Introduction
Complex adpositions
Syntactic distribution of nouns in complex adpositions
Complex Adpositions in LFG paradigm

Modeling complex adpositions in LFG: A case study from Persian and Urdu

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Test Case Languages

**Persian:**
- An Indo-Iranian language
- Mainly spoken in Iran
- SOV
- Head-initial Adpositions

**Urdu**
- Indo-Aryan language
- Mainly spoken in Pakistan
- SOV
- Head-final Adpositions
Outline of the Talk

- What are complex adpositions?
- Syntactic distribution of nouns in complex adpositions
- Restricting complex adpositions in LFG paradigm
What are complex adpositions?

- In many languages, the basic adpositions together with some nouns seem to act as predicators taking other elements for their complements.
- Such predicators in linguistic literature are usually termed as complex adpositions.
Examples of complex prepositions

- French: en face de, en dépit de, au milieu de
- Spanish: al lado de, en casa de
- Swedish: i början av, med hjälp av, i stället för
- English: in view of, in spite of, by dint of
- Polish: bez względu na, w związku z, z uwagi na
- German: an Hand von, mit Hilfe von, in Bezug auf

(adapted form Trawinski 2003)
Some Examples in Persian/Urdu

(1) a.
   az ru e tarîx
   from face Ez history
   ‘based of history’

   b.
   be tîr e sadr
   to way Ez president
   ‘as a president’

- The nouns like *ru* ‘face’ in complex adpositions are in fact relational nouns taking lexically their own complements.
Simple vs. Complex Adposition

(2) a.

\[ u \text{ be } xane \ e \ ali \ raft \]
\[ \text{he to home Ez Ali go-Perf} \]
\[ ‘He went to Ali’s home.’ (Simple adposition) \]

b.

\[ u \text{ be } illat \ e \ gurusngi \ murd \]
\[ \text{he to cause Ez hunger die-Perf} \]
\[ ‘He died of hunger.’ (Complex Adposition) \]
The nouns in complex adpositions show different syntactic distribution as compared with their normal syntactic distribution.

(Chime, 2006) has discussed such differences for Persian that actually apply to Urdu and many other languages too.

These differences support the analysis that the two lexical categories *be* and *illat* project to a complex adposition *be illat* which heads the entire phrase.

So, the assumption can be made that the lexically selected complement of the relational noun in such phrases is syntactically realized as the object of complex adposition.
Determiners/Quantifiers

(3) a. 
\[
\text{bar (in/yık/har) bam e } \text{xane}
\]
on (this/one/every) roof Ez house
‘on (this/one/every) roof of the house’

b. 
\[
\text{bar (*in/*yık/*har) asas e motale’at e danışmandan}
\]
on (*this/*one/*every) base Ez research.Pl Ez scientist.Pl
‘based of scientists’ researches’
Question Words/Exclamatories

(4) a.  
\[
\text{bar (che) bam e xane} \\
\text{on (what) roof Ez house} \\
\text{‘on (what) roof of the house’}
\]

b.  
\[
\text{bar (*che) asas e motale’at e danıfsmandan} \\
\text{on (*what) base Ez research.Pl Ez scientist.Pl} \\
\text{‘based of scientists’ researches’}
\]
Superlatives

(5) a. bar (ziba-tərən) bam e xane
    on (the most beautiful) roof Ez house
    ‘on (the most beautiful) roof of the house’

b. bar (*jādīd-tərən) asəs e motəlmət e dənəşmandan
    on (*the newest) base Ez research.Pl Ez scientist.Pl
    ‘based of scientists’ researches’
(6) a. 
\[
\begin{align*}
  \text{bar} \text{ bam e (ziba e) xane} \\
  \text{on roof Ez (beautiful Ez) house} \\
  \text{‘on the (beautiful) roof of the house’}
\end{align*}
\]

b. 
\[
\begin{align*}
  \text{be illat e (*puʃ e) barandgi} \\
  \text{to reason Ez (*vain Ez) raining} \\
  \text{‘because of the (*vain) reason of raining’}
\end{align*}
\]
Plurality

(7) a. 

\[
\text{az kitab-(ha) (y)e ali iştıfade kardam from book-(Pl) Ez Ali use do-Perf}
\]
‘I used Ali’s books.’

b. 

\[
\text{az janıb-(*ha) (*y)e dolat va mardüm from side-(Pl) Ez government and nation}
\]
‘from the government and the nation’
Coordination/Reduplication

(8) a.
   \textbf{ali ba dost va dusman mudara mikunad}
   Ali with friend and enemy bearing do.Pres
   ‘Ali bears everyone.’

b. \textbf{be illat (*va dalil) e barandgi}
   to reason (*and cause) Ez raining
   ‘because of raining’
(9) a.

be qڤl e ่นida
to say Ez Nida
‘according to Nida’

b1.

ningen=ke  be qڤl
Nida=Gen to say
‘according to Nida’

b2.

be qڤl ningen=ke
to say Nida=Gen
‘according to Nida’
The phenomenon of complex adposition formation is somehow similar to the verbal complex formation.

