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# Scope as a Diagnostic for the Position of Negation in Persian

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## **Abstract**

Negation in Persian is expressed by a pro-clitic with three different possible positions, either attached to a sentence-final main verb, a light verb in a sentence-final complex predicate, or a sentence-medial auxiliary. Because of this positional promiscuity, the overt morphology is a poor diagnostic for the syntactic position of a Neg head. This paper reports on studies using the scope of negation with respect to subject and object quantifiers in order to determine the position of the Neg head. Determining that the existing argumentation for high negation is inconclusive, we present results on a study using the relative scopes of negation and argument quantifiers to diagnose the position of negation. Combined with the finding that Persian is a scope rigid language, our results suggest that negation must originate quite low in the structure, contra existing analyses, but that some speakers have an overt string-vacuous movement which extends the scope of negation. This is not surprising from a typological perspective, as Korean and Japanese, two other SOV languages, have also been argued to demonstrate the same movement present in only a portion of the population.

# Scope as a Diagnostic for the Position of Negation in Persian

Nazila Shafiei and Dennis Ryan Storoshenko\*

## 1 Introduction

Negation in Persian is expressed by a pro-clitic with three different possible positions:<sup>1</sup>

- (1) a. Ali har mive-i-ro **na**-xord.  
Ali every fruit-EZ-ACC NEG-eat.PAST.3SG  
'Ali didn't eat every fruit.'
- b. Har pesar-i ketâb-o pâre **na**-kard.  
Every boy-EZ book-ACC torn NEG-do.PAST.3SG  
'Every boy didn't tear the book.'
- c. Armita **na**-bâyad har film-i-ro be-bin-e.  
Armita NEG-should every film-EZ-ACC SUBJ-see-3SG  
'Armita shouldn't watch every film.'

In (1a), the negative clitic *na* is attached to the verb in a simplex predicate sentence. (1b) contains a complex predicate built from the adjective *pâre* 'torn' and a light verb; here, negation cliticizes to the light verb. In the case of (1c), the sentence contains a modal between the subject and object which also bears negation. Because of this positional promiscuity, the overt morphology is a poor diagnostic for the syntactic position of a Neg<sup>0</sup> head. This paper reports on studies using the scope of negation with respect to subject and object quantifiers in order to determine the position of the Neg<sup>0</sup> head. Our results suggest that negation is base-generated quite low in the syntax, and that movement operations allow wider scopes in some derivations. Crucially, we find some situations in which negation takes the narrowest scope, below even an internal argument, which must be accounted for. The paper is structured as follows: in Section 2, we present previous analyses of negation in the language, and the predictions those analyses make with respect to scope. Section 3 outlines our experiment, including the details of scope rigidity in Persian. Our final analysis is presented in Section 4. Section 5 concludes the paper with some questions for future research.

## 2 Existing Analyses

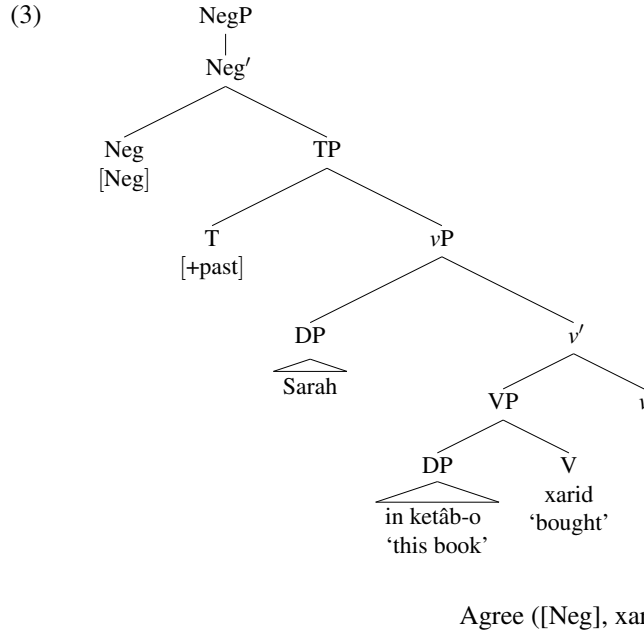
Previous analyses by Taleghani (2006) and Kwak (2010) propose that negation in Persian is always high in the sentence above TP. Therefore, for the sentence in (2), Taleghani proposes the structure in (3). Kwak offers a very similar structure for Persian negation. However, the sentences suggest that negation is pronounced very low. This fact has been accounted for using Distributed Morphology, through which the negative marker is realized on the verb below via an Agreement operation. This operation is able to function because, according to Kwak (following Ouhalla (1991)), the prefixed negation carries a [-verb] feature, which can be checked against the [+verb] feature on the verb. This leaves us with no uninterpretable feature at the end of the derivation and therefore, the derivation converges. Taleghani's analysis for the sentence in (2) is given in (3) below:

