

# Licensing by Modification: Existential Readings of Bare Plurals in Farsi <sup>1</sup>

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**Abstract.** Dayal (2004b) predicts a language in which bare plurals have more restricted existential readings than bare singulars, ‘*Hindi-in-reverse*’, to be impossible. In this paper, I provide novel data, showing that Farsi is, in fact, such a language. Nonetheless, I argue that Dayal’s account can be extended to Farsi. I propose that the unexpected pattern arises due to the special property of Farsi plural marking as a MAX operator (Jasbi, 2014). Existential readings of Farsi bare plurals only become available when they are modified. I follow Dayal’s (1995) proposal, which takes modifiers to introduce a situation variable. I argue that this proposal, together with the assumption that Farsi bare plurals lack a situation variable, similar to Dayal’s suggestion for Italian bare plurals, can explain how the presence of modifiers makes the otherwise unavailable existential reading of Farsi bare plurals available.

**Keywords:** bare plural, modification, definite, situation variable, existential reading.

## 1. Introduction

Farsi bare plurals have more restricted existential readings than bare singulars. This is an unexpected pattern under typological predictions of type-shifting approaches to bare nominals. There is a robust typological observation that there are no languages which has an overt plural indefinite determiner, but lacks an overt singular indefinite determiner (Cohen, 2007). Farsi is no exception to this generalization. Assuming the blocking relation between overt and covert type-shifters (Chierchia, 1998), the type-shifting operator  $\exists$  cannot be blocked only for bare plurals. This means that we do not expect to find a language in which bare singulars are able to get an existential reading, but bare plurals are not. Even Dayal’s revised ranking of type-shifters, which posits that  $\cap$  and  $\iota$  outrank  $\exists$ , predicts a determiner-less language in which bare plurals have more restricted existential reading than bare singulars, to be impossible. While Farsi is not a determiner-less language and only lacks a definite marker,  $\exists$  is blocked, or out-ranked in both determiner-less languages, and languages that only lack definite determiners. Therefore, the expectation based on Dayal (2004b) is for Farsi bare nominals to pattern like Hindi, which is contrary to fact. Nonetheless, I argue that the interpretation of bare nominals in Farsi fits into the typology of languages predicted by the theoretical framework of Chierchia (1998) and Dayal (2004b). The unexpected pattern arises due to the special property of Farsi plural marking as a MAX operator (Jasbi, 2014).

Another interesting property of Farsi bare plurals is that the presence of modifiers makes their otherwise unavailable existential reading available. This is known as the phenomenon of licensing by modification (Dayal, 2004a), whereby an unacceptable noun phrase is redeemed by the presence of a modifier or an unavailable reading for a noun phrase is made available with the addition of a modifier. Farsi bare plurals represent the mirror image of Italian bare plurals, in the effect of licensing by modification. I show that Dayal’s (2004a) proposal for the role of modification in licensing generic readings of Italian bare plurals can be extended to Farsi as

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well. Following her proposal, I take modifiers to introduce a situation variable. I also assume that Farsi bare plurals, like Italian bare plurals, lack a situation variable. This shared property, when carried by inherently definite bare plurals in Farsi, creates the mirror image of the role of modification in licensing of Italian bare plurals, which are inherently existential.

## 2. Farsi Bare Nominals

Farsi differs from determiner-less languages, like Hindi, in that it lacks definite articles, but has two indefinite markers *yek* and *-i* (Ghomeshi 2003, Jasbi 2016). Both singular and plural nominals can be bare. Bare nominals in Farsi have a variety of readings: *definite*, *generic*, *kind* and what seems to be *indefinite* readings, as shown in the examples below.

### (1) Definite:

- a. **bačče** xab-ide ast.  
kid sleep-PP AUX.3SG  
'The kid is asleep.'
- b. **bačče**-ha xabide and.  
kid-PL sleep-PP AUX.3PL  
'The kids are asleep.'<sup>2</sup>

### (2) Generic:

- a. **sag** pars mi-kon-ad.  
dog bark IMPF-do-3SG  
'The dog barks.'
- b. **sag**-ha pars mi-kon-and.  
dog-PL bark IMPF-do-3PL  
'Dogs bark.'

### (3) Kind:

- a. **sag** monqarez na-shode ast.  
dog extinct NEG-become.PP AUX.3SG  
'The dog is not extinct.'
- b. **sag**-ha monqarez na-shode and.  
dog-PL extinct NEG-become.PP AUX.3PL  
'Dogs are not extinct.'

### (4) Indefinite:

- a. Birun, **sag** dar-ad pars mi-kon-ad.  
outside dog have-3SG bark IMPF-do-3SG  
'Some dog is barking outside.'
- b. Birun, **sag**-ha dar-and pars mi-kon-and.  
outside dog-PL have-3PL bark IMPF-do-3PL  
'Dogs are barking outside.'

<sup>2</sup>Abbreviations are as follows: SG = singular, PL= plural, PP = past participle, AUX = auxiliary, NEG= negation, EZ = ezafe, INDF = indefinite, PST = past, IMPF = imperfective, .

## 2.1. Farsi: Hindi-in Reverse

Dayal (2004b) shows that there are differences between the interpretation of bare singulars and plurals in determiner-less languages like Hindi. While bare plurals, as shown in (5b), can take narrow scope under universal quantifiers, (5a) shows that bare singulars cannot.

- (5) a. #caroN taraf baccaa khel-rahaa-thaa.  
four ways child were-playing  
'The same child was playing everywhere.'
- b. caroN taraf bacce khel-rahe-the.  
four ways children was-playing  
'Children (different ones) were playing everywhere.'
- Hindi

Farsi presents the reverse pattern of Hindi. (6a) shows that Farsi bare singulars can get narrow scope existential readings, under universal quantifiers, however, bare plurals cannot, as shown in (6b).

