Bare Noun (Pseudo-Incorporated) Antecedents and Anaphora: Preference for Singular Interpretation

Many languages distinguish between two realizations of syntactic objects, regular objects vs. "pseudo-incorporation" (PIN) objects (Massam 1991). In Persian there are objects marked by *-ra* (1)(a), typically leading to a definite interpretation, and (b) bare noun (BN) objects leading to an indefinite, number-neutral interpretation with narrow scope with respect to other operators, characteristic for PIN. Objects with the indefinite article *yek* (c) result in an indefinite singular reading with narrow and potentially wide scope.

(1) a. *Sara ketab-ra kharid.*   b *Sara ketab kharid.*   c. *Sara yek   ketab kharid*
       Sara book-RA bought   Sara book bought   Sara a/one book bought
       'Sara bought the book'   'Sara bought a book/books'   'Sarah bought a book'

Pseudo-incorporated objects like the BN objects (b) are often claimed to be anaphorically inaccessible (e.g. Dayal 1999 for Hindi, Asudeh & Mikkelsen 2000 for Danish, Massam 2001 for Niuean, Borthen 2003 for Norwegian, Mithun 2010 for Kampangan, Espinal & McNally 2011 for Spanish verbs of possession; for Persian, cf. Ganjavi 2007, Megerdoomian 2012). This was explained in various ways, e.g. by assuming that PIN objects refer to kinds (Aguilar-Guevara & Zwarts 2010) or are interpreted as properties (van Geenhoven 1998), that they combine with the verb by way of restriction (Chung & Ladusaw 2003) or involve DRT construction rules without the introduction of discourse referents (Farkas & de Swart 2003). Given that previous results for Chinese by Law & Syrett 2017 and for Persian by the authors (reference omitted) showed that such objects are accessible in a somewhat more limited way, we currently see two promising theories:

A.   Modarresi 2014, who assumed that BN objects introduce number-neutral discourse referents, as δ in the DRSs [x δ | [x bought δ, book(δ)=1]]. This directly captures number neutrality; reduced anaphoric update is explained by the fact that overt pronouns are specified for number, which makes number-neutral discourse referents less preferred antecedents.

B.   Yanovich 2008, elaborated by Krifka & Modarresi 2016, who assume for the interpretation of BN nouns an existential closure over events following Diesing (1992) and show bare noun objects in Persian are actually definites dependent on the events (similar to weak definites in other languages such as German and English) resulting in a DRS condition ∃[e x| x = the book of e, read(e)(x)]. Anaphoric uptake is possible by an operation of abstraction and summation similar to the one developed for anaphoric uptake of quantifiers, cf. Kamp & Reyle 1993, resulting in z = Σx [e x| x = the book of e, read(e)(x)]. Due to existential closure and summation, there might be multiple entities of single books that satisfy the description, thus explaining number neutrality, but preference for the simpler singleton interpretation is predicted as the summation operation on single entity is easier.

We report on experiments that were designed to distinguish between these hypotheses. In particular, (A) predicts that number-neutral covert anaphora should be the preferred way to pick up the antecedent BN objects, at least in contexts in which general world knowledge does not lead to a bias towards reference to a single object or multiple objects. In contrast, (B) predicts a preference for singular anaphora in such non-biased contexts, as this involves Σ over one single instance only, which is easier.

     We investigate the interaction of world-knowledge and anaphoric potential of bare noun objects (BNs) like (1b) vs. *yek*-marked objects like (1c) in three different contexts; **Neutral** without particular bias as in (2), **Singular** with bias for singular interpretation as in (3), and **Plural** with bias for plural interpretation as in (4).The experimental task consisted in selecting the antecedent, given (i) number-neutral null anaphora, (ii) singular anaphora, (iii) plural anaphora. The online experiment had 36 items with 9 fillers and 246 participants, native speakers of Persian.

(2) *Ali (ketab ☐ / yek ketab ☐) kharid.*   Neutral
     va Leila (i) *khand.* / (ii) *khand-esh.* / (iii) *khand-eshoon.*   context
     Ali (book / a book) bought and Leila read-∅. / read-it. / read-them.

