2011) explain that two complementary approaches to morphology are entitled analytic and synthetic. The linguists use both approaches depending on the analytical needs. The analytic approach has to do with breaking words down, and it is usually associated with American structuralist linguistics of the first half of the twentieth century. The second approach to morphology is the synthetic approach. It basically deals with putting morphemes together. In this study, the analytical approach is incorporated to decompose the complex derivatives and unpack their internal structures.

Nida (1949) presents some basic analytic principles used in morphology. He presents six principles but here only four are described to support the study. These principles are helpful for the morphological analysis. First principle advocates that forms with the same meaning and the same sound shape in all their occurrences are instances of

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the same morpheme. Second principle asserts that forms with the same meaning but different sound shapes may be instances of the same morpheme if their distributions do not overlap. Third principle explains that not all morphemes are segmental. Fourth principle emphasizes that a morpheme may have zero as one of its allomorphs provided it has a non-zero allomorph. After analyzing the morphological structure, components of tree diagrams, and approaches to morphology, it is imperative to unpack percolation conventions.

The percolation conventions form a well-defined system to transfer the properties of morphemes to the immediately dominating nodes. It is observed that all terminal and non-terminal nodes are information-laden. This information-bearing ultimately percolates up to the immediately dominating node and gradually accumulates on the mother node. In tree diagrams, each dominating node represents the sum of its constituents, which are displayed by percolation (Jesperson, 1924; Chomsky 1970, 1981; Jackendoff, 1977; Lieber, 1980; Grimshaw, 1991; Orgun, 1996a). The percolation of features is frequently used in Syntax. In Syntax, this percolation of features is called projection (Jackendoff, 1977, Chomsky, 1970, 1981, Lieber, 1980; Grimshaw, 1991). In the present work, these percolation conventions are used to show features moving from the root up to the mother node. The curved arrows are used to show the percolation process. The analysis of each complex derivative is supported with the morphological trees, and its properties under feature percolations.

The study includes the percolation conventions presented by some linguists, including Lieber (1980), Selkirk (1982), DiSciullo (1986), and Spencer (1994).

Feature Percolation Conventions (FPCs) is a set of four mechanisms originally proposed in Lieber (1980:85)that copy the properties of morphemes to the node that immediately dominates them. These are golden rules to join nodes and assigning morphological features. Lieber assumes that morphemes are inserted into unlabeled trees, and these trees are then labeled by means of the following FPCs:

**FPC I:** All features of a stem morpheme (i.e. a morpheme lacking a subcategorization frame) including category features, percolate to the first non-branching node dominating that morpheme.

**FPC II:** All features of an affix morpheme, including category features, percolate to the first branching node dominating that morpheme.

**FPC III:** If a branching node fails to obtain features by FPC II, features from the next lowest labeled node automatically percolate up to the unlabeled branching node.

**FPC IV:** If two stems are sisters (i.e. they form a compound), features from the right-hand stem percolate up to the branching node dominating the stems.

Selkirk (1982) proposes some percolation conventions for the English derivatives in her work. She maintains that percolation refers to a well-formed condition on

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syntactic representation of morphological constructions. The purpose of percolation conventions is to combine the features of a constituent and its head. She states the framework of percolation as given below:

> If a constituent α is the head of a constituent β, α and β are associated with an identical set of features. (p.75)

Contra William (1981) and Spencer (1994), she does not take the inflectional affixes the heads of their constituents. Moreover, percolation captures the limited features of affixes and the heads. It plays a vital role in connection with the category features in a syntactic representation of morphological constructions. She asserts that affixation rules generate only structures, whereas category names are acquired through percolation in word structures. Percolation brings to surface features from the head to the mother node. The path of percolation is highlighted through unbroken arrows. She suggests the following revised formulation of percolation:

> a. If a head has a feature specification, its mother node must be specified, and vice versa.
> b. If a non-head has a feature specification, and the head has the feature specification then the mother node must have the feature specification. (p.76)

According to the revised percolation convention, features of the head, its modifiers and the mother node must be specified through percolation. No morphological node must be left unspecified. The revised feature percolation advocates the feature specification that percolates up to the branching node. Furthermore, percolation conventions characterize the well-constructed morphological trees for a language with a context-free rewriting system. It is noted that nature of percolation conventions is cyclic and recurrent.