- (6) a. jelo-ye har xune-yi **parčam** hast.  
front-EZ every house-INDF flag be.3SG  
'There are flags (different ones) in front of every house.'
- b. #jelo-ye har xune-yi **parčam**-ha hast/(and).  
front-EZ every house-INDF flag-PL be.3SG/(PL)

(7) shows that the narrow scope existential reading of bare plurals becomes available, when they are modified.

- (7) jelo-ye har xune-yi **parčam**-ha-ye meški hast.  
front-EZ every house-INDF flag-PL-EZ black be.3SG  
'There are black flags in front of every house.'

The contrast in the acceptability of (8) and (8b), shows that only bare singulars can get an existential reading in subject position.

- (8) *The doorbell is ringing. We are not expecting anyone*
- a. **mehmoon** pošt-e dar ast.  
guest behind-EZ door be.3SG  
'A guest is behind the door.'
- b. #**mehmoon**-ha pošt-e dar and.  
guest-PL behind-EZ door be.3PL  
only 'The guests are behind the door.'

Once again, (9) shows that the presence of modification makes the existential reading of bare plurals acceptable.

- (9) **mehmoon**-ha-ye naxande pošt-e dar and.  
guest-PL-EZ unexpected behind-EZ door be.3PL  
'Unexpected guests are behind the door.'

The occurrence of the differential object marker - RA with bare singulars in Farsi, depends on their interpretations. - RA marking is optional for kind-denoting bare singulars, obligatory for definite bare singulars, and impossible for existential bare singulars.

- (10) a. Bobbage kampiyuter (ra) extera kærð.  
 Bobbage computer RA invent did.  
 ‘Bobbage invented the computer.’ ✓ **kind**
- b. Zahra ketab \*(ra) xærid.  
 Zahra book RA bought  
 ‘Zahra bought the book’ ✓ **definite**
- c. Zahra ketab (\*ra) xærid.  
 Zahra book (\*RA) bought  
 ‘Zahra bought a book/books’ ✓ **existential**

However, bare plural objects are obligatorily RA-marked, irrespective of their interpretation.

- (11) Google **zæbanšenas**-ha \*(ra) estexdam mi-kon-ad.  
 Google linguist-PL RA hire IMPF-do-3SG  
 ‘Google hires (the) linguists.’

When modified, bare plural objects can appear without RA.

- (12) Google **zæbanšenas**-ha-ye zobde (ra) estexdam mi-kon-ad.  
 Google linguist-PL-EZ experienced RA hire IMPF-do-3SG  
 ‘Google hires (the) experienced linguists.’

### 3. Problems for current accounts

The bare plural in English can get a range of readings, as shown in (13).

- (13) a. Dogs are not extinct. *kind*  
 b. Dogs bark. *generic*  
 c. Dogs are barking. *existential*

There are two main approaches to explain the interpretation of bare plurals in English. Under the first approach, bare plurals in English are systematically ambiguous. They can be interpreted as *kinds* or as plural *indefinites* (Wilkinson, 1996; Gerstner-Link and Krifka, 1993). Under the second approach, which is the approach in this paper, the bare plural has the same denotation in all of these sentences (Carlson 1977, Chierchia 1998, Dayal 2004b).

**Chierchia (1998)** proposes a type-shifting approach to capture interpretations of bare nominals across languages. He posits that there are universal type shifting operators, as given in (14). These operators turn common nouns, which denote a property  $\langle e, t \rangle$ , into the argumental types  $e$  or  $\langle \langle e, t \rangle, t \rangle$ .

- (14)  $\langle e, t \rangle: (\cap, \iota, \exists) \rightarrow e / \langle \langle e, t \rangle, t \rangle$   
 a.  $\iota: \lambda P \iota x [P_s(x)]$   
 b.  $\cap: \lambda P \lambda s \iota x [P_s(x)]$   
 c.  $\exists: \lambda P \lambda Q \exists x [P_s(x) \wedge Q_s(x)]$

The insertion of these type-shifting operators can get blocked under certain conditions. Chierchia (1998) proposes the following restriction on type shifting:

- (15) a. *Blocking Principle (Type Shifting as Last Resort):*  
 For any type shifting operation  $\phi$  and any  $X: * \phi(X)$

if there is a determiner  $D$  such that for any set  $X$  in its domain,  $D(X) = \phi(X)$ .

b. Meaning Preservation:  $\cap > \{\iota, \exists\}$

The consequence of the blocking principle is that the insertion of a covert type-shifter is blocked, if a language has an overt determiner, corresponding to that type-shifter. For instance, in a language like English which has a definite determiner, iota cannot be used to turn a bare nominal into a definite description. Moreover, the ranking of type-shifters in (15b) predicts that bare nominals that can type-shift via  $\cap$ , cannot type-shift via  $\iota$  or  $\exists$ . Chierchia (1998) assumes that the insertion of  $\cap$  is restricted to cumulative properties that have a corresponding kind. Therefore, the insertion of  $\iota$  and  $\exists$  is limited to bare nominals for which  $\cap$  is not defined: (i) non-cumulative bare nominals (i.e., singular count noun), or (ii) bare nominals that do not have a corresponding kind.

To explain existential readings of bare plurals for which  $\cap$  is defined, Chierchia (1998) proposes ‘Derived Kind Predication’ or DKP, defined in (16a). This special composition operation introduces local existential quantification over instances of a kind in a given situation. The DKP rule makes use of the type-shifting operator ‘up’ or  $\cup$ , defined in (16b), which maps a kind to its corresponding property.

(16) a. **DKP**: If  $P$  applies to objects and  $k$  denotes a kind,

then  $P(k) = \exists x [\cup k(x) \wedge P(x)]$

b.  $\cup$ :  $\lambda P_{\langle s,e \rangle} \lambda x [x \leq P_s]$

Chierchia’s type-shifting system predicts that bare singulars in languages that lack definite articles, like Farsi, can only be type-shifted via iota. The reason is that  $\cap$  is undefined for bare singulars, and the existence of overt indefinite determiners blocks application of type-shifter  $\exists$ . Bare plurals for which  $\cap$  is defined are predicted to get narrow existential readings via DKP. The Farsi data, presented in the previous section, shows that this prediction is not borne out. Farsi bare plurals do not get narrow existential readings.