- (2) Sarah in ketâb-ro **na**-xarid.  
Sarah this book-ACC NEG-buy.PAST.3SG  
'Sarah didn't buy this book.'

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\*Thanks to Arian Emampour for his contribution to the stimuli in our study, as well as our participants. This paper has benefited from the comments of PLC reviewers, and discussions at the poster session. The project was funded by a University of Calgary Faculty Start-Up Grant to Storoshenko. All errors are our own.

<sup>1</sup>In our glosses, EZ indicates Ezafe, a linking morpheme in DPs, while we gloss *-ro* as ACC for accusative case, noting also that this morpheme is closely tied to definiteness.



In other words, they argue that the fact that negation is spelled out on the verbs that are supposedly very low in the sentence is a PF process with no interpretive consequences.

Kwak believes that the cliticized negation in Persian functions as a sentential operator. Her interpretation is that for a sentence like (4), the negative marker as a sentential operator should be placed above lexical categories, being *Ali*, *ketâb* ‘book’ and *xundan* ‘to read’. To contain all lexical categories, a position above TP follows, assuming the surface subject position to be [Spec, TP].

- (4) Ali ketâb ne-mi-xun-e.  
 Ali book NEG-DUR-read-3SG  
 ‘Ali does not read a book.’  
 (Kwak 2010:ex. 30)

While there are some differences in their analyses, both Taleghani and Kwak use Negative Polarity Item (NPI) Licensing as part of their arguments for high negation. The standard NPI licensing condition suggests that NPIs should be in the c-command domain of negation (Haegeman 1995, Kelepir 1999), explaining the contrast in the English sentences in (5). The ungrammaticality of (5a) is because the NPI *anybody* is not in the c-command domain of negation. This requirement is satisfied in (5b).

- (5) a. \**Anybody* didn’t come.  
 b. I didn’t say that *anybody* came.  
 (Kelepir 1999:ex. 9)

Building on this condition and using a sentence like (6) with an NPI *hichkas* ‘nobody’ in its subject position, Taleghani reasons that the sentence is only grammatical if the negative head is above TP where it can c-command the NPI.

- (6) Hichkas be in mehmni na-raft.  
 nobody to this party NEG-go.PAST.3SG  
 ‘Nobody went to this party.’  
 (Taleghani 2005:127)

However, it has been shown that in some languages, like Japanese, Korean and Turkish, NPIs do not always have to be c-commanded by the negative marker. Instead, merely being a clause-mate with negation licenses the NPI. This requirement is called the Clause-mate Condition (Kelepir 1999,

Sells and Kim 2006, Han et al. 2007, Nakao and Obata 2007). The sentences in (7) have been used as evidence for this claim. The grammaticality of the Korean examples in (7b) and (7c) which have a licensing negation in the same clause as the NPI, *celtaylo*, exemplifies this condition. That the NPI is not c-commanded by the negation is shown by the fact that both sentences yield an interpretation in which *celtaylo* takes scope over the licensing negation:

- (7) a. \* Ku-nun celtaylo kukos-ey ka-ss-ta.  
 he-TOP absolutely there-to go-PAST-DECL  
 'He absolutely went there.'
- b. Ku-nun celtaylo kukos-ey ka-ci ani ha-yess-ta.  
 he-TOP absolutely there-to go-CI NEG do-PAST-DECL  
 'It is absolutely true that he did not go there.'  
 \* 'It is not the case that he absolutely went there.'
- c. Ku-nun celtaylo kukos-ey an ka-ss-ta.  
 he-TOP absolutely there-to NEG go-PAST-DECL  
 'It is absolutely true that he did not go there.'  
 \* 'It is not the case that he absolutely went there.'  
 (Han et al. 2007:ex. 19)