Di Sciullo (1986) opines that percolation accomplishes the identification of the category of the root in the morphological tree. This identification is folded in the constellation of external arguments and affixation. She exemplifies this process through the tree diagrams. The percolation, given below, transfers the category feature to the mother node connected with the root.

4.2


Diagram *a* shows specifications of the terminal nodes. The first sister in the binary branching is N occupied with *rudiment* and the second sister is A filled in with the adjectival marker ***-ary***. Both are connected in the percolation process. The curved arrow shows the path of percolation. Diagram *b* shows percolation from the terminal node A to the mother node A to represent the adjectival construction of *rudiment**ary***.

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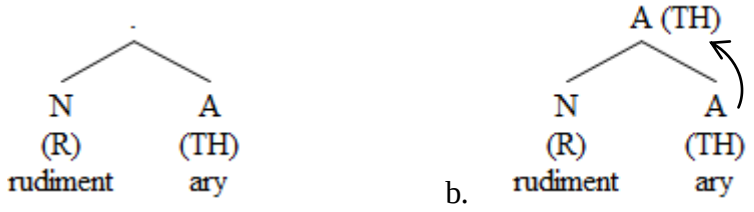
The word structure grammar derives the categorial and thematic properties of the morphological object. It consists of a set of listemes, a set of categories (N, V, A), and a set of thematic roles (AG, TH, R, LOC, etc.).She asserts that percolation gives identification to the external argument of the argument structure of the root. The root occupies the position among various arguments. It is evident from the following diagrams that the thematic role of the category head becomes the external argument of the morphological atomicity. She elaborates the function of percolation for the argument structure through the following diagrams:

4.3

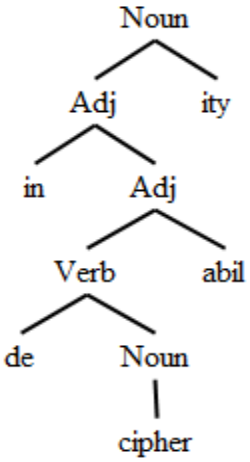



a. b.

Carnie (2013) holds that thematic relations are semantic relations that an argument plays with respect to the predicate. The argument may get two thematic relations out of agent, experiencer, theme, goal, recipient, source, location, instrument, and benefactive but only one theta role. The theta role is creeping in the syntactic hierarchical structures. In the above Diagram *b*, the terminal node A percolates its thematic role to the mother node A. Through this nexus between semantics and syntax, the morphological trees evidently percolate thematic roles of diminutive, augmentative, pejorative, affectionate, and attributive markers to the immediately dominating node besides category specifications.

Spencer (1994) claims that each morpheme in the complex construction has its grammatical category in the analysis of the nominal complex construction '***inde****cipher****ability***'. These grammatical categories are labeled to make them distinct and unique. He elaborates the grammatical categories through the following complex morphological tree:

4.4



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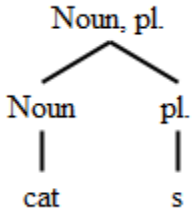
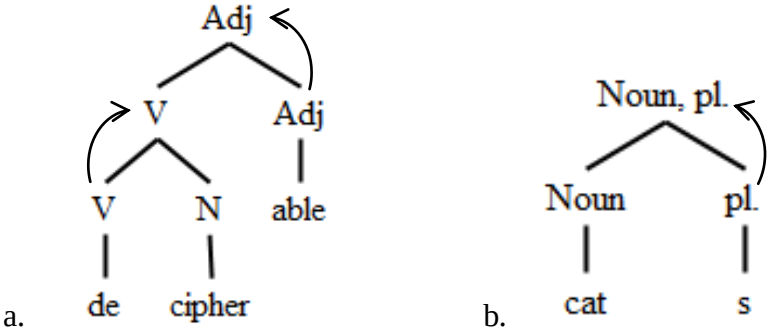
Each attachment of the affix defines the category of the word (N, A, V etc.). On this ground, he holds that each morpheme is regarded as the head of the word contrary to some other linguists. In the context of percolation, he takes the word '*cats*'. He elaborates its constituency through the following diagram:

