

Syntactic and Semantic Constraints on Pronoun and Anaphor Resolution in Persian

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The Issue This paper is concerned with the mechanism of reference resolution for two forms in Persian: the colloquial pronoun *un* “(s)he” and the anaphor *xod-eš* “self-3sg” as shown in (1):

1. Sohrāb_i be Arash_j 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 he/self-3sg contact DUR-get
‘Sohrab said to Arash that Mina will certainly contact he/self.’

In this example, the pronoun shows a clear Condition B effect, while the behaviour of *xod-eš* is more unexpected. Although the local subject is generally the most likely antecedent for the anaphor, here the lower predicate’s semantics (i.e. *tamās gereftan* “to contact” not generally being a reflexive action) precludes a reflexive reading with *xod-eš* and the embedded subject (*Mina*). Like *un*, *xod-eš* can also take either matrix argument as its antecedent (adding emphasis). In this paper, we argue that while both forms 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. Specifically, we claim that *un* functions as a “standard” co-referential pronoun, drawing its reference from context alone, while *xod-eš* shows some hallmarks of a bound anaphor.

Background Although syntactic information has been considered as the major determining constraint in reference resolution, semantic information, especially in cross-clausal referential relations (i.e. pronouns), have also been argued as an influential factor. According to the *form-specific multiple-constraints framework* (Kaiser, 2003; Kaiser et. al., 2009), anaphor resolution as a form-specific process, is determined by the interaction of multiple types of constraints (i.e. syntactic, semantic/discourse), each weighed differently in different forms and positions. Arnold (2001, as cited in Kaiser et. al., 2009) points out that the thematic role of a potential antecedent can affect its likelihood of co-reference. Specifically, some researchers have pointed to the importance of semantic information in determining referential relations, e.g. preference for source of information as antecedent of reflexives (Kuno, 1987) and perceiver of information as the antecedent of pronouns (Tenny, 2003). Opposing the hypothesis that “the relative weights of syntactic and semantic constraints are the same for reflexives and pronouns”, Kaiser et. al. (2009) found that both structural and semantic information influence the referential interpretation of pronouns and reflexives in English, although at different degrees of sensitivity (p. 78).

Constraints in Persian The same effect can be seen in Persian by comparing (1) and (2):

2. Sohrāb_i az Arash_j šenid [ke Minā hatman bā un_{i/j/*k} / xod-eš_{i/j/#k} tamās mi-gire].
S. from A. heard that M. certainly with he/self-3sg contact DUR-get
‘Sohrab heard from Arash that Mina will certainly contact he/self.’

The Persian poly-morphemic reflexive element *xod-PC* (i.e. PC standing for a pronominal clitic varying with number and person) can be bound long distance, as well as locally (Abdollahnejad, 2016). With neutral intonation, the reflexive in both sentences is more likely to be bound by matrix subject (i.e. source of information in (1) and perceiver in (2)) which can be justified by the strong influence of syntactic information on reflexives in general and the presence of Weak Subject Orientation, defined as a violable preference for subject antecedents (Sohn 2004). However, the pronoun *un* in both sentences is less clear, and it seems that semantics also plays a major role as the non-subject perceiver *Arash* in (1) is the most likely antecedent. In (2), both *un* and *xod-eš* are most likely to take the subject as antecedent, but this could be due to a

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convergence of a semantic bias for perceivers and a structural bias for subjects, respectively. In our paper, we show the same effect for *un* and *xod-eš* inside Picture Noun Phrases (PNPs) acting as the direct object of mono-clausal ditransitives. These again show not only that pronouns have a more pronounced perceiver bias, but also that the referential possibilities of *xod-eš* are changed when the internal arguments are scrambled, suggesting a c-command requirement. In non-scrambled ditransitive forms, the reflexive is not c-commanded by the matrix object and subject is the only possible antecedent in both forms (source/perceiver). For the pronoun the object and perceiver is more likely.

3. Sohrāb_i šāye-ye jaded dar-mored-e un_{i/j} /xod-eš_{i/*j} -ro be/az Arash_j goft/šenid.
 S. rumor-EZ new about-EZ he/self-3sg -OM to/from A. said/heard
 ‘Sohrab said to/heard from Arash the new rumor about he/self.’

Scrambling the indirect object over the PNP will allow *xod-eš* to take either argument as its antecedent.

More Evidence One additional piece of evidence that *xod-eš* is subject to binding requirements not present for *un* is that when two instances of *xod-eš* occur in the same sentence, they must co-refer:

4. Sohrāb mi-dune [ke faqat mādar-e xod-eš_i hičvaqt xod-eš_i -o tanhā ne-mi-zāre].
 S. DUR-know that only mother-EZ self-3sg never self-3sg -OM alone neg-DUR-put.
 ‘Sohrab_i knows that only self_i’s mother does not leave self_i alone.’

Following Anand (2006), this obligatory co-reference, especially under an attitude predicate such as *dunestan* “to know”, is suggestive of logophoric binding. This, along with the scrambling evidence above, and further discussion of possible crossover cases, suggests that *xod-eš* is indeed a bound element.

Conclusion and Future Work Having concluded that *xod-eš* is indeed a bound anaphor and not merely a pronoun, we use further tests to determine exactly the binding relationship. (1)-(4) show that while reflexivity is possible, it is not obligatory. We pursue further tests for logophoricity, such as Anand’s (2006) *de re* blocking effect, based on the distinction in (5):

5. a) Sohrāb_i fekr kard [ke Arash_j be un_i gofte [ke māšin-e xod-eš_{i/j} -o dozdid-an]].
 S. thought did that A. to 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.’
 b) Sohrāb_i fekr kard [ke Arash_j be pedar-e un_i gofte [ke māšin-e xodeš_{i/j} -o dozdid-an]].
 S. thought did that A. to father-EZ he said that car-e 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.’

In (5a), the local subject *Arash* is the best antecedent for *xod-eš*, while the matrix subject is more likely in (5b). This sensitivity to an intervening pronoun, binding *xod-eš* in (5a) but not (5b), is another diagnostic for logophoricity, which we continue to pursue. Overall, the picture is that *un* and *xod-eš* are subject to different but possibly overlapping sets of constraints with different weights for each. Following Anand, we must also consider the possibility that the binding mechanisms differ between speakers as well.

Selected References: Abdollahnejad, E. (2016). Reflexivity in Persian. In L. Hrcacs (Ed.), *The proceedings of the Canadian Linguistic Association Annual Conference*, Calgary, Canada. Retrieved from: <http://cla-acl.ca/actes-2016-proceedings>. Anand, P. (2006). *De de se*. Doctoral dissertation, MIT. Kaiser, E. (2003). *The quest for a referent: A crosslinguistic look at reference resolution*. Doctoral dissertation, Philadelphia, PA: University of Pennsylvania. Kaiser, E., Runner, J. T., Sussman, R. S., & Tanenhaus, M. K. (2009). Structural and semantic constraints on the resolution of pronouns and reflexives. *Cognition*, 112(1), 55-80. Kuno, S. (1987). *Functional syntax: Anaphora, discourse and empathy*. Chicago: University of Chicago Press. Sohng, Hong-Ki, (2004). A minimalist analysis of X0 reflexivization in Chinese and Korean. *Studies in Generative Grammar*, 14(3): 375–96. Tenny, C. (2003). Short distance pronouns, argument structure, and the grammar of sentience. *Manuscript, Carnegie Mellon University*.