

Neg-Raising: A View From Indefinites

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INTRODUCTION. The two main accounts of Neg-raising (NR) make different predictions about the scope of negation w.r.t. the scoping elements within the embedded clause of NR predicates. The semantic-pragmatic approach (Bartsch 1973, Gajewski 2005, 2007 and Homer 2015) that considers the NR reading to be the logical consequence of the literal meaning of the sentence, and predicts that negation should always have wide scope over the embedded proposition. The syntactic account of this phenomenon (Fillmore 1963, Collins & Postal 2014), which posits that the surface negation above the NR predicate is base-generated in the embedded clause and syntactically moves into the higher clause, predicts that different scopes of negation within the embedded clause should in principle be possible. In this paper, I will test the prediction of the two approaches by examining the scopal interaction of quantifiers, modals and adverbs with negation in the NR environment in Farsi. **NOVEL OBSERVATION.** Although universal quantifiers, modals and adverbs can take wide scope over negation in simple sentences (1-3), when embedded under an NR predicate, their wide scope over negation disappears (4-6).

- (1) [Hameye bacheha]_F na-yumad-and.
 all-EZ children NEG-came-PST
All the children didn't come ✓ ALL ≫ ¬ ; ✓ ¬ ≫ ALL
- (2) Ali na-bayad be-ya-d.
 Ali NEG-must SUB-come-3.SG
Ali must not come. ✓ MUST ≫ ¬ ; ✓ ¬ ≫ MUST
- (3) amdan, Ali in kar-o na-kar-d.
 intentionally Ali this work-RA NEG-do-PST
Ali intentionally didn't do this ✓ INTENTIONALLY ≫ ¬ ; ✓ ¬ ≫ INTENTIONALLY
- (4) fekr nakonam [Hameye bacheha]_F oumade baš-and.
 think NEG-do-1SG all-EZ children come-PP SUBJ-be-3.PL
I don't think all the children came. *ALL ≫ ¬ ; ✓ ¬ ≫ ALL
- (5) fekr nakonam Ali bayad be-ya-d.
 think NEG-do-1SG Ali must SUBJ-can-3.SG sub-come-3.SG
I don't think Ali must come. *MUST ≫ ¬ ; ✓ ¬ ≫ MUST
- (6) fekr na-konam amdan, Ali in kar-o kar-de baš-e.
 think NEG-do-1.SG intentionally Ali this work-RA do-PP SUBJ.be-3SG
I don't think Ali intentionally did this. *INTENTIONALLY ≫ ¬ ; ✓ ¬ ≫ INTENTIONALLY
- The observation (7) that negation can scope under indefinites NR-embedded predicates is novel.
- (7) **CONTEXT:** *Someone tells me that Ali has to read five books for his exam but I don't know which books . I know that it takes 1 hour for Ali to read a book. I learn that Ali has started reading books 3 hours ago. Considering Ali's speed in reading a book, I know that there are at least two books that he didn't have time to read.*
 fekr ne-mi-kon-am Ali do-ta ketabo xunde bash-e.
 thought NEG-IMPF-do-1SG Ali two-CL book-RA studied SUBJ.be-3SG
I don't think that Ali read two of the books. THINK ≫ TWO BOOKS ≫ ¬

PROBLEM. The set of data presented above poses some problems for both approaches. The problem for the syntactic account of NR is substantial. It fails to explain why negation cannot scope below all the scope-taking elements. The semantic-pragmatic account runs into a problem accounting for low scope of negation with respect to indefinites. However, the proponents of the latter approach can argue that indefinites are choice-functional elements denoting individuals *e* (Reinhart 1997, Winter 1997 and Kratzer 1998). Given the denotation of the NR

predicate *think* and the negation of the embedded proposition as the result of the excluded middle presupposition, we will have either (8a) or (8b), depending on where the choice function is existentially closed:

- (8) a. $\forall w'' \in \text{Think}(I,w): \neg \exists f [\text{read}_{w''} (\text{Ali}, f (\text{book}_{w''}))]$
 b. $\exists f (\forall w'' \in \text{Think}(I,w): \neg [\text{read}_{w''} (\text{Ali}, f (\text{book}_{w''}))])$

(8a) is ruled out because it denies the existence of a choice function, but (8b) gives us the intended reading for (7). A problem would arise if we change the context to (9).

- (9) CONTEXT: *Someone tells me that Ali has to read five books for his exam (A,B,C,D,E) . I know that it takes 1 hour for Ali to read a book. I learn that Ali has started reading books 3 hours ago. Considering Ali's speed in reading a book, I know that there are at least two books that he didn't have time to read, but I don't know which.*

$$\exists f (\forall w'' \in \text{Think}(I,w): \neg [\text{read}_{w''} (\text{Ali}, f (\{A,B,C,D,E\}))])$$

The intended reading is not obtained in (9) either, as the choice function always picks out the same element from the set of book $\{A,B,C,D,E\}$, thus gives rise to the wide-scope (*de re*) reading of the indefinite. **PROPOSAL.** To get the intended reading, the choice function needs to pick different elements from a single set across doxastic alternatives. As the set the choice function applies to is the same in all possible worlds, the only way to get different values is to have different choice functions in each world. I propose that choice functions are functions of type $\langle s, \langle \langle e, t \rangle, e \rangle \rangle$. They take as their first argument a possible world, then they apply on a set of type $\langle e, t \rangle$ and return an individual of type e . The NP of the indefinite is interpreted relative to the actual world, as the extension of the set of books is fixed in the real world. The determiner of the indefinite, i.e. the choice function variable, is interpreted relative to the world quantified over by the intensional operator. This, in fact, is parallel to skolemization of choice functions. In addition to an optional individual argument (Kratzer 1998), choice functions are always skolemized with a world variable.

- (10) $\exists f (\forall w'' \in \text{Think}(I,w): \neg [\text{read} (\text{Ali}, f(w''), \{A,B,C,D,E\})])$

$$(11) f (w_1, \{A,B,C,D,E\}) = A; f (w_2, \{A,B,C,D,E\}) = C; f (w_3, \{A,B,C,D,E\}) = E$$

This also suggests that in the absence of an intensional operator, the world variable of choice functions is always bound by the actual world. Therefore, the intermediate scope shown in (10) will only arise when there is an intensional operator. **PREDICTIONS.** This approach correctly predicts that such a reading is not limited to NR. In the right context, other intensional operator scoping over a negation and an indefinite, should be able to give rise to a reading where the indefinite scopes under the intensional operator but above negation. Given the logical equivalence of $\neg \square$ and $\diamond \neg$, (12) should have the reading '*It is possible that there are two books which Ali hasn't read.*' This is in fact a possible reading of sentence (12).

- (12) motmaen nist-am ke Ali do-ta ketab-o xunde baš-e
 sure NEG-be-1SG that Ali two-CL book-RA studied SUBJ.be-3SG

I'm not sure Ali read two of the books. POSSIBLE \gg TWO OF THE BOOKS \gg \neg

It also predicts that choice functional elements should cross-linguistically be able to scope over negation in the embedded clauses of NR predicates. According to the judgments of my English consultants, the same facts are true of English. **CONCLUSION.** I argued that the syntactic account cannot capture the variation among scope-taking elements in giving rise to wide scope over negation, but the semantic approach to NR can, in fact, account for the low scope of negation w.r.t indefinites in the embedded clauses of NR predicates by the addition of a world argument to choice functions. This implementation also solves a problem for choice functions (Abels & Marti 2010) which arises when the set that the choice function applies to is fixed but to get the intended reading, different elements of the set need to be picked across the worlds.