4.5




He asserts plural suffix ***-s*** head of the given word, as it renders the word *cats* plural. It is the inflectional *-s*, which changes the feature of *cat*. He states that the word *cats* inherits this feature by a process of percolation. He affirms that the feature percolation takes place from the heads. They trigger category percolation of noun, adjective, verb etc. to the dominating node. He shows the process of percolation by arrows in the following diagrams:

4.6




As indicated in the above Diagram *a*, the path of percolation is bidirectional. In the analysis of complex derivative ***de****cipher****able***, the prefixation with ***de-*** changes the nominal category of *cipher* into a verb category by the left percolation. Furthermore, this verb category ***de****cipher* is changed into an adjective with the suffixation by the right percolation.

In sum, percolation features develop morphology-syntax nexus, as both domains use its features extensively. In the above description, the percolational perspectives are discussed according to the findings of various linguists. The percolation conventions percolate systematically the features from the root to the mother node. All this is to explore compatible avenues in the research to apply a mechanism of percolation conventions on the Urdu complex derivatives. The presented formulation of right and left percolation provides a handy guide to construct the trees of the Urdu complex derivatives. The percolation features highlight step-by-step derivational process, and they are used extensively in data analysis.

## 5. THEORETICAL FRAMEWORK

The present work is conceived within the framework of Generativism initiated by Chomsky's *Syntactic Structures* (1957). Lyons (1983) uses the term Generativism for generative approach. It claims that systems of language are productive and capable of producing an infinite number of utterances, which are never experienced before. In generative grammar, realization of structures is represented by rules. These rules are generative, hierarchical, and recursive and draw heavily on structuralist notion. Chomsky's (1965) generative grammar maintains that a child masters these rules to generate and understand the utterances of other humans. All this is due to the fact that both human mind and language are governed by rules. These rules generate utterances. Generative grammar also lays the foundation of words syntax. The theoretical framework delves into some generative steps. The first step proposes a representative structure of the Urdu complex derivatives. The proposed structure is generalized with the tabular data. The second step is to draw the morphological complex tree to highlight morphosyntactic and percolational aspects. The proposed steps are generative and are interwoven in morphology-syntax nexus.

## 6. RESEARCH METHODOLOGY

In the paradigm of qualitative research, descriptive method is used to analyze the theoretical study of the Urdu complex derivatives. The study uses the purposive sampling technique to select the tetramorphemic complex nominals. The data are collected from *Feroz-ul-Lughat Jame New Edition* and is displayed with meanings, transcriptions, and etymology. The online resources are also consulted to incorporate in the study the contemporary words. The morphemes of the complex derivatives are labeled with syntactic categories. In line with phrase structure grammar, phrases structure morphology is kept in view to highlight the morphosyntactic features. Compound derivatives and inflectional aspects are not the part of data collection and discussion. Syntax Tree Editor, version 0.9.0.3, is used to draw the complex morphological trees.

## 7. DATA ANALYSIS

In the following description, the selected nominal complex derivatives are analyzed with generative perspectives defined in the research objectives and theoretical framework. Each set perspective is sectioned and elucidated with the nominal complex derivatives in the upcoming sub-headings.

### 7.1 Structural Analysis of the Proposed Nominal Template

The generative and recursive features of the complex nominals are captured in the proposed Nominal Template .This derivational strand is at least tetramorphemic besides the prefix slot of the extended proposal. It contains three steps of derivation.