(3) *Sara (television ☐ / yek television ☐) kharid*   Singular
     va too-ye otagh (i) *gozasht.* /(ii) *gozasht-esh.* /(iii) *gozasht-eshoon.* context
     Sara (television / a television) bought and in room (i) put-∅. (ii) put-it. (iii) put.them.

(4) *Leila tamam-e-ruz   varaghe ☐ / ye vargeh ☐sahih kard*   Plural
     va (i) *gozasht.* /(ii) *gozashtesh* (iii) *gozasht-eshoon too poosheh.* context
     Leila all day (exam-paper / an exam paper) marked and (i) put-∅. (ii) put-it (iii). put-them in folder.

We found that in the Neutral context with null anaphora, indefinite singular antecedents are preferred over BN antecedents, arguing against (A). In Neutral and Singular contexts in general, indefinite singular antecedents are preferred for SG and Null anaphora ($p <0.01$), consistent with the assumption of (B) that indefinite singulars introduce directly available discourse referents that do not require summation and abstraction, and hence should be preferred if anaphoric uptake is intended. The experiment also is consistent with previous findings that show that BNs are possible antecedent in all conditions (and of course preferred over singular antecedents in the Plural context ($p<0.01$)).

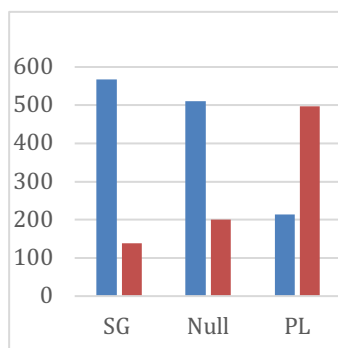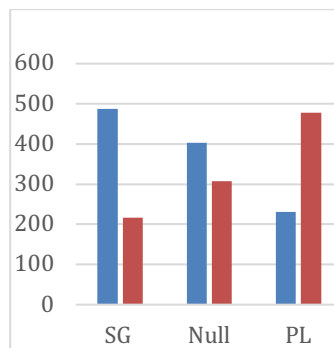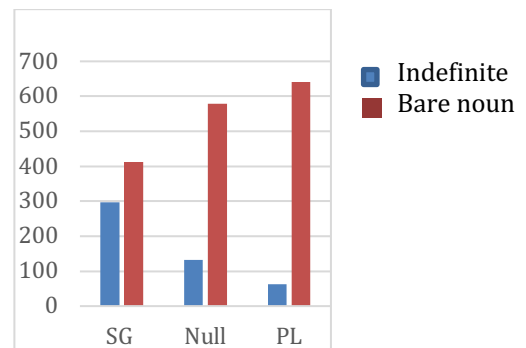Figure 1: Neutral context   Figure2: Singular Context   Figure3: Plural Context

We will also report on a second experiment in which participants were presented with a sentence containing a BN or indefinite *yek*-marked noun in three different contexts explained above; their task was to choose the anaphora in subsequent sentence (zero, singular, or plural anaphor). We will furthermore present a third experiment, in which subjects had to freely continue an initial discourse with BN and *yek*-marked antecedents in singular, neutral and plural context, with a sentence of their choice. The results, e.g. Figure 4 for Neutral Context are comparable to the experiment reported here. In particular, the free continuation experiment shows that BNs objects can be picked up easily, about often as *yek*-marked nouns, and that anaphoric pickup is slightly more frequent with singular anaphora than with neutral anaphora.
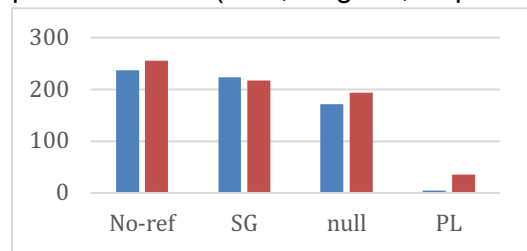

Figure 4: Completion: Neutral Context

We interpret these results as evidence against the hypothesis of Modarresi (2014) that BN antecedents introduce number-neutral discourse referents, and in favour of the hypothesis of Krifka & Modarresi (2016) that predicts that anaphoric uptake of BN is slightly more complex because it involves summation, with a general preference for a singular interpretation of BN objects.

2