

Word and Verb Nets for Semantic Processing

Understanding Verbs and the Verbal Complex

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September 6, 2012

Day 9 (Today):

- If desired: More on Auxiliaries, Modals, etc.
(Discussion of simplified Austen text)
- Causatives
- N-V, Adj-V and P-V Complex Predicates

Digression

- The last large rule-based MT Project I know of was VerbMobil:
<http://verbmobil.dfki.de/overview-us.html>
- Before that there was Eurotra.
- No actual systems that are in use resulted from these, but **many** resources were created that are still in use today.

MT Demo: Demonstrating the basic architecture via LFG grammars

- **Causatives** are constructions by which an agent is “added” to a given subcategorization frame.
- The effect is one of *eat* → *make eat/cause to eat* or *boil* → *make boil/cause to boil*.
- The Urdu/Hindi causative is created morphologically by affixation.
 - The *-va* is associated more with indirect causation, the *-a* with direct causation (Saksena 1982).
 - Some verb classes allow only an instrumental (=se) causee, some only a dative/accusative (=ko), some both.
 - This interacts with the “affectedness” of the causee (Saksena 1982, Butt 1998).

The Urdu Causative—Intransitives

- (1) a. yaassin has-a
Yassin.M.Nom laugh-Perf.M.Sg
'Yassin laughed.'
- b. nadya=ne yassin=kO has-**a**-ya
Nadya.F.Sg=Erg Yassin=Acc laugh-**Caus**-Perf.M.Sg
'Nadya made Yassin laugh.'
- (2) a. jangal jal-a
jungle.M.Nom burn-Perf.M.Sg
'The jungle burned.'
- b. fauj=ne jangal(=kO) jal-**A**-yA
army.F=Erg jungle.M.Nom/=Acc burn-**Caus**-Perf.M.Sg
'The army burned the jungle.'

The Urdu Causative—Intransitives

- Generally all intransitives allow for a causative version.
- Sometimes the causative (transitive) versions related to the intransitives via a stem alternation (*kaṭ* ‘be cut’ and *kaṭ* ‘cut’).
- However, as noted yesterday, in fact not all intransitives allow for a causative.
- With respect to causative patterning, there thus seem to be at least **three** classes of intransitives.

The Urdu Causative—Intransitives

Unaccusatives in principle work (adding the light verb ‘go’ is a good test for unaccusativity in Urdu).

(3) a. jangal jal ga-ya
jungle.M.Nom burn go-Perf.M.Sg
‘The jungle burned.’

b. fauj=ne jangal(=ko) jal-**a**-ya
army.F=Erg jungle.M.Nom/=Acc burn-**Caus**-Perf.M.Sg
‘The army burned the jungle.’

The Urdu Causative—Intransitives

All Unergatives work.

(4) a. saddaf b^hag-i
Saddaf.F.Nom run-Perf.F.Sg
'Saddaf ran.'

b. anjum=ne saddaf=ko b^hag-a-ya
Anjum.F=Erg Saddaf.F=Acc run-Caus-Perf.M.Sg
'Anjum chased Saddaf away (made her run).'

But some unaccusatives do not seem to allow causatives:

- *ja* 'go', *a* 'come', *paṛ* 'fall'

Not clear what the reason for this is — but it means with respect to causativization, there are at least **three** classes of intransitives.

Agentive transitives have an instrumental causee.

- (5) a. yassin=ne paoda kaṭ-a
Yassin=Erg plant.M.Nom cut-Perf.M.Sg
'Yassin cut the plant.'
- b. nadya=ne yassin=**se**/*ko paoda kaṭ-**a**-ya
Nadya=Erg Yassin=**Inst**/Dat plant.M.Nom cut-**Caus**-Perf.M.Sg
'Nadya had the plant cut by Yassin.'

Other transitives allow only a *kO* marked causee (“affected”)

(6) a. yassin=ne k^hana k^ha-ya
Yassin=Erg food.Nom eat-Perf.M.Sg
'Yassin ate food.'

b. nadya=ne yassin=**ko**/*se k^hana k^hil-**a**-ya
Nadya=Erg Yassin=**Dat**/Inst food.Nom eat-**Caus**-Perf.M.Sg
'Nadya had Yassin eat (fed Yassin).'

These are known as *ingestives* (others are ‘drink’, ‘learn’) — this class seems to be special to South Asia.

The Urdu Causative — Affectedness Alternation

Still others allow both affected and instrumental causees.

The causee can be either:

- a dative affected object of the main clause.
- an instrumental oblique which is not affected (it is just the instrument).

(7) anjum=ne saddaf=ko masala cak^h-**va**-ya
Anjum.F=Erg Saddaf.F=Dat spice.M.Nom taste-**Caus**-Perf.M.Sg
'Anjum had Saddaf taste the seasoning.'

(8) anjum=ne saddaf=se masala cak^h-**va**-ya
Anjum.F=Erg Saddaf.F=Inst spice.M=Nom taste-**Caus**-Perf.M.Sg
'Anjum had the seasoning tasted by Saddaf.'

Summary Causatives

- Causatives are thus another instance which are sensitive to different types of verb classes.
- You can therefore use causative patterns to establish verb classes (among other distributional evidence in the language like case markers).
- On the other hand, in order to deal with causatives in NLP properly, it is necessary to have an understanding of their structure.
- And you should have a good morphological analyzer for causatives

For example finite-state style morphologies (Beesley and Karttunen 2003) would give you something like below (see xfst in other course).

- (9) a. likHA \Leftrightarrow likH +Verb +Perf +Masc +Sg
b. likHAyA \Leftrightarrow likH +Verb +Caus1 +Perf +Masc +Sg
c. likHvAyA \Leftrightarrow likH +Verb +Caus2 +Perf +Masc +Sg

Demo: Causatives in the Urdu grammar

- There are many other types of complex predicates (N+V, Adj+V, P+V).
- We have begun a reference bank (to be expanded) at:
http://ling.uni-konstanz.de/pages/home/-pargram_urdu/
→Resources

The information in these slides was taken from the following literature

- Butt, Miriam and Tracy King. 2006. Restriction for Morphological Valency Alternations: The Urdu Causative. In M. Butt, M. Dalrymple and T.H. King (eds.) *Intelligent Linguistic Architectures: Variations on Themes* by Ronald M. Kaplan. Stanford, CA: CSLI Publications, 235-258.
- Ahmed, Tafseer, Miriam Butt, Annette Hautli and Sebastian Sulger. 2012. A Reference Dependency Bank for Analyzing Complex Predicates. In *Proceedings of LREC12, Istanbul, Turkey*.
- Ahmed, Tafseer and Miriam Butt. 2011. Discovering Semantic Classes for Urdu N-V Complex Predicates. *Proceedings of the International Conference on Computational Semantics (IWCS 2011)*, Oxford.