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The first step is adjectival, whereas the second and the third derivational steps are nominals. The strand of the proposed Nominal Template is as follows:

$N \rightarrow [N^{r} \quad A^{af} \quad N^{af} \quad N^{af}]$
$[(Neg^{af}/af) \quad N^{r} \quad A^{af} \quad N^{af} \quad N^{af}]$

The proposed Nominal Template triggers its derivation from the nominal root. An adjectival marker is added to the nominal root to generate adjectival bimorphemic derivative. Two consecutive nominal markers are attached to the adjectival derivative systematically to accomplish the tetramorphemic derivation. It is the unique feature of this template to reveal co-occurrence of the same category markers. While working on the proposed Template, it is noted that the Urdu print dictionaries need to be updated to reflect the contemporary aspects of the Urdu language. The following derivatives are collected from both *Feroz-ul-Lughat Jame New Edition* and online articles due to the non-availability in the Urdu dictionaries printed decades ago. In the following Table, the nominal derivatives, supporting to the proposed Nominal Template, are given:

**Table:** Some Complex Nominals Conforming to the Proposed Nominal Template

| **Roots (N)** | **$A^{af}N^{af}N^{af}$** | | **Nominal Complex Derivatives** |
|---|---|---|---|
| sərmɑːjɑ 'capital' | **-ɖɑːr** | **-i** | **-jəʈ**sərmɑːjɑ**ɖɑːrijəʈ** 'state of capitalism'[3] |
| xʊɖ 'self' | **-ɖɑːr** | **-i** | **-jəʈ**xʊɖ**ɖɑːrijəʈ** 'state of self determination'[4] |
| dʒɑːgiːr 'property' | **-ɖɑːr** | **-i** | **-jəʈ**dʒɑːgiːr**ɖɑːrijəʈ** 'state of feudalism'[5] |
| zər 'wealth' | **-ɖɑːr** | **-i** | **-jəʈ**zər**ɖɑːrijəʈ** 'state of being wealthy'[6] |
| sər 'head' | **-ɖɑːr** | **-i** | **-jəʈ**sər**ɖɑːrijəʈ** 'state of lordship'[7] |
| mənsəb 'dignity' | **-ɖɑːr** | **-i** | **-jəʈ**mənsəb**ɖɑːrijəʈ** 'state of officership' |
| dʒɑːnɪb 'side' | **-ɖɑːr** | **-i** | **-jəʈ**dʒɑːnɪb**ɖɑːrijəʈ** 'state of partiality'[8] |
| rɪʃʈɑ 'relation' | **-ɖɑːr** | **-i** | **-jəʈ**rɪʃʈɑ**ɖɑːrijəʈ** 'state of relationship'[9] |
| mɪnʈqɑː 'zone' | **-ɖɑːr** | **-i** | **-jəʈ**mɪnʈqɑː**ɖɑːrijəʈ** 'zonation'[10] |
| ʈəbqɑː 'class' | **-vɑːr** | **-i** | **-jəʈʈ**əbqɑː**vɑːrijəʈ** 'state of classification' |
| fɪrqɑː 'sect' | **-vɑːr** | **-i** | **-jəʈ**fɪrqɑː**vɑːrijəʈ** 'state of sectarianism' |
| soːg 'sorrow' | **-vɑːr** | **-i** | **-jəʈ**soːg**vɑːrijəʈ** 'state of sorrowfulness' |

[3] (Bashir, 2017, para. 1)
[4](Beta Urdu Tarjuma, n.d.)
[5] (Rehman, 2016, para. 1)
[6] (Bukhari, 2012, para. 2)
[7] (Abid, 2016, para. 5)
[8](Punjnood, n.d.)
[9] (Sadia, 2015, para. 3)
[10](Urdu Point, n.d.)