**Dayal (2004b)** shows that Chierchia’s system makes some wrong predictions for determiner-less languages. Chierchia’s system predicts that bare singulars, for which  $\cap$  is undefined, can be type-shifted via  $\iota$  and  $\exists$  in determiner-less languages. Therefore, we expect bare singulars in languages like Hindi, to be freely interpreted as definites, and indefinites. Dayal (2004b), however, argues that bare NP indefinites in languages like Hindi have scope restrictions, suggesting that they are not created with  $\exists$ . She proposes a revised version of Chierchia’s Meaning Preservation Principle as in (17) :

(17) *Revised Meaning Preservation*:  $\{\cap, \iota\} > \exists$

This new ranking of type-shifting operators predicts that bare singulars in determiner-less languages, can only be type-shifted via  $\iota$ . In addition to definite readings, bare singulars can get kind readings via intensionalization after the application of  $\iota$ . Bare plurals in these languages can be type-shifted via  $\iota$ , as well as via  $\cap$ , thus being ambiguous between definites and kind-denoting terms. They are also predicted to get narrow existential readings via DKP, which is only available to plural kind terms. The reason, Dayal (2004b) argues, is that the implicature generated by singular morphology results in the absence of plausible sub-group readings. As singular kinds are atomic entities, they do not allow access to the objects in their extension, but plural kinds do. Therefore, sub-group interpretations are only predicted to be possible with bare

plurals. As the option of allowing sub-group interpretations is always available to bare plurals, via DKP, Dayal's system predicts a determiner-less language in which bare plurals have more restricted existential readings than bare singulars ('Hindi-in-reverse'), to be non-existent. The same is also predicted for languages that only lack definite determiners, like Farsi. The application of  $\exists$  is blocked (Farsi) or outranked (Hindi) by other type-shifting operators in both kinds of languages. Since DKP is defined for bare plural kinds, we expect them to have existential readings. We saw, however, that this predication is not borne out for Farsi, which represents the unexpected 'Hindi-in-reverse' pattern.

**Krifka and Modarresi (2016)** provide an analysis of bare nominals in Farsi, within the framework of Discourse Representation Theory (DRT). They take bare singulars to be uniformly (dependent) definites. They get an apparent indefinite, number-neutral interpretation, similar to weak definites in languages like English and German.

Following Diesing (1992a), they assume that there is an operation of existential closure over the level of the  $\nu P$ . They propose that bare nominals that occur within the scope of an existential closure are interpreted as functional definites, which are dependent on the event of the existential closure. The existential condition  $\exists[x_2 \mid \dots]$  requires that the assignment  $g$  can be extended so that it maps  $x_2$  to an entity that verifies the conditions. As existential quantification does not have alternatives like numerals, it does not trigger the scalar implicature that there is only one such extension. Therefore, it gives rise to an apparent indefinite, number-neutral reading.

Krifka and Modarresi (2016) take RA-marking to indicate that the bare nominal objects have scrambled out of  $\nu P$  (Browning and Karimi, 1994; Karimi, 2003). Since scrambled bare nominals escape the existential closure (Modarresi 2014), they cannot be related to the event of the verbal predicate. This results in a definite, number-specific singular interpretation of bare singulars. The same also holds for subjects that generate within  $\nu P$ . Although subjects do not have a morphosyntactic marker of scrambling, Krifka and Modarresi (2016) argue that their structural position can be tracked by phonological clues. When inside the  $\nu P$ , subjects are accentuated and interpreted as indefinite, as shown in (18).

- |   |  |
|---|--|
| (18) a. <b>ketab oftad.</b><br>book fell.3SG<br>' <i>The book fell.</i> ' | b. <b>ketab oftad.</b><br>book fell.3SG<br>' <i>Some book(s) fell.</i> ' |
|---|--|

To account for the fact that bare plurals in the object position are always RA-marked, Krifka and Modarresi (2016) argue that plural marking under existential closure is avoided, because  $\exists [e \ x \ \mid \ \dots]$  allows for the existence of more than one event  $e$  and object  $x$ . Therefore, the plural marker would be semantically superfluous under the existential closure.

There are two problems with this account. First, it predicts that a similar ban on plural marking under existential closure should be found across languages that have number-neutral bare singulars. This prediction is not borne out in Hindi, for instance. Moreover, it fails to explain why modified bare plural objects, which still carry the semantically superfluous number-marking, are not ungrammatical under existential closure. Assuming that RA marks the movement out of the existential closure, the data in (12), repeated here as (19), shows that modified bare plural objects can stay under the existential closure, as they do not have to be RA-marked.

- (19) Google **zæbanšenas**-ha-ye zobde (ra) estexdam mi-kon-ad.  
 Google linguist-PL-EZ experienced RA hire IMPF-do-3SG  
 ‘Google hires (the) experienced linguists.’

#### 4. Farsi bare plurals are strong definites

I propose that the unexpected pattern of Farsi arises due to the special property of Farsi plural marking as a MAX operator (Jasbi, 2014). Farsi bare plurals have been argued to be definite by Ghomeshi (2003), Ghaniabadi (2009) and Nomoto (2013). However, unlike these accounts, which take the connection between definiteness and plurality to be syntactically established, I follow Jasbi (2014) in taking the definiteness to be encoded in the denotation of the plural marker of Farsi, *-ha*. Making a distinction between weak and strong definites (Poole, 2017; Schwarz, 2009), I take Farsi bare singular definites, which are type-shifted via  $t$ , to be weak definites (Krifka and Modarresi, 2016). Since Farsi bare plurals are inherently definites, and cannot be type-shifted, I refer to them as *strong* definites (Poole, 2017). In other words, I take the distinction between weak and strong definites to arise from the ability of the associated bare nominal to type-shift.

