Syntactic and Semantic Constraints on Pronoun and Anaphor Resolution in Persian

Elias Abdollahnejad & Dennis Ryan Storoshenko
University of Calgary, Alberta

The First North American Conference in Iranian Linguistics

Stony Brook University
28-30 April, 2017
The Issue

What is the mechanism of reference resolution for the colloquial pronoun un “(s)he” and the anaphor (reflexive) xod-eš “self-3sg”?

Pronoun un shows a clear Condition B effect, while the behaviour of anaphor xod-eš is more unexpected.

1. sohrab_i be araš_j goft [ke mina_k un_i/*k /xod-eš_i/*k =ro dust dare].
   S to A said that mina (s)he /self-PC.3sg =OM like have
   ‘Sohrab said to Arash that Mina likes her-him/self.’
Main Claims

• While both forms (pronoun & reflexive) can appear in overlapping environments, and are subject to some of the same constraints, the reference resolution mechanisms for \( un \) and \( xod-eš \) are different.

• Pronoun \( un \) functions as a “standard” co-referential pronoun, drawing its reference from context alone.
  \[
  \left[ \ldots un_1 \ldots \right]^{g[1 \rightarrow x]}
  \]

• Reflexive \( xod-eš \) shows some hallmarks of a bound variable.
  \[
  \left[ \ldots \lambda x_1 \ldots xod-eš_1 \ldots \right]
  \]
Outline

1) Constraints on Reference Resolution
2) Behaviour and Features of Persian Reflexives
3) Semantics (source vs. perceiver) and Reference Resolution
4) Conclusion and Future Work
Outline

1) **Constraints on Reference Resolution**
2) Behaviour and Features of Persian Reflexives
3) Semantics (source vs. perceiver) and Reference Resolution
4) Conclusion and Future Work
Syntax vs. Semantics

• **Syntactic** and **Semantic** information have been argued to have different determining values in reference resolution. (Kuno, 1987; Tenny, 2003; Kaiser et. al. 2009; among others)

• Within clause: Syntax > Semantics
• Across clauses: Overlap
• Between sentences: Syntax < Semantics
Roles and Hierarchies

• Other than the pure syntactic theories, binding relations have also been argued for in terms of argument hierarchies (e.g. HPSG) or specific maps to theta roles (e.g. Arnold 2001).

• Specific relations have been discussed to be more relevant to specific types of anaphors:
  • Preference for source of information as antecedent of reflexives (Kuno, 1987),
  • Preference for perceiver of information as the antecedent of pronouns (Tenny, 2003),
Form-Specific Multiple-Constraints Framework  (Kaiser, 2003; Kaiser & Trueswell, 2008)

- The *either-or* classification of reference resolution based on **structural** or **non-structural** constraints is an “oversimplification” (Kaiser et. al. 2009).

- **Form-specific multiple-constraints framework:**
  “anaphor resolution is the result of the interaction of multiple constraints” guiding “reference resolution to be **weighted differently** for different referential forms” (Kaiser et. al. 2009, p. 56).
Form-Specific Multiple-Constraints Framework (Kaiser et. al., 2009)

• Kaiser et. al. (2009) used the verb to manipulate the source/perceiver status of the subject and object in English sentences with PNPs.

4. Peter told Andrew about the picture of \{him/himself\} on the wall.

5. Peter heard from Andrew about the picture of \{him/himself\} on the wall.

• They used this contrast to measure the effects of structure vs. semantic roles,
Implications of This Framework (Kaiser et. al., 2009)

- For reflexives, structure is equally important regardless of the semantics,
- For pronouns neither bias fully determines the result,
- The weight of biases is different for each form,
Outline

1) Constraints on Reference Resolution

2) **Behaviour and Features of Persian Reflexives**

3) Semantics (source vs. perceiver) and Reference Resolution

4) Conclusion and Future Work
Reflexives in Persian

• Moyne (1971) uses Persian to discuss distinct syntactic and semantic features of reflexive and emphatic elements.

• Mahootian & Gebhardt (1997):
  • Reflexive pronouns are **anaphoric** with two main functions:
    ① indicating coreference of object and subject,
    ② serving as intensifiers,
  • In Persian, “the scope of reflexivity is **not restricted to the clause**”, i.e. antecedent and reflexive can occur in separate clauses (p. 96).
Persian Reflexive Forms

• Reflexivity appears in two forms in Persian:

i. The simplex expression *xod* ‘self’ with all persons and numbers (used more in formal and written context),

ii. *xod* plus a Pronominal Clitic (*xod-PC*). The clitic determines the number and person of the reflexive element (used more in colloquial and informal language),
Pronouns and Anaphors in Persian

Binding

6. \([\text{minā}_i\ \text{un}_i/\text{k} / \text{xod-eš}_i/?_k / \text{xod}_i*/_k = \text{ro} \ \text{moarefi} \ \text{kard}]\).
   \text{mina} (s)\text{he} / \text{self-PC.3sg} / \text{self} = \text{OM introduce did}
   ‘Mina introduced her-him/self.’

