

# DEFINITENESS MARKING THROUGH NUMBER\*

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This paper pays attention to the syntactic and semantic properties of number markers in Persian and their definiteness effect in noun phrases. Based on the descriptive generalizations made in this paper, a Distributed-Morphology based analysis is proposed of number marking in Persian and how it interfaces with definiteness marking. I argue that number morphology in the context of definite noun phrases is syncretic in the sense that it realizes both a definiteness feature [+def] and a number feature [ $\pm$ pl].

## 1. Introduction

Number markers in Persian encode both cardinality and definiteness. Two particular observations are of interest here. First, in the context of indefinite noun phrases, as in (1), plural marking cannot appear with numerals+classifiers. It is however possible for the plural marker to occur with numeral+classifier in definite noun phrases such as (2).

- (1) se-tâ ketâb(\*-â) xarid-am.  
three-CLS book(\*-PL) bought-1SG  
'I bought three books.'
- (2) se-tâ ketâb(-â) ru-ye miz-e.  
three-CLS books(-PL) on-EZ table-is  
'The three books are on the table.'

Three questions arise from this observation that I will attempt to address in this study: (i) What prevents the plural marker from appearing in indefinite noun phrases involving numerals+classifiers? (ii) What triggers the co-occurrence possibility of plural marking and numerals+classifiers in definite noun phrases? (iii) Why is the plural marker optional in the context of definite noun phrases with numerals+classifiers?

The second puzzling observation, illustrated in (3) and (4), is the appearance of the plural marker *-hâ* on mass nouns. In episodic contexts, typical mass nouns in Persian like *barq* 'electricity' and *roqan* 'oil' are optionally

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\* I would like to thank Jila Ghomeshi who supervised me in this research and contributed greatly to my ideas and understanding. I also thank the audience at the Mass/Count Workshop at the University of Toronto; the University of Manitoba Linguistics Colloquium; and the annual CLA conference at the Carleton University for their comments and discussion. All errors are of course my own. The following abbreviations are used for the data: CL = clitic, CLS = classifier, DEF = definite, DUR = durative, EZ = Ezafe vowel, IMP = imperative, IND = indefinite, NEG = negative, OM = object marker, PART = participle, PL<sub>DEF</sub> = definite plural, PRS = present, PST = past, SG<sub>DEF</sub> = definite singular, '+' in the examples separates the two parts of a compound.

marked with the plural marker *-hâ*. This however does not result in a coerced (count) reading, contrary to the standard assumption (Ghomeshi 2003, Borer 2005, Mathieu 2007). As I will argue, the plural marker *-hâ* in these examples seems to play the same role as the definite article *the* in the English translations.

- (3) barq(-â)                      qat'-e.  
 electricity(-PL)              cut-CL.is.3SG  
 'The power is shut off.'
- (4) roqan(-â)-ro rixt-am      tu      qâblame.  
 oil(-PL)-OM poured-1SG in      pot  
 'I poured the oil into the pot.'

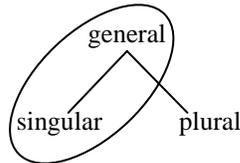
Taking into consideration the facts concerning the behavior of number markers in Persian noun phrases, I propose that (i) number and definiteness are syncretic in Persian; and that (ii) number and definiteness are modifying features, in Wiltschko's (2008) term, not heads of functional projections.

## 2. Background: Number and Definiteness Marking in Persian

### 2.1 Number

Persian number system is an instance of a number system in (5), with general/singular vs. plural. This means that the unmarked noun in Persian can be general (kind-referring<sup>1</sup>) or singular.

- (5) *Number system with general/singular vs. plural* (Corbett 2000: 13)



As shown in (6), bare (unmarked) nouns in Persian are neutral in being singular or kind-referring.

- (6) gonješk                      did-am.  
 sparrow.SG/GENERAL      saw-1SG  
 'I saw a sparrow/sparrows.'

However, the appearance of (in)definite marker removes this ambiguity and thus makes singular distinct from general. This is illustrated in (7).

<sup>1</sup> In this paper, I use *kind-referring* interchangeably with *generic*.