Motivated by a series of original observations, Poole (2017) introduces the notion of  $\Pi$ -positions. These are syntactic environments, where a DP must denote a property  $\langle e, t \rangle$ . There are four  $\Pi$ -positions: the pivot of an existential construction (20a), the color term of a change-of-color verb (20b), the name argument of a naming verb (20c), and predicate nominals (20d).

- (20)  $\Pi$ -positions (Poole, 2017)
- |   |                                  |
|---|----------------------------------|
| a. There is [ <b>a potato</b> ] $\langle e, t \rangle$ in the pantry. | <i>Existential constructions</i> |
| b. Megan painted the house [ <b>magenta</b> ] $\langle e, t \rangle$  | <i>Change-of-color verbs</i>     |
| c. Irene called the cat [ <b>Snowflake</b> ] $\langle e, t \rangle$   | <i>Naming verbs</i>              |
| d. Erika became [ <b>a teacher</b> ] $\langle e, t \rangle$           | <i>Predicate nominals</i>        |

He argues that seemingly type- $e$  expressions that occur in  $\Pi$ -positions, in fact, are covertly type-shifted into property type  $\langle e, t \rangle$ . This means that only type- $e$  expressions that cannot type-shift into properties, are prohibited from  $\Pi$ -positions. He defines the *definite generalization* as (21).

- (21) **Definite Generalization** (Poole, 2017):  $\Pi$ -positions prohibit strong definite descriptions.

The data in (22)-(28), show that Farsi bare plurals are ungrammatical in all  $\Pi$ -positions. The presence of modification renders the occurrence of bare plurals in  $\Pi$ -positions, grammatical.

(i) *Existential constructions*: The contrast in (22) shows that Farsi bare plurals are ungrammatical in existential constructions, (22a), but bare singulars are not, (22b).

- |  |   |
|--|---|
| (22) a. *ru miz <b>ketab</b> -ha hast-(and).<br>on table book-PL be-3PL<br>‘There are books on the table.’ | b. ru miz <b>ketab</b> hast.<br>on table book be.3SG<br>‘There are books on the table.’ |
|--|---|

When modified, however, bare plurals become acceptable in existential constructions, as shown in (23).

(23) ru miz **ketab**-ha-ye zabanšenasi hast.  
 on table book-PL-EZ linguistics is  
 ‘There are linguistic books on the table.’

(ii) *Change-of-color verbs*: The sentences in (24), show that Farsi bare plurals are ungrammatical with change-of-color verbs, (24a), but bare singulars are not, (24b).

(24) a. \*Zahra divar-ha ra **rang**-ha zad.                      b. Zahra divar-ha ra **rang** zad  
 Zahra wall-PL RA color-PL hit.3SG                      Zahra wall-PL RA color hit.3SG  
 ‘Zahra painted the walls colors.’                      ‘Zahra painted the walls a color.’

(25) shows that modified bare plurals are acceptable with change-of-color verbs.

(25) Zahra divar-ha ra **rang**-ha-ye shad zad.  
 Zahra wall-PL RA color-PL-EZ happy hit.3SG  
 ‘Zahra painted the walls bright colors.’

(iii) *Naming verbs*: The sentences in (26) show that Farsi bare plurals are ungrammatical as the name argument of naming verbs, (26a), but bare singulars are not, (26b).

(26) a. \*raees-jomhoor moxalef-an-e xod ra **terrorist**-ha xan-d.  
 president opponent-PL-EZ self RA terrorist-PL cal-.PST.3SG  
 ‘The president called his opponents terrorists.’  
 b. raees-jomhoor moxalef-an-e xod ra **terrorist** xan-d.  
 president opponent-PL-EZ self RA terrorist cal-.PST.3SG  
 ‘The president called his opponents terrorists.’

Once again, (27) shows that the modification makes bare plurals acceptable with naming verbs.

(27) raees-jomhoor moxalef-an-e xod ra **terrorist**-ha-ye xareji xan-d.  
 president opponent-PL-EZ self RA terrorist-PL foreigner cal-.PST.3SG  
 ‘The president called his opponents foreign terrorists.’

(iv) *Predicate nominals*: Finally, the contrast in (28) shows that Farsi bare plurals are ungrammatical with predicate nominals, (28a), but bare singulars are not, (28b).

(28) a. \*do ozv-e hezb **vazir**-ha shod-and.  
 two member-EZ party minister-PL become.PST-3PL  
 ‘Two members of the party became ministers.’  
 b. do ozv-e hezb **vazir** shod-and.  
 two member-EZ party minister become.PST-3PL  
 ‘Two members of the party became ministers.’

The example in (29) shows that modified bare plurals are acceptable with predicate nominals.

(29) do ozv-e hezb **vazir**-ha-ye bargozide-ye dolat shod-and.  
 two member-EZ party minister-PL-EZ selected-EZ government become.PST-3PL  
 ‘Two members of the party became the government’s selected ministers.’

I take the ungrammaticality of bare plurals in  $\Pi$ -positions as evidence that they denote type-e expressions that cannot type-shift. The acceptability of modified bare plurals in  $\Pi$ -positions, shows that they can be of property type  $\langle e,t \rangle$ . In the next section, I will explain how the presence of modification makes type-shifting of bare plurals possible.



The distribution of Farsi bare plurals in predicational and specificational copular sentences provides further evidence for their status as type-e expressions. (30) shows that Farsi bare plurals are ungrammatical in the second nominal position of predicational copular sentences, which needs a property type.

- (30) a. \*ma **danešju**-ha hast-im.  
           we student-PL be-1PL  
           ‘we are students.’  
       b. ma **danešju** hast-im.  
           we student be-1PL  
           ‘we are students.’

When modified, bare plurals become acceptable.

