THE EFFECT OF THE PERSIAN OBJECT MARKER –RA
AND OF LEXICAL RESTRICTION
ON THE ACCEPTABILITY OF EXTRACTION
ACROSS WH ISLANDS

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Abstract: *In this paper, we present and discuss our results of a grammaticality judgment task which examines the effect of the Persian object marker -ra and of lexical restriction on wh-object fronting in weak-islands. We observe that wh-object fronting in Persian is sensitive to weak-islands and while a lexical restriction does not improve acceptability, the presence of the object marker significantly increases the acceptability scores. With respect to the comparison of the effect of the object marker and of lexical restriction in island vs. non-island sentences, our findings raise issues pertinent to the syntactic model of intervention locality.*

Keywords: *weak-island, intervention effect, d-linking, lexical restriction, Relativized Minimality*

1. Introduction

Wh-islands are analyzed as violations of Relativized Minimality in Rizzi (1990) and much related work. In (1a), for example, *who* intervenes and blocks the formation of a chain between *what* and its copy in the object position of *killed*. When the long-extracted wh-element is not bare, as it is in (1a), but lexically-restricted and d(iscourse)-linked as in (1b), speakers note a clear amelioration (e.g., Pesetsky, 1987). In terms of Relativized Minimality, the acceptable status of (1b) as compared to (1a) means that a chain can be licitly formed between *which animal* and its base position.

(1)   a.   *What do you wonder who killed <what>?
       b.   ?Which animal do you wonder who killed <which animal>?

Following Starke (2001), Rizzi (2004) proposes that the relative acceptability of (1b) is accounted for by the idea that the d-linked wh *which animal* contains an additional feature B that is absent on the intervener *who*, a 'pure' wh-element. On the basis of this analysis, (1b) instantiates a case of feature *inclusion [wh$_{+A+B}$...wh$_{+A}$...<wh$_{+A+B}$>]*, argued by Friedmann et al., (2009) and Rizzi (2011) to circumvent the intervention effect created by the configuration of feature *identity* [wh$_{+A}$...wh$_{+A}$...<wh$_{+A}$>] (1a), thereby allowing the formation of the chain. It should be noted that Rizzi characterizes the B feature on which-NP *wh*-phrases as a (Criterial) Topic [+Top] feature because these phrases are d-linked and refer to old information, shared by the hearer and the speaker.

In Persian (an SOV language), d-linked wh-objects appear with an object marker, namely the suffix *–ra*. *–Ra* appears both on bare and on lexically-restricted wh-phrases. If we take *-ra* to be a morpho-syntactic instantiation of the feature B (i.e., [*+Top*]), the study of Persian weak-islands is of interest because it allows us to assess the effect of the feature B encoded as a specific morpheme and compare it with the effect of lexical restriction on the extraction of a wh-object out of weak-islands[1].

The questions posed (and tentatively answered) in this paper are the following:

- Does Persian show sensitivity to wh-island phenomena?

- Does the appearance of *–ra* on the fronted wh-object in wh-islands affect the violation incurred by the intervention effect, as expected under the featural approach to Relativized Minimality?

- Does lexical restriction contribute to improve the acceptability of wh-islands, showing a cumulative effect with the presence of *-ra*?

2. The meaning of -ra

Persian *–ra* (phonetically -ro, -o, -a) has been the focus of much research since Browne (1970) analyzed it as a specificity marker. Karimi (1989, 1990) extended Browne's analysis of *–ra* and suggested that it is a *"specific-oblique marker"* which marks definite-specific or indefinite-specific DPs. Peterson (1974) and Windfuhr (1979, 1987) posited some topic-marking function for *–ra,* suggesting that *–ra* marked DPs have an "aboutness" interpretation. Ghomeshi (1996, 1997) challenged these analyses and claimed that the morpheme is a phrasal affix heading a KP (Kase Phrase) that case-marks DPs adjoined to VP and conveys presuppositionality. Compare (2a) without *-ra* and (2b) with *-ra*.