Similar examples exist for Japanese and Turkish. All of these languages share the property of being SOV, which suggests the possibility of a typological distinction in NPI licensing which Persian may share. Conversely, Meisel (1997) claims that in languages with pre-verbal negation, negation is cliticized to the verb and these two move up, a movement which Choi (1999) uses to derive the licensing of subject NPIs.<sup>2</sup>

What matters here, for our purpose, is that subject NPIs cannot be indicators of high negation cross-linguistically, and there needs to be more investigation of where the Persian negative head actually winds up. Moreover, although both Taleghani and Kwak propose that negation is high in Persian, neither provides quantifier scope evidence for this. Following the methods implemented in Han et al. (2007, 2008), we investigate the scope interaction between the negative marker and quantified arguments, which have not only been used to diagnose the position of negation, but also to test for verb raising of the type described by Meisel and Choi.

### 3 Study Design

Our study uses a Truth Value Judgement Task, as defined in Crain and Thornton (1998). Though initially designed for use with children, this method has proven very adaptable to adult participants as well. The study involves a setup in which two experimenters are visible in front of the participants; while the canonical design uses live action, we follow the Han et al. studies in using video recordings to make the task more amenable to adult participants, and to keep the stimuli constant. One of the two experimenters is holding a large plush toy or puppet, Mickey Mouse in our case, while the other acts out a scenario using small toys. At the beginning of each trial, the "actor" experimenter instructs Mickey to pay attention, and then describes the figures to be used in the trial. For example, one trial might involve three dogs facing a fence, contemplating jumping over the fence to investigate the tree beyond. The key manipulation in our study is the number of dogs jumping, with two possible outcomes as in Figure 1. On the left, two out of the three dogs have jumped, while on the right none of them jumped. At the end of the action, Mickey mouse is asked to say what happened. In this context, his sentence would be (8):

- (8) Har sag-i az roo hesâr na-parid.  
 Every dog-EZ from over fence NEG-jump.PAST.3SG  
 'Every dog didn't jump over the fence.'

At this point, the participants are asked to judge whether Mickey's statement is true or false. If participants interpret the sentence with wide scope negation, which is a reasonable prediction of the

<sup>2</sup>Though, as pointed out in Han et al. (2007), this would not account for the scope facts in (7).



Figure 1: Neg >  $\forall$  and  $\forall$  > Neg versions of (8).

Taleghani and Kwak analyses, then participants seeing trials in the left context should judge the left context as true and the right context as false. If negation has a narrower scope, then the left context is false, while the right is true. However, there are two further issues which must be kept in mind before adopting these simple assumptions. First, there is the fact that the right context also satisfies the truth conditions for Neg >  $\forall$ . This ‘entailment problem’ is discussed in the Han et al. studies, though Gricean reasoning might still predict that the right context would be rejected, as *Hich sag-i az roo hesâr na-parid* ‘no dogs jumped over the fence’ would be less ambiguous. The sentence is not false in the given context, but there are other lexical choices which would uniquely select this context, which may lead people with a wide scope negation to only accept the left context as true. However, with the narrow scope of negation, only the right context can possibly be true.

The larger issue is that the interpretations of negation with respect to quantifier scope do not on their own reveal the position of negation unless the position of the quantifier is known. To establish the position of the quantified subject in (8), we must first determine whether quantifier raising can change scope relations in Persian more generally. Consider the sentence in (9):

- (9) Har pesar-i ye doxtar-i-ro boosid.  
 Every boy-EZ one girl-EZ-ACC kiss.PAST.3SG  
 ‘Every boy kissed some girl.’