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The above nominal derivatives give the impression of the proposed Nominal Template. The systematic attachment of various morphemes generalizes the proposed Template on other nominal derivatives of the same morphemic structure. The first left column of the above Table contains the nominal roots. The second column consists of the adjectival markers-***ɖa:r*** and ***-va:r*** to generate the adjectival derivatives. The third column, according to the morphological context, comprises the nominal marker ***-i***. It is a characteristic of the bound morpheme ***-i*** to convert an adjective to a noun and vice versa. In the given formative ecologies, the bound morpheme ***-i*** is added to the adjectival complex derivatives to generate the nominal trimorphemic derivatives. Furthermore, the nominal marker ***-jəʈ*** 'shows state of being, ideology, and philosophy' accomplishes the nominal tetramorphemic derivation.

The extended proposal of the proposed Nominal Template provides a slot for prefix addition. This additional slot is an instance of the derivational recursivity. The nominal complex derivative ***ɣer****dʒa:nɪbɖa:rijəʈ* 'state of impartiality' conforms to the segmentation of the extended proposal. The morphemic sectioning of ***ɣer****dʒa:nɪbɖa:rijəʈ* 'state of impartiality' (N) is given below:

$N \rightarrow [(Neg^{af}/af) \quad N^{r}A^{af}N^{af}N^{af}]$

***ɣer-*** 'not' ($Neg^{af}$) + [*dʒa:nɪb* 'side' (N) + ***-ɖa:r*** ($A^{af}$) →*dʒa:nɪbɖa:r* 'partial' (A) + ***-i*** ($N^{af}$) →*dʒa:nɪbɖa:ri* 'partiality' (N) + ***-jəʈ*** ($N^{af}$) →*dʒa:nɪbɖa:rijəʈ* 'state of partiality']= ***ɣer****dʒa:nɪbɖa:rijəʈ* 'state of impartiality' (N)

**7.2 Percolational Analysis**

The nominal complex derivative ***ɣer****dʒa:nɪbɖa:rijəʈ* 'state of impartiality' (N) concords to the proposed Nominal Template. Its internal structure copies the morphemic configuration of the extended proposal of the proposed Nominal Template.

The root *dʒa:nɪb* 'side' of the given complex derivative is noun. It is adjectivized by adding the category-changing adjectival marker ***-ɖa:r*** 'having, keeping' to the root, and the adjectival complex derivative *dʒa:nɪb****ɖa:r*** 'partial' (A) is derived. The second derivational step is to attach the nominal marker ***-i*** to *dʒa:nɪb****ɖa:r*** 'partial' (A). This attachment generates the structure of *dʒa:nɪb****ɖa:ri*** 'partiality' (N). The nominal marker ***-jəʈ*** is suffixed to *dʒa:nɪb****ɖa:ri*** 'partiality' (N) to derive the nominal complex derivative *dʒa:nɪb****ɖa:rijəʈ*** 'state of partiality'. Finally, the prefix ***ɣer-*** 'not' ($Neg^{af}$) is attached to *dʒa:nɪb****ɖa:rijəʈ*** 'state of partiality' in the end to make the analysis easy. Thus, the complex nominal structure of ***ɣer****dʒa:nɪbɖa:rijəʈ* 'state of impartiality' is generated with four recursive derivational attachments.

Morphological complex trees provide a hierarchical representation of the derivatives to highlight certain embedded morphemes and features. They present a quick means to investigate structural relations through various terminal and non-terminal nodes.