- (7) a. ye gonješk/gonješk-i did-am.  
 one sparrow -IND saw-1SG  
 ‘I saw a sparrow.’
- b. gonješk (-â)-ro did-am.  
 gonješk(-DEF)-OM saw-1SG  
 ‘I saw the sparrow.’

### 2.1.1 Plural Marking in Persian

Plural number in Persian is morphologically realized as *-hâ* (*-â* after consonants) and is interpreted as *more than one* (>1)<sup>2</sup>.

- (8) gonješk-â-ro did-am.  
 sparrow-PL<sub>DEF</sub>-OM saw-1SG  
 ‘I saw the sparrows.’

When appearing on kind-referring nouns, plural marking yields taxonomic reading.

- (9) ketâb-â dust-â-ye xub o qâbel-e+e'temâd-i hast-and.  
 book-PL friend-PL-EZ good and able+reliance-IND is-3PL  
 ‘Books are good and reliable friends.’ [*Taxonomic reading*: ‘all kinds of books’]

<http://sardargomestan.persianblog.ir/1386/3/>

Assuming that kind-referring nouns in direct object position are construed as forming a complex predicate with the verb (Ghomeshi 2008: 95), plural marking on such nouns yields adverbial reading.

- (10) Sinâ ketâb-hâ xund.  
 Sina book-PL read.PST.3SG  
 ‘Sina read books a lot.’

Recall that plural marking can optionally co-occur with numerals+classifiers when the noun phrase is definite.

- (11) se-tâ ketâb(-â) ru-ye miz-e.  
 three-CLS book(-PL<sub>DEF</sub>) on-EZ table-CL.is.3SG  
 ‘The three books are on the table.’

In this context, plural marking functions as a definite marker, as its presence induces an inclusive reading for the noun phrase which contrasts with indefinite cardinality reading. Specifically, the plural marker *-hâ* in (11) triggers a reading which involves reference to the three books as a whole, not as a set of three

<sup>2</sup> I gloss the plural marker as PL<sub>DEF</sub> when it yields definite reading and PL when it yields cardinal reading.

individual items. This is empirically supported by the fact that the quantifier *har* ‘every’ can occur in this noun phrase for emphasis, yielding the same interpretation.

- (12) har se-tâ ketâb(-â) ru-ye miz-e.  
 every three-CLS book(-PL<sub>DEF</sub>) on-EZ table-CL.is.3SG  
 ‘All the three books are on the table.’

In the absence of plural marking, noun phrases involving numerals+classifiers are construed as ambiguous between definite and indefinite. This ambiguity can be resolved by prosody. To elaborate, definiteness in Persian has a prosodic manifestation, affecting prosodic phrasing and prominence. Assuming that a noun phrase with a numeral+classifier is a phonological phrase ( $\phi$ ), an indefinite noun phrase appears as consisting of two phonological words ( $\omega$ ), each with a PROMINENT syllable. In contrast, definite noun phrases with numerals+classifiers involve a phonological phrase which consists of one phonological word, with the prominent syllable in the rightmost element. I assume that this phonological phrasing pattern is a prosodic correlate of the plural marker in definite noun phrases involving numerals+classifiers.

- (13) se-tâ ketâb (i) *Indefinite* (ii) *Definite*  
 three-CLS book [ [SE-tâ]<sub>ω</sub> [keTÂB]<sub>ω</sub> ]<sub>φ</sub> [ [se-tâ keTÂB]<sub>ω</sub> ]<sub>φ</sub>  
 ‘three books/the three books’

Putting prosody aside, a possible syntactic account of this ambiguity would be to argue that the numerals select for bare nouns and since bare nouns are unmarked, they are compatible with a plural interpretation in Persian.

## 2.2 Definiteness

In formal Persian, nouns are not morphologically marked for definiteness. Bare nouns can occur in argument positions. In subject position, bare nouns are construed as definite.

- (14) gonješk parid ru deraxt.  
 sparrow flew.3SG on tree  
 ‘The sparrow flew on the tree.’

Definite bare nouns in direct object position are followed by the Case marker *-râ* (*-ro* after vowels and *-o* after consonants in colloquial Persian).