The English equivalent is classically ambiguous, used to argue that quantifier raising (QR) can invert quantifier scopes. However, it is the first author’s judgement that (9) only allows a surface scope reading. This lack of inversion, also reported for Korean (Han et al. 2007) and Japanese (Han et al. 2008), is known as Scope Rigidity. The claim for those languages has been that scope-taking elements can only be interpreted according to their surface c-command relations, validating the assumption that the scope of negation relative to a quantifier can diagnose the height of negation relative to the surface position of that quantifier. If Persian is indeed Scope Rigid, then this methodology is adequate for drawing conclusions about the position of the Neg<sup>0</sup> head.

To test the position of negation, we designed two studies, one focusing on object quantifiers, and one focusing on subject quantifiers. Each study had the same basic 2X2 design, as in Table 3. The *x* variable here, Scope, refers to the end state of the given scenario, whether it favours a wide or a narrow scope reading of negation. The *y* variable, Quantifier, distinguishes between trials where the quantifier was *har* ‘every’ or *do* ‘two’. The numeral was included for two reasons. First of all, with careful design of the scenarios, trials with the numeral quantifier can avoid the entailment problem. Assuming a scenario in which four dogs were contemplating the fence, and two of them jumped while two did not, then Neg > 2 would be false, while 2 > Neg would be true. Conversely, in a scenario with two dogs, only one of whom jumps, Neg > 2 would be true, while 2 > Neg would be false. However, this was also included as a methodological control, as the same variables were used in the Han et al. (2008) study on Japanese. Assuming that there should be little parametric variation between languages on the interpretation of these very basic quantifiers, we included the numeral to see whether the same contrast between  $\forall$  and 2 which was found in the Japanese study would be replicated here.

In each study, four  $\forall$  and four 2 scenarios were created, with each having a Neg > Q and a Q > Neg version, as with the dogs in Figure 1. To avoid priming effects of seeing both scope possibilities, Scope was treated as a between subjects variable, though Quantifier was within subjects,

meaning that each participant saw all eight scenarios in their given study. In addition to the eight experimental trials, we included four trials whose target sentences were formed along the lines of (9) to test for scope rigidity within our participants. Two of these were presented in contexts that were true under the surface reading, and two were presented in contexts that were true on the inverse reading. In addition, two pure filler trials were included, one unambiguously true and the other unambiguously false, to ensure that participants were paying attention to the task. Across the whole set of test stimuli, an equal number of simplex (1a) and complex (1b) predicates were used. The examples below illustrate the four possible experimental permutations of target sentences; each of these sentences would be matched to two scenarios, one favoring each scope reading.

- (10) Arman har mive-i-ro na-xord.  
Arman every fruit-EZ-ACC NEG-eat.PAST.3SG  
'Arman didn't eat every fruit.' (Object,∀)
- (11) Behnam do tâ nâme pâre na-kard.  
Behnam two PL letter torn NEG-do.PAST.3SG  
'Behnam didn't tear up two letters.' (Object,2)
- (12) Har bache-i be mâmân-esh zang na-zad.  
Every kid-EZ to mom-GEN.3SG ring NEG-hit.PAST.3SG  
'Every child didn't call their mom.' (Subject,∀)
- (13) Do tâ pesar farsh-o na-sâb-id-and.  
Two PL boy carpet-ACC NEG-rub-PAST.3SG-PL  
'Two boys didn't clean the carpet.' (Subject,2)

As noted above, all stimuli were video recorded. The first author portrayed the actor in the stimuli, narrating all the scenarios in Persian. Mickey Mouse was voiced by an undergraduate heritage speaker of Persian born in Canada. This speaker's youth and slight accent were detectable to participants; it was hoped that this would work in our favour through the study, as adult participants might be more willing to give a younger speaker the benefit of the doubt, making less harsh judgements than for an adult. At the end of each trial, participants were asked to judge Mickey Mouse's sentence as true or false, and to provide a justification if they believed the sentence to be false. Each study consisted of three training trials to familiarize participants with the task, followed by the 14 test trials presented in a pseudo-random order, held constant for all participants. After the final trial, participants were given a debriefing form, asking whether any of the stimuli sounded especially unnatural, or were difficult to judge. 24 participants were recruited for each study, with 12 per Scope condition, yielding a total of 48.