- (31) ma **danešju**-ha-ye zabanšenasi-im  
       we student-PL-EZ linguistics-1PL  
       ‘we are linguistics students.’

(32) Both bare plurals and singulars are acceptable in the second nominal position of specificational copular sentences, which takes an expression of type e (Heycock 2012, Romero 2005).

- (32) a. moshkel **daneshju** ast.  
           problem student be-3SG  
           *The problem is the/a student.*  
       b. moshkel **daneshju**-ha and.  
           problem student-PL be-3PL  
           *The problem is students.*

I follow Poole (2017) in taking the type rigidity of strong definites to come from their syntactic structure. Poole (2017) proposes that the strong definite determiner and nominal type-shifters occupy  $D^0$ . As they compete for the same syntactic slot, they are in complementary distribution. My proposed structures for Farsi bare singular and plural DPs are given in (33).

- (33) a. [DP (**SHIFTER**) [ $nP$   $N^0$  NP]] → Bare singulars; Weak definite; Type shifting possible  
       b. [DP **-ha**<sub>STRONG</sub> [ $nP$   $N^0$  NP]] → Bare plurals; Strong definite; Type shifting impossible



Following Jasbi (2014), I take (34) as the denotation of the Farsi plural marking *-ha*. It takes a property P as argument and applies the operator MAX to cumulated property \*P, yielding the largest plural entity that satisfies \*P.

- (34)  $\llbracket \text{-ha} \rrbracket = \lambda P_{\langle e,t \rangle}. \text{MAX}(*P) \wedge |\llbracket P \rrbracket| > 1$ , if there exists a maximal plural entity in P, undefined otherwise.

This is equivalent to (35).

- (35)  $\llbracket \text{-ha} \rrbracket = \lambda P_{\langle e,t \rangle}. \iota x.(P(x)) \wedge |x| > 1$ , if there exists a maximal plural entity in P, undefined otherwise.

Notice that the proposed meaning of *-ha* is the same as the denotation of  $\iota$ , which is crucially different from  $\cap$ . I follow Dayal (2004b) to distinguish between  $\iota$  and  $\cap$  operators in terms of intensionality. The operator  $\cap$  is the intensional version of iota. Dayal (2004b) argues that  $\iota$

is higher on the scale of definiteness than  $\cap$ . Languages vary in choosing different points in the scale as the cut-off for lexicalization. No language, however, can lexicalize  $\cap$ , which is lower on the scale, without first lexicalizing  $\iota$ , which is higher. Adding the intensionality to the difference in the type rigidity (Poole, 2017), we expect to find four types of definites across languages, as shown in (36).

(36) *Types of Definites*

<i>Definite</i>	<b>INTENSIONALITY</b>	<b>TYPE-SHIFTING</b>
$\cap_{\text{WEAK}}$	✓	✓
$\iota_{\text{WEAK}}$	*	✓
$\cap_{\text{STRONG}}$	✓	*
$\iota_{\text{STRONG}}$	*	*

### 5. Fitting Farsi into the typology

I adapt the standard view that common nouns are of type  $\langle e,t \rangle$ . Assuming Dayal’s ranking of type-shifter, they can be type-shifted by  $\cap$  and  $\iota$ . The application of  $\exists$  is blocked in Farsi due to the existence of overt indefinite determiners. Therefore, Farsi bare nominals are ambiguous between definites and kind-denoting terms (Dayal 2004b, Krifka and Modarresi 2016).

*Definite readings:* Both singular and plural bare nominals can get definite readings. Bare singulars get definite readings by type-shifting via Iota. As type-shifted definites, bare singulars are weak definites (Poole, 2017; Krifka and Modarresi, 2016). Bare plurals, on the other hand, are inherently definite, by virtue of the denotation of plural marker *-ha*. Bare plural DPs cannot host a covert type-shifter, thus they are strong definites.

*Existential readings:* Bare singular objects and some  $\nu$ P internal subjects allow narrow existential readings via the mechanism of pseudo-incorporation (Modarresi 2014; Krifka and Modarresi 2016). The unavailability of existential readings for Farsi bare plurals follows from their definiteness ( $\iota_{\text{STRONG}}$ ) and type rigidity. There are two ways for Farsi bare plurals to get an existential reading: (1) staying in the scope of the existential closure, (2) via the DKP rule. However, both of these options need bare plurals to type-shift. They either have to type-shift to property type to stay under existential closure, or have to type-shift via  $\cup$  in order for DKP to apply to them. As Farsi bare plurals cannot type-shift, they cannot yield existential readings.<sup>3</sup>

*Kind readings:* Both bare singulars and plurals in Farsi, can get kind interpretations. Neither of them, however, can type-shift via  $\cap$ . To combine with a kind-level predicate, they must be mapped to the associated individual concept via abstraction over the world/situation variable. This mismatch can be repaired by intensionalization. Type-mismatch repairing mechanisms can only apply as a last resort, thus they only apply later in the course of derivation.

It should be highlighted that the availability of this kind of type-shifting for bare plurals, is not in contrast with our assumption about the type rigidity of bare plurals. *-ha* is only in complementary distribution with nominal type-shifters, which occupy  $D^0$ , because every DP structure can only host one of them. This does not rule out the application of type-mismatch repairing type-shifting mechanisms that apply outside of the DP domain. Therefore, I conclude

<sup>3</sup>Dayal (2013) proposes to eliminate existential closure from DKP. Her modified DKP rule, however, still only applies to kind terms formed by  $\cap$ . Farsi bare plurals are crucially formed via  $\iota$ , not  $\cap$ .

that there are two kinds of type-shifting mechanisms: (i) nominal type-shifters, which occupy  $D^0$ , (ii) type-mismatch repairing type-shifters, which apply outside of DP domain. These type-shifters are constrained by two different economy principles. (ia) ‘*Avoid structure*’: Nominal type-shifters are applied at the earliest possible level (Chierchia, 1998) (iia) ‘*last resort*’: Type-shifting for repairing type-mismatch is costly, and can only be used as a last resort (Partee and Rooth, 1983).