- (15) gonješk-*o* did-am.  
 sparrow-OM saw-1SG  
 ‘I saw the sparrow.’

In colloquial Persian, singular definite nouns can optionally be marked with the stressed vowel *-ê* (*-â* before consonants, cf. (7b)).

- (16) gonješk(-*é*)      parid      ru      deraxt.  
 sparrow(-SG<sub>DEF</sub>)    flew.3SG    on      tree  
 ‘The sparrow flew on the tree.’

The occurrence of the plural marker on bare nouns results in definite reading unless it appears in a context like (18), where the plural marker co-occurs with an overt marker of indefiniteness.

- (17) gonješk-*â*      parid-an      ru      deraxt.  
 sparrow-PL<sub>DEF</sub>    flew.3PL    on      tree  
 ‘The sparrows flew on the tree.’
- (18) gonješk-*â*-ye      gašang-*i*      did-am.  
 sparrow-PL-EZ      beautiful-IND      saw-1SG  
 ‘I saw some beautiful sparrows.’

Ghomeshi (2003, 2008) suggests that the difference in definiteness of bare nouns parallels a difference in their syntactic category: definite bare nouns are DPs containing an empty D<sup>0</sup>-head; indefinite bare nouns are QPs; and kind-referring nouns are NPs.

- (19) a. b. c.

### 2.3 Number and Definiteness-neutrality (Ghomeshi 2008)

Ghomeshi (2008) shows contexts where lack of morphological markers for number and definiteness in Persian results in neutrality. For instance, in (20), where the bare noun (*italicized*) appears as a complement of the verb, the lack of number marking yields number-neutrality.

- (20) *Number-neutrality*  
 Ali *ketâb* xunde  
 Ali book read.PART.3SG  
 ‘Ali has read books (one or more).’

[Ghomeshi 2008: 94.9a]

Similarly, the absence of a morphological marker for definiteness in (21) results in the bare noun—contained within a locative PP—being interpreted as definiteness-neutral<sup>3</sup>.

<sup>3</sup> Ghomeshi (2008) notes that although the bare nouns contained within locative PPs are best translated into English as definite nouns, they are not anaphoric, identifiable, or unique. She considers them as examples of noun phrases that Carlson and Sussman (2004) call *weak definite* (see her work for a detailed discussion and analysis of such noun phrases).

(21) *Definiteness-neutrality*

mâ tu pârک futbâl bâzi kard-im.  
 we in park soccer play did-1PL  
 ‘We played soccer in the park.’

[Ghameshi 2008: 96.16.a]

Two consequences can be drawn from our discussion in this section: (i) the absence of number and/or definite morphology results in bare nouns being interpreted as number-/definiteness-neutral; and (ii) unlike number which is explicitly marked only for plural, definiteness can be expressed in Persian by the optional suffix *-é* on singular nouns and the suffix *-hâ* on plural nouns.

### 3. Number Markers Encoding Definiteness

This section investigates how number markers encode definiteness in Persian. In section 2.1.1, the definiteness effect of plural marking on count nouns was discussed. The focus of this section will be on the definiteness effect of number marking on mass nouns. I begin with the role of the plural marker *-hâ* on the definite interpretation of mass nouns and will conclude the section by showing how the singular definite marker *-é* contributes to the interpretation of mass nouns.

Plural marking on mass nouns in languages like English and Persian is assumed to be allowed *only* when the interpretation of the mass noun is subject to coercion—i.e. count reading of mass nouns (Ghameshi 2003). As such, plural marking serves the purpose of portioning out the undivided stuff into conventionalized units or types (Borer 2005, Mathieu 2007).

