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Analyzing the Structure of Urdu NPs with Multiple Genitives

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ABSTRACT
In this article the syntactic structure of those noun phrases of Urdu is explored in which there are multiple instances of genitive marked elements. The structural ambiguities in such phrases are described. It is shown that only the attributive genitive modifiers stack together at the same level to modify the head noun otherwise there is always a hierarchical structure for the genitive modifiers. The nominal which license genitive marked arguments are described and their classification is given. This classification will help building an enriched lexicon for the development of a computational grammar for Urdu.

Keywords: syntactic structure, structural ambiguities, genitive, computational grammar

Introduction

The form kaa in Urdu-Hindi originated from the past participle form of the Indo-Aryan verb kar-do. It inflects for gender, number and case and agrees with the head noun: kaa (M.Sg.Dir), ke (M.Sg.Obl/M.Pl), kii (F). (Payne J., 2004) This form is traced back to a Prakrit past participle form keraa that is further traced back to Sanskrit past participle form kritaa. The evidence for it is provided by Beames (1996) who has given the example, kapi-kritamvacanam ‗speech made by monkey or alternatively ‗speech of the monkey‘. The inflected forms keraa, kerii, kere were in use in old Hindi. The possessive/genitive forms of pronouns were made by adding these forms to them. Later the first syllable of these forms was lost and only the second one was retained with some forms of the pronouns and hence Hindi-Urdu now uses meraa, teraa, etc. as possessive pronouns. But with some other forms of pronouns and all nouns the forms kaa, kii, ke began to be used.

Based on some tests to distinguish affixes and clitics by Miller (1992), Zwicky (1987), Butt and King (2004) have analyzed these forms as clitics. One of the tests is that these have scope over noun coordination and the other is that some other element can intervene between these endings and the nominal host. The most frequent use of these clitics is that they mark possessive nouns, that is, these generally express possession or have-a relation. Consider the following instances of genitive phrases.
Both of instances in (1) show a have-a relation. Although the genitive markers are hosted on the modifier noun, these show agreement of number and gender with the head noun. Another requirement for a genitive phrase to be grammatical is that the host of the genitive marker should be in oblique form. If some genitive phrase hosts a genitive marker then both the head noun and the genitive marker in the host genitive phrase will be in oblique form.

In (2a) the host of the genitive marker bacca _child is in its oblique form. When the whole genitive phrase in (2a) hosts another genitive marker as in (2b) then both the head noun kHilonaa _toy and the genitive marker kaa in the phrase become oblique. Such is the morpho-syntactic behavior of genitive markers in Urdu. In addition to possession there are so many other relations that are expressed by genitive markers. (Platts, 2002) To explore all these relations is not in the scope of this paper. The rest of the paper is organized as follows. Section 2 analyzes the structure of genitive phrases with multiple instances of genitive marked nouns. Section 3 describes the genitive marked arguments with the verbal elements and provides the classification of nouns based on genitive marked arguments. An implementation in the LFG (Lexical Functional Grammar) framework is discussed in section 4. Section 5 concludes the paper.
Structure of Genitive Phrases with Multiple Genitive Modifiers

Both flat and hierarchical structures of genitive phrases with multiple instances of genitive marked nouns are possible. Consider the following example.

(3) a. ی کی چندی کی اگنیگک
alii=kiccaandii=kiaanguguTHii
Ali=Gen.F silver=Gen.F ring.F.3Sg
‗Ali’s silver-ring‘ OR       ‗The ring of Ali’s silver‘

b. ی دا کی بُی کی
nida=kaasone=kaakaang
‗Nida’s golden ring‘

For (3a), the following three bracketing structures could all be assumed.

(i) [alii=kii [caangdii=kiaanguguTHii]]
(ii) [[alii=kiccaandii]=kiaanguguTHii]
(iii) [alii=kiccaandii=kiaanguguTHii]

The first two are the plausible structures for the genitive phrase and are both hierarchical. In (i) the head noun aanguguTHii _ring is modified by the genitive marked element caangdii=kii _of silver and then the resulting genitive phrase is modified by another genitive marked element alii=kii _of Ali‘. In the second bracketing structure (ii), first the noun caandii _silver is modified by alii=kii _of Ali and then the genitive marker is attached to this phrase to modify the head noun aanguguTHii _ring’. In (iii) the head noun aanguguTHii _ring is modified by two modifiers alii=kii _of Ali and caandii=kii _of silver‘.