The table in (37) provides a summary of expected interpretations of bare nominals in a language that lacks definite determiners, but has definite bare plurals, like Farsi.

(37) *Interpretation of bare nominals in Farsi*

	<b>BARE SINGULAR</b>	<b>BARE PLURAL</b>
Kind	✓ $\iota$ + intensionalization	✓ intensionalization
Definite	✓ $\iota$	✓ by default
Narrow scope existential	✓ pseudo-incorporation	*
Wide scope existential	* $\exists$ outranked by $\iota$	*

There are two cases that need further explanation. First, the seemingly indefinite reading of bare singulars and unmodified bare plurals, as was shown in (4), repeated here as (38):

- (38) a. Birun, **sag** dar-ad pars mi-kon-ad.  
 outside dog have-3SG bark IMPF-do-3SG  
 ‘Some dog is barking outside.’  
 b. Birun, **sag**-ha dar-and pars mi-kon-and.  
 Outside dog-PL have-3PL bark IMPF-do-3PL  
 ‘Dogs are barking outside.’

Following Dayal (2004b), I argue that bare nominals do not enforce familiarity presuppositions. The indefinite reading of Farsi bare nominals in subject position only arises in contexts, where the (plural) entity referred to, is not salient. The presence of the adverb “*outside*” in (38), is crucial in the availability of the indefinite reading. If we change the adverb to “*in our garden*”, for instance, the indefinite reading disappears. In other words, bare nominal subjects only get indefinite readings, when their referents are not established in the common ground.

I make a distinction between indefinite readings of bare nominals, as shown in the above examples, and their existential readings, as shown in (8), repeated here as (39).

- (39) *The doorbell is ringing. We are not expecting anyone*  
 a. **mehmoon** pošt-e dar ast.  
 guest behind-EZ door be.3SG  
 ‘A guest is behind the door.’  
 b. #**mehmoon**-ha pošt-e dar and.  
 guest-PL behind-EZ door be.3PL  
 only ‘The guests are behind the door.’  
 c. **mehmoon**-ha-ye naxande pošt-e dar and.  
 guest-PL-EZ unexpected behind-EZ door be.3PL  
 ‘Unexpected guests are behind the door.’

Existential readings of bare nominal subjects, which are only available to  $\nu P$  internal subjects

(Krifka and Modarresi, 2016), are not allowed for bare plurals. Existential readings of bare plural subjects only become available with the presence of modification, as the contrast between (39b) and (39c) illustrates. The indefinite reading of bare plurals, in contrast, is not affected by the presence of modification.

The second case is the optional RA-marking of kind-denoting bare singular objects, as was shown in (10a), repeated here as (40).

- (40) Bobbage kampiyuter (ra) extera kærd.  
 Bobbage computer RA invent did.  
 ‘*Bobbage invented the computer.*’

There is a difference in the interpretation of RA-marked and non-RA-marked objects. While the RA-marked object refers to an already familiar kind, the non-RA-marked object is interpreted as a novel kind. The sentence in (40) with the non-RA-marked object, for instance, is felicitous in a context where it is uttered by Bobbage’s friend right after Bobbage invented the computer. The same meaning difference is observed with modified bare plural objects. For example, the sentence in (41) with the non-RA-marked modified plural object is felicitous as headlines of newspapers, reporting about the new invention of Russian scientists. The RA-marked modified plural object, on the other hand, is used to introduce inventors of the already familiar kind “space satellites”.

- (41) danešmand-ha-ye rusi mahvare-ha-ye fazayi (ra) extera kærd-and.  
 scientist-PL-EZ Russian satellite-PL-EZ space RA invent did-3PL.  
 ‘*Russian scientists invented space satellites.*’

The kind reading of RA-marked objects is derived by the following assumptions: (1) RA-marking indicates the scrambling of nominal objects out of  $\nu P$ . (2) Intensionalization, which is required to repair the type mismatch between the definite bare singular and the kind predicate, is a last resort mechanism, thus it is applied as late as possible. Since intensionalization is not allowed to apply early in the derivation, i.e. under  $\nu P$ , where non-RA-marked objects reside, and type-shifting via  $\cap$  is not available to bare singulars or plurals, we need another mechanism to derive kind readings of non-RA-marked bare objects. I do not have a solution to what this mechanism is, but I think such ‘novel kind’ readings depend on the availability of existential readings of bare nominals. Geurts (2001) makes a similar observation about English. In contexts where a novel kind is named, an indefinite is used in the object of a kind-selecting predicate, as shown in (42).

- (42) This morning Fred invented a/\*the pumpkin crusher.

## 6. Licensing by Modification

The Farsi data show that existential readings of bare plurals become available in the presence of modification. This phenomenon, whereby the presence of modification licenses an occurrence or a certain reading of noun phrases, which is otherwise unacceptable, is known as *licensing by modification*. Different cases of this phenomenon has been reported in a number of languages (Dayal, 2004a; Wolter, 2007; Mathieu, 2012; Mascarenhas, 2012; Fong, 2020). A well known case of this phenomenon, discussed by Dayal (1995, 1998, 2004a), is ‘*subtriggering*’, whereby *any* becomes acceptable in non-modal, non-negative contexts, if modified by a relative clause

(43b), a prepositional phrase (43c) or an adverbial phrase (43d).

(43) a.\*Any student signed the petition.

b. Any student who went to the meeting signed the petition.

c. Any student at the meeting signed the petition.

d. Any student there signed the petition.

Dayal (2004b)

Dayal (2004a) discusses another case of the phenomenon of licensing by modification. Italian bare plurals are not acceptable in subject position, as shown in (44a). But (44b) shows that the presence of a modifier makes bare plurals in subject position, acceptable (Longobardi, 2000; Dayal, 2004a).

(44) a. \*Studenti hanno telefonato.