(22) *Quantity reading*

čây-â-ro gozâšt-am tu sini.  
 tea-PL-OM put.PST-1SG in tray  
 ‘I put the teas in the tray.’ [i.e. cups/glasses]

(23) *Taxonomic reading*

a. čây-â-ye xâreji ta'm-e behtar-i dâr-an.  
 tea-PL-EZ foreign flavor-EZ better-IND have-3PL  
 ‘Foreign teas have better flavor.’ [i.e. different kinds/brands]

b. berenj-â-ye šomâl zud mi-paz-e.  
 rice-PL-EZ north early DUR-cook-3SG  
 ‘Rices from the north cooks fast.’ [i.e. different varieties]

#### 3.1 Non-coerced Mass Nouns

Pluralizing mass nouns in Persian does not always result in coercion effects. Mass nouns like *electricity*, *water*, *snow* are commonly used with the plural marker *-hâ* in their typical mass uses, although, crucially, they can also appear

as singular (see Tsoulas (2006) for similar cases in Greek). I call mass nouns of this type *non-coerced mass nouns*.

- (24) barq-â                      ke      mi-r-e,                      aksolamal-e šomâ či-ye?  
 electricity-PL<sub>DEF</sub>                      that      DUR-go-3SG reaction-EZ you      what-is  
 ‘What is your reaction when the power shuts off?’  
<http://www.cloob.com/club/post/show/clubname/tabrizlilar/topicid/1646777/wrapper/true>

- (25) âb-â                      qat’-e.  
 water-PL<sub>DEF</sub>      cut-is.3SG  
 ‘The water is shut off.’

- (26) barf-â                      âb=šod.  
 snow-PL<sub>DEF</sub>      water=became.3SG  
 ‘The snow melted.’

Each of the examples above presents an episodic context in which the plural mass noun yields an inclusive reading. That is, the reference of the noun is to the totality of the mass that satisfies the description. Thus, in (24) and 0, *barq-â* ‘the power’ and *âb-â* ‘the water’ refer to the whole power and water supply of the locations the speakers are talking about. This indicates that plural marking on non-coerced mass nouns, in addition to its portioning-out function, yields definite descriptions. In fact, what the definite article does in the English translations of the mass nouns in the above sentences, plural marking does in Persian.

In contexts where non-coerced plural mass nouns are used anaphorically, the previous mention always appears as singular. The following naturally-occurring example reinforces our claim that plural marking on such mass nouns induces definiteness.

- (27) tu in kambud-e âb      čerâ      âb-â-ro                      hadar=mi-kon-i?  
 in this shortage-EZ water why      water-PL<sub>DEF</sub>-OM      waste=DUR-do-2SG  
 ‘With this water shortage, why do you waste the water(\*s)?’  
<http://www.hammihan.com/forum/showthread.php?t=7015&page=2792>

The definiteness effect of plural marking on non-coerced mass noun is further supported by the fact that they cannot be used as predicate nominals (28) and in the existential construction (29).

- (28) \*un-â                      âb-â /                      barf-â                      hast-an.  
 that-PL<sub>(DEF)</sub>      water-PL<sub>DEF</sub>      snow-PL<sub>DEF</sub>      is-3PL  
 ‘\*They are the water/the snow.’

- (29) tu      satl                      âb(\*-â)                      bud.  
 in      bucket                      water(\*-PL<sub>DEF</sub>)                      was.3SG  
 ‘There was (\*the) water in the bucket.’

As illustrated in 0, non-coerced mass nouns cannot be pluralized when they are kind-referring. I take this as direct evidence that the mass nouns in examples (24) to (26) are true mass nouns and that plural marking here cannot function as what Borer (2005) terms *stuff divider*. Nor can it function as a definite marker because mass nouns, according to Krifka (2004: 22), are generally used as names for atomic kinds, and as such do not need definite markers.

- (30) âb(\*-â) vase mâ hayâti-ye.  
 water(\*-PL<sub>DEF</sub>) for we vital-is.3SG  
 ‘Water is vital for us.’

<http://saharam.blogspot.com/comments.bs?postid=237>

One interesting observation is that plural marking on non-coerced mass nouns yields coerced or count reading when it occurs in indefinite noun phrases, as in (31) and (32). From this follows that definiteness is an added value to the portioning-out function of plural marking in definite noun phrases.