Three structures for a noun phrase with two genitive modifiers are not always possible. For example in (3b) the bracketing structure [[nidaa=kaasone]=kaakaang] is not possible due to morpho-syntactic behavior of the genitive markers. Here, a genitive marker is supposed to be attached with another genitive phrase nidaa=kaasone _Nida’s gold in which the genitive marker kaa does not show the agreement of case with the head noun sone _gold. So the hierarchical structure like (ii) cannot be assumed for (3b).

The flat structure for both instances in (3) is not plausible in that the two genitive modifiers cannot alternate their positions (4). So we cannot say that the two modifiers are modifying the head noun at the same level.

1In the transcription scheme, consider _a’, _i’, _u’ as short vowels and _aa’, _ii’, _uu’ as long vowels. The equal symbol _=’ marks a clitic boundary. Glosses used in this paper are as follows: 1,2,3 stand for 1st, 2nd and 3rd person, respectively; Gen=genitive, Dir=direct case, Obl=oblique case, Sg=Singular, Pl=Plural, Inf=Infinitive.
One can argue that (4) is ungrammatical rather due to another reason that the possessive modifier is not the most prominent (the outer most). In (5) there is no possessive modifier and still only one order (5a) of genitive marked elements is grammatical. Some more instances of genitive phrases where a flat structure of genitive modifiers is not possible are given in (6).

The noun that opens a position for another nominal is called the relational element. (Seiler, 1983) The noun biivii ‘wife’ in (6a) is a relational element and the modifier alii=kii makes a constituent with this noun. In (6b) the head noun qiimat ‘price’ actually is an attribute and this attribute can only be of gHaRii ‘watch’. So (6a) and (6b) both have hierarchical structures as illustrated below.

(i) [[alii=kii biivii]=kiianguuTHii]
(ii) [[alii=gHaRii]=kii qiimat]
The hierarchical structure could be deep on either side depending upon the semantics of participants in genitive phrases.

**Attributive Genitive Modifiers**

The list of some attributes and their examples is given in Table 1. Attributive genitive modifiers here are taken to be those genitive modifiers which result after adding a genitive marker to some attribute of the head noun. More than one attributive genitive element can modify the head noun at the same level. That is, a genitive phrase with multiple attributive genitive modifiers has a flat structure.

**Table 1. Attributes**

<table>
<thead>
<tr>
<th>SN.</th>
<th>Attribute</th>
<th>Example/Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Material</td>
<td>gold, clay</td>
</tr>
<tr>
<td>2</td>
<td>Price</td>
<td>10 rupees, low price</td>
</tr>
<tr>
<td>3</td>
<td>Size</td>
<td>small size</td>
</tr>
<tr>
<td>4</td>
<td>Height</td>
<td>tall height</td>
</tr>
<tr>
<td>5</td>
<td>Color</td>
<td>red color</td>
</tr>
<tr>
<td>6</td>
<td>Weight</td>
<td>3 kilograms</td>
</tr>
<tr>
<td>7</td>
<td>Age</td>
<td>20 years</td>
</tr>
</tbody>
</table>

Consider the following instances of genitive phrases with multiple instances of attributive genitive modifiers.

(7) a. لوجے لذ ی  گْسے سًگ ی  لڑی
lambeqad=kii[ gore rañg=kii[ laRkii
tall height=Gen.F white color=Gen.Fgirl.F
the girl of tall height and white colour’

b. ین لیوت یب چًِْٹے عةئض یب لیپ
kamqiimat=kaa[ cHoTe size=kaa[ laptop
low price=Gen.M small size=Gen.Mlaptop.M
“A laptop of low price and small size’

In both (7a) and (7b) the order of genitive modifiers can be alternated without changing the truth conditional meaning. My claim is that only attributive genitive modifiers can stack together in a flat structure in Urdu. Furthermore, attributive genitive modifiers show a syntactically similar distribution as adjectival modifiers. The instances in (7) can be uttered with adjective modifiers as in (8).
Like adjectival modifiers (9), the attributive genitive modifiers also modify the head noun (10) and that these cannot modify other genitive phrases. With this argumentation it is clear why example phrases in (4) and (5b) are ungrammatical.