Alsina (1996) and Butt (1995) have argued that complex predicate formation should take place in syntax.

Frank (1996), however, have the opposite position to place complex predicate formation within the lexical component. Although in her approach subcategorization requirements and restrictions on combinations are specified within the lexical entries, still the separate pieces are combined in the syntax.

These proposals have been forwarded for the verbal complex formation in different languages. We extend the proposal for licensing the complex adpositions in LFG formalism.

Trawinski (2003) proposed an HPSG-based linguistically motivated, formal treatment of CPs, applicable for computational platforms intended for developing typed feature structure grammars.
In our case too, the subcategorization requirement and the features recognizing some specific combinations of adpositions and nouns are included in lexical entries and are checked at the syntax level.

The syntactic composition of two predicates is done in LFG using RESTRICTION which allows f-structures and predicates to be manipulated in detail.

In grammar rules the specifier/complement of the noun part is suppressed via RESTRICTION and is assigned as the object of the complex adpositions.
c-structure of complex adpositions

(10)

zardari be tor e sadr bol-a
zardari to way Ez president speak-Perf.M.3Sg
‘Zardari spoke as a president.’ (Urdu)
f-structure of complex adpositions

(11)

zardari be tor e sadr bol-a
zardari to way Ez president speak-Perf.M.3Sg
'Zardari spoke as a president.' (Urdu)

"Zardari be taor e sadr bolaa"

```
PRED 'bol<[1:Zardari]>'
  1[PRED 'Zardari']
SUBL 2 GEND masc, NUM sg, PERS 3
    15[
        [PRED 'be<taor<[7:sadr]>']
            9[PRED 'sadr']
                10 Case Gen-e, GEND masc, NUM sg, PERS 3
        ADJUNCT {[
            OBJ 7
                4
                    8
                        50
                            27
                    52 GEND masc, NUM sg, PERS 3, after_ad +
                11
                    12
                        34 TENSE past
                    [PRED 'taor<[7:sadr]>'
                        5 OBL [7:sadr]
                        6 GEND masc, NUM sg, PERS 3, after_ad +
                ]
            ]
        ]
    ]
```

Lexical Entry:

\[ \text{be} \ P \ (\uparrow \text{PRED}) = 'be<%\text{ARG1}>'; \]

\[ \text{P} \ (\uparrow \text{PRED}) = 'be<(\uparrow \text{OBJ})>'; \]

XLE Rule:

\[ \text{Pc} \rightarrow \{ \text{P: } \uparrow = \downarrow; \}

\[ \text{N: } \downarrow \text{\textbackslash PRED\textbackslash OBL} = \uparrow \text{\textbackslash PRED\textbackslash OBJ} \]

\[ (\uparrow \text{PRED ARG1})=(\downarrow \text{PRED}) \]

\[ (\uparrow \text{OBJ})=(\downarrow \text{OBL}) \]

\[ (\downarrow \text{after_ad})=c + \]

| .. |
| .. |
| .. |
Simple vs. Complex Adposition (c-structure)

(12) a. u be xane e ali raft. ‘He went to Ali’s house.’
    b. u be illat e gurusngi murd. ‘He died of hunger.’
Simple vs. Complex Adposition (f-structure)

(13) a. u be xane e ali raft. ‘He went to Ali’s house.’
   
b. u be illat e gurusngi murd. ‘He died of hunger.’
(14) a. be qcl e ali. ‘according to Ali.’
    b. ali ke be qcl. ‘according to Ali.’
(15) a. be ۃ发展前景 e ali. ‘according to Ali.’
   b. ali ke be ۃ发展前景. ‘according to Ali.’
(N + P) complex adpositions in Persian

- bana bar
- nīsbat be
- raje be
(zer + N) complex adpositions in Urdu

- police ki zer e harasat ‘arrested by the police’
- adlīyah ki zer e nigrani ‘under the vigilance of courts’
- Zardari ki zer e sadarat ‘headed by Zardari’
- Ali ke zer e istemal ‘used by Ali’
- faoj ke zer e qabzah ‘captured by the Army’
- doctor ke zer e ilaj ‘cured by the doctor’
Lexical features and constraints

- Which adposition can form complex adposition with some noun?
- Which noun can actually be part of some complex adposition?
- Which specific combinatorics preferences are?
- The order of two parts of a complex adposition
- The constraints on position and case of the object of complex adpositions
Many complex adpositions developed in Persian are also used in Urdu

Complex adpositions in Urdu formed with Persian simple adposition zer are found in Urdu but not in Persian

The phenomenon of complex adposition formation resembles with the verbal complex formation

The available apparatus in XLE environment makes it possible to model the linguistically motivated analysis of complex adpositions in LFG
Thanks!
References