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[1] Lexical restriction has been traditionally associated with d-linking (Pesetsky, 1987) or [+Top] feature (Rizzi, 2004, 2011). This is not the case in Persian because d-linked wh-objects must appear with the suffix *–ra* irrespective of whether they are lexically restricted or not. Non *–ra* and lexically restricted wh-phrases are ungrammatical in Persian (*kodum ketab-**(ra)* 'which book') and *–ra* also obligatorily co-occurs with *who* (*ki-**(ra)*) when it is direct object. However, the presence of *–ra* on *what* is optional and gives rise to an interpretive difference. When *–ra* appears with *what* as in (*chi-ra kharidi* 'what did you buy'), the sentence is infelicitous in an out-of-the-blue or non-presuppositional context. It is only felicitous in a context that presupposes a specific set from which the hearer is supposed to purchase something.

(2)   a. Hasan   ketab-i   kharid.

          Hasan   book-INDEF bought-3sg

        'Hasan bought a book'

        b. Hasan   ketab-i-ra   kharid.

          Hasan   book-INDEF-RA bought-3sg

        'Hasan bought the book'

(2a) means that Hasan took part in an activity – book buying. The sentence means that what Hasan did was purchase a book, not a specific book. In (2b), the object refers to a specific book purchased by Hasan. The sentence is felicitous only if both the speaker and the hearer are cognizant of the referent of the purchased book. Pesetsky's (1987, 2000) characterization of d-linking closely approximates the meaning of *–ra*.

We can now present our acceptability judgment experiment where we manipulated the presence of *–ra* and the lexical restriction of wh-objects, in order to evaluate their effect on the acceptability of wh-object fronting in weak-islands. Moreover, we want to assess whether these variables have an effect specifically on wh-islands, or more generally on the processing of any sentence involving object extraction. We also manipulated the nature of the intervening subject, which was either a wh-element (weak-island) or a pronoun (see Villata et al., in this volume, for a similar study in French). Sentences with pronominal subjects provided a comparison point against which to assess (a) whether Persian is sensitive to weak-islands (in which case acceptability judgments should be globally higher for pronominal subjects than for wh-subjects), and if so, (b) whether the ameliorating effect of *–ra* and lexical restriction is specific to weak-islands, as predicted by Relativized Minimality, or whether it affects any sentence with object extraction.

3. Experiment

3.1 Method

3.1.1 Participants

Forty Persian native speakers participated in this experiment. They were all students, mostly preparing a PhD or MA at the University of Lausanne, Switzerland. They were naïve as to the purpose of the experiment and their participation was voluntary.

3.1.2 Materials

Items were spread in a fully crossed design involving 8 conditions in which we manipulated three variables: (1) the presence of the object marker (OM) on the extracted wh-object (*ra* vs. non-*ra*), (2) lexical restriction of the extracted wh-object (Lexically Restricted vs. Bare), and (3) the nature of the intervener (wh- vs. pronoun). All variables

were manipulated within-participants and within-items, such that the same sentence appeared in 8 different versions created by the crossing of the three variables. A total of 64 test sentences were created which were interspersed with 64 fillers consisting of fully acceptable S(O)V sentences with transitive and intransitive verbs and completely unacceptable sentences in which there was a mismatch between the verb valency and the number of arguments. Table (1) presents an item in the 8 experimental conditions.

	-wh	+wh
-ra -lr	Chi taajob mikoni un khund? What think do.2sg he read.3sg 'What do you think he read?'	Chi taajob mikoni ki khund? What wonder do.2sg who read.3sg 'What do you wonder who read?'
-ra +lr	Kodum ketab taajob mikoni un khund? Which book think do.2sg he read.3sg 'Which book do you think he read?'	Kodum ketab taajob mikoni ki khund? Which book wonder do.2sg who read.3sg 'Which book do you wonder who read?'
+ra -lr	Chi-ra taajob mikoni un khund? What-RA think do.2sg he read.3sg 'What do you think he read?'	Chi-ra taajob mikoni ki khund? What-RA wonder do.2sg who read.3sg 'What do you wonder who read?'
+ra +lr	Kodum ketab-ra taajob mikoni un khund? Which book-RA think do.2sg he read.3sg 'Which book do you think he read?'	Kodum ketab-ra taajob mikoni ki khund? Which book-RA wonder do.2sg who read.3sg 'Which book do you wonder who read?'