Participants were native Iranian Persian speakers, recruited from the city of Calgary, Alberta. All were aged 20 to 50, with a mean of 31.6 years old. None arrived in Canada before the age of 16, meaning that most of their education took place in Iran; length of stay in Canada was quite variable, ranging from 17 years to less than one month. Participants were tested individually or in small groups in a classroom in the Language Research Centre on the University of Calgary campus. Video stimuli were projected onto a screen, while participants recorded their responses on paper. In group settings, participants were discouraged from consulting with each other until the end of the final debriefing, though the first author was on hand to provide clarification if needed. All instructions and response forms were in Persian, to maximize the native speaker experience. Participants were offered compensation for their participation, though many opted instead to donate the money to

	Neg>Q	Q>Neg
∀	Condition 1	Condition 3
2	Condition 2	Condition 4

Table 1: Design for Study 1 (Objects) and Study 2 (Subjects).

charity. Participants were assigned to each study and between group variable at random, with none participating in both studies.

#### 4 Discussion and Analysis

The results of the two studies are summarized in Tables 4 to 4.

	Surface Scope	Inverse Scope
Study 1	89.6	4.2
Study 2	91.7	2.1
Total	90.6	3.1

Table 2: Percent of Acceptance in Scope Rigidity Trials.

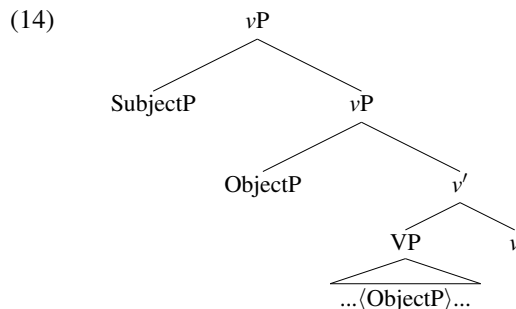
Table 4 reports on the scope rigidity trials, which were identical in Study 1 and Study 2. The results show that only 3.1% of the inverse scope sentences were accepted, whereas the acceptance rate is 90.6% for the surface scope reading. This shows that Persian is a scope-rigid language and quantifiers are interpreted in their surface positions. Therefore, the syntactic position of negation can be inferred from its relative scope with quantifiers.

	Neg>Object (High)	Object>Neg (Low)
$\forall$	60.4	43.7
2	47.9	83.3

Table 3: Percent of Acceptance of Low/High Negation in Relation to Quantified Objects

The results of Study 1 are given in Table 4. Data were analyzed using a Generalized Estimating Equation (GEE) in SPSS v.20. The statistical model tested for overall effects of Quantifier, Scope, and for an interaction. While the statistical analysis uses a repeated measures design, considering each trial response individually, Table 4 presents overall acceptance rates for each condition. The statistical analysis finds no overall effects of quantifier or scope ( $\chi^2(1) = 2.621$ ,  $p=0.11$  and  $\chi^2(1) = 0.655$ ,  $p=0.42$  respectively). However, a significant interaction is found ( $\chi^2(1) = 9.847$ ,  $p=0.002$ ), which suggests that the two quantifiers interact with negation in different ways. The fact that the only pairwise comparison to come out as significant is where we compare the two quantifiers in the narrow negation scope condition ( $\chi^2(1) = 7.473$ ,  $p=0.006$ ) echoes this. Overall, trials where negation scope is narrow are more likely to be accepted when the quantifier is *do* ‘two’ than *har* ‘every’, though the 43.7% acceptance of trials with object *har* scoping over negation suggests that negation can be low, interpreted where it overtly appears in the sentence.

To derive the asymmetric *c*-command needed for the Object  $\forall$ >Neg reading, we assume an operation known as Object Shift. According to Karimi (2005), definite objects marked with *-(r)o* undergo movement to the edge of *vP*. In our study, all universally quantified objects have this suffix, as in (10), while numeral quantified objects do not (11). The proposed structure is adapted in (14):





With this structure, and assuming no further QR, readings of  $\forall > \text{Neg}$  can only obtain when  $\text{Neg}^0$  is quite low in the structure. Interestingly, if the numeral quantified objects do not undergo this movement, we might expect them to always take narrow scope with negation, when in fact the opposite seems to occur. Following the findings of the statistical analysis, we propose that the numeral quantifiers take scope through a different mechanism than the universal, in this case using a choice function, as proposed in Reinhart (1997) for indefinite numerals. This is an expected result, as the same pattern was observed in the Han et al. (2008) study on Japanese.