In (9b) the adjectival modifier *baRaa* _'big' is not modifying the head noun *kamrah_ _'room'_. We cannot suppose that this adjective is modifying the possessor noun because in that case it should have been in oblique form to agree with *Ali*, which is oblique given that it is hosting a genitive *kaa* on the possessor noun phrase. As the adjective cannot modify the genitive phrase *alii kaa kamrah_ _'Ali’s room'_, the whole phrase becomes ungrammatical. The phrase in (10b) can only be grammatical if the phrase *pine kaa paani_ _drinking-water* is considered as a unit. As in English the phrase *every men’s room* is acceptable because *men’s room* is considered as a noun-noun
compound involving the possessive morpheme and every takes men’s room as a unit for its complement. (Baker, 1995)

Sometimes ambiguity is generated as to whether the genitive attributive modifier before the material genitive modifier is for the material of the head noun or the head noun itself (11a). If the material genitive modifier is placed before any other genitive attributive modifier (11b) then no such ambiguity is generated.

(11) a. عشر سًگ کی لکڑی کی هیض
   surx
   Rang kii lakRii kii mez
   red color=Gen.F wood=Gen.F table.F.Sg
   _The table made of red wood OR
   _The red table made of wood‘

b. عشر سًگ کی لکڑی کی هیض
   surx rang kii mez wood=Gen.F red
color=Gen.Ftable.F.Sg
   _The red table made of wood‘

When both adjectives and attributive genitive modifiers are present in noun phrases then attributive genitive modifiers are placed near the head noun after the adjectives (12).

(12) دَا کب لَل سًگ کب خُطُّ رَس لجةط
   nidaa=kaa laal rang kaaxuub-suurat libaas Nida=gen red
color=Gen beautiful suit
   _Nida’s beautiful red suit‘

(13) a. کن لیوت کب لیپ ثَََِب
   kam qiimat kaa laptop
   low price=Gen laptop
   _A laptop of low price‘

b. پْذهغ سَبَث کب لیپ ثَََِب
   pandrah sao ropai kaa laptop
   fifteen hundred rupee=Gen laptop
   _A laptop of fifteen hundred rupees‘

(14) a. لیوتعْ سَبَث کب گَان
   sao ropai=ki kii qiimat
   hundred rupee=Gen price
   _Price of one hundred rupees‘

b. لیوتعْ سَبَث
   sao ropai=ki kii qiimat
   hundred rupee=Gen price
   _Price of one hundred rupees‘
If a genitive marker is added to some specified attribute (13a) or some value of attribute (13b), in both cases it will be considered as an attributive genitive modifier, provided the modified noun is not an abstract one. In (14a) and (14b) the modified nouns are abstract and therefore modifiers in such cases are not attributive genitive modifiers. The *is-a* relation is expressed in (14b).

The *part-whole* relation with a genitive construction is expressed by marking the *whole* with the genitive marker but the other way round is also possible in Urdu. In the latter case the *part* before hosting the genitive marker is modified by some adjective/quantifier and it acts like attributive genitive modifiers (15a-b).

(15) a. 
\[\text{ایک ٹی‌گ کبہ ہشغب} \]
\[\text{ektaaṛ}=\text{kaamurQaa} \]
\[\text{one leg}=\text{Gen.Mrooster.M} \]
\[\text{'The rooster of one leg'} \]

b. 
\[\text{بپیلے سًگ یب دّ پشّں یب یہ پٌکِ} \]
\[\text{piileraṛ}=\text{kaa} \]
\[\text{yellow colour}=\text{Gen} \]
\[\text{do paroṛ}=\text{kaayiŋpaŋkHaa} \]
\[\text{two wing}=\text{Gen} \]
\[\text{this fan} \]
\[\text{'This fan of yellow colour and of two wings'} \]

So far, in this section, multiple instances of genitive modifiers have been explored and the analogy of attributive genitive modifiers with adjectives was described. Multiple genitive arguments of nouns are discussed in the next section.