- (31) zemestun-â barf-â-ye sangin-i mi-bârid.  
 winter-PL snow-PL-EZ heavy-IND DUR-fell.3SG  
 ‘In winters, it snowed heavily.’ (lit. some heavy snows fell.) [snows = snowfalls]

<http://www.tiknews.org/display/?ID=70669&page=30>

- (32) barf-â-ye qašang-i ru deraxt-â jam’=šod-e.  
 snow-PL-EZ beautiful-IND on tree-PL collection=became-PP  
 ‘Beautiful snow(\*s) have stacked on the tree.’ [snows = patches of snow]

<http://www.flickr.com/photos/7752276@N02/2232431627/>

Relying on our observations, the distribution of the plural marker in Persian can be stated as follows: plural marking can occur in all kinds of count noun phrases and coerced mass noun phrases. However, in non-coerced mass noun phrases and noun phrases involving numerals+classifiers, plural marking is possible only when the noun phrase is definite. The table in (33) summarizes these generalizations.

- (33) *Plural marking on Persian noun phrases*

		<i>-hâ</i>		
		DEFINITE	INDEFINITE	KIND
COUNT		✓	✓	✓
MASS	<i>Coerced</i>	✓	✓	✓
	<i>Non-Coerced</i>	✓	*	*
NUMERALS+CLASSIFIERS		✓	*	n/a

### 3.2 Singular Definite Marker *-é* in Colloquial Persian

Recall that in colloquial Persian, singular definite nouns can optionally be marked with the stressed vowel *-é* (*-á* before consonants, cf. (16)). As shown in (34) and (35), the optional appearance of this suffix on definite bare mass nouns results in count reading because the referent is interpreted as being of an understood quantity.

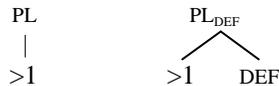
- (34) [*Watching a snowball melting away*]  
 negâ=kon! barf(-é) dâr-e âb=mi-š-e.  
 look=do.IMP snow(-SG<sub>DEF</sub>) have-3SG water=DUR-become.PRS-3SG  
 ‘Look! The snow is melting away.’
- (35) [*Addressing a boy who is holding a bottle of syrup in his hand*]  
 movâzeb=bâš šarbat(-â)-ro na-riz-i ru mobil!  
 careful=be.IMP syrup(-SG<sub>DEF</sub>)-OM NEG-pour.PRS-2SG on furniture  
 ‘Be careful not to pour the syrup on the furniture!’

We have seen in this section that although morphological marking of mass nouns for number contributes to their definite interpretation, only plural marking on mass nouns can yield non-coerced reading.

## 4. Definiteness/Number Syncretism

We have seen so far that Persian uses number markers to encode definiteness. This suggests that the semantics of definiteness is bundled together with the semantics of number. Given this, I propose that *-hâ* functions as a definite marker when its number feature is bundled with the definite feature, and as a plural marker when it is specified only with the number feature. Thus, in definite noun phrases, *-hâ* is a portmanteau morpheme with a feature bundle [+def, +pl]. But in other contexts, *-hâ* is a homophonous morpheme which represents plural number, as schematized in (36):

- (36) *-hâ*: plural and definite plural marker



These two plural morphemes enter into different systems of contrast: PL contrasts with the unmarked noun; PL<sub>DEF</sub> contrasts with definite singular noun marked with *-é*.

- (37) *Number system in Persian*

	NUMBER	DEFINITE NUMBER
Singular	Unmarked	<i>-é</i> (SG <sub>DEF</sub> )
Plural	<i>-hâ</i> (PL)	<i>-hâ</i> (PL <sub>DEF</sub> )

Based on this number system, definite noun phrases are distinguished from other types of noun phrases by the feature composition of their number markers. If the feature [def] is bundled with a value of the feature [pl], the number marker triggers a definite reading. If not, the noun phrase is ambiguous between being indefinite and kind-referring. This is illustrated in table (38):