Clearly, the results in Table 4 are incompatible with the prediction that negation is always high and scopes over the TP in Persian. If this were the case, we would expect to see 0% (or close to 0) acceptance of low negation ( $\text{Object} > \text{Neg}$ ) and also 100% (or close to 100) acceptance of high negation ( $\text{Neg} > \text{Object}$ ). Secondly, the results suggest an inconsistency as to how wide the scope of negation could be, which is shown by the fact that the responses are not categorical, i.e., always true or always false. To show that the split is between, rather than within, adult native speakers, we plot the response patterns of our  $\text{Q} > \text{Neg}$  participants in Figure 2. The  $x$ -axis in this figure plots the number of times out of four a given participant responded “True” on a  $\forall > \text{Neg}$  trial, while the  $y$ -axis plots the number of participants exhibiting each pattern.

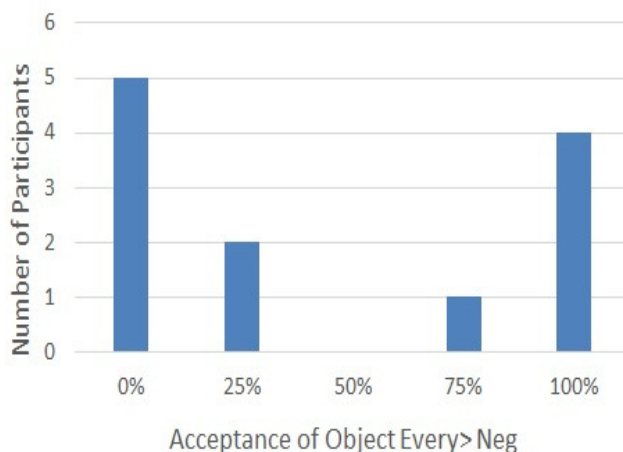


Figure 2: Bimodal Distribution of Participants Accepting  $\forall > \text{Neg}$ .

The bimodal distribution in Figure 2 suggests that we have detected a split between participants. In other words, negation can scope either high or low when there is a quantifier in the object position for different participants, but no participant accepted the wide scope of the quantifier only half of the time. Following Karimi’s analysis that Object Shift is a feature of all speakers’ grammars, we adopt Meisel’s movement analysis and claim that this result shows a between-speaker variation in the position of the verb, to which negation cliticizes from a low base position. This is based on the final analyses in the Korean and Japanese studies where similar between-participant splits were observed. Furthermore, as Karimi’s Object Shift has observable word order effects, while head movement of the sentence-final verb would not, we believe verb raising to be the most likely difference.

However, our study does find one difference from the prior Korean and Japanese studies with respect to the results for universally quantified objects. As discussed above, the scenario where none of the dogs jumped over the fence, the  $\forall > \text{Neg}$  scenario, also satisfies the truth conditions of  $\text{Neg} > \forall$ . This entailment problem was manifested in both the Korean and Japanese speakers, where the acceptance of the  $\forall > \text{Neg}$  scenarios was close to 100%, and their reasoning was based on a bimodal split in acceptance of  $\text{Neg} > \forall$ . We suspect that unlike those prior studies, our Persian participants were keenly aware of the Gricean reasoning which dictates that if the meaning of the sentence were  $\text{Neg} > \forall$ , but the scenario is one where none of the objects are acted upon, then a different form should be used. This emerges in our debriefings, where many participants in the  $\forall > \text{Neg}$  groups suggested that *hich* ‘(lit.) none’ would be better. While this is an intriguing difference worthy of

future study, this lack of the entailment does not undercut our analysis for the between-speaker split. If negation were uniformly high, we should expect  $\text{Neg} > \forall$  to be true for all participants, and this simply is not the case. Furthermore, an examination of the response patterns within the 60.4% acceptance of  $\text{Neg} > \forall$  repeats a more bimodal distribution than one where all participants judged two or three of the scenarios to be true. In closing this portion of the discussion, we note that there was no observable item effect (no one item jumped out as an outlier), and no observed effect of simplex versus complex predicates.