Table 1: Example of item in the 8 experimental conditions. Note that in Persian, the verb '*taajob kardan'* is ambiguous and can be interpreted as both *'wonder'* and *'think'*. When it means *'wonder'*, it takes an interrogative complement, whereas when it is interpreted as *'think'*, it requires a declarative complement.

3.1.3 Procedure

The experiment was conducted online through IbexFarm. Participants were given a thorough instruction on how to rate the sentences and provided with practice items (similar to test items and fillers) to help them become fully familiar with the experimental task. They were asked to rate the sentences on a 1-7 Likert scale: 1 corresponds to a completely unacceptable sentence and 7 to a totally acceptable sentence. Each sentence appeared once throughout the experiment and stayed on the screen until the participant made her or his acceptability choice. After the sentence was rated, the next item appeared and there was no time pressure during the experiment.

3.1.4 Data analysis

Data were analyzed with mixed-effect models estimated with the lmerTest package in the R-software environment (R Development Core Team, 2011). OM, lexical restriction, and the nature of the intervener were treated as fixed factors while subjects and item variability were considered as random intercepts.

3.2 Results

Of the whole data set consisting of 2560 data points, 2496 responses were taken into statistical analysis; one participant had to be excluded as his responses were completely monotonous by giving the score of 1 to all experimental items and 7 to all fillers. Figure (1) presents the mean acceptability score of the 8 experimental conditions.
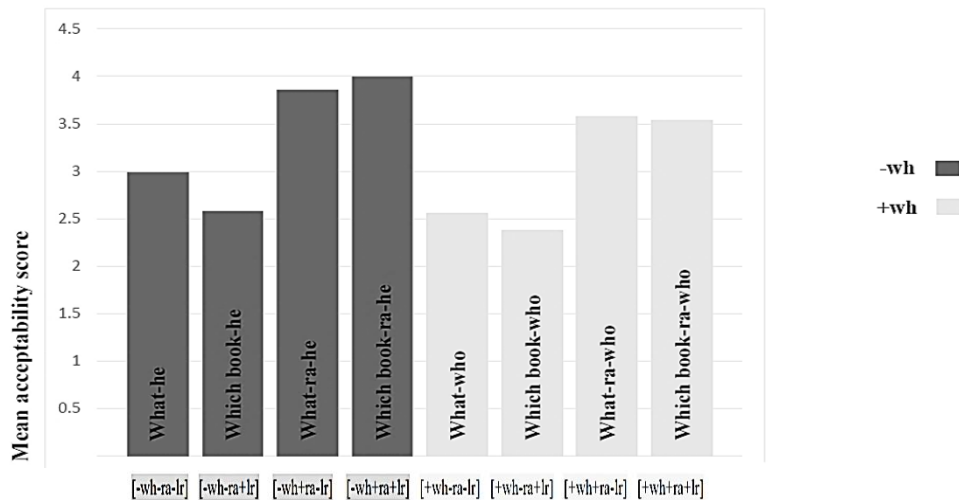

Figure 1: Mean acceptability scores in the 8 experimental conditions

Results from the mixed model analysis revealed a main effect of the nature of the intervener (β = -0.34, t = -7.82, p<.001), attesting to significantly higher rates for sentences in which a pronominal subject was used (M=3.3) than sentences where the intervening subject was a wh-element (M=2.9). A main effect of OM was found significant (β = 1.12, t = 25.70, p < .001), with significantly higher rates for –*ra* marked wh-elements (M=3.7) than for non-*ra* marked ones (M=2.6). The effect of OM did not interact with the intervener, attesting that OM had the same effect for wh- and pronoun interveners (β = -0.06, t = -0.64, p = 0.52). A main effect of lexical restriction was also found significant (β = -0.12, t = -2.78, p < .01), with higher scores for non-lexically restricted objects (M=3.2) than for lexically restricted ones (M=3.05). Lexical restriction did not interact with the intervener, attesting that the same effect was found for both types of intervening subjects (β = 0.03, t = 0.31, p = 0.75). OM interacted with lexical restriction (β = 0.34, t = 3.96, p < .001), suggesting that with non-*ra* marked objects, lexical restriction penalizes sentence acceptability. Since the interaction between OM and lexical restriction was modulated by the nature of the intervener, as attested by the 3-way interaction (β = -0.41, t = -2.37, p <.01), we explored it separately for wh-interveners and pronominal interveners. The model on wh- interveners showed a main effect of OM (β = 1.09, t = 19.13, p < .001), a near-significant effect of lexical restriction (β = -0.11, t = -1.88, p = .06) and no interaction (β =