7. \(\text{sohrāb}_j \ \text{goft} \ [\text{ke} \ \text{minā}_i\ \text{un}_i/j / \text{xod-eš}_i/j / \text{xod}_i*/j = \text{ro} \ \text{dust dāre}]\).
   \text{sohrab} \ \text{say.3sg.past that} \ \text{mina} (s)\text{he} / \text{self-PC.3sg} / \text{self} = \text{OM like} \ \text{have}
   ‘Sohrab said that Mina likes her-him/self.’
Diagnostics for Anaphors

Bound variables tend to have sloppy reading with quantifier antecedents.

8. hær-kæsi_i xod-eš_i / xod_i=ro dust dâre.
   Executive body self-PC.3sg / self =OM like have
   ‘Everybody likes self.’

Sloppy reading: ∀ x [x likes x] = John likes John, Bill likes Bill, ...
Strict reading: Everybody likes the very same person.

• Both forms of reflexive are bound variables.
Diagnostics for Anaphors

VP Ellipsis

- If after VP ellipsis only the sloppy reading is possible (not the strict reading) the reflexive element is a bound variable (not a free variable).

9. sohrabᵢ xod-ešᵢ / xodᵢ-ro dust dāre, væli sârâⱽ xod-ešⱽ / xodⱽ=o dust nē-dâre.

S. self-PC.3sg / self-OM like have but Sara self-PC.3sg/self=OM like neg-have
   ‘Sohrab likes self, but Sara doesn’t like self.’

Sohrab likes Sohrab,
=but Sara doesn’t like Sara. (sloppy reading) Bound Variable (preferred)
=but Sara doesn’t like Sohrab. (strict reading) Free variable
Diagnostics for Anaphors

• One additional piece of evidence that *xod-eš* is subject to binding requirements is that when two instances of *xod-eš* occur in the same sentence, they must co-refer.

10. sohrāb, be mināj goft ke mi-dune [ke faqat mādar-e *xod-eš* hičvaqt *xod-eš* = o tanhā ne-mi-zāre].

    *xod-eš* *xod-eš*

S. to M. said that DUR-know that only mother-EZ self-3sg never self-3sg =OM alone neg-DUR-put.

‘Sohrab, said to Mina, that he knows that only self,’s mother does not leave self, alone.’

    self,’s mother    self,

• They are bound by the same (lambda) binder.
Outline

1) Constraints on Reference Resolution
2) Behaviour and Features of Persian Reflexives
3) Semantics (source vs. perceiver) and Reference Resolution
4) Conclusion and Future Work
Constraints in Persian

11. **source** Sohrāb, **perceiver** Arash *goft* [ke minā k hatman bā un i/j/*k* / xod-eš i/j/#k *tamās mi-gire*].

   S. to A. said that M. certainly with (s)he / self-3sg contact DUR-get

   ‘Sohrab **said to** Arash that Mina will certainly contact him/self.’

12. **perceiver** Sohrāb, **source** Arash *šenid* [ke minā k hatman bā un i/j/*k* / xod-eš i/j/#k *tamās mi-gire*].

   S. from A. heard that M. certainly with (s)he / self-3sg contact DUR-get

   ‘Sohrab **heard from** Arash that Mina will certainly contact him/self.’

• Does the manipulation of source/perceiver status of subject and object cause any difference in the likelihood of potential antecedents?
Constraints in Persian

11. Sohrab said to Arash that Mina will certainly contact him/self.

12. Sohrab heard from Arash that Mina will certainly contact him/self.

Reflexive: more likely to be bound by matrix subject.

- Strong influence of syntactic information on reflexives in general,
- Weak Subject Orientation as a violable preference for subject antecedents (Sohng 2004),
11. sohrābī be arashī goft [ke mināk hatman bā un_i/j/*k tamās mi-gire].
S. to A. said that M. certainly with (s)he contact DUR-get
‘Sohrab said to Arash that Mina will certainly contact him/self.’

12. sohrābī az arashī šenid [ke mināk hatman bā un_i/j/*k tamās mi-gire].
S. from A. heard that M. certainly with (s)he contact DUR-get
‘Sohrab heard from Arash that Mina will certainly contact him/self.’