*'Students have telephoned'*

b. Studenti **che volevano sapere la data dell'esame** hanno telefonato.

*'Students who wanted to find out the date of the exam have telephoned.'* Dayal (2004b)

The presence of modification can also make otherwise unavailable generic readings of Italian bare plural objects, available. This is illustrated by the contrast between (45a) and (45b).

(45) a. \*Leo odia gatti.

*'Leo hates cats.'*

b. Leo odia gatti **di grandi dimensioni**.

*'Leo hates cats of large size.'*

Dayal (2004b)

Dayal (2004a) argues that the phenomenon of licensing by modification is crucially different from syntactic cases of licensing, in that the licenser (the post-nominal modifier) is c-commanded by the licensee (the host noun), rather than the other way around. Given this difference, she concludes that an optimal account of this phenomenon should derive these licensing effects from the interaction between the semantics of modification, the noun phrase and other expressions in the sentence.

She proposes that these effects arise because postnominal modifiers introduce an independent situation variable. The head noun which is in the same extended projection has the option of sharing the situation index of its modifier. Let us see how the presence of a situation variable can license Italian bare plurals in subject position.

Dayal (2004a) proposes that Italian bare plurals lack a situation variable. The missing situation variable in (46) is shown on the common noun, in sub-scripted square brackets. Bare plurals need to inherit the specification of the situation variable of the c-commanding verb. This is not possible, because the bare plural is not in the scope of the verb, resulting in ungrammaticality in (46).

(46) \*<sub>[IP studenti<sub>i</sub>?</sub>] <sub>[VP hanno telefonato]]</sub>

A phrasal modifier introduces an independent situation variable. The bare plural, being in the same extended projection, can inherit the specification of the situation variable on the modifier. This is shown in (47).

(47) <sub>[IP <sub>[studenti<sub>i</sub>] <sub>[che volevano sapere la data dell'esame]<sub>i</sub>]] <sub>[VP hanno telefonato]]</sub></sub></sub></sub>

Farsi represents the mirror image of Italian. Bare plurals are ungrammatical in the object position inside *vP*. The presence of modification can override the ban on bare plurals in object position. I argue that Dayal’s analysis of Italian bare plurals can be extended to capture licensing of existential readings of Farsi bare plurals, if we assume that Farsi bare plurals, like Italian bare plurals, lack a situation variable. When combined with distinct properties of bare plurals in Italian and Farsi, the lack of a situation variable on these bare plurals creates two opposite patterns. Now, let us look at arguments that support the assumption that Farsi bare plurals lack a situation variable.

### 6.1. No situation variable on Farsi bare plurals

The following examples show that Farsi bare plurals are scopally inert. They always refer to a contextually salient plural entity. Unlike bare singulars, the referent of Farsi bare plurals can never covary with spatio-temporal and world variables.

The contrast in (48) shows that the quantification introduced by the temporal adverb, does not bind a situation variable on the bare plural in (48a), but it does so, in the case of bare singulars, as shown in (48b). Since the bare plural in (48a) can only refer to a salient plural entity of mosquitoes in the context of the utterance, the sentence only has the implausible reading that the same group of mosquitoes kept entering the room.

- (48) *I forgot to close the window...*
- a. #koll-e ruz tu otaq paše-ha mi-umad-(and).  
 whole-EZ day in room mosquito-PL IMPF-came-(3PL)  
 only ‘*The whole day, the mosquitoes kept entering the room.*’
- b. koll-e ruz tu otaq paše mi-amad.  
 whole-EZ day in room mosquito IMPF-came.3SG  
 ‘*The whole day, mosquitoes kept entering the room.*’

The acceptability of (49) shows that the referent of modified bare plurals can covary with the temporal parameter.

- (49) koll-e ruz tu otaq paše-ha-ye riz mi-um-ad.  
 whole-EZ day in room mosquito-PL-EZ small IMPF-came-3SG  
 ‘*The whole day, small mosquitoes kept entering the room.*’

(50) shows a similar contrast with the spatial parameter. (50a) does not have a plausible interpretation. Since the referent of bare plurals is the same contextual salient plurality of kids, the sentence can only mean that the same group of kids are sleeping in every room, which is impossible. The acceptability of (50b) shows that the referent of bare singulars can have two distinct situation indices.

- (50) a. #tu har otaq-i bačče-ha xabide ænd.  
 in every room-INDF children sleep.PP AUX-3PL  
 ‘*The children (the same ones) were playing in every room.*’
- b. tu har otaq-i bačče xabide æst.  
 in every room- child sleep.PP AUX-3SG  
 ‘*In every room, children (different ones) were sleeping.*’

When embedded under an intensional operator, as in (51), Farsi bare plurals get wide scope,

transparent readings. (51) shows that the presence of modification makes the opaque reading of bare plurals, available.

- (51) a. donbal-e ketab-ha mi-gæšt-am  
 behind-EZ book-PL IMPF-look.PST-1SG  
 ‘I was looking for the books’  
 b. donbal-e ketab-ha-ye zabanšenasi mi-gæšt-am  
 behind-EZ book-PL-EZ linguistics IMPF-look.PST-1SG  
 ‘I was looking for linguistic books’

I conclude that Farsi bare plurals lack a free situation variable that can be bound by spatio-temporal or intensional operators.

## 6.2. Existential readings of modified bare plurals

As strong definites that lack a situation variable, Farsi bare plurals do not have any free variable. Therefore, they are ungrammatical under existential closure due to vacuous binding (Milsark, 1974). Since Farsi bare plurals cannot type-shift, they lack existential readings.