(38) *Definiteness marking in Persian*

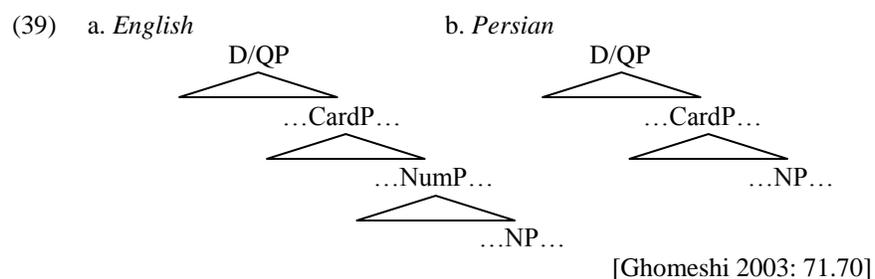
	[def]	[pl]	Exponents
DEFINITE	+	+/-	-hâ/-é/-Ø
INDEFINITE		+/-	-hâ
KIND-REFERRING		+	-hâ

## 5. Categorical Identity of Persian Plural Marker

Having established that definiteness marking in Persian can be implemented via the plural marker, we now need to determine the categorial nature of the plural marker and how it is accommodated in the Persian syntax.

### 5.1 Persian Plural Marking does not Instantiate Num

Ghameshi (2003) argues that plural marking in Persian, contra English, is licensed within D/QPs rather than NumPs. She assumes that DPs involve definite NPs and QPs indefinite NPs. Thus, Persian is different from English in that it lacks a NumP projection.



### 5.2 Persian Plural Marker: a Head or a Modifier?

Building on distributional properties of plural markers in English and Halkomelem, Wiltschko (2008) proposes that plural markers across languages can be either a projecting functional head (e.g. English) or a modifier adjoined to a head (e.g. Halkomelem). She suggests diagnostics for distinguishing these two types of plural markers according to which, modificational plural markers do not trigger agreement; their absence is not associated with a specific meaning but instead is truly unmarked; and do not allow for form-meaning mismatches.

Applying these diagnostics to Persian, we see in (40) that plural marking on the head noun does not trigger agreement with the demonstrative.

- (40) in(\*-â)      pesar-â      mi-dov-and.  
 this(\*-PL<sub>(DEF)</sub>) boy-PL<sub>DEF</sub>      DUR-run.PRES.3PL  
 ‘These boys are running.’

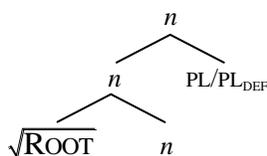
The absence of plural marking in Persian results in the unmarked noun being compatible with singular and plural interpretation. For instance, the unmarked (singular) noun *ketâb* ‘book’ is compatible with a plural interpretation (cf. section 2.3 above).

Finally, plural marking in Persian does not allow for form-meaning mismatches. This is reflected in the fact that Persian does not have any cases of *pluralia tantum*. Nouns instantiating *pluralia tantum* in English, e.g. *scissors*, *pants*, *glasses*, etc., always appear singular in Persian. When pluralized, they are construed as referring to non-atomic sets of pairs.

- (41) a. qeyçi-hâ                      b. šalvâr-â                      c. eynak-â  
       scissors-PL                      pants-PL                      glasses-PL  
       ‘pairs of scissors’                ‘pairs of pants’                ‘pairs of glasses’

Based on these observations, I propose that the Persian plural marker is a modifier adjoined to the head noun. I follow Marantz (1997, 2001) in assuming that the head noun, as a lexical category, is syntactically derived by merging a category-neutral root with the category-defining functional head *n*.