Pronoun: It seems that semantics (i.e. bias for perceiver) also plays a major role.
The same effect seems to exist for un and xod-eš inside PNPs acting as the direct object of mono-clausal ditransitives.

S. rumor-EZ new about-EZ (s)he / self-3sg =OM to A. said
   ‘Sohrab said to Arash the new rumor about him/self.’
Picture Noun Phrases (PNPs)

• The same effect seems to exist for *un* and *xod-eš* inside PNPs acting as the direct object of mono-clausal ditransitives.

13. sohrāb <sub>DO</sub> šaye-ye jadid darmored-e xod-eš<sub>i/*j</sub> =ro] [<sub>IO</sub> be arash<sub>j</sub>] goft.

S. rumor-EZ new about-EZ self-3sg =OM to A. said

‘Sohrab said to Arash the new rumor about him/self.’

Reflexive:

• Subject (source of info) is the possible antecedent.
• Indirect object cannot be coindexed with *xod-eš* (it does not c-command the reflexive).
Picture Noun Phrases (PNPs)

• The same effect seems to exist for *un* and *xod-eš* inside PNPs acting as the direct object of mono-clausal ditransitives.

13. sohrāb_i [ _DO šaye-ye jadid darmored-e un_i/j =ro] [ _IO be arash_j ] goft.

S. rumor-EZ new about-EZ (s)he =OM to A. said

‘Sohrab said to Arash the new rumor about him/self.’

**Pronoun:** subject and indirect object are both possible references (perceiver (object) more likely).
Picture Noun Phrases (PNPs)

14. Sohrāb, [DO šaye-ye jadid darmored-e un_{i/j} / xod-eš_{i/?j} =ro] [IO az arash_{j}] šenid.

S. rumor-EZ new about-EZ (s)he / self-3sg =OM from A. heard

‘Sohrab heard from Arash the new rumor about him/self.’
Picture Noun Phrases (PNPs)

perceiver


S. rumor-EZ new about-EZ self-3sg =OM from A. heard

‘sOhrab heard from Arash the new rumor about him/self.’

Reflexive:

• Subject (perceiver) is the possible antecedent,

• Indirect object cannot (?) be coindexed with xod-eš (it does not c-command the reflexive).
Picture Noun Phrases (PNPs)

perceiver

14. [ṣoḥrāb] [DO šaye-ye jadid darmored-e un₂,₃=ro] [IO az arash₂] šenid.
S. rumor-EZ new about-EZ (s)he =OM from A. heard

‘Sohrab heard from Arash the new rumor about him/self.’

Pronoun: subject and indirect object are both possible references (perceiver (subject) more likely).
Outline

1) Constraints on Reference Resolution
2) Behaviour and Features of Persian Reflexives
3) Semantics (source vs. perceiver) and Reference Resolution
4) Conclusion and Future Work
General Conclusion

• Overall, the picture is that *un* and *xod-eš* are subject to different but possibly overlapping sets of constraints with different weights for each.

• To account for the inconsistent behaviour of *xod-eš*, we leave for future work the possibility that there may be semantically different but homophonous forms of *xod-eš* (c.f. Anand (2006) for Mandarin *ziji*),
Future Work

• Having concluded that xod-eš is indeed a bound anaphor and not merely a pronoun, we will conduct experiments to determine the relative weights of the binding constraints.

• Visual world paradigm eye tracking,
Future Work

We will pursue further tests for logophoricity, based on the distinction in 15 and 16 (c.f. Anand 2006).

15. sohrāb fekr kard [ke arash be un gofte [ke māšin-e xod-eši =o dozdid-an]].

S. thought did that A. to (s)he said that car-e self-3sg =OM stole-3PL

‘Sohrab_i thought that Arash_j has said to him_i that they have stolen self_i/j’s car.’

16. sohrāb fekr kard [ke arash be pedar-e un gofte [ke māšin-e xod-eši =o dozdid-an]].

S. thought did that A. to father-EZ (s)he said that car-EZ self-3sg =OM stole-3PL

‘Sohrab_i thought that Arash_j has said to his_i father that they have stolen self_i/j’s car.’
Take Home Message

• Literature on binding in Persian is still relatively scant – Good news: lots of work to do!

• The data are subtle, and the possible analyses quite complex (as multiple factor analyses seem likely).

• All of this must be kept in mind before binding is used as a diagnostic for syntactic structure (locality and maybe even c-command).
Thank You

سپاس
This project is funded by SSHRC Insight Development Grant 430-2016-00128 to Storoshenko

Bibliography