**Nominals and Genitive Arguments**

Some nouns like *brother, child, enemy, edge*, etc., are supposed inherently relational, (Partee & Borschev, 2003) taking the genitive arguments in English and many other languages but the clearest cases of arguments in noun phrases are found in some nominalization. The relationship between nouns and verbs was established first by Chomsky (1970), when he showed that verbs and nouns seem to share complement-taking properties (16).

(16) a. The enemy destroyed the city.

b. The enemy’s destruction of the city.

One basic difference between the argument structure of verbs and nouns is that verbs can take bare NPs as their arguments but the nouns cannot take bare NPs as their arguments. First it was believed that nouns take arguments only optionally (Anderson, 1983-1984). Later it was shown (13) by Grimshaw (1990) that many nouns have two senses or interpretations. In one sense they denote complex events and take arguments obligatorily and in another sense they denote simple events and do not necessarily take arguments. In the first sense they are called process nominals or derived nominals (14) and in the later sense they are called result nominals. Later in this section, it will be examined whether this distinction also exists in Urdu or not.
In Urdu, infinitives are used to construct clauses and are also used as nominals. Butt (15) has debated whether infinitive clauses in Urdu are equivalent to finite clauses or whether they are nominalizations or gerunds. Bhatt (2005) (16) proposed that infinitives can be projected without a subject but Davison (2008) (17) recommended only full clause structure for Urdu infinitives. She provided evidence for the presence of projected syntactic subject in infinitive clauses, even if it is not pronounced.

In this paper Urdu infinitives as nominals will be explored as to what types of genitive arguments they can take. Consider the example phrases of infinitival nominals in (17).

(17) a. یٌذُي یب جَلٌب
   ii̧ndHan=kaajalnaa
   fuel=Gen.Mburn.Inf
   ‗burning of fuel‘

b. هشیغ کب جَلٌب
   mariiz=kaakHaa̧nsnaa
   patient=Gen.Mcough.Inf
   ‗Coughing of the patient‘

c. ًذا  یب دیکٌَِب
   nidaa=kaa de kHnaa
   Nida=Gen.Msee.Inf
   ‗Seeing of Nida/ Seeing by Nida‘

d. ًاذ  یب ًذا  کْ دیکٌَِب
   alii =kaanidaa=kodekHnaa
   Ali=Gen.MNida=Accsee.Inf
   ‗Seeing of Nida by Ali‘

For both unaccusative intransitive verbs (17a) and unergative intransitive verbs (17b), the subject argument (the theme in the first case and the agent in the latter case) of the nominal is marked genitive.

The question is which argument of the transitive verb *dekHnaa *see is marked by genitive marker in (17c). Is it subject or object? It is assumed that it can be either in Urdu. If only one argument of the infinitival nominal of a transitive verb is mentioned in Urdu then it can be either its internal argument or its external argument.

Lebaux (1986) (18), however, explained that if the subject of nominal derived from transitive verb is present then object must obligatorily be there for the noun phrase to be grammatical. Grimshaw (1990) showed that obligatory arguments are taken by nominals only when these are action nominals and it could also be the case that the same nominal behaves in both senses. With this explanation the nominal in (17c) will be considered as a result nominal. It is observed that with infinitives only one argument is marked genitive. In case full argument structure is realized, the subject is marked genitive and the object is marked nominative or accusative. This is illustrated in (18)-(19).
In (18) the infinitive of a transitive verb _becnaa_ 'sell' is given with its arguments. The subject reading of genitive modifier in (18a) and object reading in (18b) both are okay. In (18c-d) both object and subject are mentioned and only the subject is marked genitive. The instances in (19) are frequent expressions in Urdu web corpora where only the object reading is construed. In case of only single genitive argument of the infinitive, most of the times object reading is meaningful.