0.14, t = 1.21, p = 0.23). The model on pronominal interveners showed a main effect of OM (β =1.14, t = 17.72, p < .001), an effect of lexical restriction (β = -0.13, t = -2.08, p < .05) and an interaction between the two factors (β = 0.55, t = 4.26, p < .001). The interaction attested to a significant effect of lexical restriction for non-*ra* marked objects (β = -0.41, t = -5.65, p < .001), but to a marginally significant effect for –*ra* marked objects (β = 0.14, t = 1.78, p = 0.07).

4. Discussion

There are three main findings in our experiment. The first finding is that the extraction of a wh-object over a wh-subject is judged significantly worse than the extraction over a pronominal subject. Our current evidence which is based on a systematic, controlled testing shows that Persian wh-object fronting is sensitive to extraction across weak-islands, as expected under most if not all theories of syntax (see Villata et al. (this volume) for similar evidence in French).

The second finding is that the presence of –*ra* on the object improves its extractability. However, that improvement is found across the board, independently of whether the intervening subject is a wh- or a pronoun. This finding suggests that the effect of –*ra* does not fall under specific principles as defined by Relativized Minimality to account for intervention effects. It has been suggested that retrieving an extracted element from memory relies on a cue-based retrieval mechanism, by which the verb triggers retrieval of the target on the basis of cues (e.g., McElree 2000; McElree et al. 2003; Lewis & Vasishth 2005). As an object marker, –*ra* provides a highly reliable cue for the retrieval of the fronted object, which may explain why a strong effect is observed independently of the nature of the intervener.

The third finding is that the lexical restriction of the object fails to ameliorate sentence acceptability; rather, it penalizes it if the object is non-*ra*-marked. Again, this effect is the same whether the intervening subject is a wh- or a pronoun, suggesting that it has nothing to do with the specifics of wh-islands. The finding that lexically restricted wh-objects without –*ra* are so weakly rated may be due to the fact that lexical restriction provides clear anchoring into discourse by specifying the set over which the question is posed, which therefore strongly calls for the presence of –*ra* as the morphological marking of d-linking. In other words, these objects are torn between two contradictory forces, lexical restriction, anchoring the NP into the discourse, and lack of –*ra*, detaching it from the previously known discourse. In order to avoid this tension and explore the role of lexical restriction in wh-islands in Persian, we are currently exploring structures in which the extracted element is an indirect object, which cannot be marked with –*ra*.

One may wonder why acceptability scores for sentences with pronoun subjects are so low; they barely reach 4 in the condition with –*ra* marked objects. It has classically been observed across languages that object extraction in object relative clauses but also in object questions is costly (Gordon et al., 2001; Warren & Gibson, 2002). It has recently been proposed that the processing difficulty of object extraction in object relatives is due to intervention locality, given that object movement to the left-periphery in object relative clauses crosses the subject (Adani et al., 2010; Friedmann et al., 2009). Nevertheless, even if object extraction is costly, it is not expected to trigger rates around 4 on a 7-point scale in these languages. So why do we find such low scores in our Persian sentences? One

possibility could be that Persian being a pro-drop language, the presence of the embedded overt subject in our sentences made them unnatural. Fully grammatical SOV filler sentences in our experiment also contained overt subjects, but nevertheless gave rise to an average near-ceiling score of 6.7; hence, the presence of an overt subject per se is not enough to explain the low scores in our test sentences. Still, it may be that whereas overt subjects are felicitous in SOV structures, they are not in OSV structures. Another factor that may have contributed to low acceptability scores in the present experiment lies in the specificity of object extraction in Persian, requiring *–ra*. That is to say that although object extraction, in all languages, is a marked order calling for the presence of a context, the presence of *–ra* in Persian may render context even more critical for object extraction to be felicitous.

The experiment reported on in this paper is a first-stab attempt to study the extraction of wh-object out of (weak)-islands in Persian and to evaluate the role of feature-based Relativized Minimality in this respect. The results of the experiment should be taken as an initial hypothesis and further experimental and theoretical work is needed, which we hope to pursue in the near future.

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