	Neg > Subject (High)	Subject > Neg (Low)
$\forall$	66.7	14.6
2	18.75	85.4

Table 4: Percent of Acceptance of Low/High Negation in Relation to Quantified Subjects.

The results of Study 2, as shown in Table 4, again suggest a contrast. While there is 66.7% acceptance of negation scoping over  $\forall$  in subject position, there is only 14.6% of acceptance of  $\forall$  scoping over negation. The data analysis for Study 2 shows no effects for the quantifier or scope ( $\chi^2(1) = 1.65, p=0.2$  and  $\chi^2(1) = 0.45, p=0.5$  respectively) similar to Study 1. However, the interaction between the two quantifiers was once more found to be significant ( $\chi^2(1) = 28.3, p < 0.001$ ). These results support the findings of Study 1 as they suggest that the two quantifiers exhibit different behaviours in different scope situations. Additionally, all of the different pairwise comparisons are significant. In the case of numeral *do*, the results are consistent with the assumption that the numeral indefinite can take wide scope via a choice function, regardless of the position of negation. The universal quantifier results are more difficult to interpret. Figure 3 summarizes the acceptance rate of low and high negation in relation with universally quantified subjects and objects. As this figure shows, roughly 60% of participants always have high interpretation of negation.

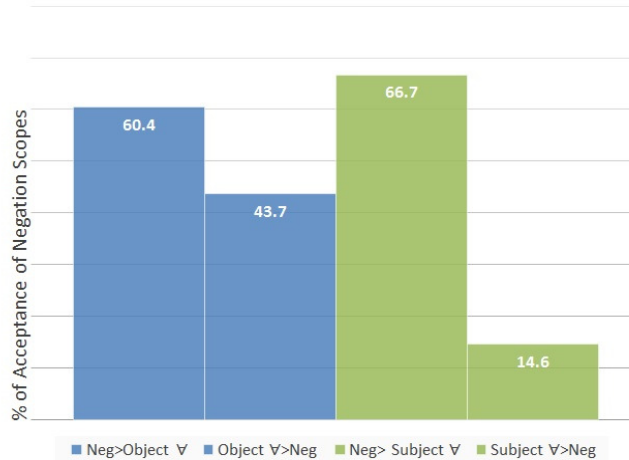
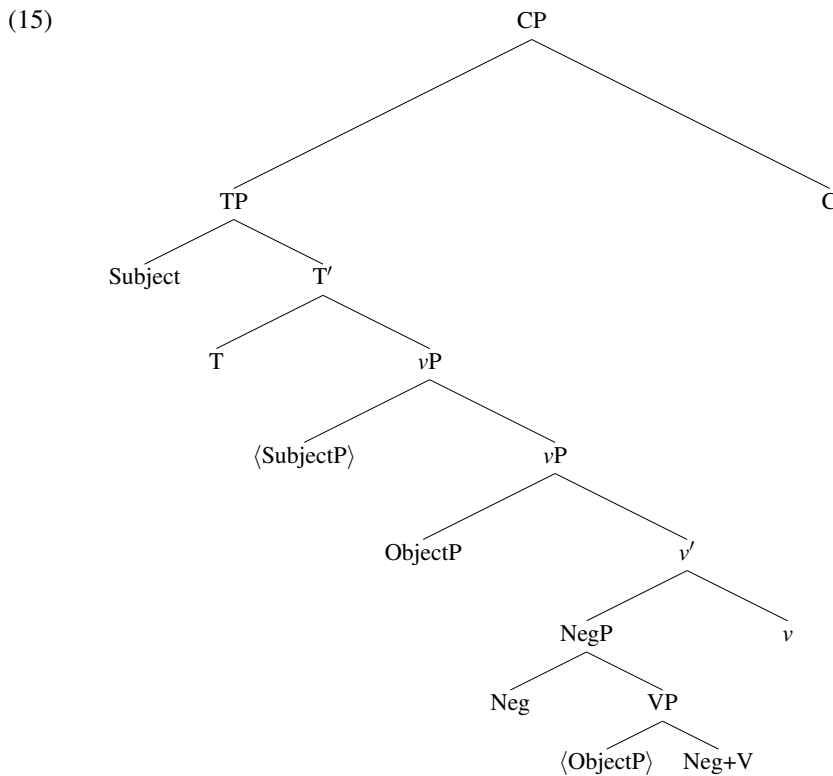


Figure 3: Scope Readings of Negation in Relation to the Universal Quantifier.