Persian infinitives are also used as nominals and they too can take either subject or object, but not both with the ezafe construction [19]. In Urdu, however, not only some arguments of infinitive nominals are marked with the genitive, but also arguments of participial adjectives and some subordinate clauses are marked genitive.
b. عَبْبُ كِبْ ذَعَبْأُ
saañp=kaadasaahuaa
  One, who has been bitten of snake'

(21) a. بِلِيظَ كِتَ أَتَيْتِ
Police = kehote
police=Gen.Oblbe.Imperfbe.Perf
  In the presence of police,
  b. عِتَادَ كِتَ أَنَيْتِ
  With the coming of teacher,

(22) a. لاْدَا كِبْ ْلااَتْ
  One, who has been brought up with love'
  b. سَاًسَاتَ كِبْ ْلااَتْ
  One, who has forgotten at night'

In (20) the subjects of participle adjectives are marked with the genitive. In (21) the subjects of participles are marked genitive and here these participles are acting like clauses. In (22) genitive marked elements give adverbial meanings with derived adjectival participles.

Nominals other than infinitives with genitive marked arguments

In Urdu many nouns other than infinitives are derived from verbal roots and take genitive arguments. Some nouns are derived from verbal roots of Urdu itself and some are derived from verbal roots of other languages like Arabic and Persian. These nouns can be divided into two classes. The nouns in one class take only one genitive marked argument and the nouns in other class can take two genitive marked arguments. Some instances of nouns from the former class are given in (23)-(24).

(23) a. كِتَ ْلااَتْ
Train=kiiravaangii
  _departure of train'

  b. كِتَ ْلااَتْ
Train=kii
station=se ravaangii
  _departure of train from the station’
(24) a. عیلاة کی تجبی sailaab=kiitabaahii flood=Gen.F destruction.F _Destruction due to flood‘

b. فظلْں کی fasloñ=kiitabaahii


c. آغی کی تجبی insaan=kiitabaahii

man=Gen.F destruction.F _Destruction of man OR

_Destruction by man‘

d. أغی کی فظلْں insaan=kiifasloñ=kiitabaahii


_Destruction of crops by man‘ OR

_Destruction of crops of a man‘ e. * عیلاة کی فظلْں کی تجبی sialaab=kiifasloñ=kiitabaahii


_Destruction of crops due to flood‘

e. عیلاة کی فظلْں کی تجبی sailaab=se fasloñ=kiitabaahii

flood=Abl crop.Pl=Gen.M destruction

_Destruction of crops due to flood‘

In (23) ravaangii _departure is a noun derived from the intransitive verb and has two alternate sub categorization frames. In both cases it takes genitive marked subject. All nouns of intransitive nature have their subject as genitive marked. The noun tabaahii _destruction is of transitive nature and can take either a genitive marked subject or a genitive marked object (24a-c) but not both of them (24d-e) are marked for genitive case. In (24f) the subject of the nominal is marked by the ablative marker se. Other nominals in Urdu which fall in this class are for example pitaaii _beating‘, dHulaaii _washing‘, pisaaii _crushing‘, muaaina _examination‘.

There are some nouns that can take only a genitive marked object, for example, the nominal bacaao
safety derived from the verb *bacaanaa* _save_. The noun *intixaab* _selection_ usually takes a genitive object. However, it can also act as result nominal where it refers to the result of the selection process as in English.

(25) a. طذّ یب ًتخة sadr=kaaintixaab
   president=Gen selection
   _Selection of the president_‘

b. $\text{کلی کب آنخیة}$ alii=kaa
   intixaab      Ali=Gen
   selection
   _Selection made by Ali_‘

c. ے یہ خْثظْست ش
   yihxuub-suuratSerallii=kaaintixaabhai
   this beautiful    verse Ali=Gen selection be
   _This beautiful verse is selection of Ali_‘

In (25b) the noun *intixaab* _selection_ refers to some result of the process which is evidenced in (25c). Because event or process nominals cannot be used predicatively as showed by Grimshaw [13], the instance of noun *intixaab* _selection_ in (25c) is a result nominal which is modified by a genitive modifier. The second class of nominals in Urdu is typical in that both subject and object/theme are marked by genitive markers. In Persian there is not a single nominal in which both subject and object are licensed by *ezafe* construction. In English too, both subject and object of any noun cannot be prenominal genitives. It is a special characteristics of Urdu and some other Indo-Aryan languages that these have some nominals in which both subject and object/theme both are marked genitive at the same time. The noun *gHeraao* _circumventing_ derived from the verb *gHernaa* _circumvent_ is one example of such nouns.