- (42) *Persian plural marker as a modifier*



## 6. Definiteness: an Inherent or a Modifying Feature

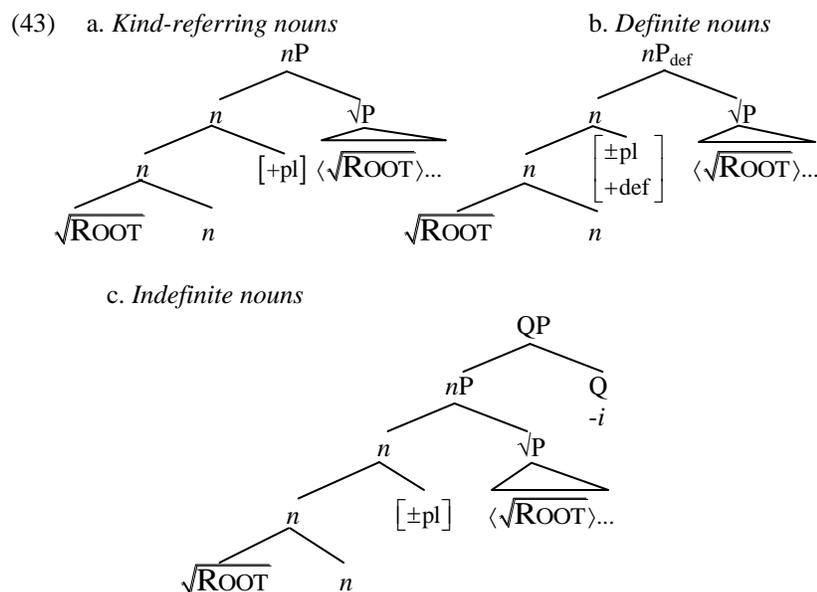
Given that definiteness in Persian is expressed via number markers, the question arises as to whether the feature [def] has the same interpretive properties as the feature [pl]? To answer this question, we need to appeal to Wiltschko’s (2008) diagnostics again. If definiteness in Persian heads a functional projection, then it must involve obligatory agreement. But this is not the case, because there is no element in Persian noun phrases that enters into definiteness agreement with the head noun. Also, the absence of definiteness marking does not result in a specific meaning. The noun without definiteness morphology is unmarked such that it is compatible with definite, indefinite, and kind-referring interpretations (see section 2.3). Thus, I propose that definiteness like number is a modifying feature in Persian that is specified on the same node in the syntactic structure. This entails that (i) definiteness is determined from the feature composition of the terminal node for the number marker; and that (ii) DP projection in Persian is not needed (cf. Ghomeshi 2008).

## 7. Analysis

In this paper, I assume Distributed Morphology as my theoretical framework. Under DM, word structure and phrase structure are derived solely from Syntax. Syntactic structures are input to Morphology, where phonological exponents are inserted into terminal nodes of the syntactic structures late in the derivation.

### 7.1 The Syntax of Number/Definiteness Marking in Persian

Building on the descriptive generalizations of number marking in Persian, I propose that the following syntactic structures are input to Morphology. I use the label  $nP_{\text{def}}$  for definite noun phrases—i.e. those involving the feature bundle  $[\pm\text{pl}, +\text{def}]$ .



At Morphology, the phonological exponents of morphemes are inserted at Vocabulary Insertion. Since we established that plural and definite plural in Persian are two independent morphemes, we need two phonological exponents to be inserted for these morphemes at Vocabulary Insertion. However, as can be seen in (45) and (46), the phonological exponents for these two morphemes turn out to be homophonous.

(44) *VI for the definite singular marker in Persian*

$$-\emptyset / -\acute{e} \leftrightarrow \begin{bmatrix} -\text{pl} \\ +\text{def} \end{bmatrix}$$

(45) *VI for the definite plural marker in Persian*

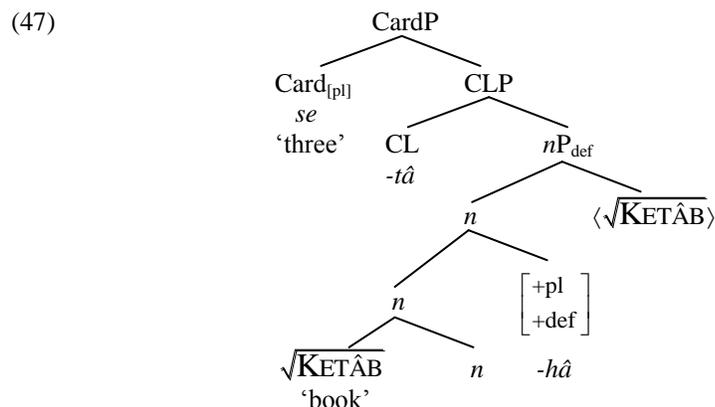
$$-h\hat{a} \leftrightarrow \begin{bmatrix} +pl \\ +def \end{bmatrix}$$

(46) *VI for the plural marker in Persian*

$$-h\hat{a} \leftrightarrow [+pl]$$

## 7.2 Plural Marking in Noun phrases with Numerals+Classifiers

Given our analysis, in this section, I try to provide answers to the questions raised in the introduction regarding the behavior of the plural marker in noun phrases with numerals. I take (47) as the representative structure of noun phrases with numerals+classifiers:



*Question A:* What prevents the plural marker from appearing in indefinite noun phrases involving numerals+classifiers? With reference to the structure in (47), I propose that the head Card is inherently specified with the feature [pl]. This prevents the spell-out of the plural marker, which bears the feature [+pl] lower in the structure.