Following Dayal (1995), I take modifiers to introduce a situation variable. Bare plurals can inherit the situation variable of their modifier, as illustrated in (52).

$$(52) \iota x.P(x)_{[s]} \wedge \text{Modifier}(x)(s)$$

Notice that the result is the same as having bare plurals type-shifted via  $\cap$ , the intensional counterpart of iota.

$$(53) \iota x.P(x)_{[s]} = \cap P(x)$$

A property denotation is further achieved by type-shifting via PRED:  $x \rightarrow \cup X$  (Partee and Rooth, 1983). As PRED is not a nominal type-shifter, it can apply on Farsi bare plurals. Only type-shifters that occupy  $D^0$  are in complementary distribution with the plural marker *-ha*. Modified bare plurals would have the logical representation in (54), under the existential closure.

$$(54) \exists (\cup_{\text{PRED}}(\iota x.P(x)_{[s]} \wedge \text{Modifier}(x)(s)))$$

The equivalence of  $\cup \cap P = P$  explains why bare singulars and modified bare plurals have the same distribution under the existential closure.

## 6.3. Cross-linguistic effects of modification on the interpretation of bare plurals

The phenomenon of licensing by modification creates two opposite patterns in Italian and Farsi. In Italian, modification licenses bare plural subjects and generic readings of bare plurals. In Farsi, modification removes the ban on bare plural objects, and existential readings of bare plurals. Given that generic readings for nominals are associated with a position outside of the  $\nu P$ , and existential readings for nominals are associated with a position inside of the  $\nu P$  (Mapping Hypothesis (Diesing, 1992b)), the effect of licensing by modification can be phrased as follows: The presence of modification with Italian bare plurals makes their occurrence outside of  $\nu P$  available. In Farsi, it makes the occurrence of bare plurals inside of  $\nu P$  available.

The question is how the same phenomenon, with the same underlying cause (i.e. the lack of the situation variable), can have two opposite manifestations. The source of this variation, I

believe, lies in different interpretation potentials of Italian and Farsi bare plurals. Longobardi (1994, 2000) proposes that Italian bare plurals have a null existential determiner, which needs to be governed by the verb in order to be licensed. This means that they have to stay under existential closure. Farsi bare plurals, on the other hand, are strong definites, which have to move out of the existential closure. The ban on bare plurals' occurrence under the existential closure was shown by obligatory RA-marking of bare plural objects, and the unavailability of existential readings for bare plural subjects.

The restriction on the domain in which bare plurals can appear, is the result of lacking a situation variable. Dayal (2004a) argues that Italian bare plurals depend on another element (i.e. the c-commanding verb) to provide them with a requisite situation specification that they lack. The lack of situation variable on Farsi bare plurals results in vacuous binding under the existential closure. To avoid this, bare plurals move out of  $\nu$ P. In order to override such restrictions on their domain of occurrence, bare plurals have to repair this deficiency. This is exactly what modification does. It provides Italian and Farsi bare plurals with a situation variable, the lack of which is the source of the restrictions on their domain of occurrence.

Bare plurals that can type-shift via  $\cap$ , like in English, have a situation variable by default. The presence of modification is not expected to have any licensing effect on these bare plurals (Dayal, 2004a). The table in (55) provides a summary of the patterns observed in English, Italian, and Farsi.

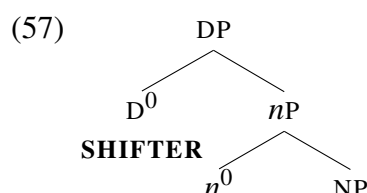
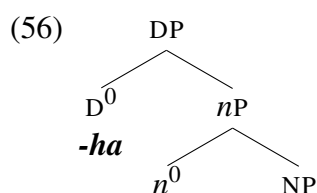
(55)

	<b>Bare Plural</b>	<b>Situation variable</b>	<b>Domain of occurrence</b>	<b>Licensing by Modification</b>
English	kind	✓	below/above $\nu$ P	no effect
Italian	existential	*	<b>below</b> $\nu$ P	(interpretation) <b>above</b> $\nu$ P
Farsi	definite	*	<b>above</b> $\nu$ P	(interpretation) <b>below</b> $\nu$ P

## 7. Conclusion

In this paper, I have discussed two patterns in the interpretation of Farsi bare plurals. (1) Farsi bare plurals have more restricted existential readings than bare singulars. (2) The presence of modifiers makes the otherwise unavailable existential reading of Farsi bare plurals available. The first pattern makes Farsi the reverse of Hindi pattern, in which bare singulars have more restricted existential readings. The Hindi-in-reverse pattern is predicted to be non-existent by Chierchia's (1998) and Dayal's (2004a) type-shifting approaches to the interpretation of bare nominals.

I argued that this unexpected pattern arises, because the Farsi plural marker *-ha*, is a MAX operator (Jasbi, 2014). Adapting ideas by Poole (2017), I proposed that Farsi bare plurals are strong definites, which cannot type-shift. (56) shows the DP structure of bare plurals, and (57) shows the DP structure of bare singulars in Farsi.





Given the strong definiteness of bare plurals, the Farsi pattern fits into the typology predicted by Dayal's (2004b) ranking of type-shifters.

To explain the availability of existential readings for modified bare plurals, I followed Dayal (2004a), in taking modification to introduce an independent situation variable. I also provided arguments to show that Farsi bare plurals lack a situation variable. Farsi represents the reverse of the licensing effect of modification on Italian bare plurals. I explained that the two opposite manifestations of licensing by modification arise, because Italian bare plurals are existentials, while Farsi bare plurals are strong definites.

An open question, which I did not discuss here, is which kinds of modifiers have licensing effects across languages. Dayal (2004a) argues that only phrasal modifiers provide the necessary situation variable that is crucial to giving rise to the licensing effect. In Farsi, both adjectival and phrasal modifiers can license the existential reading of bare plurals. Therefore, I conclude that both can introduce a situation variable. Crucially, however, both adjectival and phrasal modifiers in Farsi are post-nominal, unlike English, where only phrasal modifiers are post-nominals. This seems to suggest that the important feature for the licensing effect to arise, is the position of modifiers, with respect to the head noun. I leave the investigation of this question for future research.

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