(26) a. ًْجْاًًْں یب تِةًے یب گیشا
   naojavaanoñ=kaatHaane=kaagHeraao
   youngster.Pl=Gen    police-station=Gen circumventing
   _Circumventing of police-station by youngsters_‘

b. طذّ یب لیکشي یشاًے یب
   sadr=kaa
   election karaane=kaelaan      president=Gen election
do. Inf=Gen announcement
   _Announcement made by president to conduct elections_‘

c. گُم کب طذّ ے کی
   avaam=kaasadr=keelaan=kaaxair-
   maqdam      people=Gen president=Gen
   announcement=Gen welcome
   _Welcome of people for the announcement of president._
For each head noun in noun phrases of (26), there are two arguments and these are both marked genitive.

**LFG Implementation**

LFG’s modular framework represents the syntax with two basic representations. The c- (constituent) structure encodes the basic constituency structure and linear hierarchy of the elements and the (functional) structure models grammatical relations, functional information and other dependencies. In Urdu grammar development [20] genitive markers are dealt in syntax. These clitics have their own terminal node to represent the head of a case phrase.

The genitive marker agrees in gender, number and case with the head noun. This agreement is dealt with at f-structure via feature unification. The genitive phrases with a single instance of genitive marked element work well. With multiple instances of genitive elements the complexity increases. Consider (27):

(27) a. اشبب کپ بپیں کلب لشکش
abrahaa=kaahaatHiyoñ=kaalaSkarAbraha=Gen.Sg
elephant.Pl=Gen army.M
   _Abrah’s army of elephants

b. اشبب کپ بپیں کلب لشکش
abrahaa=kehaatHiyoñ=kaalaSkar
   _The army of Abraha’s elephants’

c. اشبب کپ بپیں کلب لشکش
abrahaa=kehaatHiyoñ=kelaSkarAbraha
=Gen elephant.Pl=Gen army.Pl
   _The armies of Abraha’s elephants’ OR
   _Abraha’s armies of elephants’

Without any restriction the following three bracketing structures for (27a) can be assumed.

(i) [abrahaa=kaa [haatHiyoñ=kaalaSkar]]
(ii) [abrahaa=kaahaatHiyoñ=kaalaSkar]
(iii) [[abrahaa=kaahaatHiyoñ]=kaalaSkar]

Due to non-agreement of number with the head noun the bracketing structure in (iii) is ruled out via feature unification. Structural ambiguity increases when a genitive phrase with multiple instances of genitive elements hosts a case marker, say for example an ergative marker. When a case marker is added to any instance of (27a-b) both result into the similar surface structure as in (27c).

To rule out the bracketing structure (ii) above, it is proposed to typify different genitive case phrases in the grammar, like attributive genitive case phrase, relational genitive case phrase, and
so. When the two case phrases in (ii) will not be recognized as attributive case phrase, then it will be rejected and only the first one will be recognized for (27a) that seems plausible.

Likewise different nominals taking genitive arguments are proposed to be categorized according to the number and type of genitive arguments they take. The lexicon with full sub categorization information of nouns will help to correctly parse the noun phrases in Urdu and the coverage of the parser will be increased.

Conclusion

In this article noun phrases of Urdu with multiple instances of genitive elements have been analyzed. The flat and hierarchical structures of such phrases are explored. It is shown that attributive genitive modifiers behave like adjective modifiers in the syntax and can stack together at the same level and it is proposed to deal such elements separate to other genitive elements. The hierarchical structure of noun phrases with genitive modifiers, however, needs to be worked out further as to disambiguate depth of hierarchy in either direction based on features of the participants. It will help making grammar robust and increasing the coverage. The classification of nominals based on their number and type of genitive arguments is proposed to provide an enriched lexicon to the parser of the grammar.

References