*Question B:* What triggers the co-occurrence possibility of plural marking and numerals+classifiers in definite noun phrases? I suggest that in this context, *-hâ* spells out [+def], not [+pl].

*Question C:* Why is the plural marker optional in the context of definite noun phrases with numerals+classifiers? This is perhaps the most troubling question for which I cannot provide an answer within DM. However, I am going to propose an account inspired by constraint ranking system of Optimality Theory which addresses all the issues surrounding the occurrence of the plural marker in noun phrases with numerals+classifiers in Persian.

I propose that the appearance of the plural marker *-hâ* in noun phrases involving numerals+classifiers is determined by economy through the interaction between the following constraints:

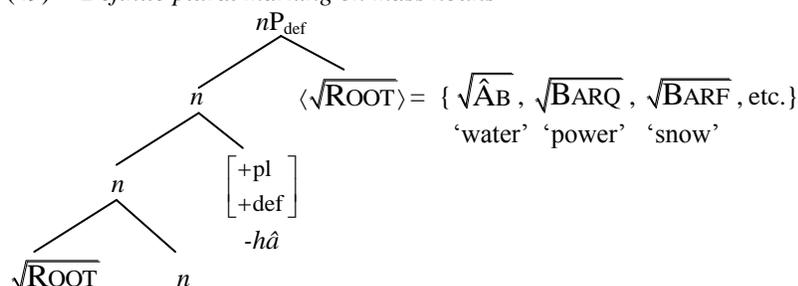
- (48) (i) [+pl] must be phonologically realized.  
 (ii) [+def] must be spelled out.  
 (iii) Avoid redundancy in number marking.

In indefinite noun phrases, the presence of the plural marker results in ungrammaticality because economy disallows the co-occurrence of the plural marker and numeral+classifier. Thus, I propose that in deriving indefinite noun phrases with numerals, constraint (iii) outranks constraint (i). In definite noun phrases, the plural marker is optional because constraints (ii) and (iii) are tied. In other words, both possibilities are equally economical.

### 7.3 Plural Marking on True Mass Nouns

Recall from section 3.1 that plural marking on true (non-coerced) mass nouns induces definiteness. Under our analysis, the plural marker spells out the feature bundle [+pl, +def].

- (49) *Definite plural marking on mass nouns*



Assuming that the definiteness-inducing plural marker spells out the [+def] feature, the question arises as to how the feature [+pl] contributes to the semantics of true mass nouns, given that they are construed as unstable entities (i.e. vague in number). With reference to the fact that the plural marker appears on non-coerced mass nouns only in episodic contexts, I hypothesize that, as far as the interpretation of number is concerned, *-hâ* functions as a *precisifier*. I take *-hâ* as an operator that takes a vague expression (e.g. a true mass noun) and returns a precise one, relative to the context of utterance (see Chierchia 2009 for a semantic model).

We have seen in this paper that the occurrence of the plural marker *-hâ* on definite count/mass nouns induces both number and definiteness. This indicates that what licenses plural marking in Persian noun phrases is the morphosyntactic feature composition of the node for number markers, not the noun's count/mass status.

## 8. Conclusion

In this paper, I have argued for an analysis of definiteness marking via Persian number markers. I have proposed that

- The definite interpretations associated with number markers are derived from their morphosyntactic feature geometry and the syntactic structure where they occur;
- In Persian number system, number and definiteness are syncretic.
- Number and definiteness features in Persian are modifying features in the sense that they do not project as functional heads.

Given the analysis presented in this paper, we can conclude that the effect of number marking in Persian is broader compared with English because in Persian definiteness is bundled with number.

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