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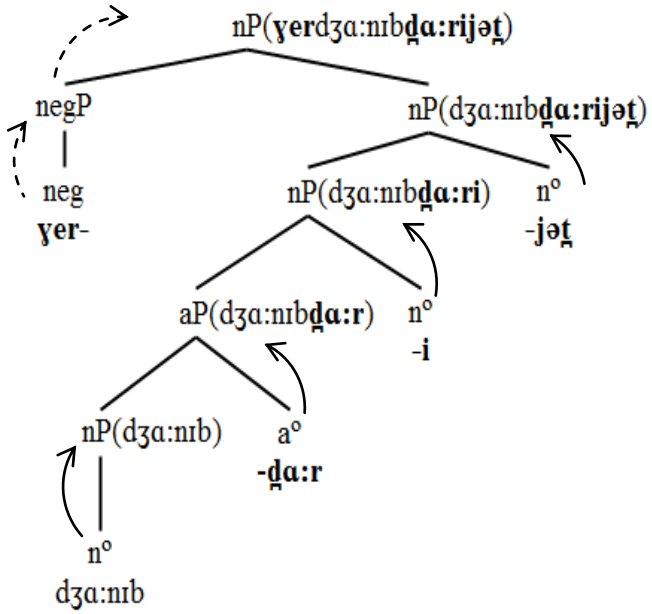
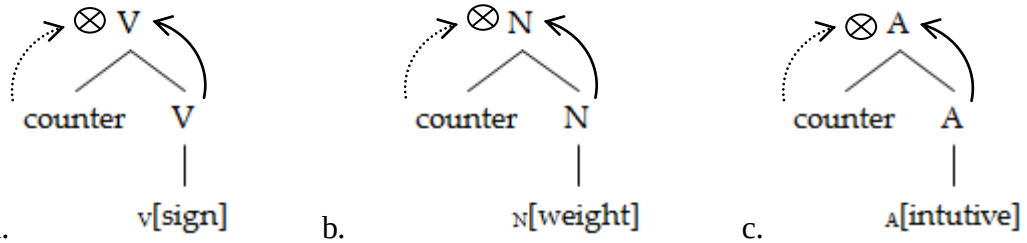
The nominal complex derivative ***ɣer****dʒɑ:nɪb****ɖɑ:rijəʈ*** 'state of impartiality' representing the proposed Nominal Template is presented in a tree diagram below:

7.2.1




Tree diagram, given above, demonstrates the recursive percolation patterns. It is drawn according to FPC I, FPC II, and FPC III presented by Lieber (1980). In the bottom-up analysis, the category feature of the root *dʒɑ:nɪb* 'side' (N) percolates to the non-branching node nP. The second, the third, and the fourth percolations conform to FPC II, which asserts that all category features of the affix morphemes, as the above diagram shows the adjectival marker ***-ɖɑ:r*** and the nominal markers ***-i*** and ***-jəʈ***, percolate to the branching nodes. They include aP and nPs respectively. In the present locality condition, the negator ***ɣer-*** 'not' lacks word-class determining role. FPC III states if a branching node fails to obtain features by FPC II, features from the next lowest labeled node automatically percolate up to the unlabeled branching node.The demonstration of FPC III is elaborated in the following tree diagrams:

7.2.2




a. b. c.

In the above diagrams, the prefix *counter* lacks category feature and does not percolate its features to the mother nodes V, N, and A respectively. Its non-percolation feature is indicated with the doted arrows and the null symbol. The Urdu derivatives also conform to the above formalism. It sometimes happens that the first daughter of the branching node fails to percolate its feature up to the mother node. In that case, FPC III helps by merging the next labeled node. In the tree diagram of ***ɣer****dʒɑ:nɪb****ɖɑ:rijəʈ*** 'state of impartiality' (N), the negator ***ɣer-*** 'not' does not percolate

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its category feature to the mother node, though it converts a noun to an adjective e.g., ***ɣer****va:qia?* 'hostile' (A) is derived from *va:qia?* 'occurring' (N). In the nominal complex derivative ***ɣer****dʒa:nɪbḏa:rijəṯ* 'state of impartiality' (N), the negator ***ɣer-*** lacks wordclass-determining role. In this condition, the second sister node percolates its nominal feature to the mother node.

This systematic percolation process is viewed in four steps. This percolation also supports percolation feature by Selkirk (1982), which associates the merge of α and β with an identical set of features. She takes the position that no node of the morphological tree should be left unspecified, and percolation conventions are traced from the head to the mother node. Her observation is verified in the above diagram, which presents cyclic and recurrent percolations. It is supportive to the percolation convention by Di Sciullo (1986). It holds that each morpheme has a thematic role, which functions according to a theta criterion. The thematic roles of various markers, including the adjectival marker ***-ḏa:r*** and the nominal markers ***-i*** and ***-jəṯ*** demonstrate various perspectives of the complex derivation. Spencer (1994) maintains that each morpheme has its grammatical category, and each morpheme appears to be the head in its category. He holds that grammatical features are also percolated up through binary branches and they affect the morphological structure.