That negation scopes over subjects and objects at similar rates, with generally bimodal distributions in the response patterns, suggests a situation where 60% of Persian speakers have a grammar in which the verb raises very high in the clausal domain, taking scope over subjects and objects. The puzzle we are left with is accounting for the low acceptance of the wide scope universal in subject position. If it is the case that roughly 40% of participants have a grammar in which the verb (with negation attached) never raises to a position to scope over even objects, then that same percentage should be manifested when considering quantified subjects. A simple explanation for this anomaly would be that it is a sampling effect, and that our Subject  $Q > \text{Neg}$  group had a larger proportion of “verb raisers” than the other groups. This is possible, as our treatment of Scope as a between

subject variable makes it impossible to tell whether a given participant accepts both scope readings. However, we again turn to the debriefing forms, where participants were very clear in their observation that subject position *har* is very rare, and that in  $\forall > \text{Neg}$  contexts, *hich* should be used. We speculate that for subject quantifiers moreso than objects, participants are aware of the two possible interpretations, and are following a pragmatic motivation to eschew an ambiguous form. That is,  $\forall > \text{Neg}$  interpreting participants for whom the target sentence is true in the given context may still reject it as false, preferring a form which will unambiguously express the same meaning. The lack of the entailment problem in our results points to a population which is more sensitive to pragmatics than those observed in the prior Korean and Japanese studies.

Thus, our final analysis is that like Korean and Japanese, Persian negation cliticizes to a verb from a low position and then undergoes string-vacuous verb movement, the height of which is parametrized between speakers. While we acknowledge that the position of T is a contentious issue in the literature on Persian, with Taleghani (2006) using the position of modal auxiliaries as in (1c) to argue for a leftward T, while Toosarvandani (2009) assumes verb movement to T in Persian would be string vacuous and thus depend on a right-headed TP, the issue is moot for the present analysis. While we tentatively adopt Taleghani’s left-headed T based on the position of the auxiliaries, we propose that the verb movement carrying negation must proceed even higher to a right-headed C:



In negated sentences, we propose that the negation clitic originates in a low position, attaching to the verb at V, followed by obligatory movement to *v*. Then, some speakers have an additional movement which takes the verb higher to a position outscoping the subject assumed to be at [Spec, TP]. The right headedness of C is crucial here though, as the movement is assumed to be overt, with scope rigidity dictating that LF movement should not have any semantic effect. To derive high scope negation, the Neg+V movement must be overt, and therefore must land sentence-finally.

### 5 Conclusion and Future Work

This paper opens with a simple question of determining the syntactic position of negation in Persian. Determining that the argumentation for high negation is inconclusive, we present results on a study

using the relative scopes of negation and argument quantifiers to diagnose the position of negation. Combined with the finding that Persian is a scope rigid language, our results suggest that negation must originate quite low in the structure, contra existing analyses, but that some speakers have an overt string-vacuous movement which extends the scope of negation. This is not surprising from a typological perspective, as two other SOV languages have also been argued to demonstrate the same movement present in only a portion of the population. However, this analysis also has consequences for the larger picture of Persian syntax. Both the above-cited Toosarvandani paper and Shafiei (2015) rely on verb movement of the type described in this paper for their analyses of Persian ellipsis; this study provides independent evidence for such movement. However, space does not permit a full integration of this analysis with the nuances of simplex versus complex predicates and their interactions with ellipsis. Furthermore, we have not addressed the question of how negation, now treated as syntactically low, interacts with the modal auxiliaries. This is left for future work.

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