The pentamorphemic construction demonstrates the following merger operations to accomplish the complex derivation:

7.2.3

*dʒa:nɪb* 'side' (N) + ***-ḏa:r*** ($A^{af}$) = *dʒa:nɪb****ḏa:r*** 'partial' (A)
*dʒa:nɪb****ḏa:r*** 'partial' (A) + ***-i***, ($N^{af}$) = *dʒa:nɪb****ḏa:ri*** 'partiality' (N)
*dʒa:nɪb****ḏa:ri*** 'partiality'(N) + ***-jəṯ*** ($N^{af}$) = *dʒa:nɪb****ḏa:rijəṯ*** 'state of partiality' (N)
***ɣer-*** 'not' ($Neg^{af}$) + *dʒa:nɪb****ḏa:rijəṯ*** 'state of partiality' (N)
= ***ɣer****dʒa:nɪb****ḏa:rijəṯ*** 'state of impartiality' (N)

Each node is tied with the loop of government and binding relation. In the relevant locality domains, the governor nodes ***-ḏa:r*** ($A^{af}$), ***-i*** ($N^{af}$), and ***-jəṯ*** ($N^{af}$) trigger the derivation of ***ɣer****dʒa:nɪb****ḏa:rijəṯ*** 'state of impartiality' (N). However, the nominal marker ***-jəṯ*** ($N^{af}$) unveils the projection of headedness to label the derivative N. The negator ***ɣer-*** 'not' occupies the specifier position. The adjacency principle is observed for the morphological combinations. The local and near category suffix is attached first. The wrong attachment of morphemes produces ungrammatical derivatives. Minimalist morphology puts forward the principle of affix order. It states that affixes that express lower-ranked categories must be attached first. In the construction of ***ɣer****dʒa:nɪb****ḏa:rijəṯ*** 'state of impartiality' (N), the adjectival marker ***-ḏa:r*** is attached to the root *dʒa:nɪb* 'side' (N) first being the lowest in the affixal hierarchy. The bound morpheme ***-i*** gives many realizations. It nominalizes an adjective and vice versa. In the nominal complex derivative *dʒa:nɪb****ḏa:ri*** 'partiality' (N), the suffix ***-i*** nominalizes

the complex adjective *ʤa:nɪbd̪a:r* 'partial' (A). This description shows that certain nodes are underspecified due to the syntactic need. Binary branching presents the minimalist view of the structure and helps avoid structural and semantic ambiguity.

## 8. CONCLUSION

The study has applied some feature percolation conventions on the Urdu complex nominals. The binary branching tree diagrams help magnify the morphosyntactic features of the complex derivatives. The study reveals that binary branching trees demonstrate the constituency of the complex structures vividly. Contra ternary branching trees, binary branching trees are systematic and organized. Violation of systematic merger operations causes structural ambiguity and crashes the derivation. The study discloses that feature percolation conventions trace features from the minimal projection to the maximal projection. They leave no node unspecified. They percolate not only category features to the immediately dominating nodes but also assign thematic roles to the concerning nodes. Since percolation occurs from the heads, the affixes count as heads, bring drastic change, and determine the category of the complex derivatives.This study supports percolation conventions and their application for the analysis and synthesis of free and bound morphemes to form the complex derivatives. It highlights the co-occurrence of the nominal markers as one of the derivational phenomena.The pictorial representation of morphological hierarchical structures is expected to orientate the researchers for drawing tree diagrams of compound words and the role of infix in their construction in both Urdu and other cognate languages. The feature of underlying movement in their construction may introduce a new spectrum in the study of compound derivatives and open up new avenues of research in the field of comparative linguistics.

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